

# **SERS 2025 Board Workshop**

## **Friday, February 20, 2026**

To Join the Zoom Webinar, Click the Link:

[https://ohsers.zoom.us/webinar/register/WN\\_ltgq7b7IQRaKKROQ3K8UwQ](https://ohsers.zoom.us/webinar/register/WN_ltgq7b7IQRaKKROQ3K8UwQ)

**Webinar ID:** 939 6272 1617

**Password:** 12345

To Join by Phone, Dial: (305) 224-1968 and enter the **Webinar ID:** 939 6272 1617 and **Password:** 12345 when prompted.

8:30 a.m. – 8:35 a.m.	<b>Introduction/Overview</b>	<b>Richard Stensrud, SERS Executive Director</b>
8:35 a.m. – 9:45 a.m.	<b>First Brood: One Presentation by One Man Educational Session under R.C. 171.50 and 3309.051</b>	<b>Dr. Anirban Basu - Chairman &amp; CEO Sage Policy Group, Inc.</b>
9:45 a.m. – 10:00 a.m.	<b>Break</b>	
10:00 a.m. – 11:00 a.m.	<b>Institutional Asset Allocation Update Educational Session under R.C. 171.50 and 3309.051</b>	<b>JP Morgan</b>
11:00 – 11:30 a.m.	<b>Lunch</b>	
11:30 a.m. – 12:30 p.m.	<b>Asset Allocation Discussion Educational Session under R.C. 171.50 and 3309.051</b>	<b>Farouki Majeed – SERS Chief Investment Officer and Wilshire Associates</b>
12:30 p.m. – 12:45 p.m.	<b>Break</b>	
12:45 p.m. – 1:45 p.m.	<b>Pension Sustainability Update Session Educational Session under R.C. 171.50 and 3309.051</b>	<b>CavMac SERS Actuaries</b>
1:45 p.m. – 2:00 p.m.	<b>Break</b>	
2:00 p.m. – 3:00 p.m.	<b>Ramifications of Mandatory Social Security Contributions Educational Session under R.C. 171.50 and 3309.051</b>	<b>Tom Lussier LGV&amp;A</b>
3:00 p.m. – 3:05 p.m.	<b>Closing Remarks</b>	<b>Richard Stensrud SERS Executive Director</b>

FY2026 SERS Board Roll Call

- James Rossler \_\_\_\_\_
- Daniel Wilson \_\_\_\_\_
- Jeanine Alexander \_\_\_\_\_
- Jeffrey DeLeone \_\_\_\_\_
- Matthew King \_\_\_\_\_
- Catherine Moss \_\_\_\_\_
- Rebekah Roe \_\_\_\_\_
- Aimee Russell \_\_\_\_\_
- Frank Weglarz \_\_\_\_\_



**Anirban Basu, MPP, MA, JD, Ph.D.**

Chairman & Chief Executive Officer  
Sage Policy Group, Inc.  
575 South Charles Street Suite 505  
Baltimore, MD 21201  
410-522-7243  
email: [abasu@sagepolicy.com](mailto:abasu@sagepolicy.com)

**Career Brief**

Anirban Basu is the Chairman and CEO of Sage Policy Group, an economic and policy consulting firm headquartered in Baltimore, Maryland with an office in Orlando, Florida.

In 2014, Maryland Governor Larry Hogan appointed him Chair of the Maryland Economic Development Commission (2014-2021). He serves as Chairman of the Baltimore County Economic Advisory Committee. He also serves the chief economist function for Associated Builders and Contractors, the Construction Financial Management Association, the Modular Building Institute, the Maryland Bankers Association, the International Food Distributors Association, and several others.

In 2007, 2016, and 2022, the Daily Record newspaper selected Dr. Basu as one of Maryland's 50 most influential people. The Baltimore Business Journal named him one of the region's 20 most powerful business leaders in 2010.

Dr. Basu is currently on the boards of the University of Maryland School of Law, St. Mary's College, the University of Maryland Medical Center, the University System of Maryland Foundation, the Lyric Opera House, the B&O Railroad Museum, and the Center Club. He is also on Truist Bank's advisory board.

Dr. Basu earned his B.S. in Foreign Service at Georgetown University. He earned his Master's in Public Policy from Harvard University's John F. Kennedy School of Government, and his Master's in Economics from the University of Maryland, College Park. He acquired his Juris Doctor at the University of Maryland School of Law. He completed his doctoral work at UMBC with a concentration in health economics.

He has lectured at several universities, including Johns Hopkins University and Goucher College.

# First



# Brood

**One Presentation by One Man**

**By: Anirban Basu**  
**MPP, MA, JD, PHD**  
**Sage Policy Group, Inc.**

**On Behalf of**  
**School Employees**  
**Retirement System of Ohio**

**February 20, 2026**

# Judge Dread

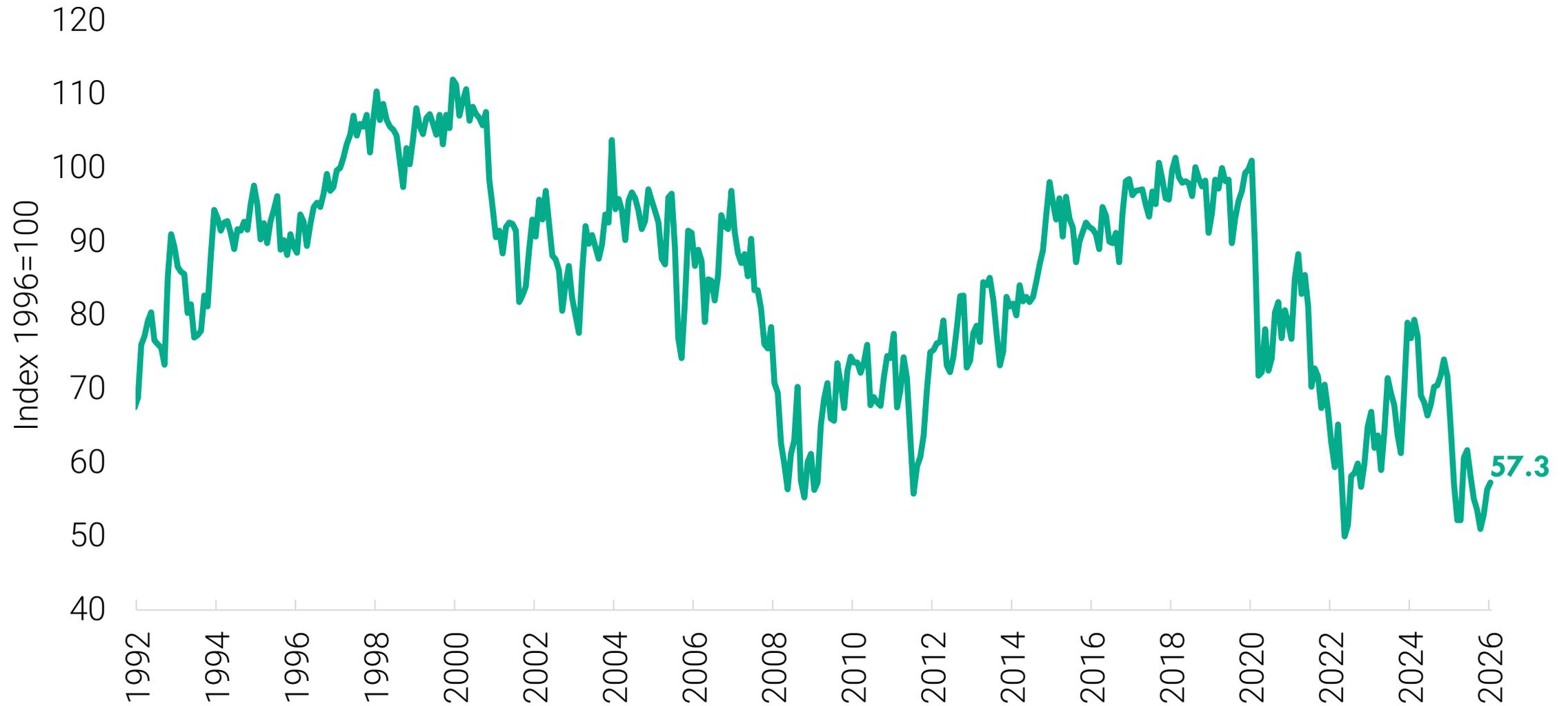
**SAGE** | policy group



Judge Dredd (1995) – Sylvester Stallone as Judge Joseph Dredd

# University of Michigan Index of Consumer Sentiment

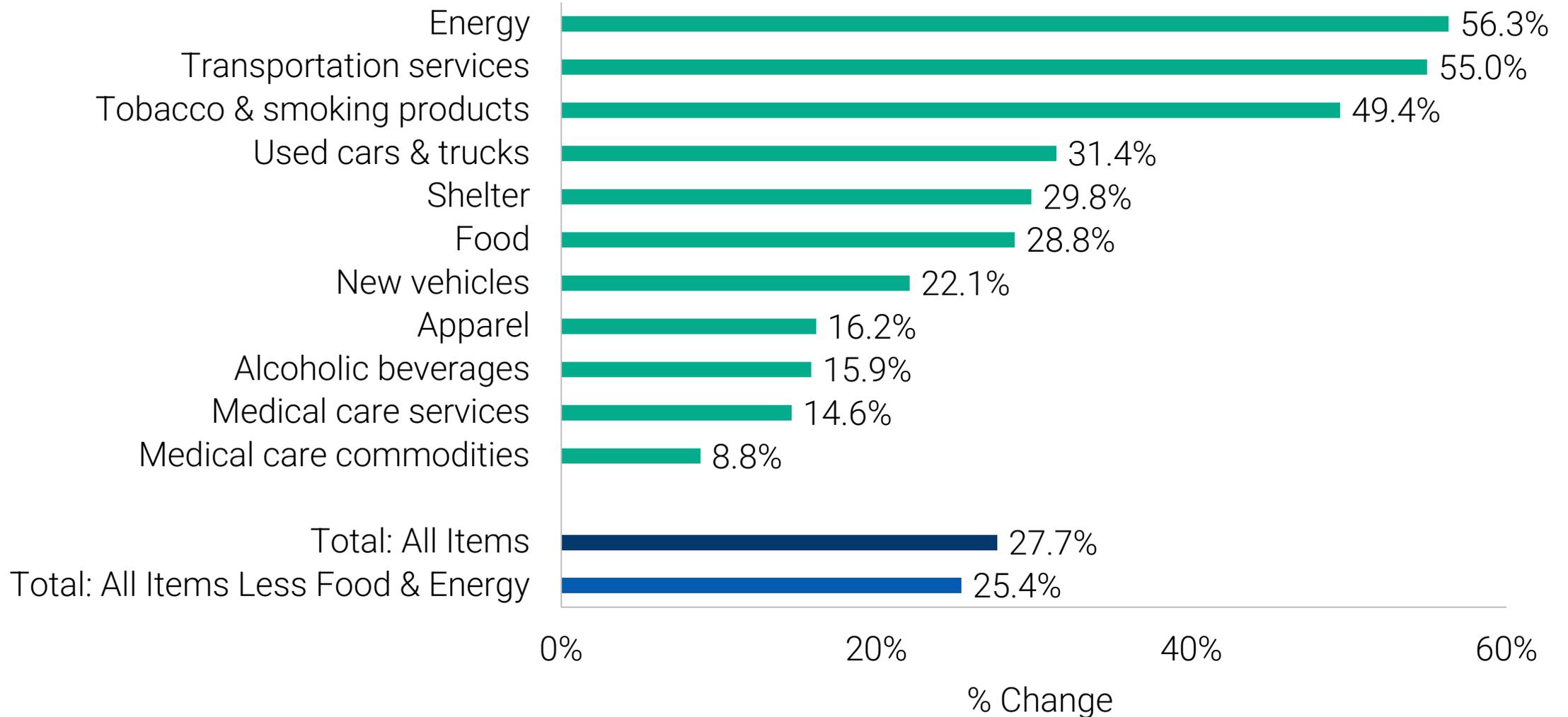
1992 – February 2026



Source: University of Michigan Survey of Consumers

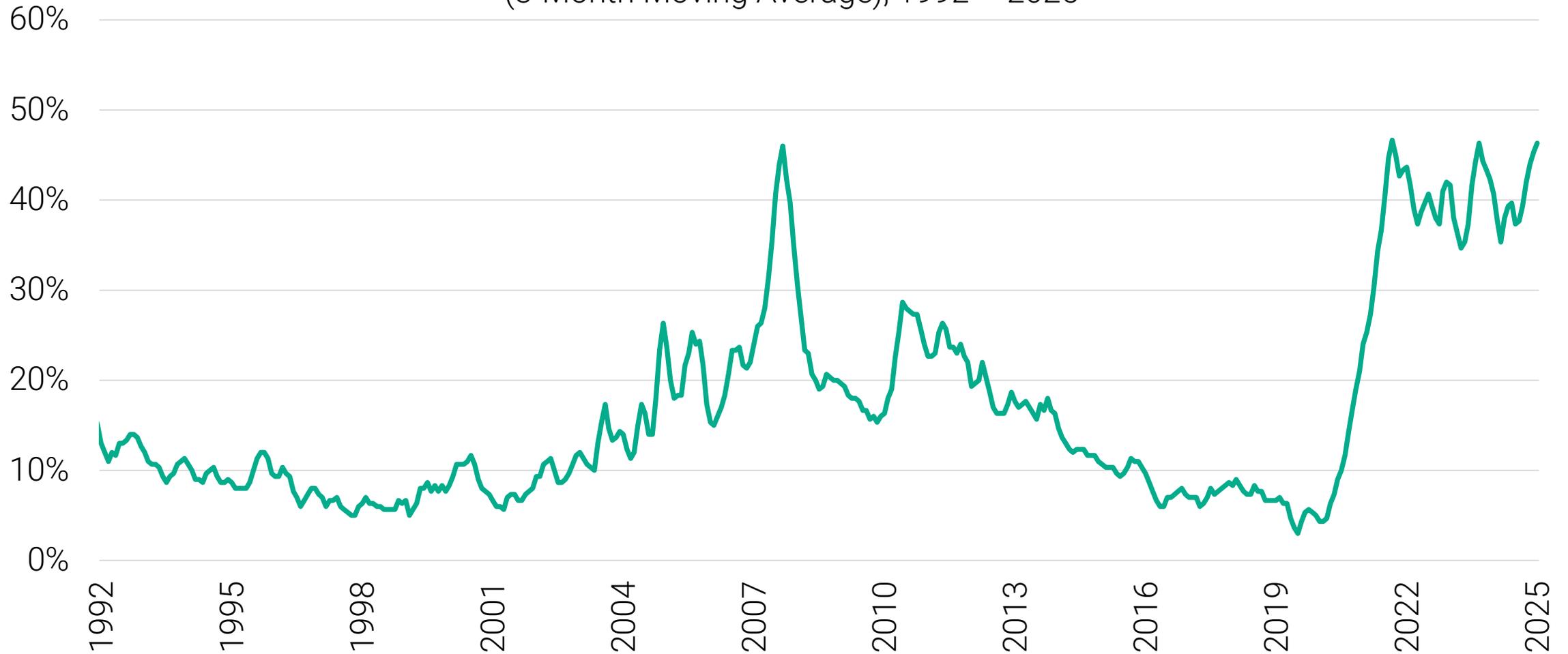
# Consumer Price Index, Select Categories (SA)

% Change May 2020 v. January 2026



# Frustration with High Prices Persists

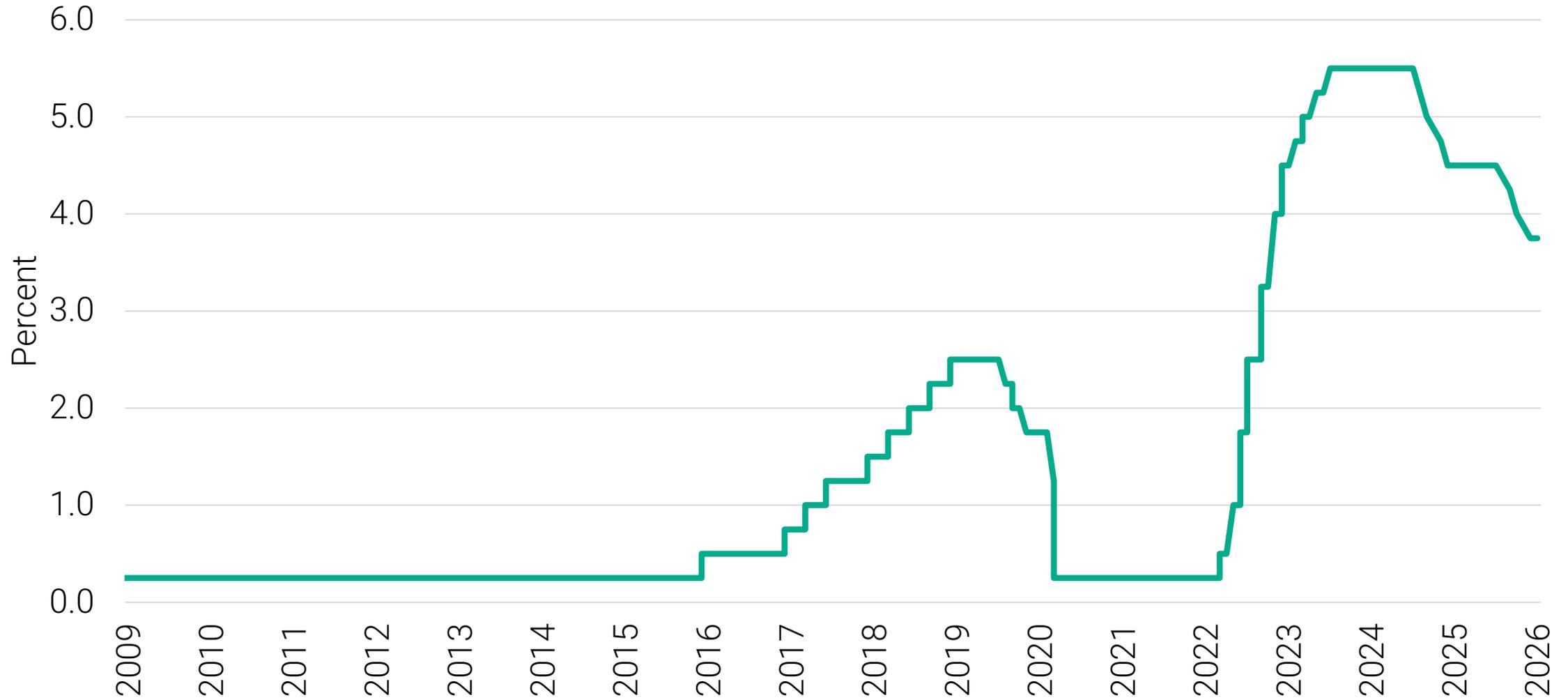
% of Consumers Blaming High Prices for Poor Personal Finances  
(3-Month Moving Average), 1992 – 2025



Source: University of Michigan Survey of Consumers

# Federal Funds Rate, Target Rate Upper Limit

2009 – 2026



Source: Board of Governors of the Federal Reserve System

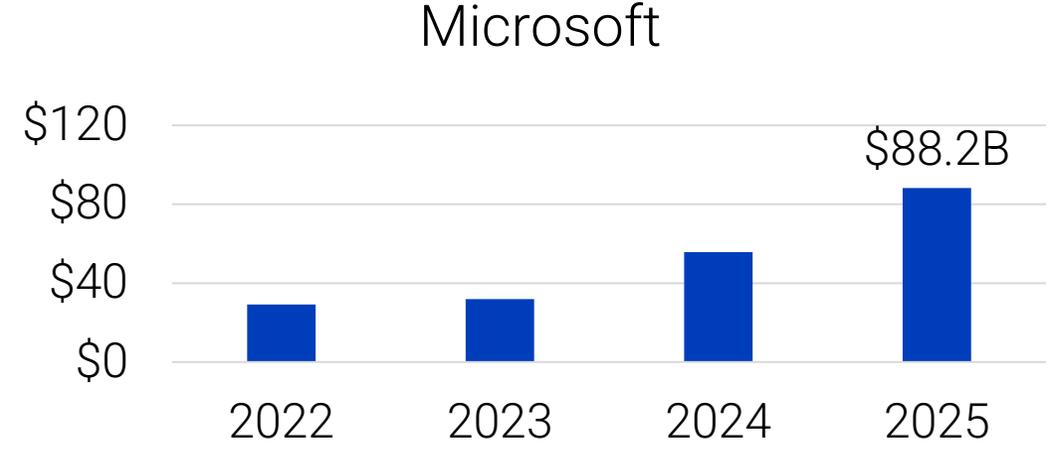
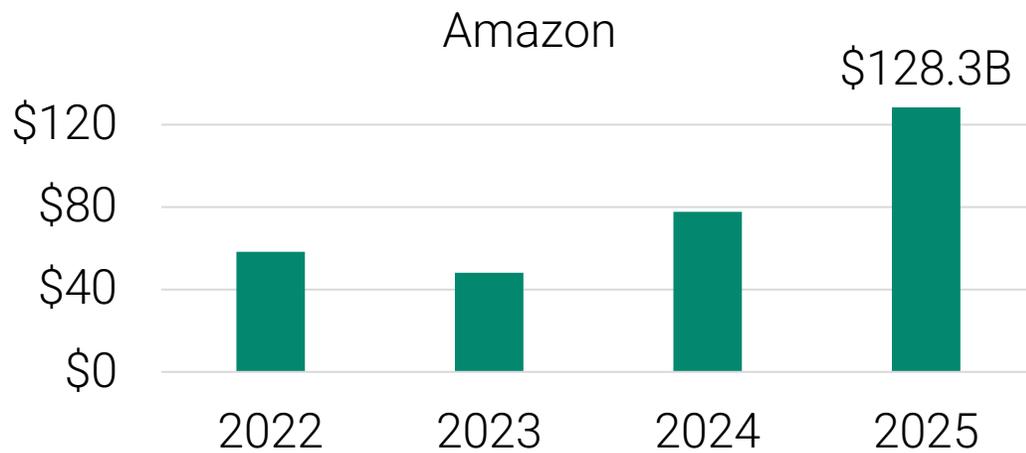
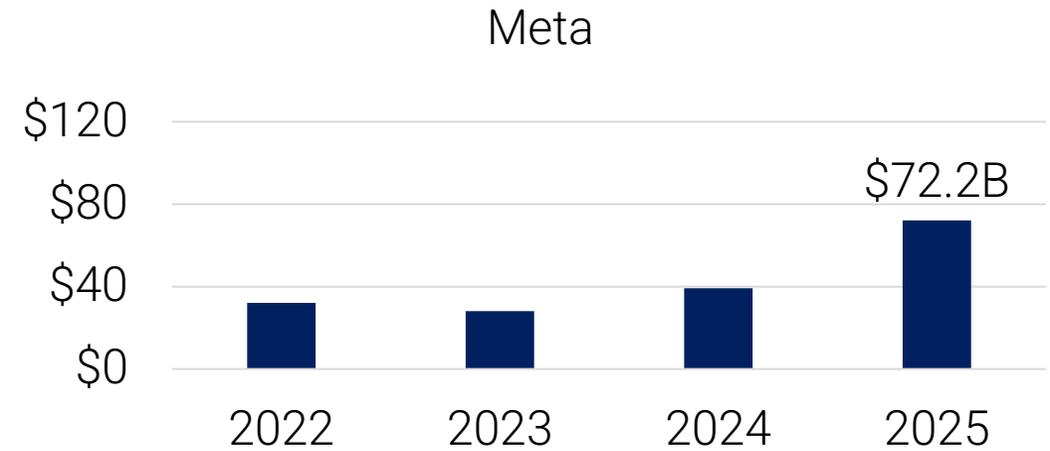
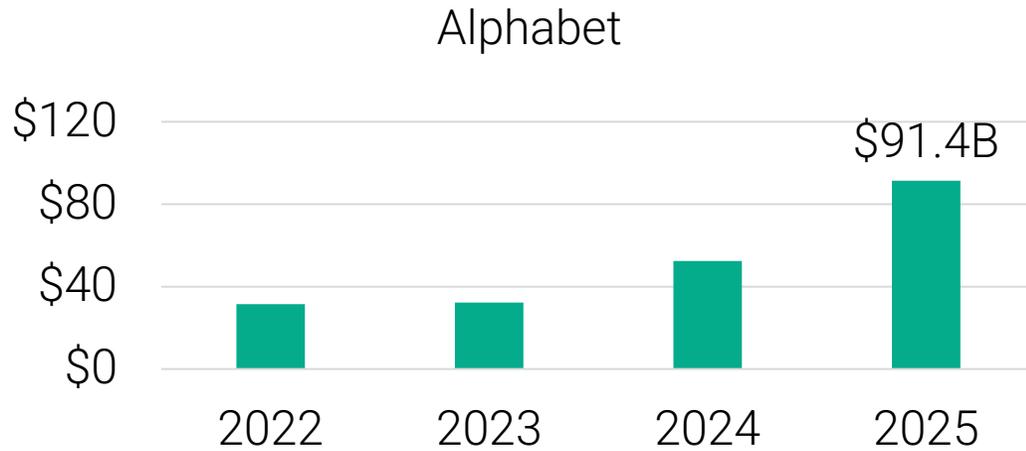
# Over the Top



Over the Top (1987)—Sylvester Stallone as long-haul truck driver Lincoln Hawk

# Big Tech's AI-Fueled Spending Surge

Annual Capital Expenditures (\$Billions), 2022 – 2025



Source: Company financial statements

# S&P 500

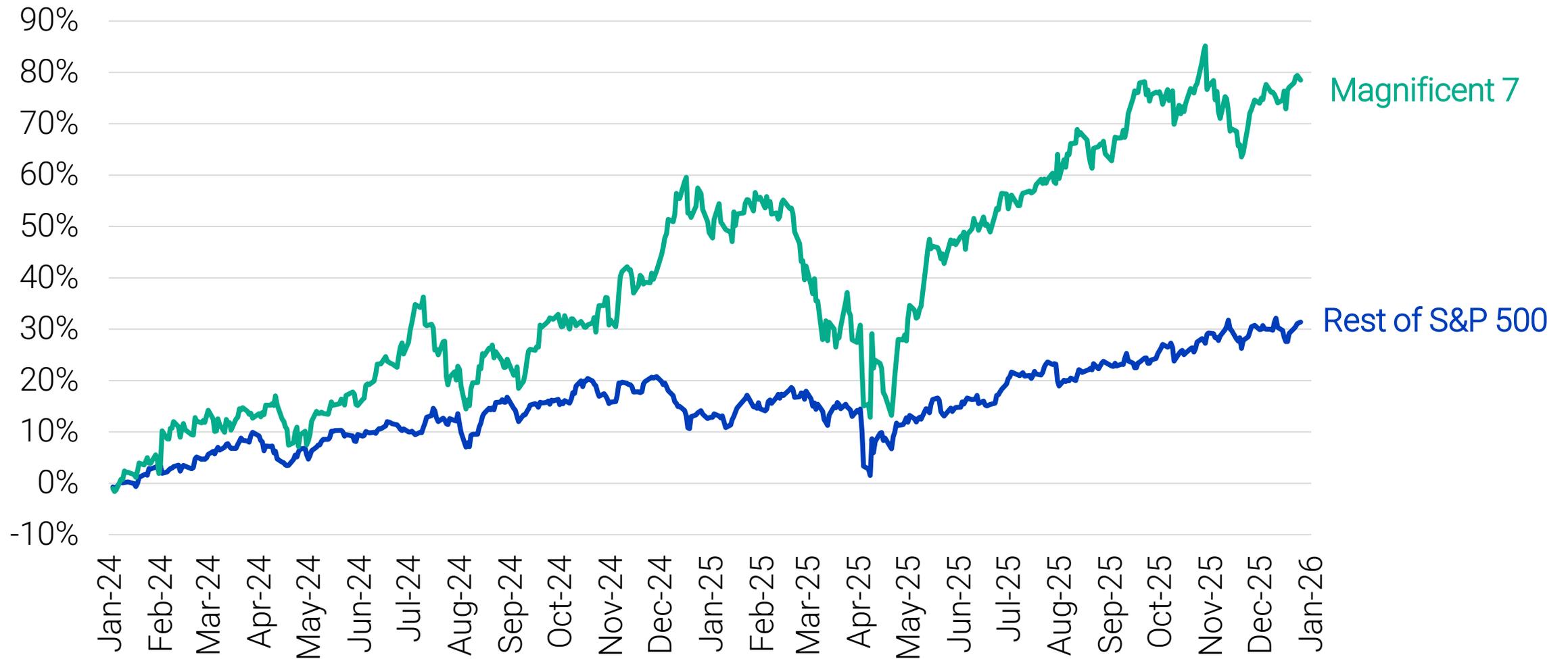
2020 – January 2026



Source: FRED, Federal Reserve Bank of St. Louis

# Magnificent 7 v. Rest of S&P 500

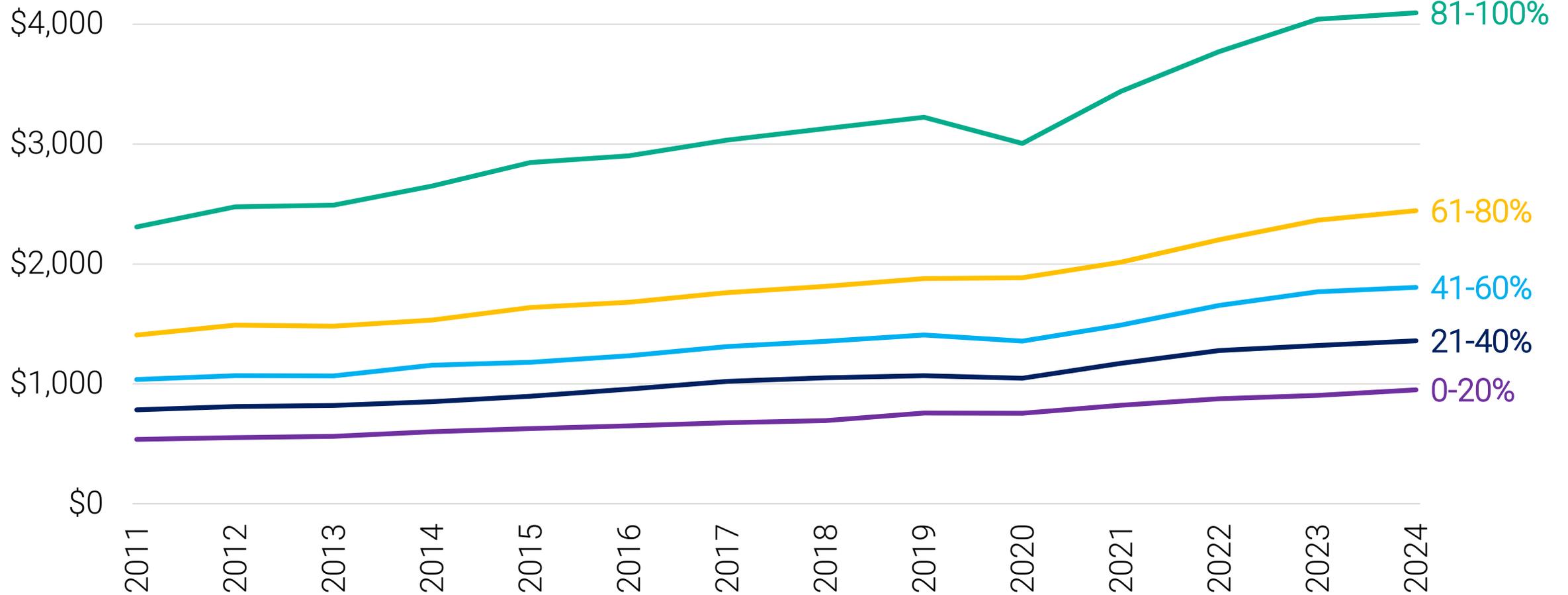
% Change in Close Price Since January 2024



Source: Yahoo! Finance

# Top 20% of Earners Do Almost 40% of Spending

Aggregate Spending (\$ Billions) by Income Quintile



Source: U.S. Bureau of Labor Statistics

# The Spendables

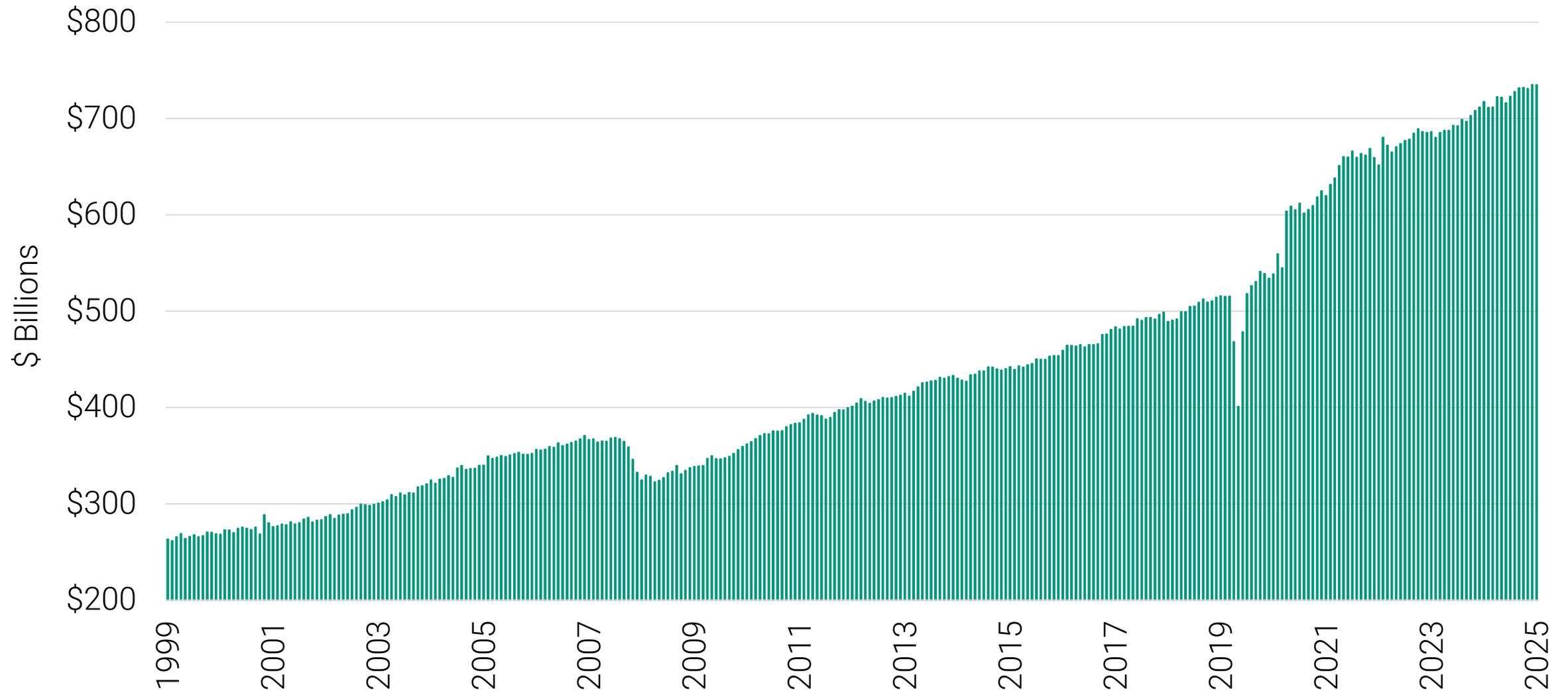


The Expendables (2010) — Sylvester Stallone as mercenary Barney Ross

**SAGE** | policy group

# Tango With Cash

U.S. Retail Sales, 1999 – December 2025

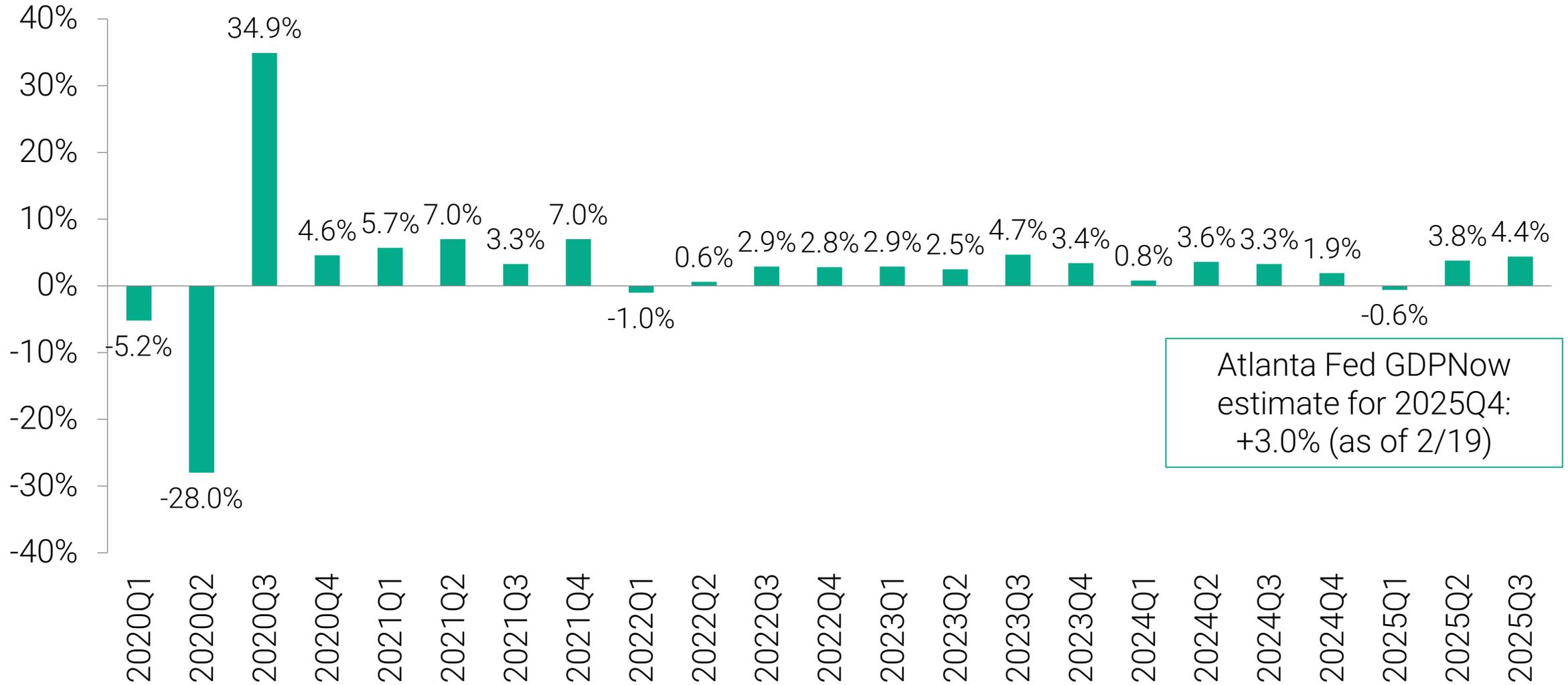


Source: U.S. Census Bureau

Tango & Cash (1989)—Sylvester Stallone as police officer Ray Tango

# U.S. Gross Domestic Product Growth

% Change from Preceding Period (SAAR), 2020 – 2025Q3

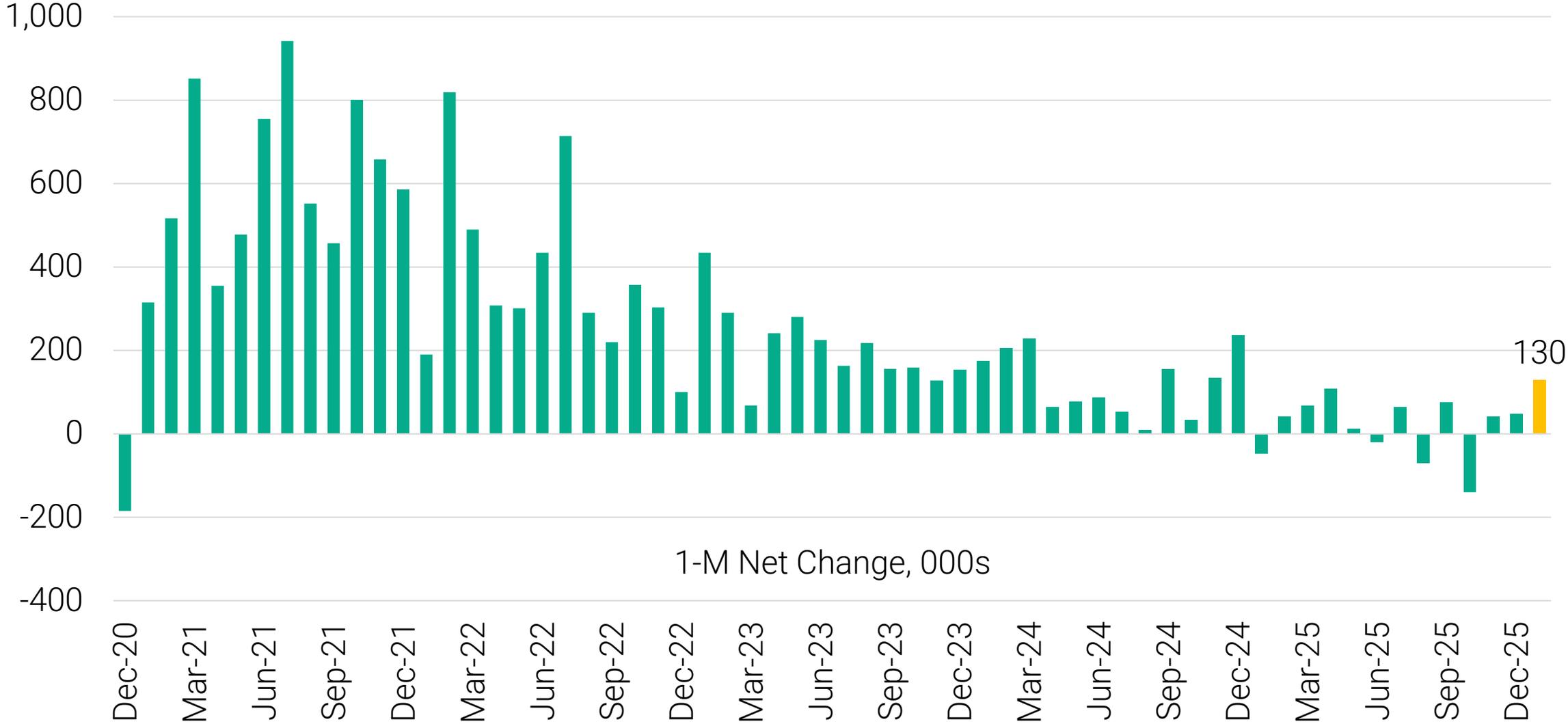


Atlanta Fed GDPNow  
estimate for 2025Q4:  
+3.0% (as of 2/19)

Source: U.S. Bureau of Economic Analysis \*2025Q3: 1<sup>st</sup> (advance) estimate, updated 1/22/2026

# U.S. Job Growth, Monthly

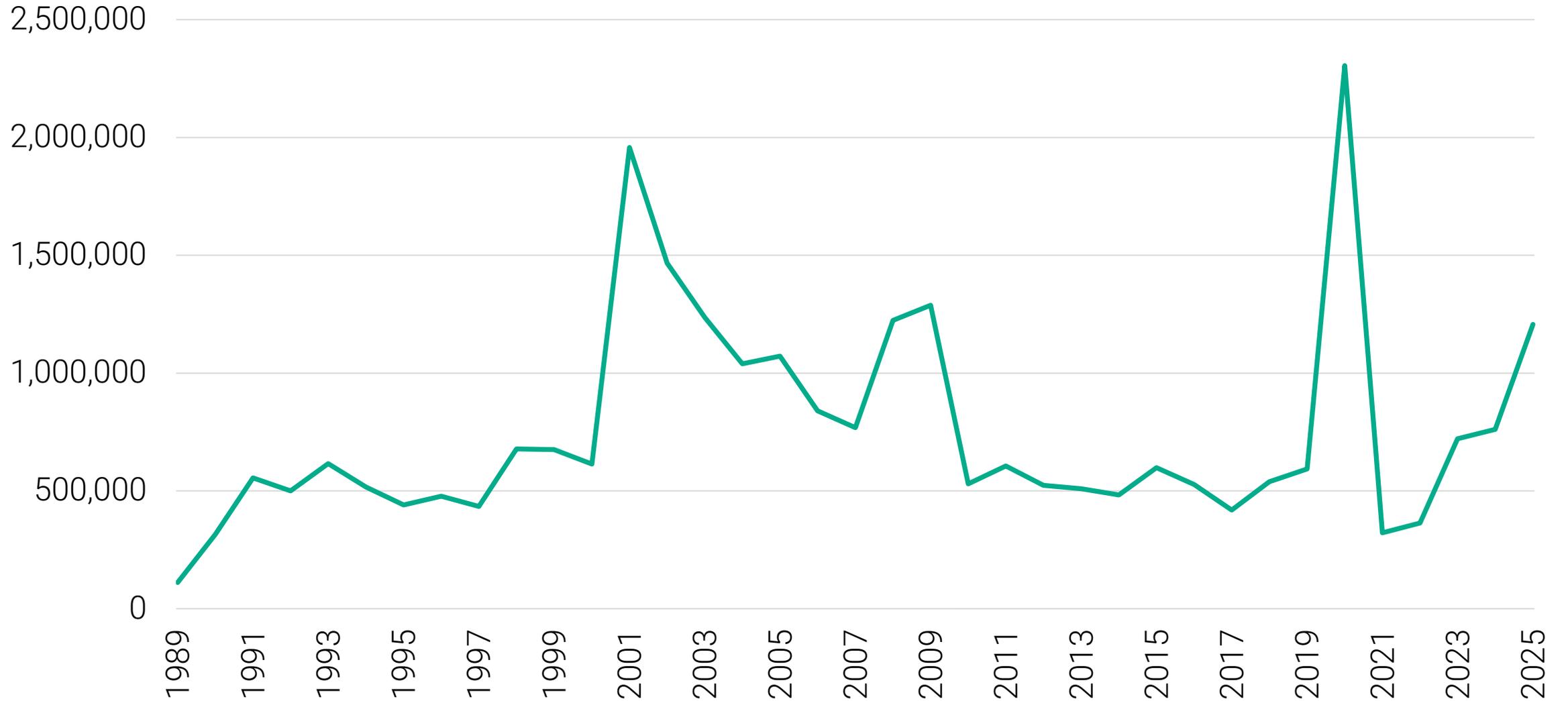
December 2020 – January 2026



Source: U.S. Bureau of Labor Statistics

# U.S. Employers' Announced Job Cuts

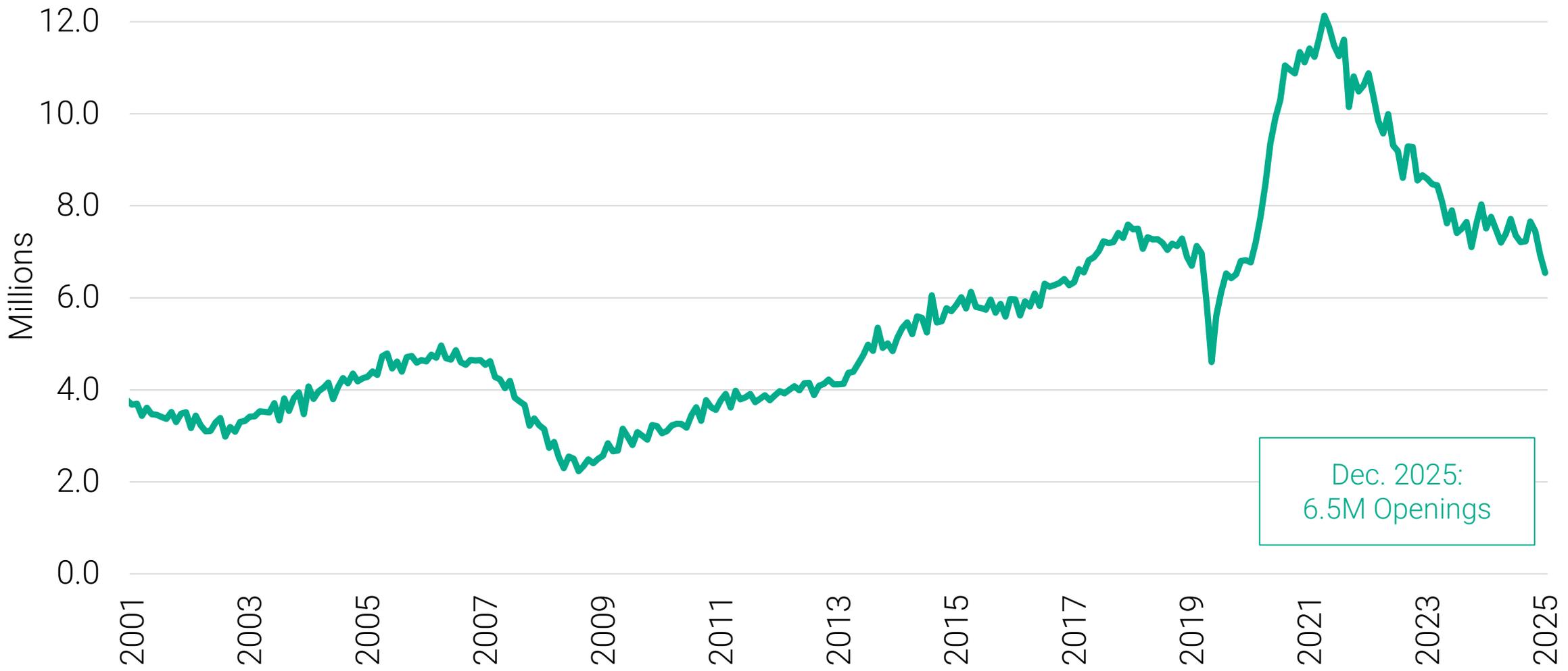
1989 – 2025



Source: Challenger, Gray & Christmas, Inc. Job Cut Announcement Report

# U.S. Job Openings

2001 – December 2025

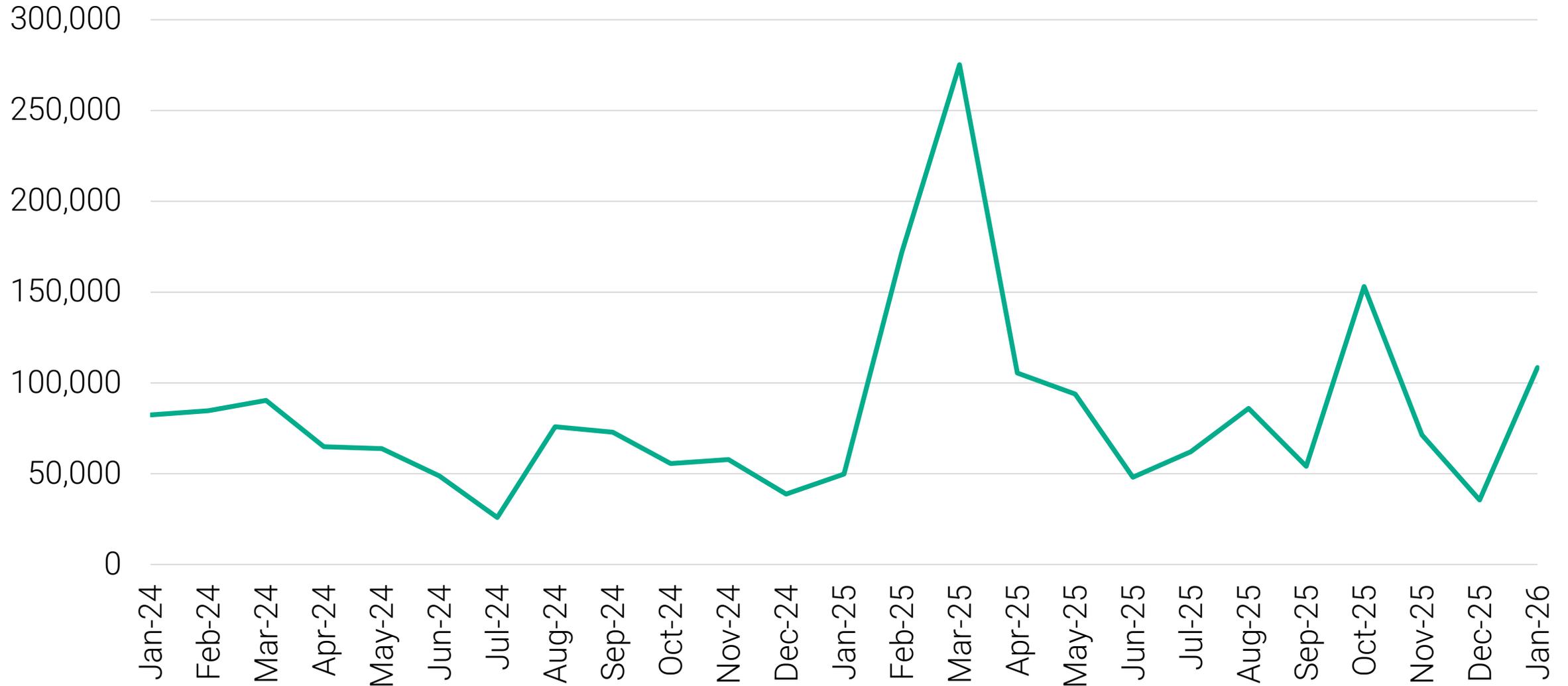


Dec. 2025:  
6.5M Openings

Source: U.S. Bureau of Labor Statistics

# U.S. Employers' Announced Job Cuts

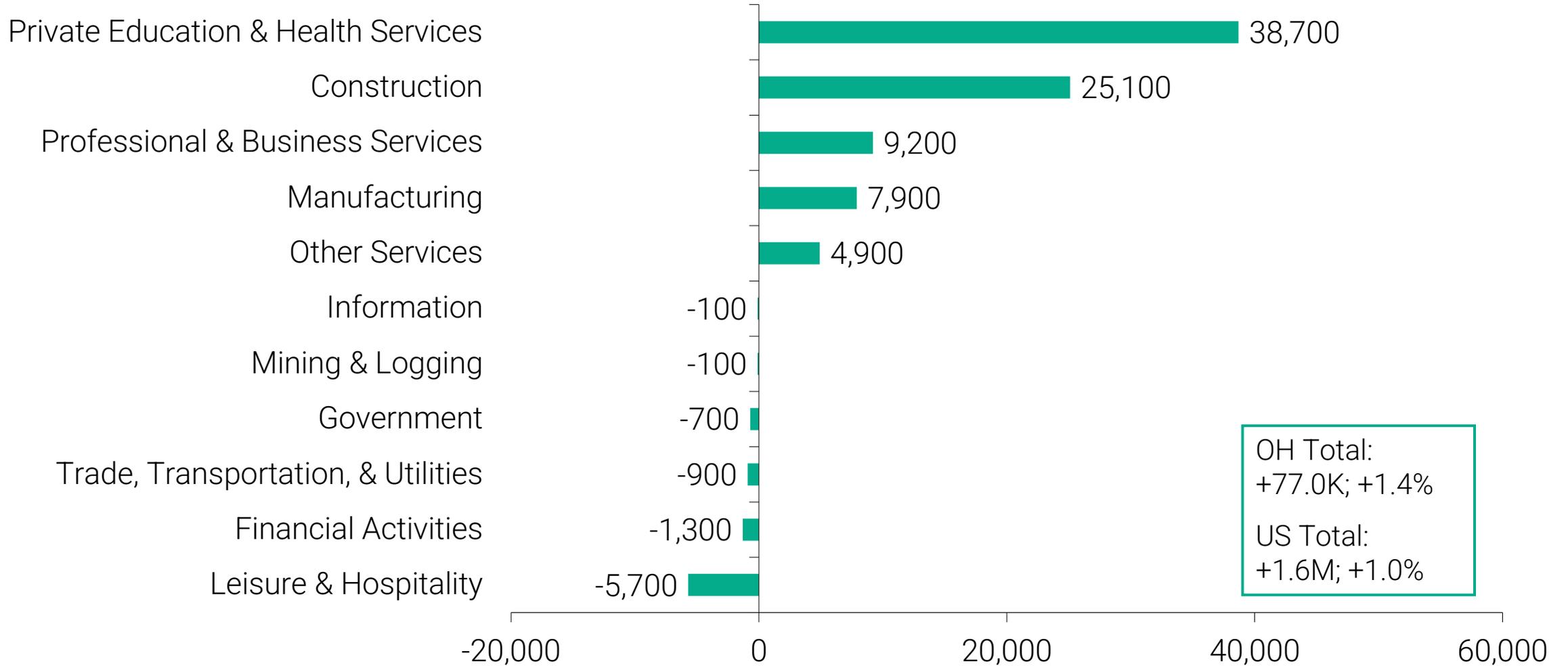
2024 – 2026



Source: Challenger, Gray & Christmas, Inc. Job Cut Announcement Report

# Ohio Nonfarm Employment

December 2023 v. December 2025 Absolute Change



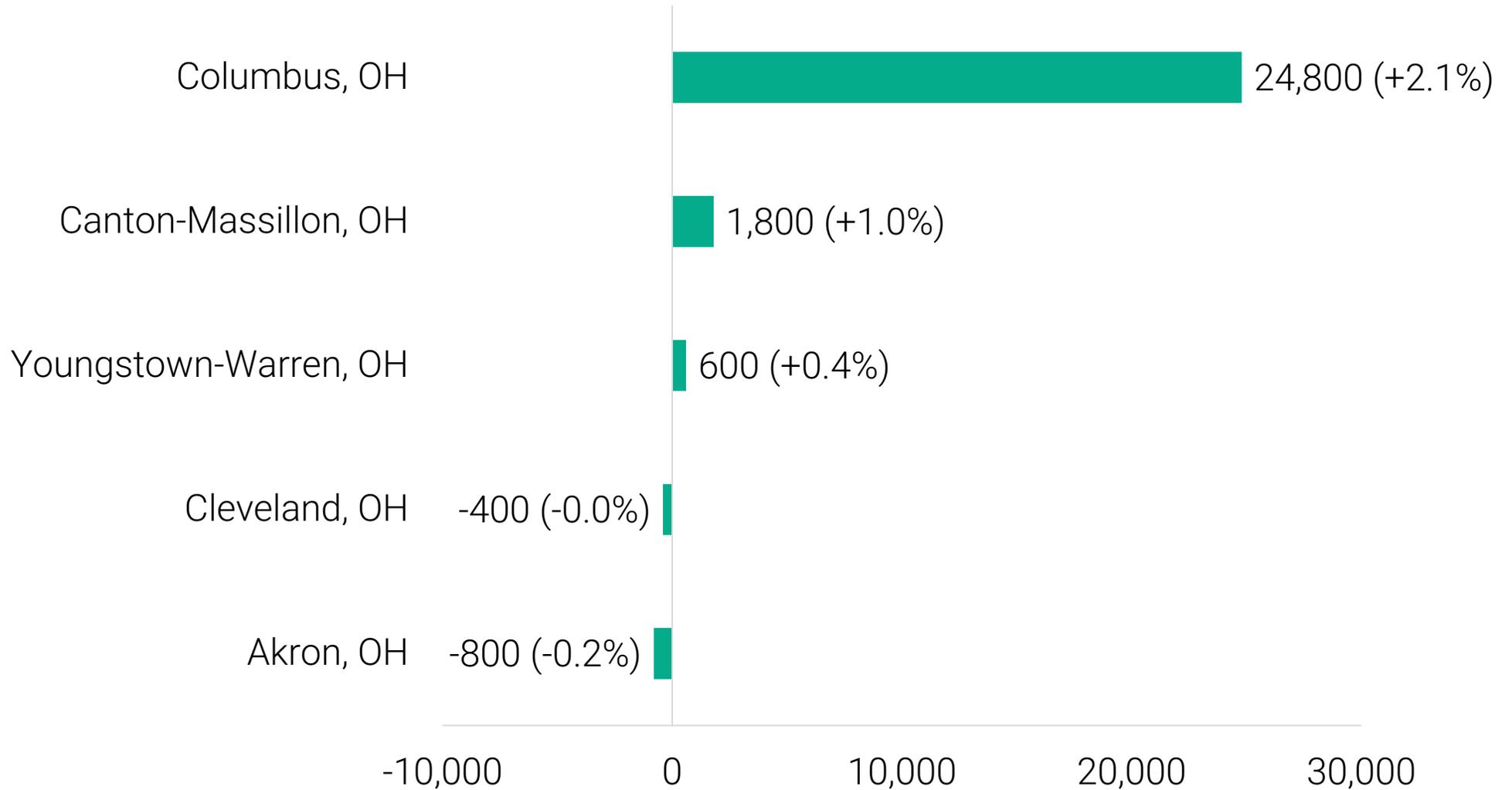
\*According to the Local Area Unemployment Statistics (LAUS) program  
OH added 53,254 jobs between December 2023 and December 2025.

Source: U.S. Bureau of Labor Statistics  
\*Data are seasonally adjusted (SA)



# Nonfarm Employment, Select MSAs

December 2023 v. December 2025



Source: U.S. Bureau of Labor Statistics Note: data are not seasonally adjusted

# Employment Growth, 25 Largest Metros (NSA)

December 2023 v. December 2025 Absolute Change

Rank	MSA	%
1	Charlotte-Concord-Gastonia, NC-SC	3.9%
2	San Antonio-New Braunfels, TX	3.1%
3	Austin-Round Rock-San Marcos, TX	2.9%
4	Orlando-Kissimmee-Sanford, FL	2.8%
5	New York-Newark-Jersey City, NY-NJ	2.1%
6	Philadelphia-Camden-Wilm., PA-NJ-DE-MD	2.0%
6	Phoenix-Mesa-Chandler, AZ	2.0%
6	Tampa-St. Petersburg-Clearwater, FL	2.0%
9	Houston-Pasadena-The Woodlands, TX	1.9%
10	Dallas-Fort Worth-Arlington, TX	1.8%
11	Miami-Fort Lauderdale-West Palm Beach, FL	1.6%
11	Seattle-Tacoma-Bellevue, WA	1.6%
13	Riverside-San Bernardino-Ontario, CA	1.5%

Rank	MSA	%
14	Atlanta-Sandy Springs-Roswell, GA	1.4%
14	Minneapolis-St. Paul-Bloomington, MN-WI	1.4%
16	San Diego-Chula Vista-Carlsbad, CA	1.2%
17	Chicago-Naperville-Elgin, IL-IN-WI	1.0%
18	Baltimore-Columbia-Towson, MD	0.9%
18	Denver-Aurora-Centennial, CO	0.9%
20	Detroit-Warren-Dearborn, MI	0.5%
21	Los Angeles-Long Beach-Anaheim, CA	0.4%
21	St. Louis, MO-IL	0.4%
23	Washington-Arlington-Alex., DC-VA-MD-WV	0.2%
24	Boston-Cambridge-Newton, MA-NH	-0.4%
25	San Francisco-Oakland-Fremont, CA	-0.9%
-	U.S. Total (SA)	1.0%

Source: Bureau of Labor Statistics

Note: MSA data are not seasonally adjusted (NSA);  
U.S. data are seasonally adjusted (SA)

# Unemployment Rates, 25 Largest Metros (NSA), Dec. 2025

Rank	MSA	%
1	Austin-Round Rock-San Marcos, TX	3.2%
2	Atlanta-Sandy Springs-Roswell, GA	3.3%
3	Miami-Fort Lauderdale-West Palm Beach, FL	3.5%
3	Phoenix-Mesa-Chandler, AZ	3.5%
3	St. Louis, MO-IL	3.5%
6	Baltimore-Columbia-Towson, MD	3.6%
6	Charlotte-Concord-Gastonia, NC-SC	3.6%
6	Dallas-Fort Worth-Arlington, TX	3.6%
6	Denver-Aurora-Centennial, CO	3.6%
10	San Antonio-New Braunfels, TX	3.7%
11	Washington-Arlington-Alex., DC-VA-MD-WV	3.8%
12	Minneapolis-St. Paul-Bloomington, MN-WI	4.0%
12	Philadelphia-Camden-Wilm., PA-NJ-DE-MD	4.0%

Rank	MSA	%
14	San Francisco-Oakland-Fremont, CA	4.1%
15	Houston-Pasadena-The Woodlands, TX	4.2%
16	Boston-Cambridge-Newton, MA-NH	4.3%
17	Orlando-Kissimmee-Sanford, FL	4.4%
17	San Diego-Chula Vista-Carlsbad, CA	4.4%
19	Chicago-Naperville-Elgin, IL-IN-WI	4.5%
19	New York-Newark-Jersey City, NY-NJ	4.5%
21	Tampa-St. Petersburg-Clearwater, FL	4.6%
22	Detroit-Warren-Dearborn, MI	4.7%
23	Los Angeles-Long Beach-Anaheim, CA	4.8%
24	Seattle-Tacoma-Bellevue, WA	5.0%
25	Riverside-San Bernardino-Ontario, CA	5.1%
-	U.S. Total (SA)	4.4%

Source: Bureau of Labor Statistics

Note: MSA data are not seasonally adjusted (NSA);  
U.S. data are seasonally adjusted (SA)



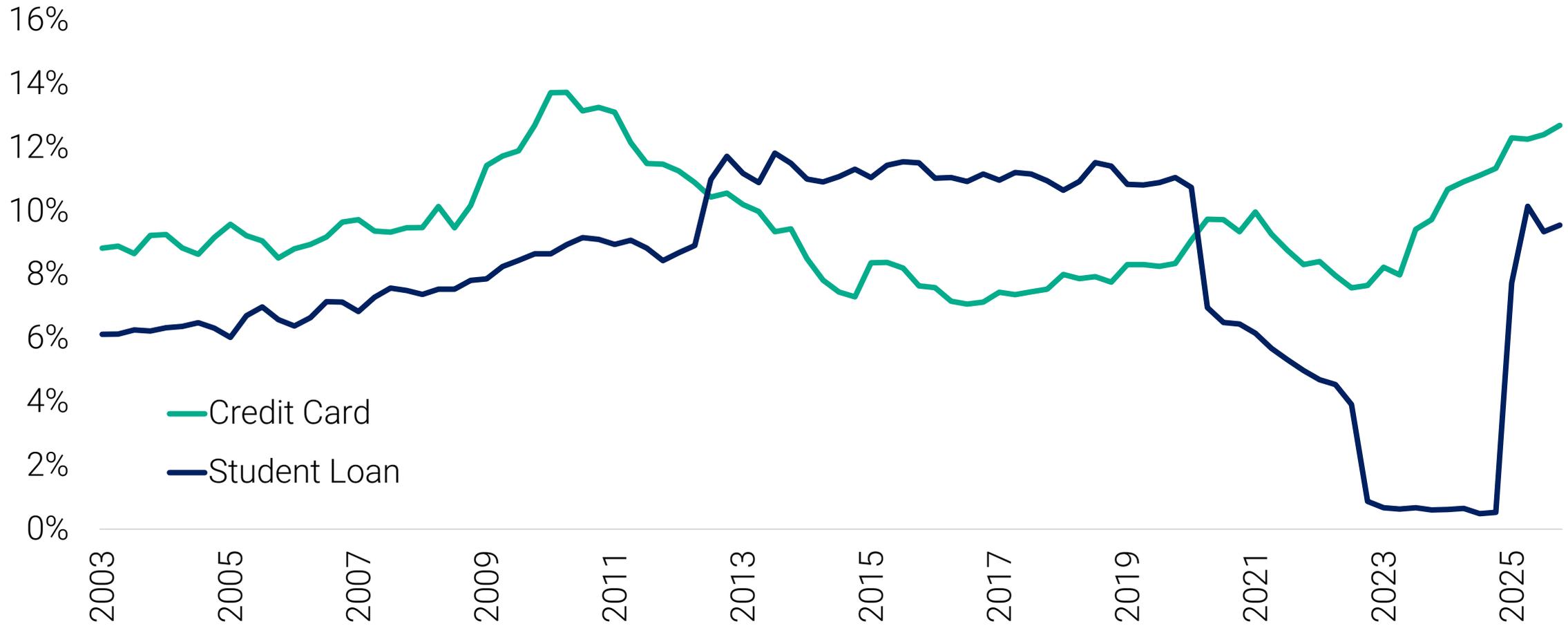
# A Little Rocky



Rocky (1976)—Sylvester Stallone as boxer Rocky Balboa

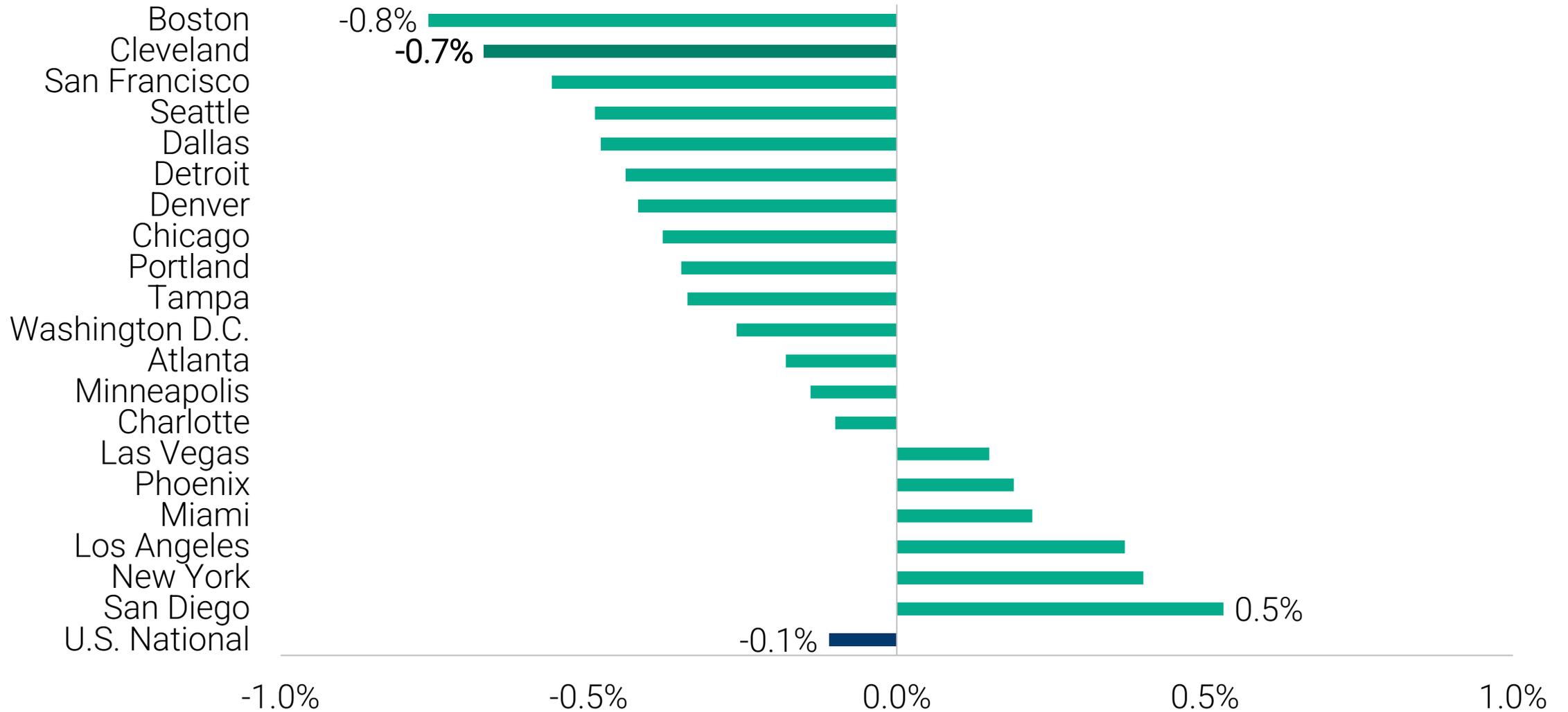
# Rocky I: Loan Delinquency Surges

Severe Delinquency by Loan Type, 2003 – 2025  
% of Balance 90+ Days Delinquent



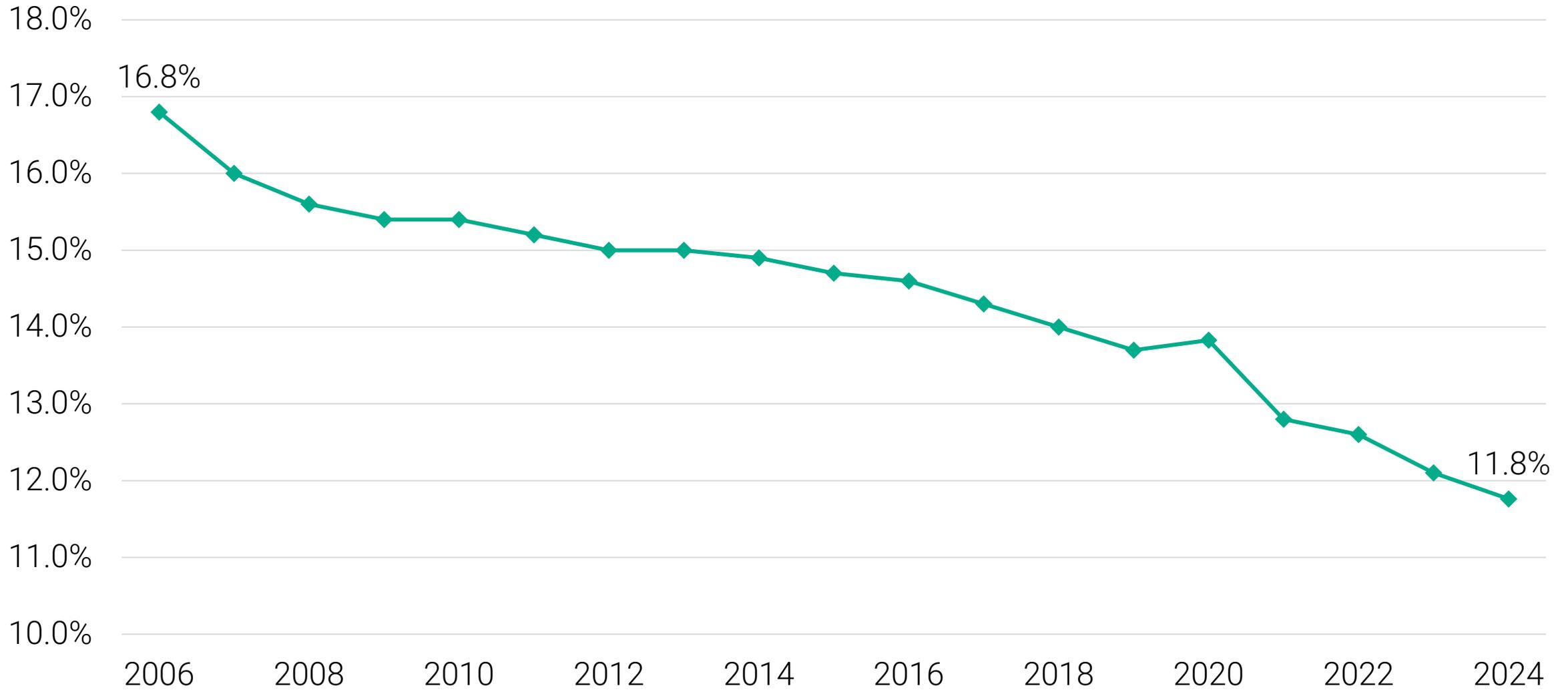
# Rocky II: S&P Case-Shiller Home Price Index

1-Month % Change, November 2025



# Americans are Increasingly Staying Put

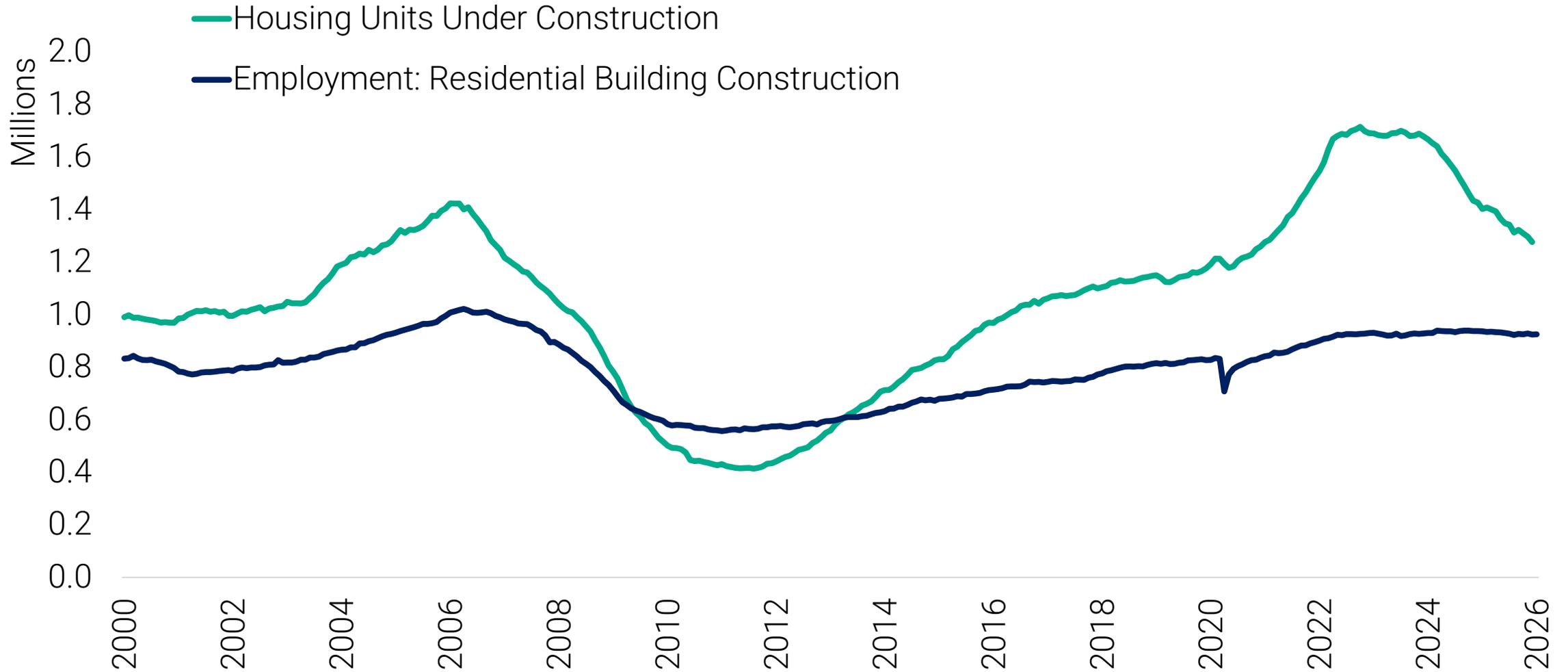
Percentage of U.S. Population that Moved in the Past Year



Source: U.S. Census Bureau, American Community Survey

# Housing Units Under Construction vs. Residential Employment

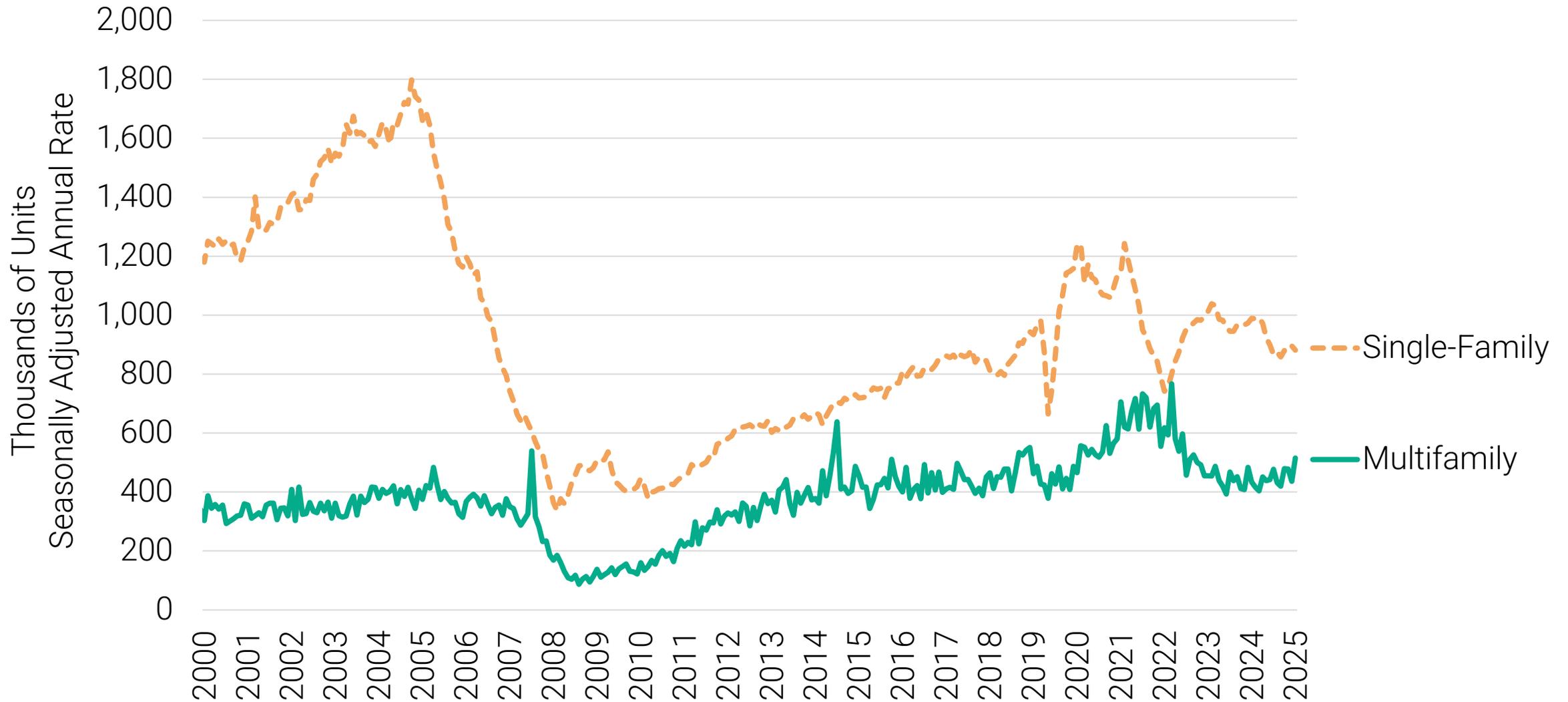
2000 – 2026



Source: U.S. Census Bureau; U.S. Bureau of Labor Statistics

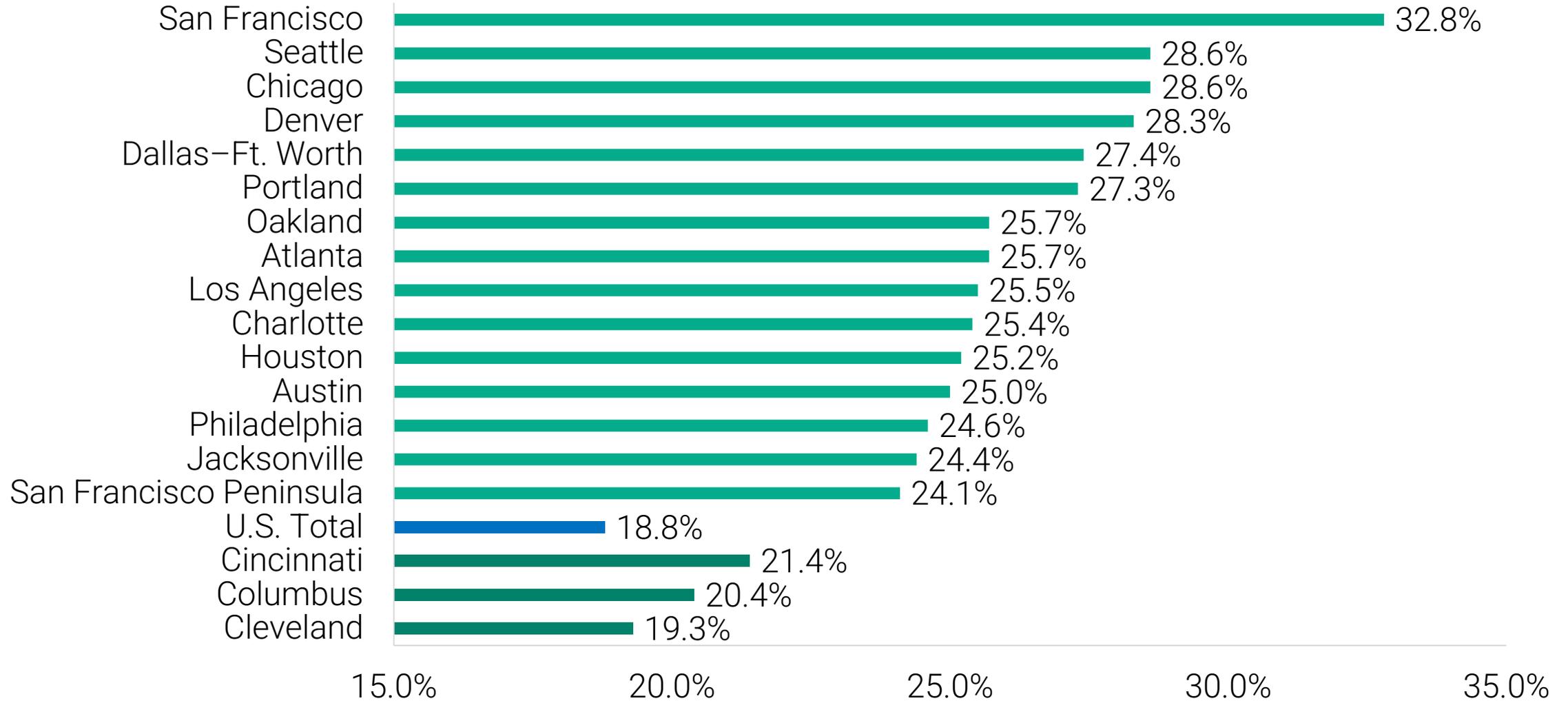
# U.S. Residential Building Permits

2000 – December 2025



Source: U.S. Census Bureau

# Rocky III: Highest Office Vacancy Rates, 2025Q4



Source: CBRE

## Rocky IV: U.S. Cities Face Fiscal Stress

- With the city facing a projected \$1.12 billion shortfall in 2026 Chicago Mayor Brandon Johnson said recently, “We have reached a point of no return”.
- Between December 2024 and April 2025, Chicago, Los Angeles, San Francisco, and Washington all experienced credit rating downgrades.
- According to research conducted by The Pew Charitable Trusts, at least 20 of the nation’s 25 most populous cities have reported budget gaps for fiscal year 2026—and often beyond.

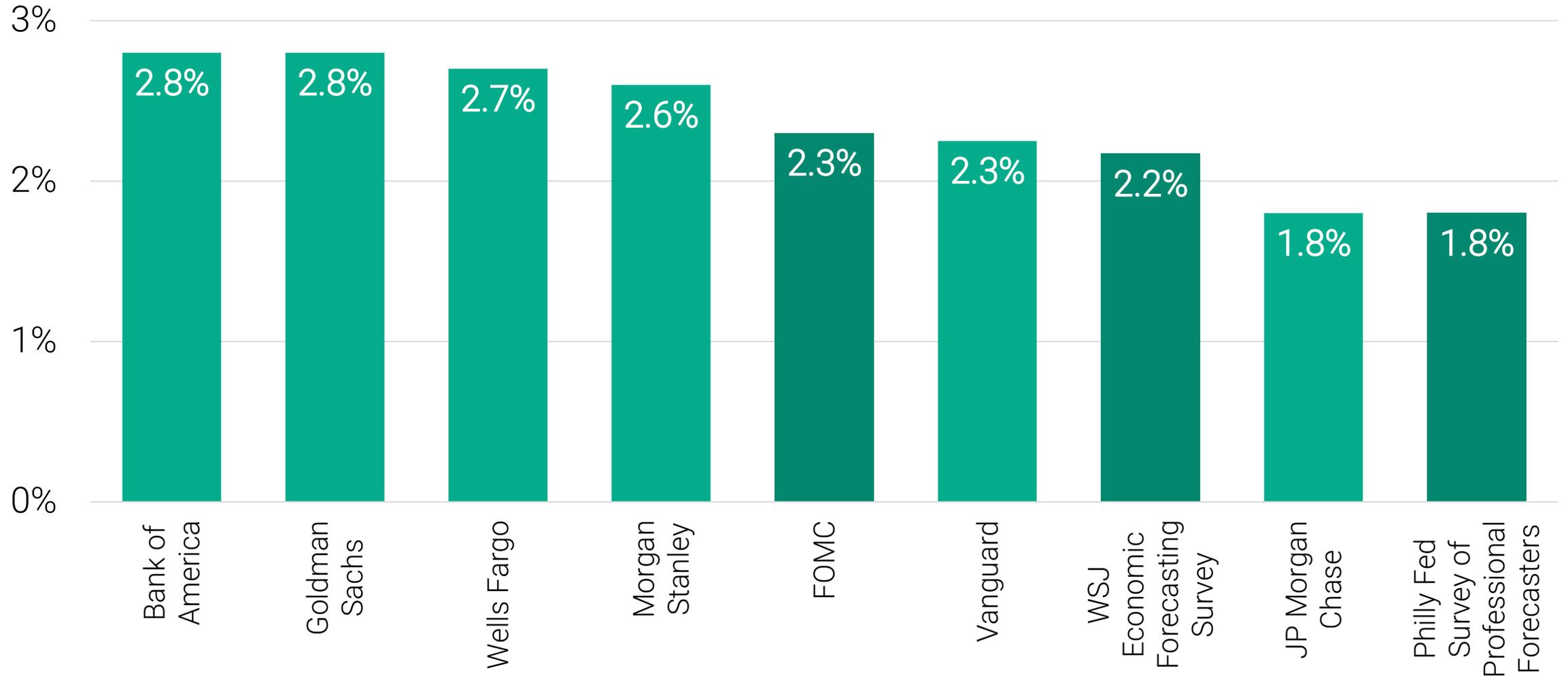
# Cliffhanger



Cliffhanger (1993) – Sylvester Stallone as mountain climber Gabe Walker

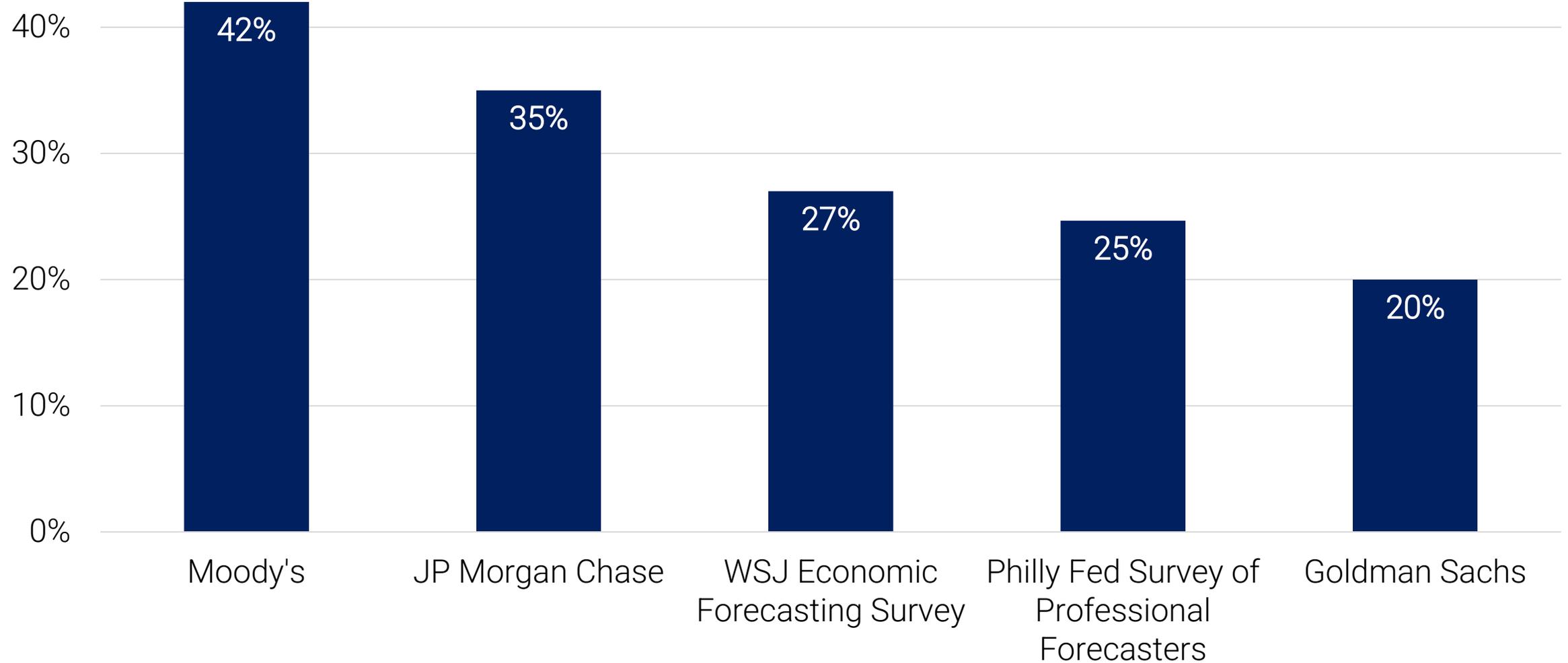
**SAGE** | policy group

# Major Forecasts for U.S. GDP Growth in 2026



Source: Brokerage and media reports

# 2026 Recession Probability, Major Forecasts



Source: Brokerage and media reports

# The **Alarum** has Sounded

- Inflation poised to stage a comeback – blame tariffs/immigration?;
- Interest rates will be higher for longer – ditto;
- Many consumers now exhausted financially, and circumstances could worsen;
- Are asset prices overextended?
- So forecast is for growth in 2026, but there are risks, including rising interest rates and falling asset prices, and that's because of . . . well you know.

# Thank You



Want to work with Sage?

Find us at:

[www.SagePolicy.com](http://www.SagePolicy.com)

Want our newsletter?

Sign up at:

[www.SageEcon.com](http://www.SageEcon.com)

# Q&A

J.P. Morgan Asset Management

# Institutional Asset Allocation Update

February 2026



**Jared B. Gross, Managing Director**  
Head of Institutional Portfolio Strategy  
J.P. Morgan Asset Management

# 1

---

# Strategic Allocation Framework

# Asset allocation is a continuous process



Source: J.P. Morgan Asset Management.

## Important questions for asset allocators

---

1. What are my long-term objectives (and constraints)?
2. Is the market giving me enough return to meet my objectives?
3. Does a portfolio with adequate return stay within my risk budget?
4. Is there sufficient liquidity to meet obligations and rebalance?
5. Are there near-term market imbalances that suggest a tactical response?
6. What is the best marginal use (and source) of capital?

# 2

---

## Long Term Capital Market Assumptions

## Three themes impact our longer-term macroeconomic outlook

---

We find that thoughtful consideration of underlying economic trends offers a significant enhancement over the simple assumption of linear mean reversion to equilibrium valuations. Understandably, our confidence in these themes is front-loaded.

### 1 Economic nationalism

The open global economy established over the past few decades is being restructured. A decline in free trade and cross-border migration will produce slower growth and higher inflation.

### 2 Fiscal stimulus

With monetary authorities held back by inflation concerns, fiscal stimulus has become a more significant incremental source of growth (and of growing deficits).

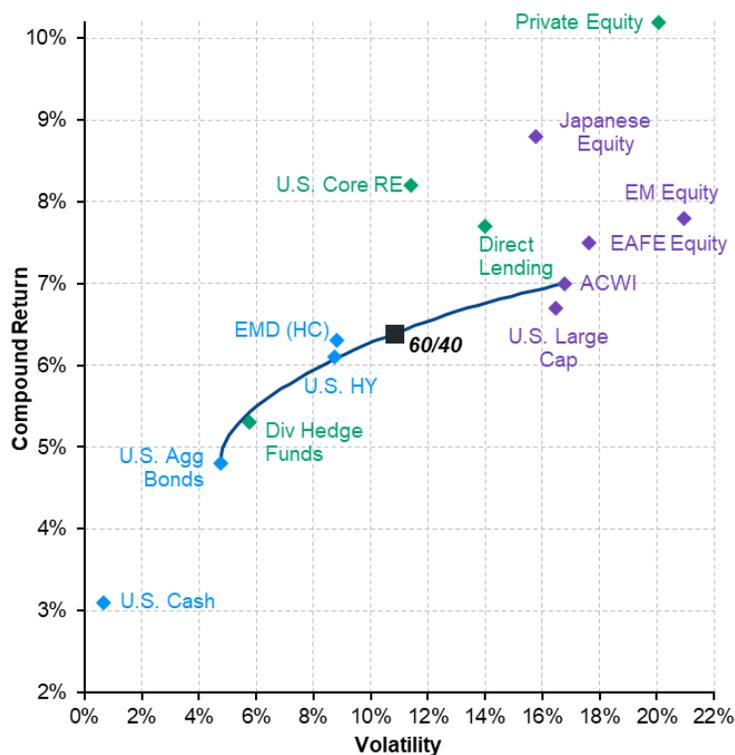
### 3 Capital investment

The vast amount of capital required to build out AI and its associated energy infrastructure will create opportunities and distortions across major markets.

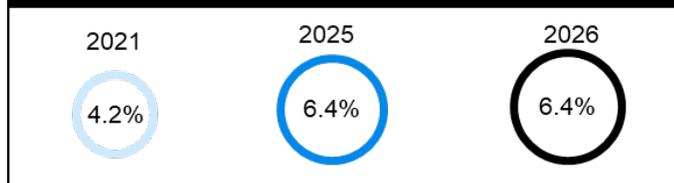
Source: J.P. Morgan Asset Management.

# 2026 Long-Term Capital Market Assumptions

## Stock-bond frontier and key asset classes



### 60/40 PORTFOLIO<sup>1</sup> (ACWI/U.S. Agg Bonds)



## Underlying expectations

Developed market growth is supported by fiscal stimulus and capital investment while inflation remains sticky

The Federal Reserve's ability to lower rates will depend on the level of PCE inflation and the evolving relationship with the Trump Administration.

Yield curves normalize with short rates falling and longer rates stable – leading to consistently higher term premia

IG and HY credit spreads may widen from current historically tight levels, but remain broadly supported by positive fundamentals

The dollar weakens relative to other developed market currencies, supporting returns on foreign investments

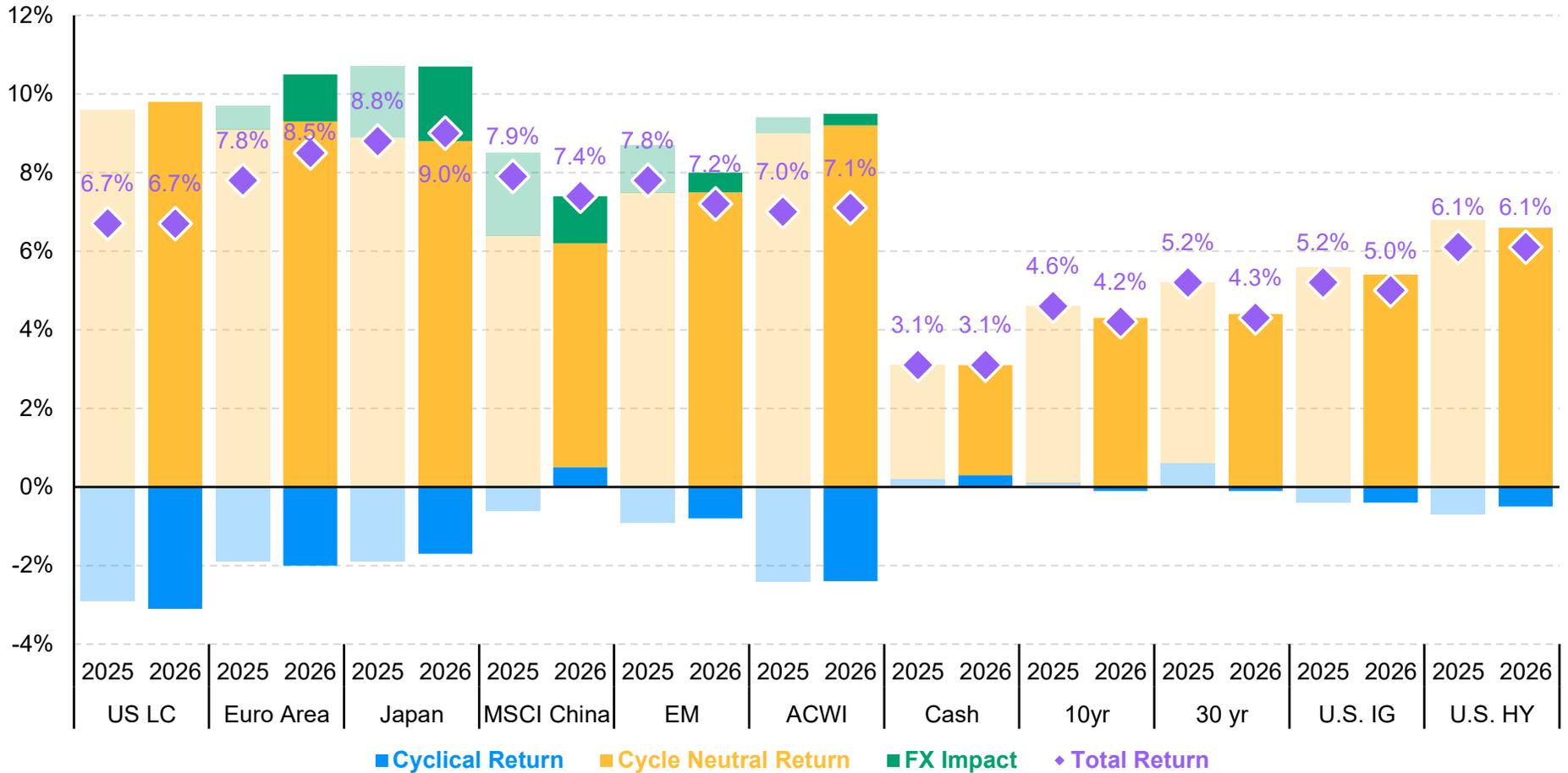
U.S. equity markets are expensive and highly concentrated, but remain supported by strong revenue and high margins

Non-U.S. equity markets are materially cheaper and should outperform the U.S. on a relative basis (including FX).

Private markets are sensitive to public market performance and valuations, the cost of leverage, and changing alpha expectations

Source: JP Morgan Asset Management; data as of September 20, 2025. **Past performance is not a reliable indicator of current and future results.**

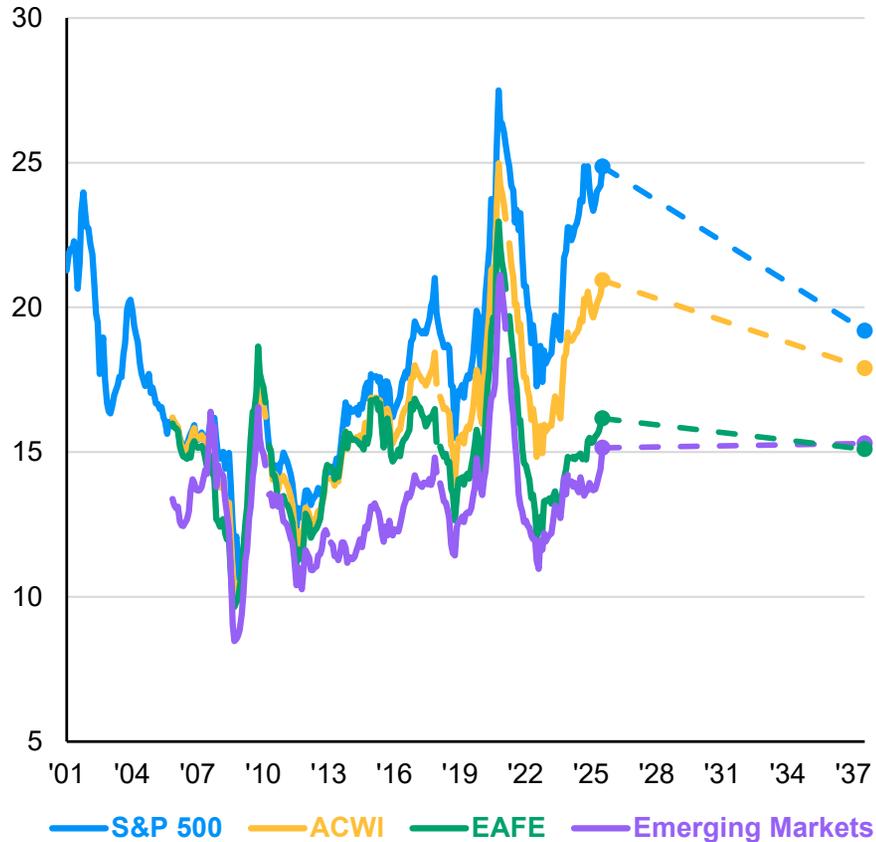
# 2025 and 2026 total returns and key components across public markets



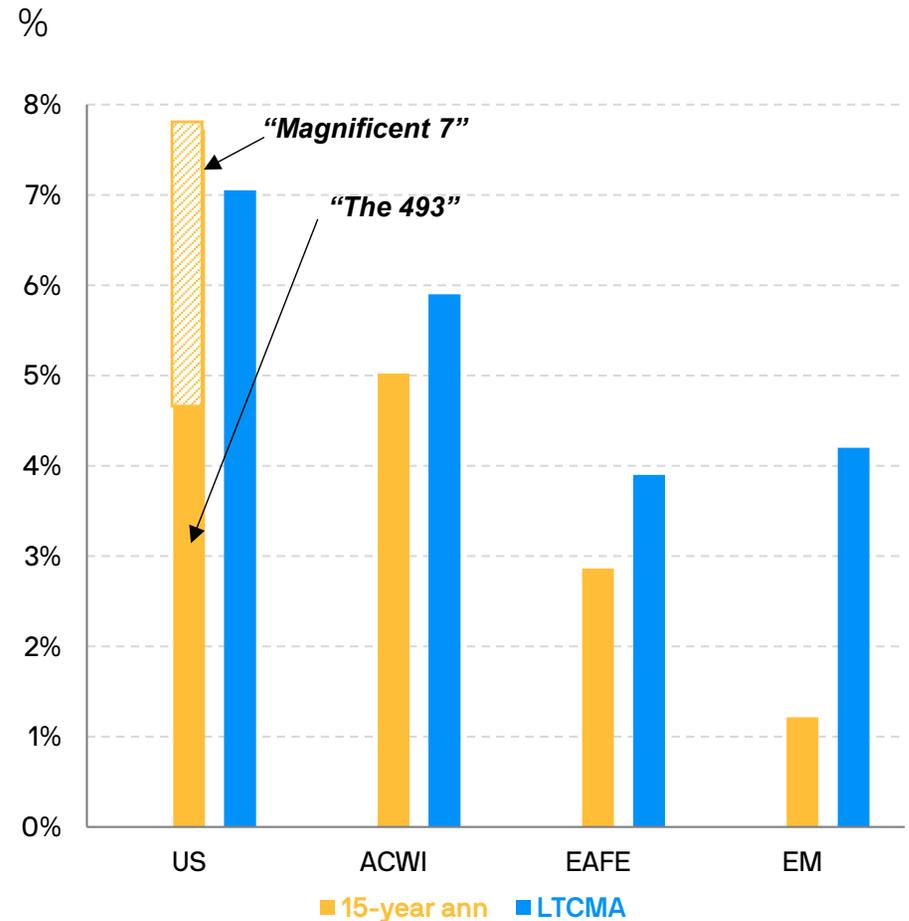
Source: J.P. Morgan Asset Management; data as of September 30, 2025.

# High U.S. equity valuations are a drag, but earnings power provides an offset

**P/E ratio**  
Trailing 12-month P/E



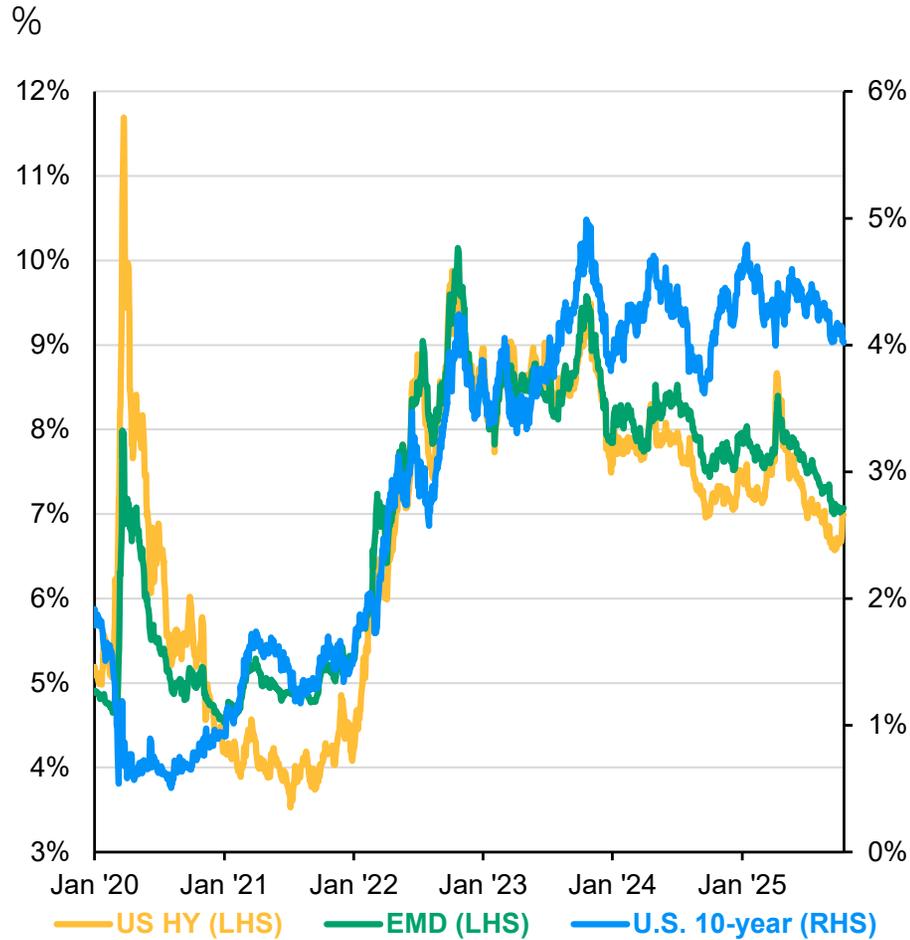
**Earnings growth**



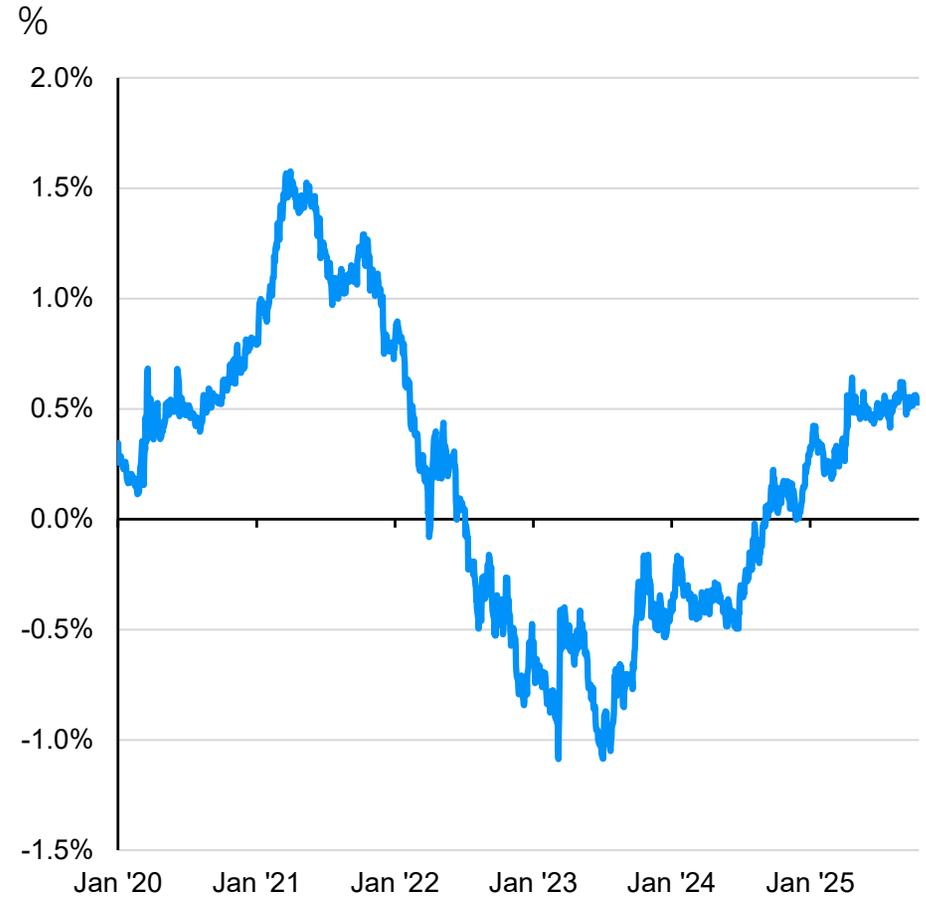
(LHS) Source: Bloomberg, J.P. Morgan Asset Management; data as of October 13, 2025. (RHS) Source: Bloomberg, J.P. Morgan Asset Management; data as of October 13, 2025.

# Fixed income returns are supported by higher yields and steeper curves

## Yields



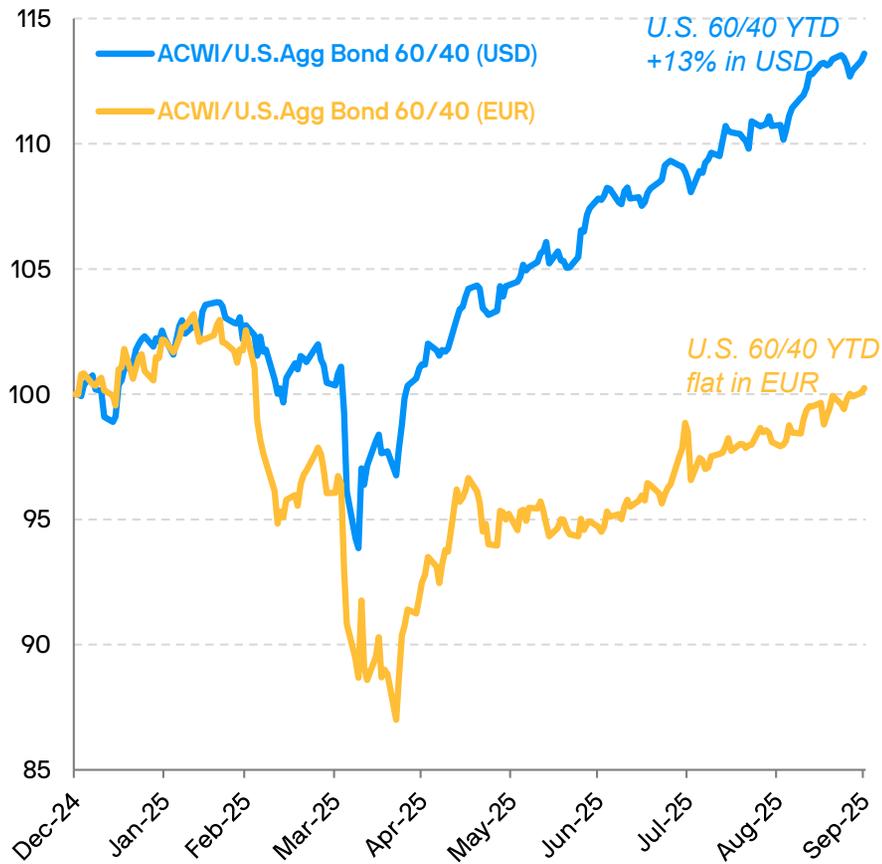
## Yield curve, 2s10s



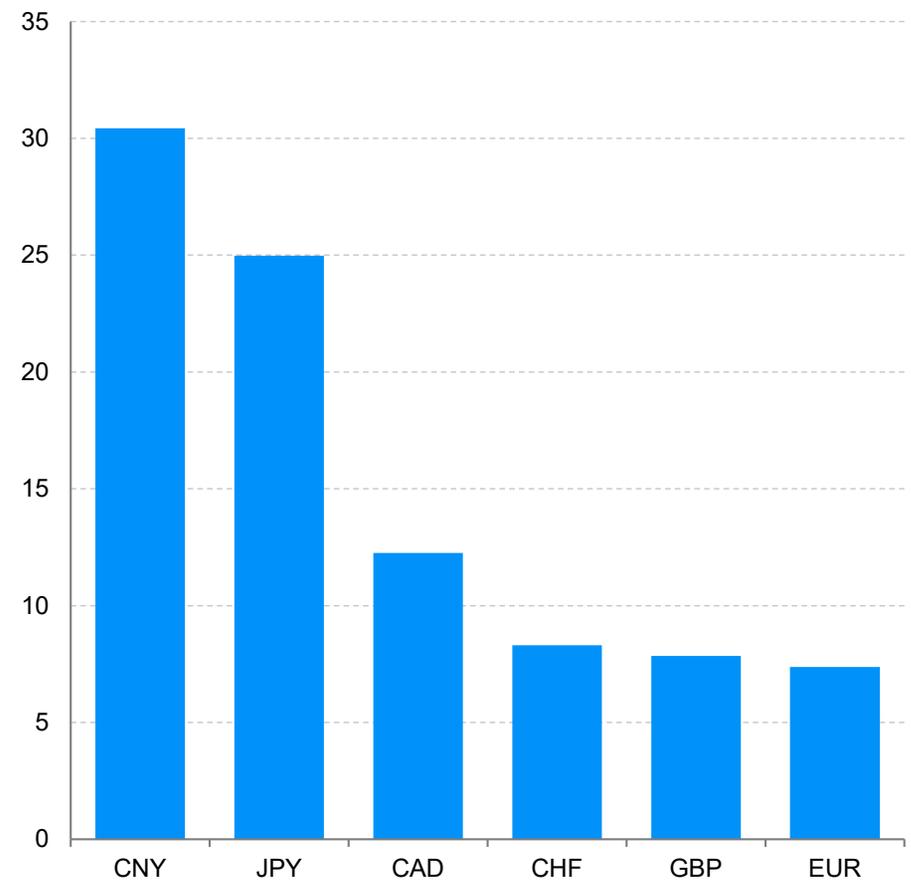
(LHS) Source: Bloomberg, J.P. Morgan Asset Management; data as of October 13, 2025. Note: EMD is dollar denominated sovereigns (EMBIG diversified) (RHS) Source: Bloomberg, J.P. Morgan Asset Management; data as of October 13, 2025.

## Expectations of dollar weakness drive global returns higher

YTD returns for ACWI/U.S. Agg Bond 60/40  
USD and EUR, reindexed

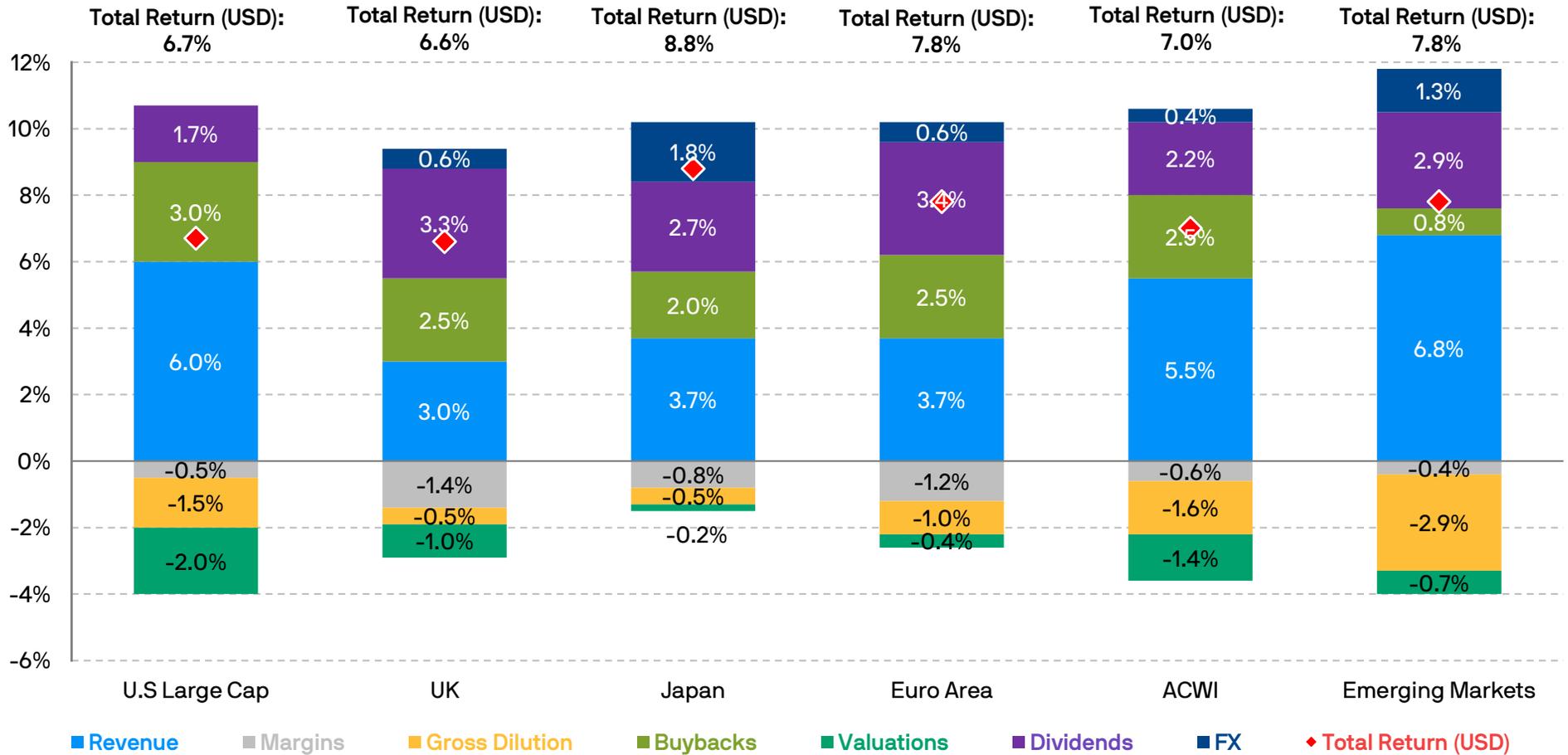


Currency spot deviation from LTCMA  
2025 fair value, %



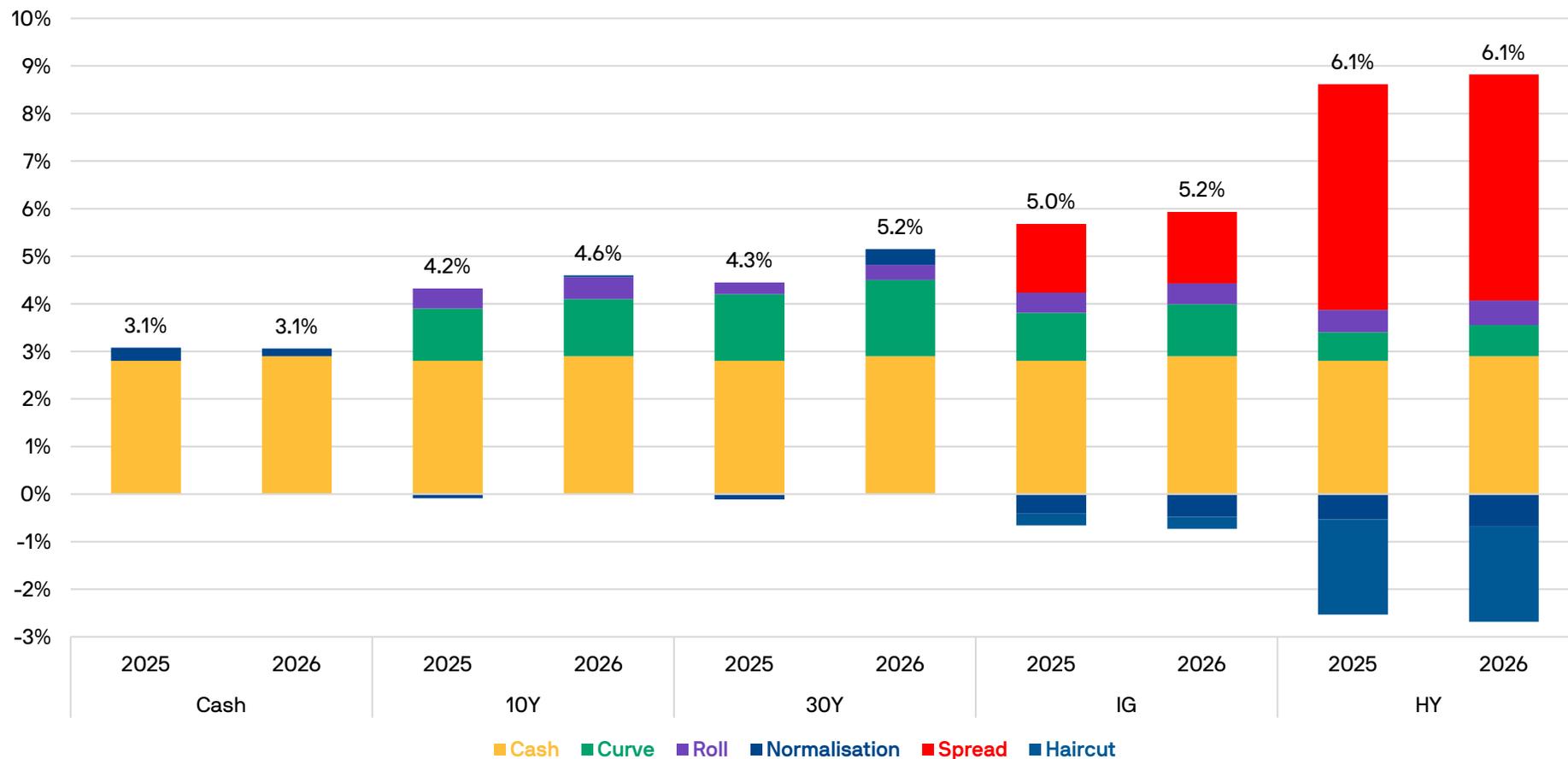
Source: J.P. Morgan Asset Management; data as of September 2025.

# Revenues and margins sustain equity returns in the face of high valuations



Source: J.P. Morgan Asset Management; data as of September 2025.

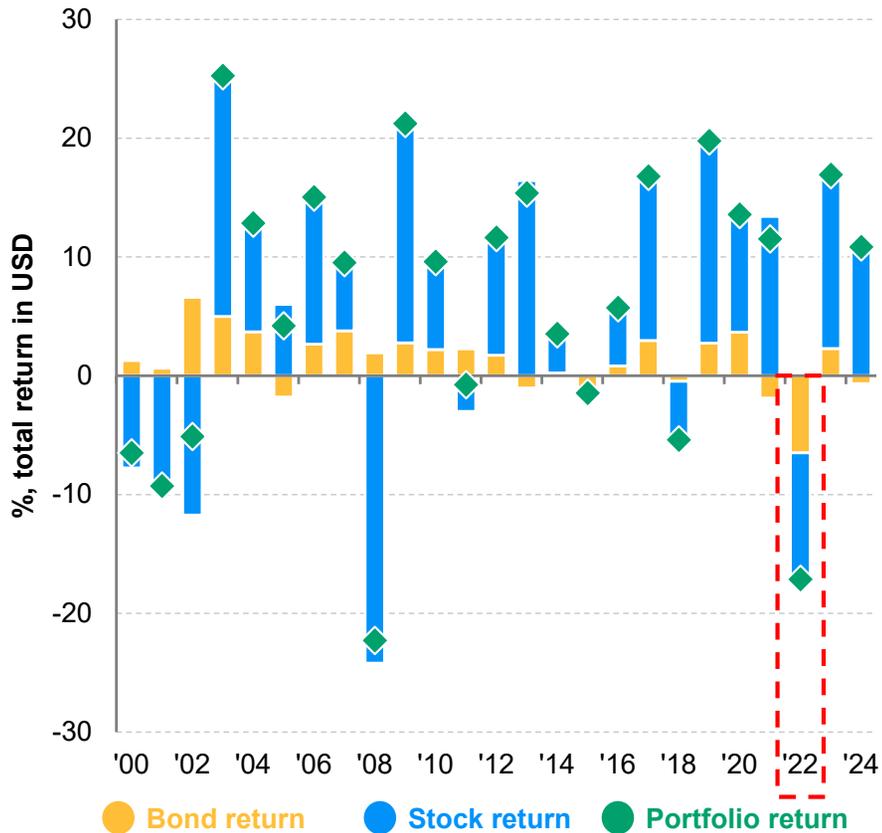
## Fixed income: higher initial yields offset by expectations of spreads normalizing



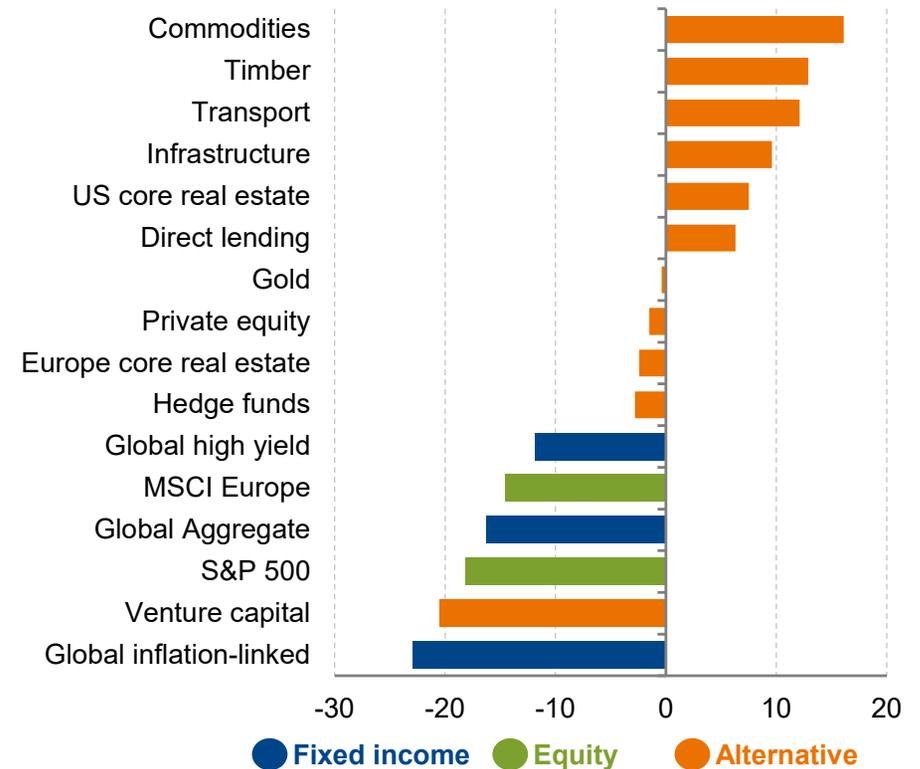
Source: J.P. Morgan Asset Management; estimates as of October 2025. Outlooks and past performance are not reliable indicators of future results. Opinions, estimates, forecasts, projections and statements of financial market trends that are based on current market conditions constitute our judgment and are subject to change without notice. There can be no guarantee they will be met.

# The risk to public market diversification is real, alternatives can help

Annual returns of a 60/40 stock-bond portfolio



Public and private market returns (2022)

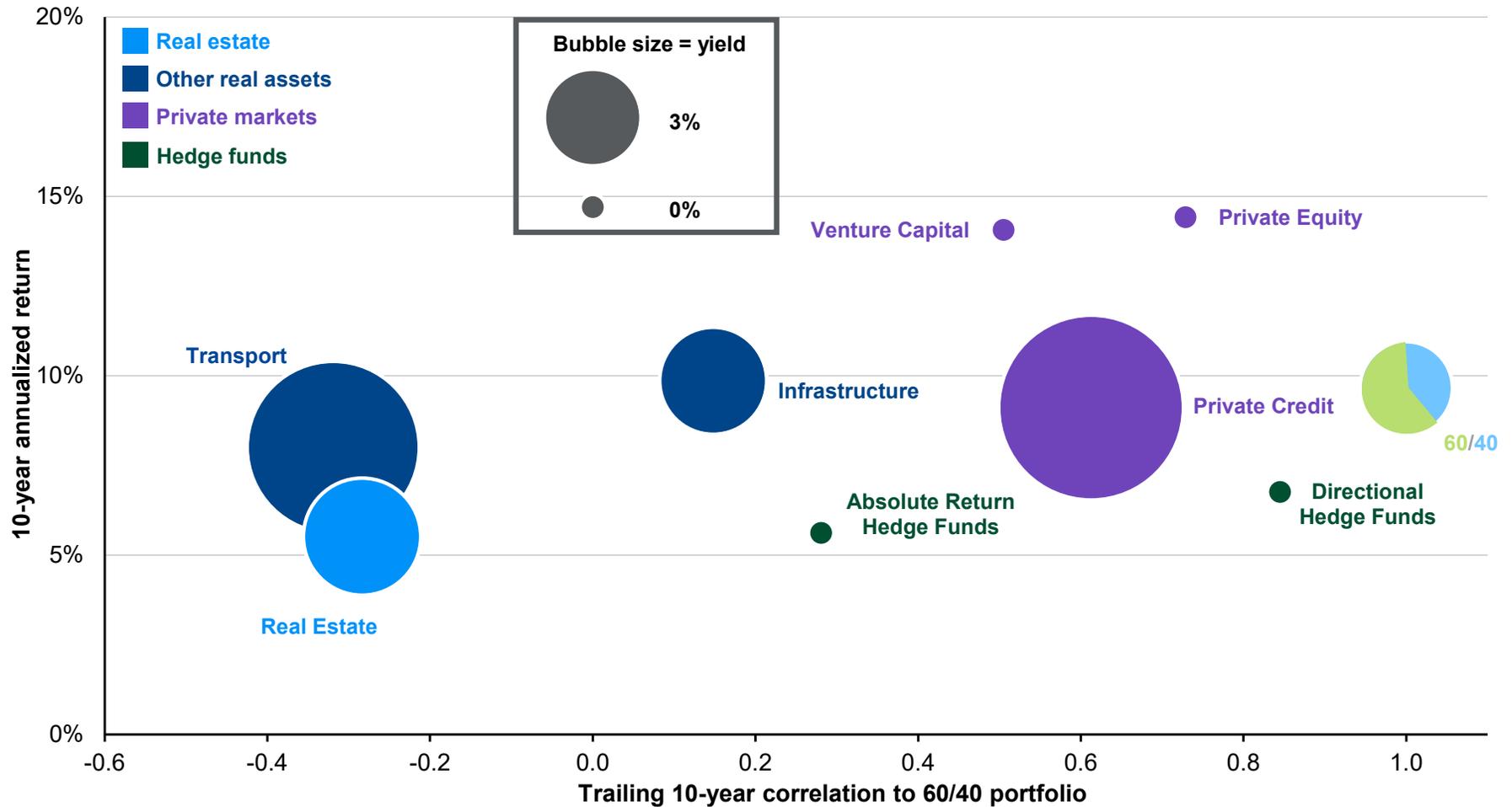


Source: (Left) Bloomberg, LSEG Datastream, MSCI, J.P. Morgan Asset Management. Stock returns are calculated using MSCI World Index and bond returns using Bloomberg Global Aggregate Index. All returns shown are in USD. (Right) Bloomberg, Burgiss, Cliffwater, FactSet, HRFI, ICE BofA, LSEG Datastream, MSCI, NCREIF, S&P Global, J.P. Morgan Asset Management. Global Aggregate: Bloomberg Global Aggregate; Global inflation-linked: Bloomberg Global Inflation-Linked; Global HY: ICE BofA Global High Yield; Hedge funds: HRFI Fund Weighted Composite; US core real estate: NCREIF Property Index – Open End Diversified Core Equity; Europe core real estate: MSCI Global Property Fund Index – Continental Europe; Direct lending: Cliffwater Direct Lending Index; Infrastructure: MSCI Global Quarterly Infrastructure Asset Index (equal-weighted blend); Timber: NCREIF Timberland Total Return Index. Private equity and venture capital are time-weighted returns from Burgiss. Transport returns are derived from a J.P. Morgan Asset Management index. Past performance is not a reliable indicator of current and future results. Guide to the Markets - UK. Data as of 17 September 2025.

# Alternative investments can offer a source of diversification, returns, and income

## Correlations, returns and yields

10-year correlations and 10-year annualized total returns, 3Q15 - 2Q25



Source: Burgiss, Cliffwater, FactSet, MSCI, PivotalPath, J.P. Morgan Asset Management.

## Alternative Assets USD return forecasts – real and financial alts

### 2026 LTCMA Alts Assumptions (Levered<sup>1</sup>, Net of fees, %)

Real assets	2026	2025	Financial alternatives	2026	2025
<b>Private real estate equity (USD)</b>			<b>Private equity (USD)<sup>3</sup></b>		
U.S. Core	8.2	8.1	<b>Cap-weighted composite</b>	<b>10.2</b>	<b>9.9</b>
U.S. Value-added	10.1	10.1	Private equity - small cap	10.1	10.1
European core	6.9	7.6	Private equity - mid cap	9.9	9.8
European value-added	9.0	9.7	Private equity - large/mega cap	10.2	9.8
Asia pacific core	8.4	8.1			
<b>REITs (USD)</b>			<b>Private debt (USD)</b>		
U.S. REITs	8.8	8.0	Direct lending	7.7	8.2
European REITs	6.7	8.7			
Asia pacific REITs	8.1	7.8	<b>Venture capital (USD)</b>		
Global REITs <sup>2</sup>	8.7	8.0	Venture capital	8.5	8.8
<b>Commercial mortgage loans (USD)</b>			<b>Hedge funds (USD)</b>		
U.S.	6.2	6.4	Equity long bias	5.5	5.0
<b>Global core infrastructure (USD)</b>			Event-driven	5.2	4.9
Core	6.5	6.3	Relative value	5.7	5.0
<b>Global transport (USD)</b>			Macro	4.1	3.8
Core	7.9	7.8	Diversified <sup>4</sup>	5.3	4.9
<b>Global timber (USD)</b>			Conservative <sup>5</sup>	4.0	3.4
Core	6.3	5.3			
<b>Commodities (USD)</b>					
Commodities (gross of fees)	4.6	4.3			
Gold (gross of fees)	5.5	4.5			

Source: J.P. Morgan Asset Management; estimates as of September 30, 2024 and September 30, 2025. <sup>1</sup>All return assumptions incorporate leverage, except for commodities, where it does not apply. <sup>2</sup>The global composite is built assuming the following weights: roughly 70% U.S., 10% Europe and 20% Asia-Pacific. <sup>3</sup>The private equity composite is AUM-weighted: 65% large cap and mega cap, 25% mid cap and 10% small cap. Capitalization size categories refer to the size of the asset pool, which has a direct correlation to the size of companies acquired, except in the case of mega cap. <sup>4</sup>The Diversified assumption represents the projected return for multi-strategy hedge funds that seek to achieve consistent returns and low overall portfolio volatility by primarily investing in lower volatility strategies such as equity market neutral and fixed income arbitrage. The 2024 Conservative assumption uses a 0.70 beta to Diversified. <sup>5</sup>The Conservative assumption represents the projected return for multi-strategy hedge funds that seek to achieve consistent returns and low overall portfolio volatility by primarily investing in lower volatility strategies such as equity market neutral and fixed income arbitrage. The 2024 Conservative assumption uses a 0.70 beta to Diversified.

## Summary of LTCMA output

### Asset class correlations to stocks and bonds

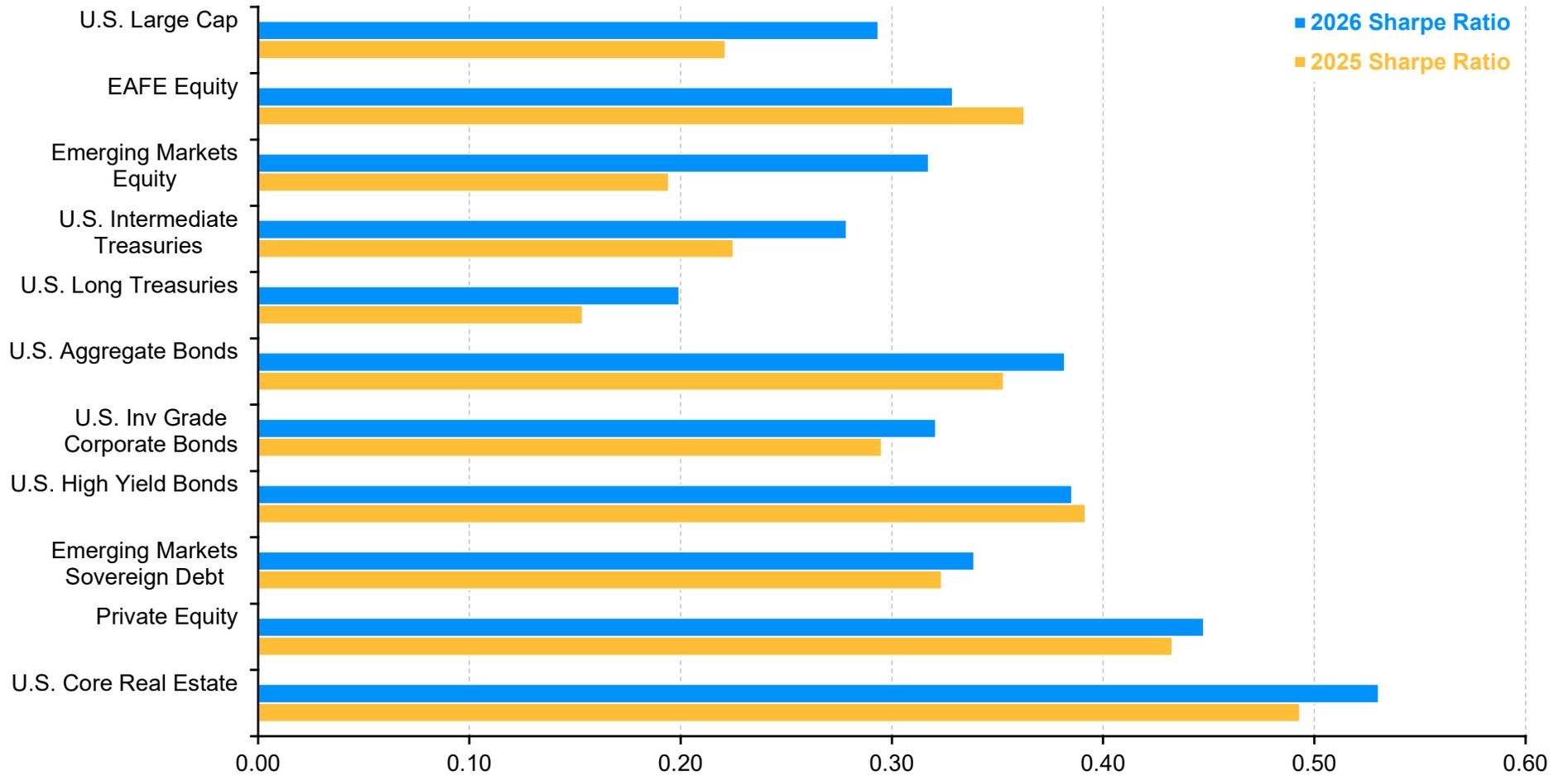
	U.S. Large Cap	U.S. Treasuries (Intermediate)
U.S. Cash	0.01	0.20
U.S. Int. Treasuries	-0.01	1.00
U.S. Aggregate Bonds	0.30	0.85
U.S. IG Corporate Bonds	0.51	0.55
U.S. High Yield Bonds	0.75	0.03
U.S. Large Cap	1.00	-0.01
U.S. Small Cap	0.90	-0.08
EAFE Equity	0.87	0.02
ACWI Equity	0.97	0.00
U.S. Core Real Estate	0.35	-0.28
Global Core Infrastructure	0.47	-0.18
Global Core Transport	-0.07	0.01
Private Equity	0.75	-0.31
Direct Lending	0.55	-0.24

### Return and volatility estimates

	2026 Return	2025 Return	2026 Volatility	2025 Volatility
U.S. Cash	3.10%	3.10%	0.67%	0.65%
U.S. Int. Treasuries	4.00%	3.80%	3.48%	3.34%
U.S. Aggregate Bonds	4.80%	4.60%	4.76%	4.52%
U.S. IG Corporate Bonds	5.20%	5.00%	7.39%	7.28%
U.S. High Yield Bonds	6.10%	6.10%	8.74%	8.52%
U.S. Large Cap	6.70%	6.70%	16.47%	16.26%
U.S. Small Cap	6.90%	6.90%	21.10%	20.73%
EAFE Equity	7.50%	8.10%	17.63%	17.61%
ACWI Equity	7.00%	7.10%	16.78%	16.71%
U.S. Core Real Estate	8.20%	8.10%	11.39%	11.32%
Global Core Infrastructure	6.50%	6.30%	10.25%	11.01%
Global Core Transport	7.90%	7.80%	12.77%	13.54%
Private Equity	10.20%	9.90%	19.78%	19.62%
Direct Lending	7.70%	8.20%	14.01%	13.60%

Source: FactSet, Federal Reserve, J.P. Morgan Asset Management. Data as of September 30, 2025.

## USD Sharpe ratios for major asset classes



Source: J.P. Morgan Asset Management; data as of September 30, 2025.

# 3

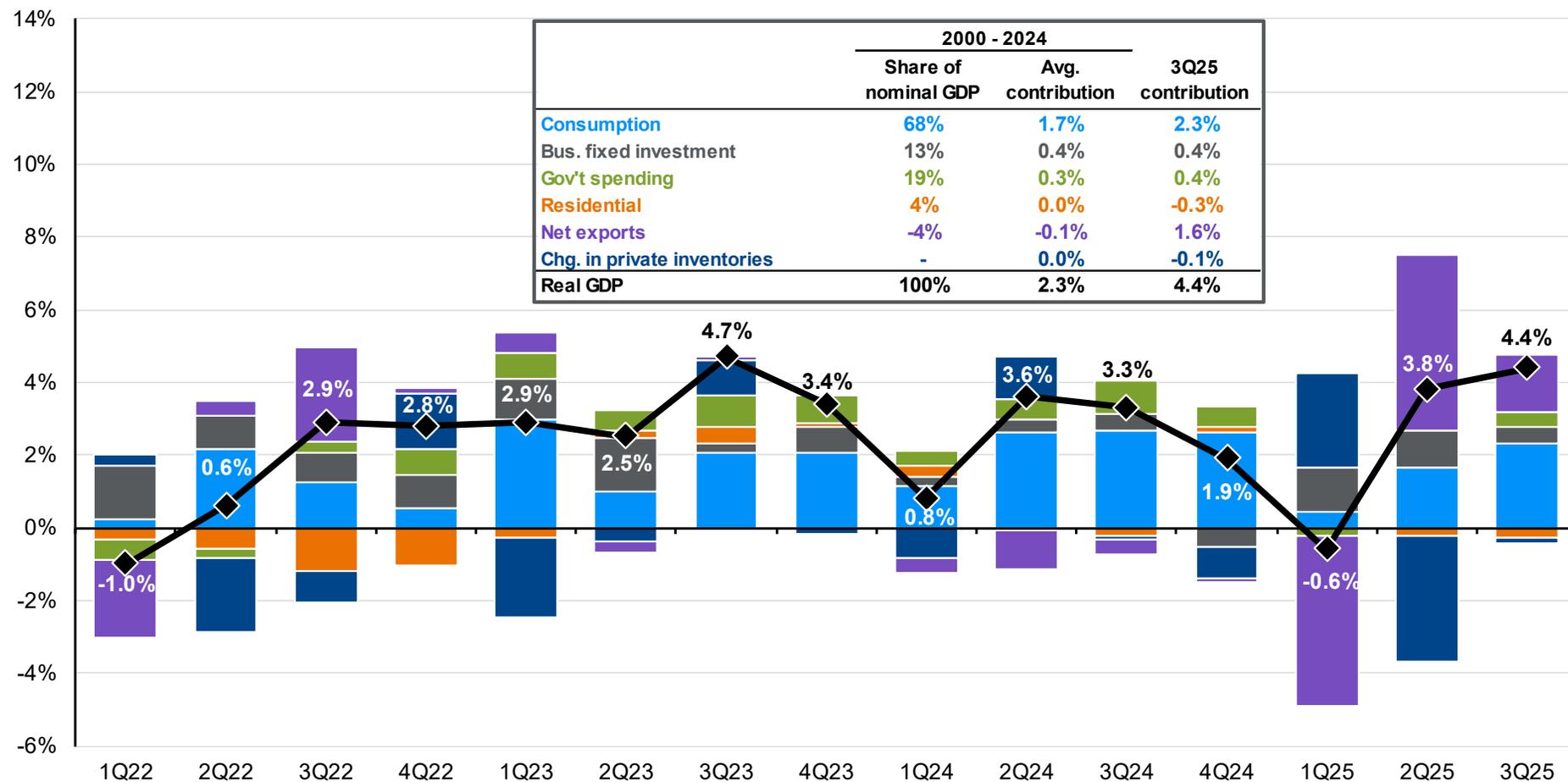
---

## Macroeconomic and market conditions

# U.S. growth remains positive

## Contributors to real GDP growth

Quarter-over-quarter, seasonally adjusted annualized rate

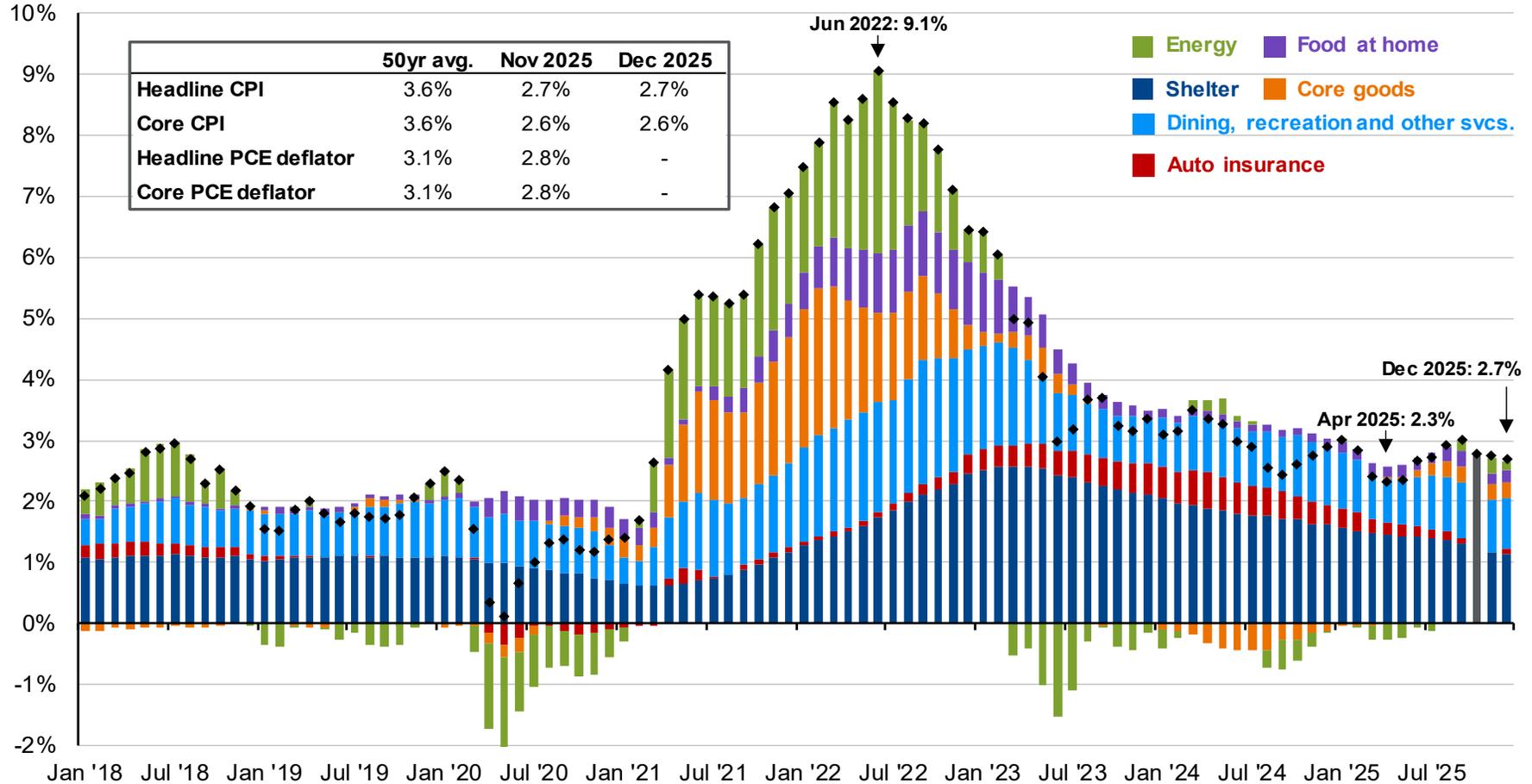


Source: BEA, FactSet, J.P. Morgan Asset Management ; *Guide to the Markets - U.S.* Data are as of February 2, 2026.

# U.S. inflation remains sticky

## Contributors to headline CPI inflation

Contribution to year-over-year % change in CPI, non-seasonally adjusted

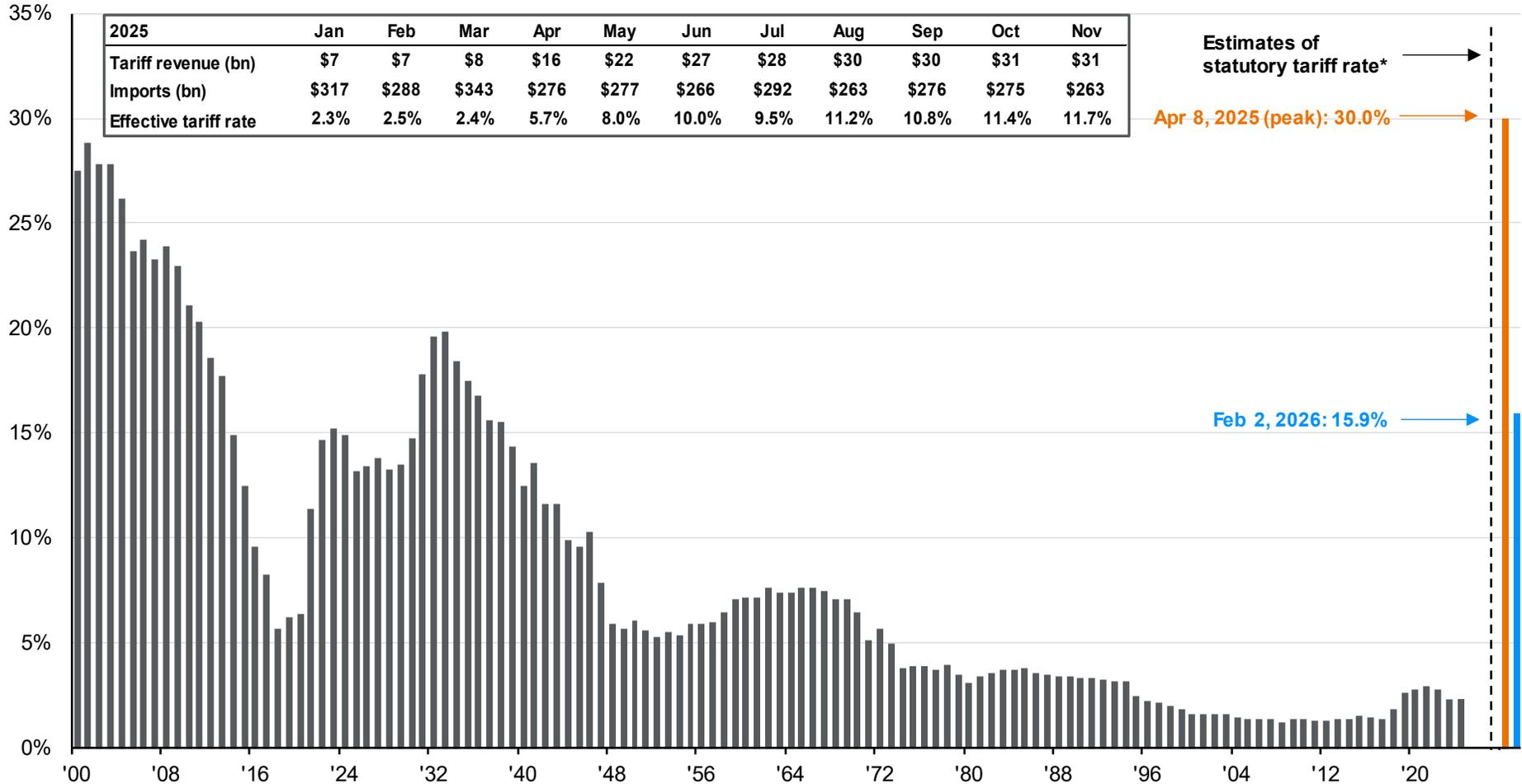


Source: BLS, FactSet, J.P. Morgan Asset Management. Contributions mirror the BLS methodology on Table 7 of the CPI report. Values may not sum to headline CPI figures due to rounding and underlying calculations. "Shelter" includes owners' equivalent rent, rent of primary residence and home insurance. "Food at home" includes alcoholic beverages. Headline and core PCE deflator inflation shown are based on seasonally adjusted data due to data availability. \*Official October 2025 data unavailable due to government shutdown and data shown are J.P. Morgan Asset Management estimates. *Guide to the Markets - U.S.* Data are as of February 2, 2026.

# The tariff story is still unfolding

## Average tariff rate on U.S. goods imports for consumption

Duties collected / value of total goods imports for consumption, 1900 - 2024

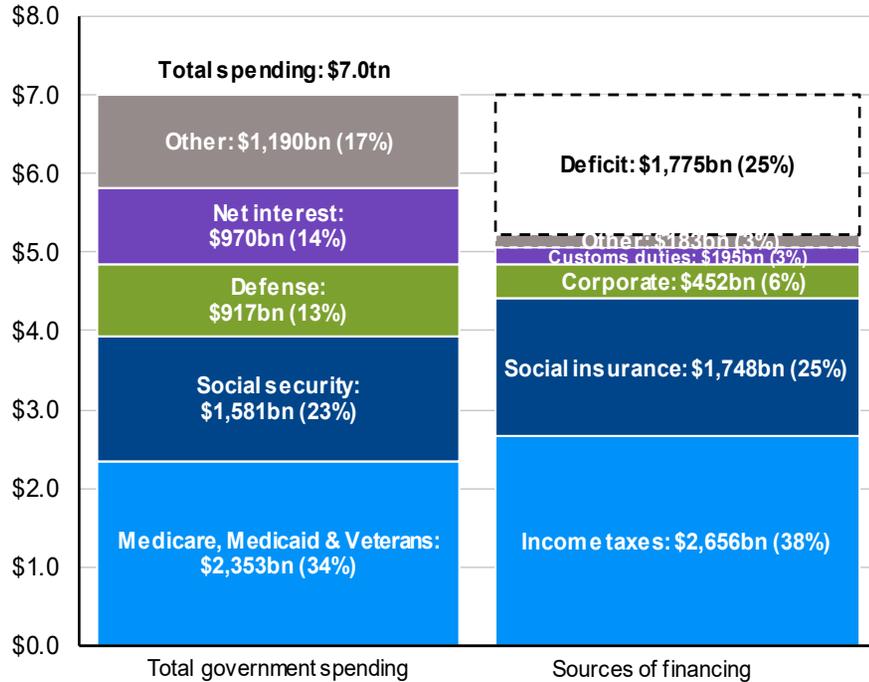


Source: U.S. Census Bureau, U.S. Department of Treasury, U.S. International Trade Commission, J.P. Morgan Asset Management. *Guide to the Markets – U.S.* Data as of February 2, 2026.

# The U.S. fiscal outlook is deteriorating

## The 2025 federal budget

USD trillions

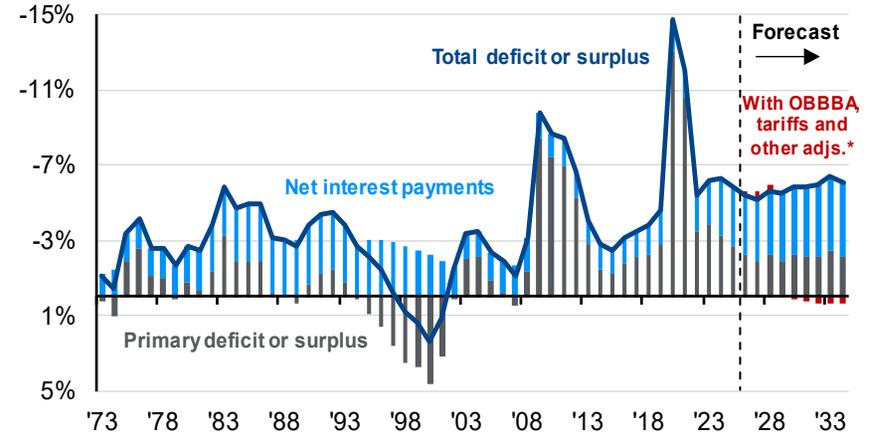


### CBO's Baseline economic assumptions

	2025	'26-'27	'28-'29	'30-'35
Real GDP growth	2.2%	1.8%	1.8%	1.8%
10-year Treasury	4.1%	3.9%	3.9%	3.8%
Headline inflation (CPI)	2.3%	2.4%	2.3%	2.2%
Unemployment	4.2%	4.4%	4.4%	4.4%

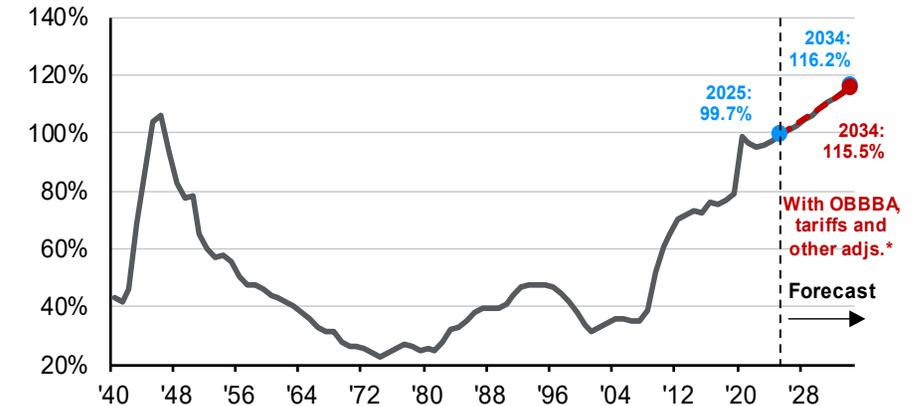
## Federal deficit and net interest payments

% of GDP, 1973 - 2034, CBO Baseline Forecast



## Federal net debt (accumulated deficits)

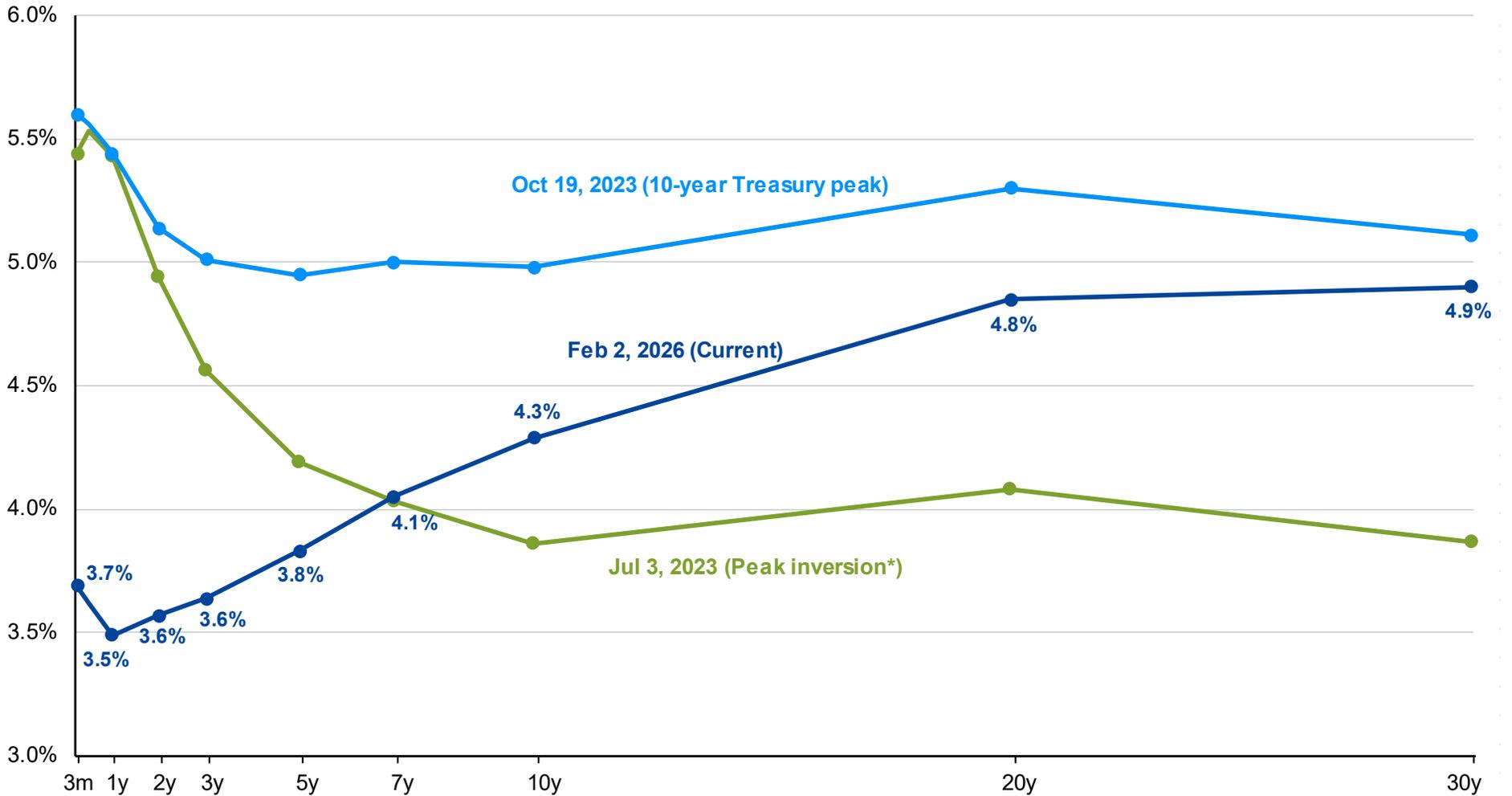
% of GDP, 1940 - 2034, CBO Baseline Forecast, end of fiscal year



Source: BEA, CBO, Treasury Department, J.P. Morgan Asset Management; data as of February 2, 2026.

# The yield curve has steepened significantly

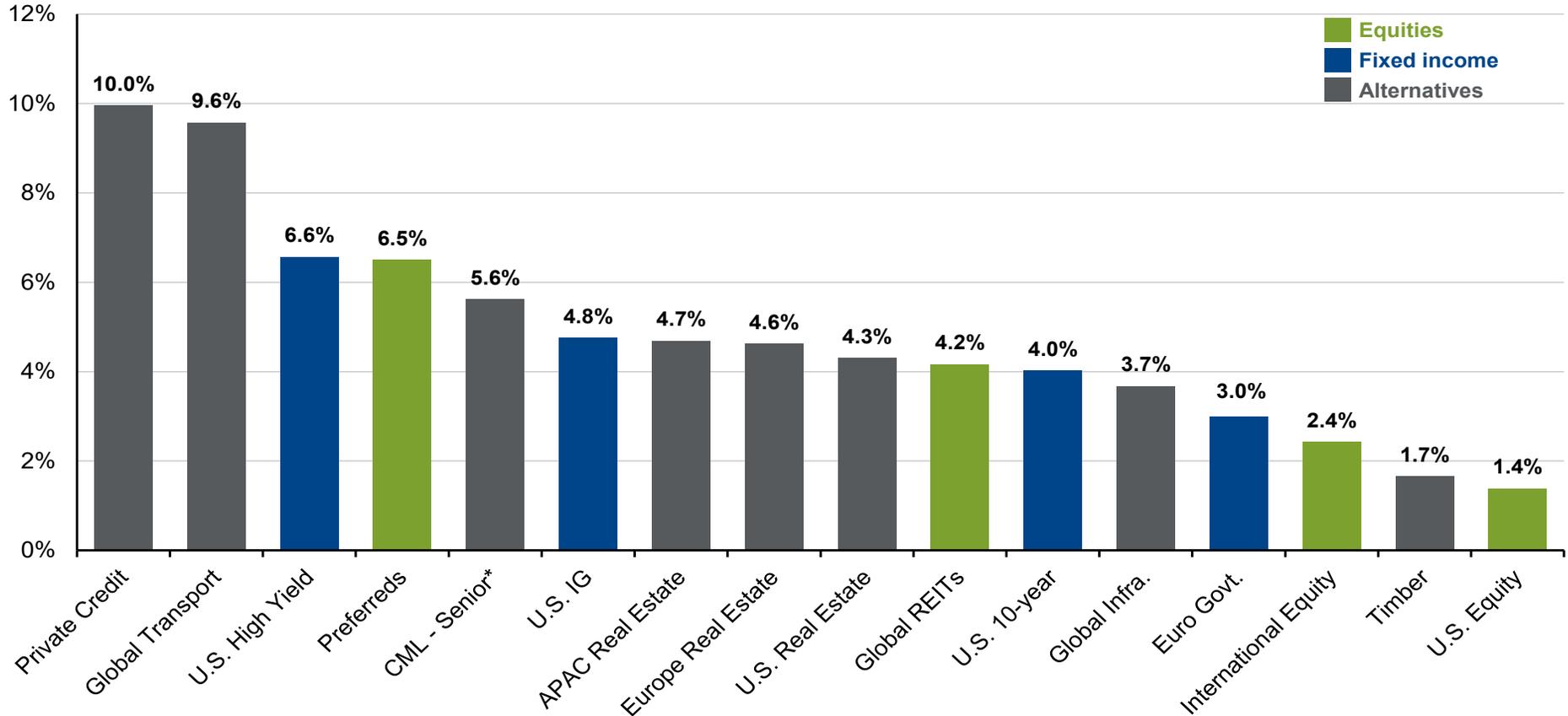
## U.S. Treasury yield curve



Source: FactSet, Federal Reserve, J.P. Morgan Asset Management; data as of February 2, 2026.

# The search for yield extends beyond traditional fixed income

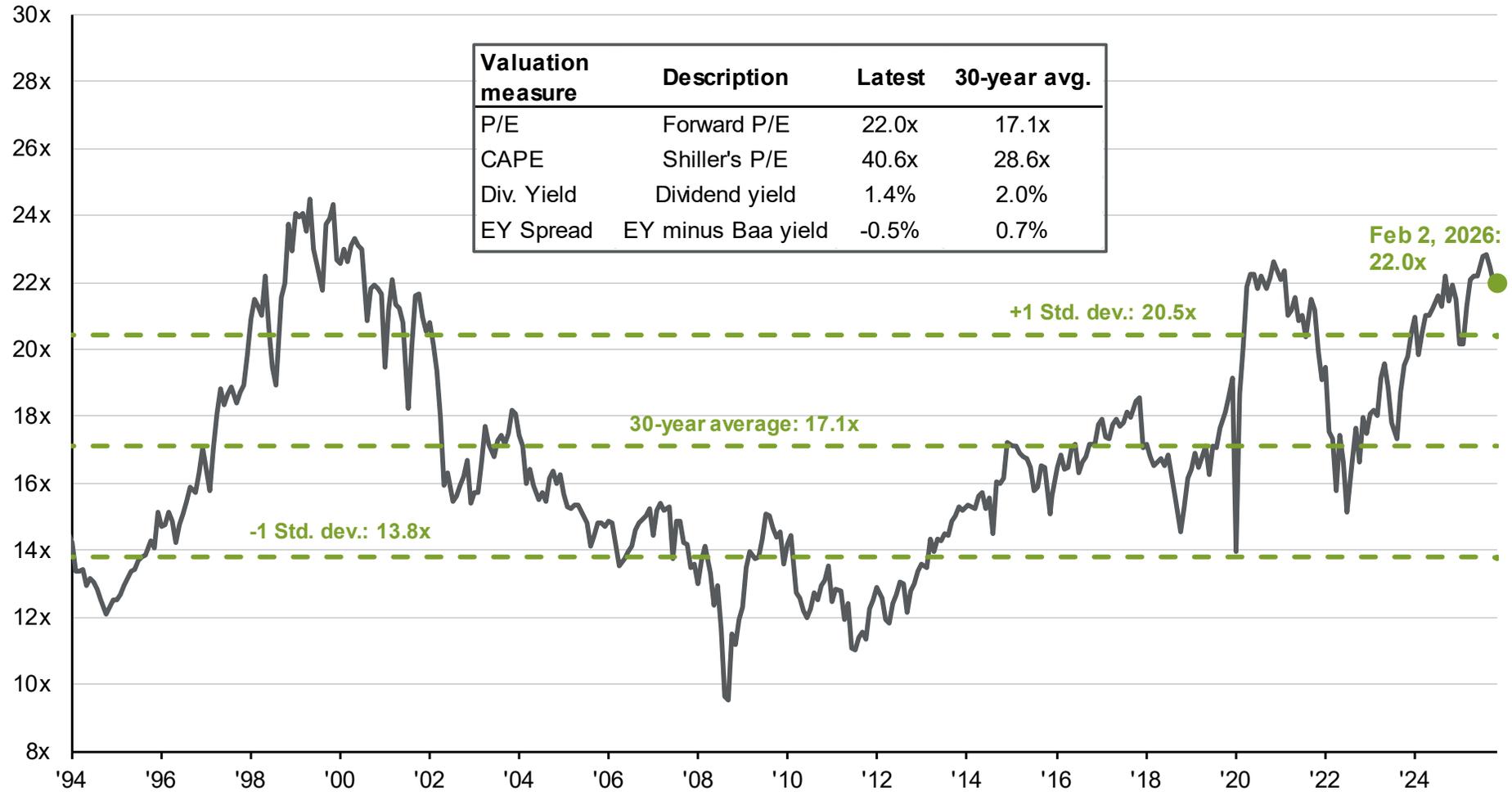
## Asset class yields



Source: BAML, Bloomberg, FactSet, Federal Reserve, FTSE, KBRA DLD, MSCI, NCREIF, Wells Fargo, J.P. Morgan Asset Management. \*CML is commercial mortgage loans tracked by the Gilberto-Levy Commercial Mortgage Index. Equities and fixed income yields are as of 11/30/2025. Alternative yields are as of 6/30/2025, except CML - Senior, which is as of 9/30/2025. CML - Senior: Market-capitalization weighted average for all mortgages in the Gilberto-Levy Commercial Mortgage Index. Global Transport: Levered yields for transport assets calculated as the difference between charter rates (rental income), operating expenses, debt amortization and interest expenses, as a percentage of equity value, and are based on a historical 15-year average. Yields for each of the sub-vessel types are calculated and respective weightings are applied to arrive at the current levered yields for Global Transportation; Preferreds: BAML Hybrid Preferred Securities; Private Credit: KBRA DLD Index; U.S. High Yield: Bloomberg U.S. Aggregate Corporate High Yield; Global Infrastructure: MSCI Global Private Infrastructure Asset Index; Global REITs: FTSE NAREIT Global REITs; International Equity: MSCI AC World ex-U.S.; U.S. 10-year: 10-year U.S. Treasury yield; U.S. Equity: S&P 500 trailing twelve months' dividend yield; Europe Real Estate: Market weighted-avg. of MSCI Global Property Fund Indices - U.K. & Cont. Europe; U.S. and Asia Pacific (APAC) core real estate: MSCI Global Property Fund Index. Euro Govt.: Bloomberg Euro Aggregate Government - Treasury (7-10Y); Timber: NCREIF Timberland Index (U.S.) - EBITDA Return. Past performance is not a reliable indicator of current and future results. *Guide to Alternatives*. Data are based on availability as of November 30, 2025.

# Stocks remain historically expensive

## S&P 500 index: Forward P/E ratio

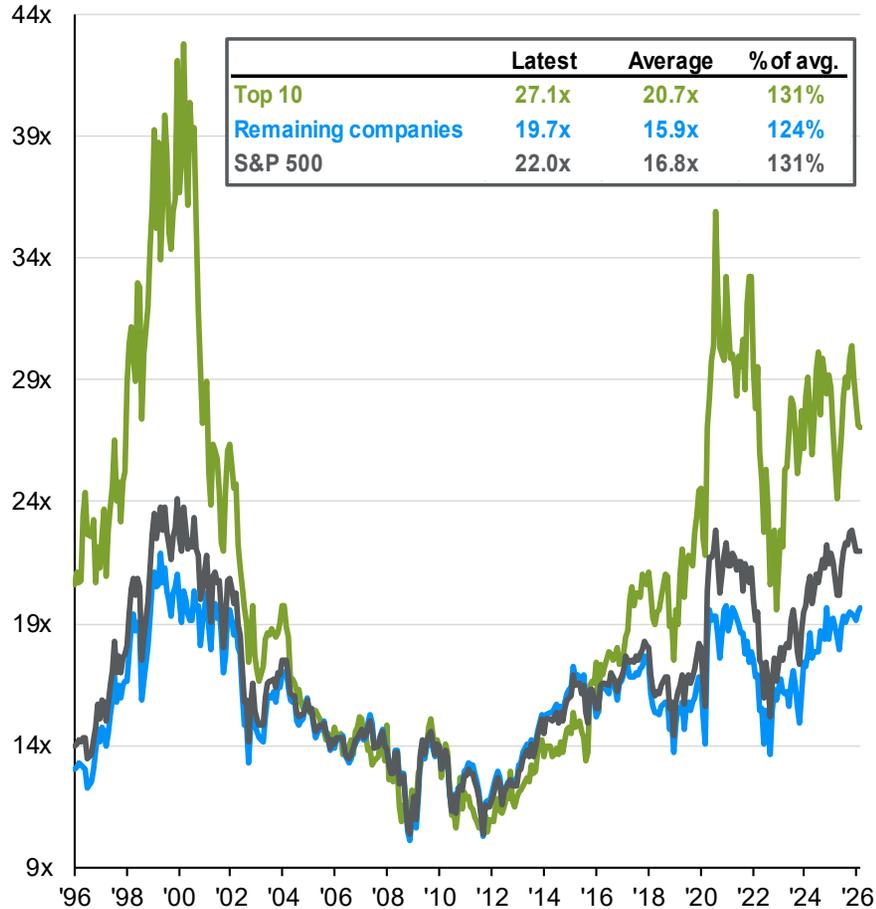


Source: Bloomberg, FactSet, Moody's, Refinitiv Datastream, Robert Shiller, Standard & Poor's, J.P. Morgan Asset Management; data as of February 2, 2026.

## Market concentration is extreme

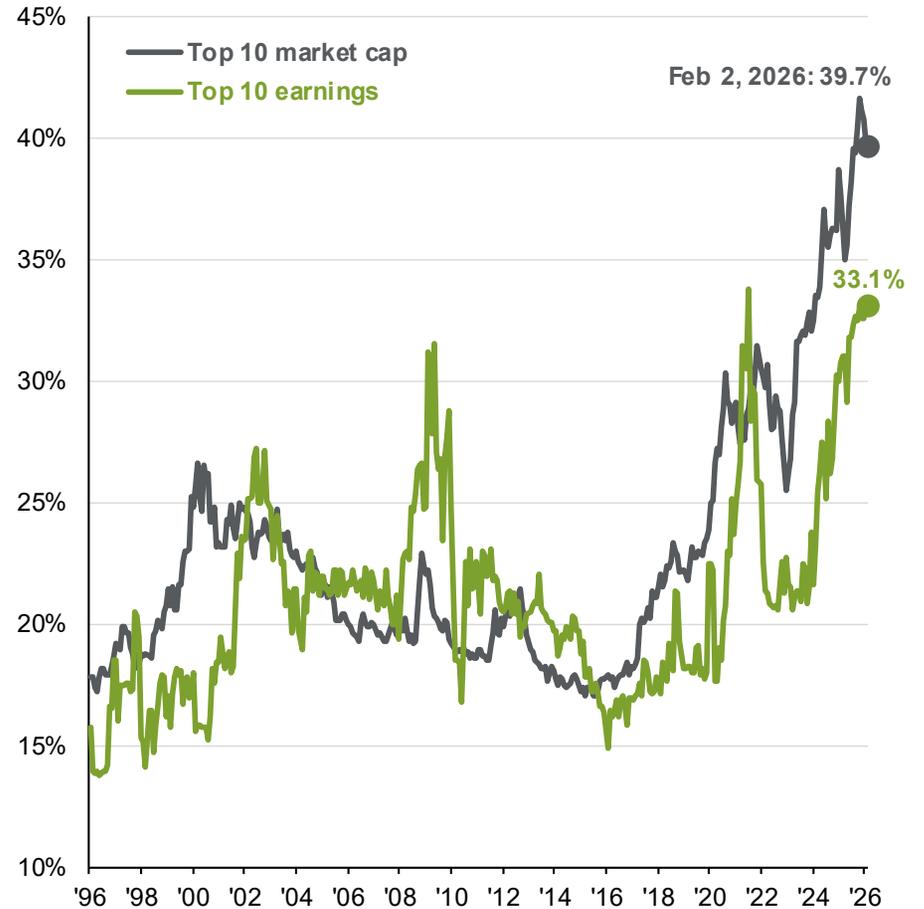
### P/E of top 10 and remaining companies in S&P 500

Next 12 months



### Weight of the top 10 companies in the S&P 500

% of market capitalization, % of last 12 months' earnings

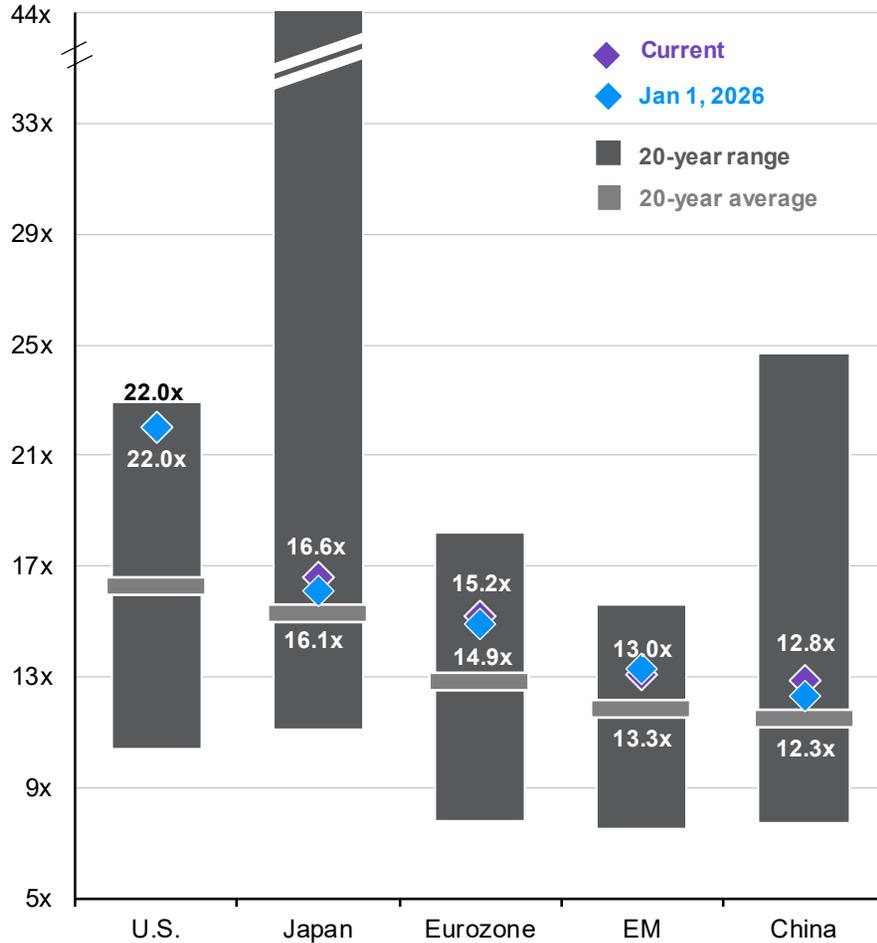


Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management; data as of February 2, 2026.

# Top-down or bottom-up, international equities are cheap

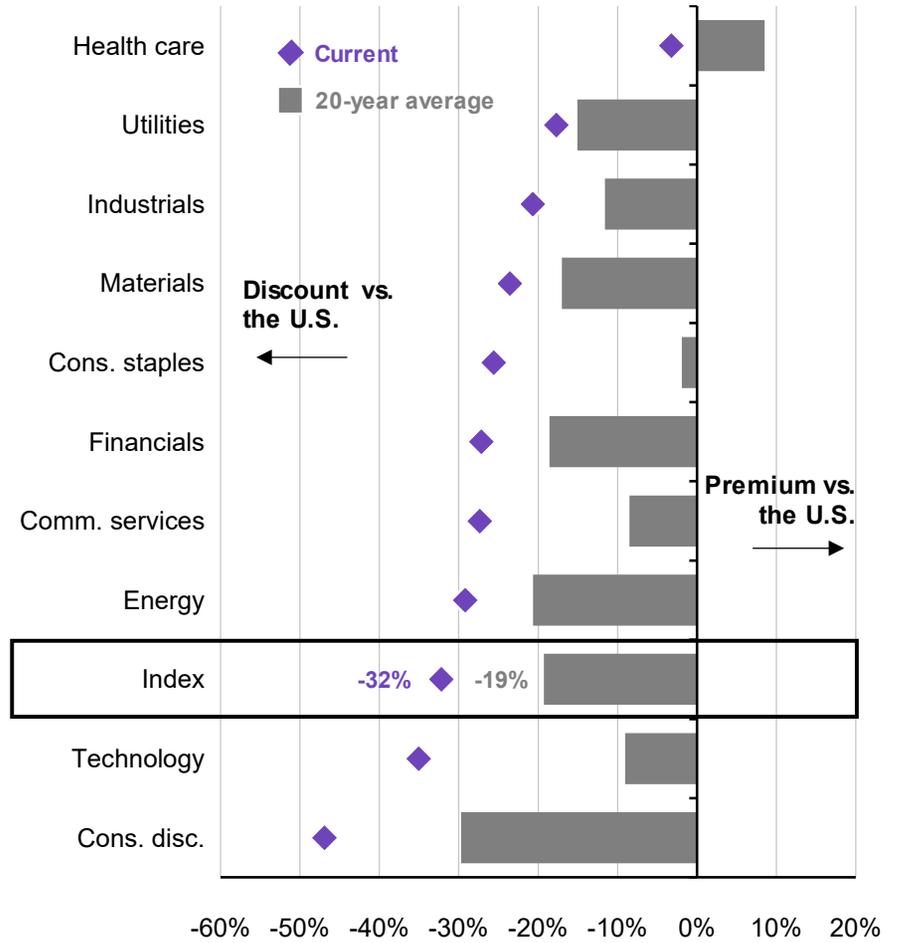
## Valuations by region/country

Forward P/E ratio



## Relative valuations by sector

Forward P/E ratio, MSCI ACWI ex-U.S. divided by S&P 500

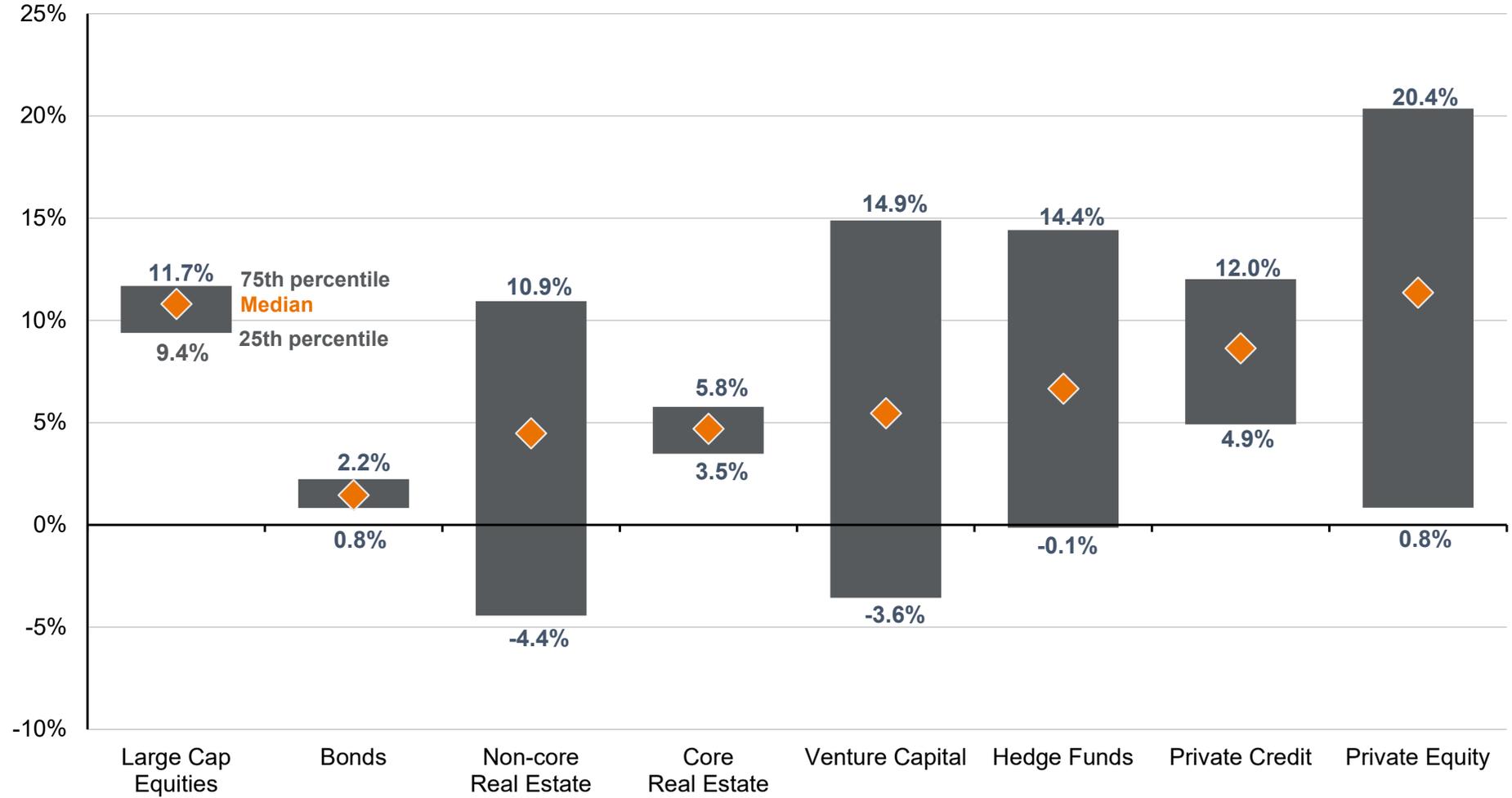


Source: FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management; data as of February 2, 2026.

# “Market” returns in alternatives are an average of managers’ performance

## Public and private manager dispersion

Based on returns from 3Q15 - 3Q25\*

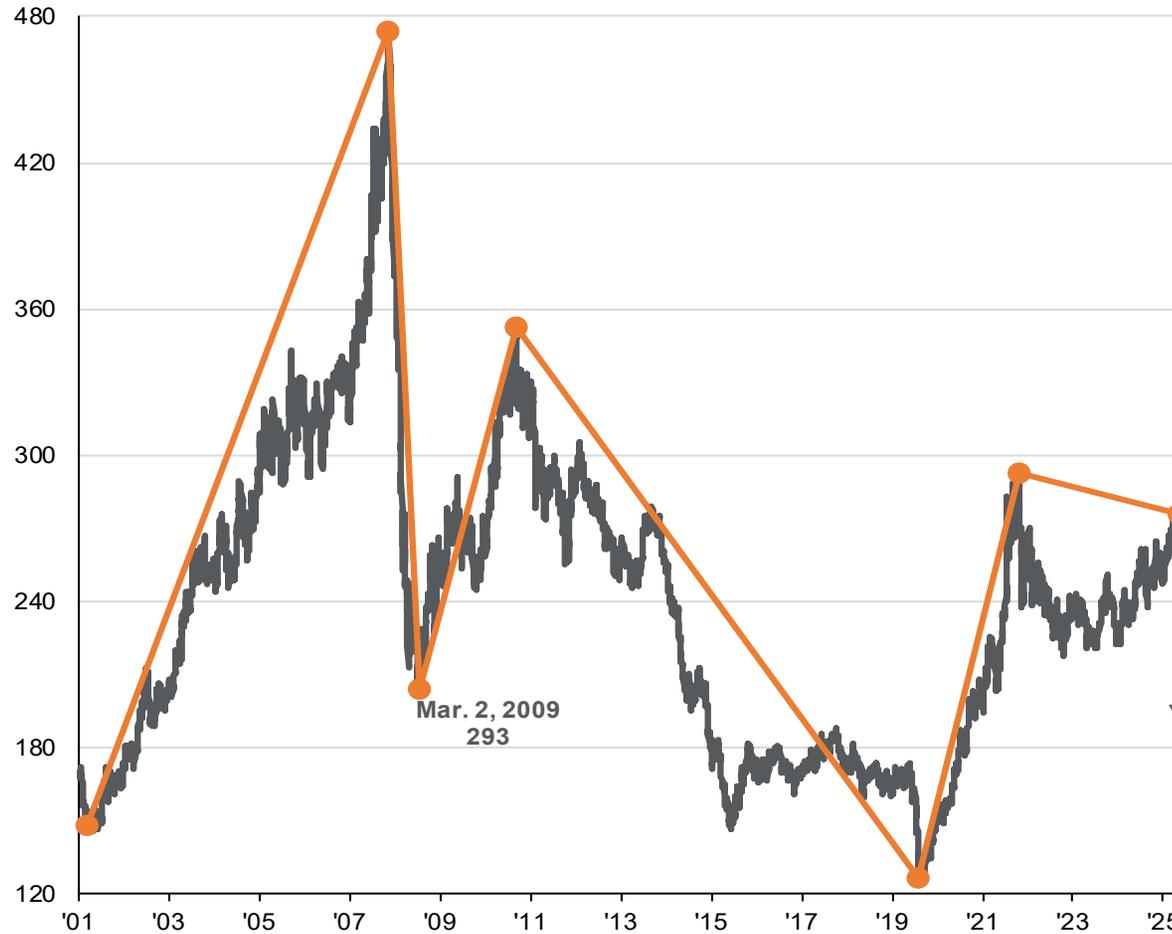


Source: Burgiss, Morningstar, MSCI, PivotalPath, J.P. Morgan Asset Management; data as of February 2, 2026.

# Commodities are volatile and experience wide performance dispersion

## Bloomberg Commodity Index

Since index inception, total returns



## Commodity prices

Bloomberg Commodity Index constituents

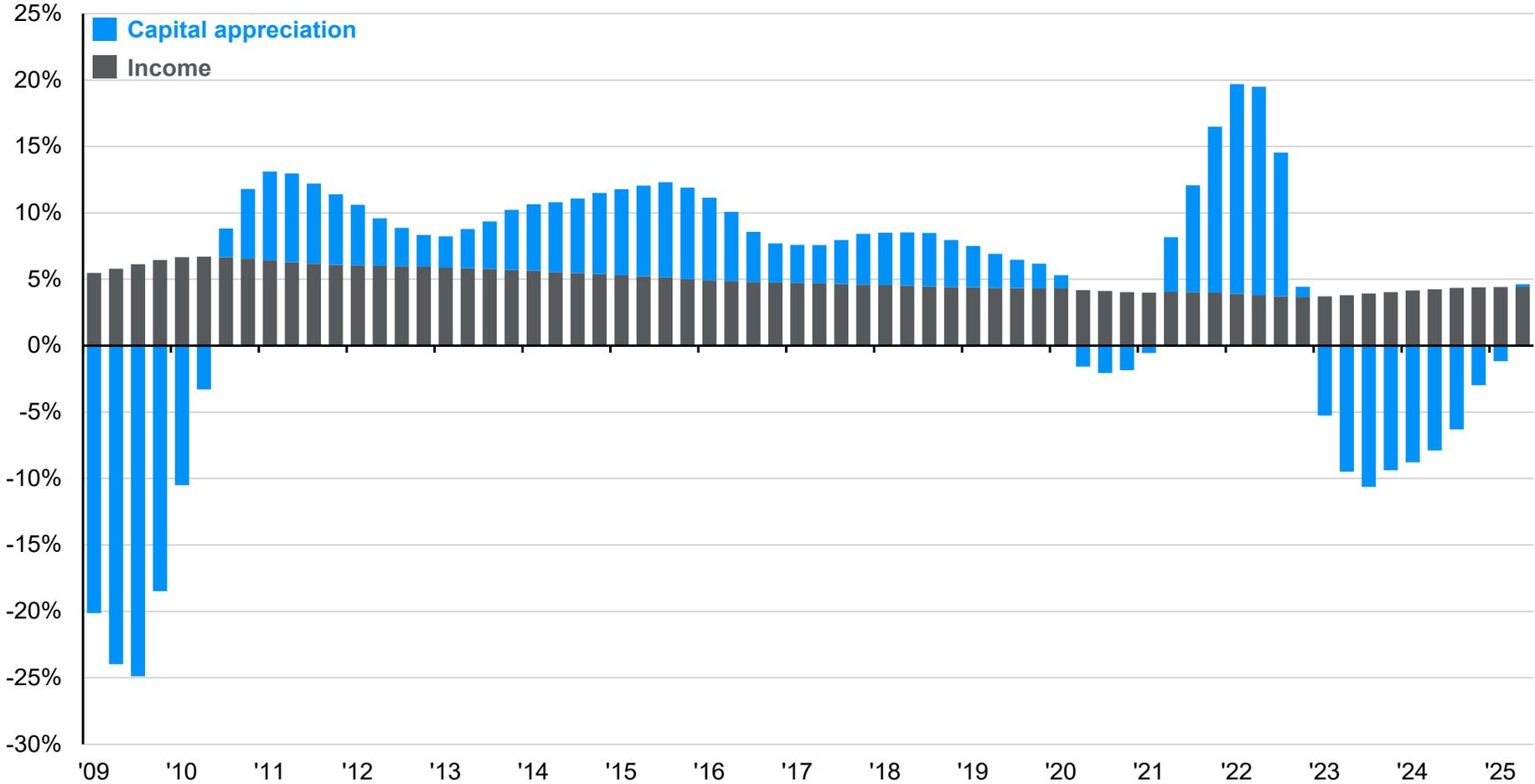
Bloomberg Commodity Index			
Constituents	Index weight	2025 change	Change since peak*
<b>Sub-indices</b>			
<b>Energy</b>	<b>22.8%</b>	<b>-14.1%</b>	<b>-59.1%</b>
WTI crude oil	4.7%	-20.8%	-52.8%
Natural gas	7.0%	-27.0%	-92.0%
Brent crude	5.5%	-10.6%	-29.8%
Low sulphur gas oil	2.2%	-0.2%	-21.2%
RBOB gasoline	1.6%	-8.2%	-26.2%
ULS diesel	1.7%	2.0%	-36.0%
<b>Grains</b>	<b>20.5%</b>	<b>-10.3%</b>	<b>-48.7%</b>
Corn	4.7%	-13.5%	-47.2%
Soybeans	5.5%	14.7%	-37.6%
Soybean meal	3.0%	-16.3%	-21.9%
Wheat	2.3%	-20.9%	-69.9%
Soybean oil	3.5%	-20.1%	-65.7%
HRW w wheat	1.5%	21.7%	-35.5%
<b>Industrial metals</b>	<b>15.1%</b>	<b>16.4%</b>	<b>-11.3%</b>
Copper	6.3%	33.0%	14.9%
Aluminum	4.3%	14.9%	-8.0%
Zinc	2.1%	4.8%	-18.3%
Nickel	2.3%	3.0%	-50.0%
<b>Precious metals</b>	<b>29.3%</b>	<b>82.3%</b>	<b>156.3%</b>
Gold	20.3%	55.9%	94.2%
Silver	9.0%	129.0%	168.7%
<b>Softs</b>	<b>6.2%</b>	<b>-1.4%</b>	<b>19.0%</b>
Sugar	2.0%	-20.2%	-8.5%
Coffee	2.9%	23.0%	92.0%
Cotton	1.3%	-13.9%	-54.7%
<b>Livestock</b>	<b>5.3%</b>	<b>17.7%</b>	<b>33.6%</b>
Live cattle	3.7%	26.2%	59.5%
Lean hogs	1.6%	3.3%	-2.3%

Source: Bloomberg, FactSet, J.P. Morgan Asset Management. All the Bloomberg subsectors and constituents are represented by the respective Bloomberg subindex except ULS Diesel, which is represented by the EIA composite for U.S. ULS diesel prices. The weights do not add up to 100% as the Lead subindex, which failed to meet the minimum threshold in 2023, continues to remain part of the index.\*The Bloomberg Commodity Index peaked on June 9, 2022. *Guide to the Markets – U.S.* Data are as of December 31, 2025.

# Real estate returns are driven by stable income and variable capital gains

## Global private real estate returns

Rolling 4-quarter returns from income and capital appreciation

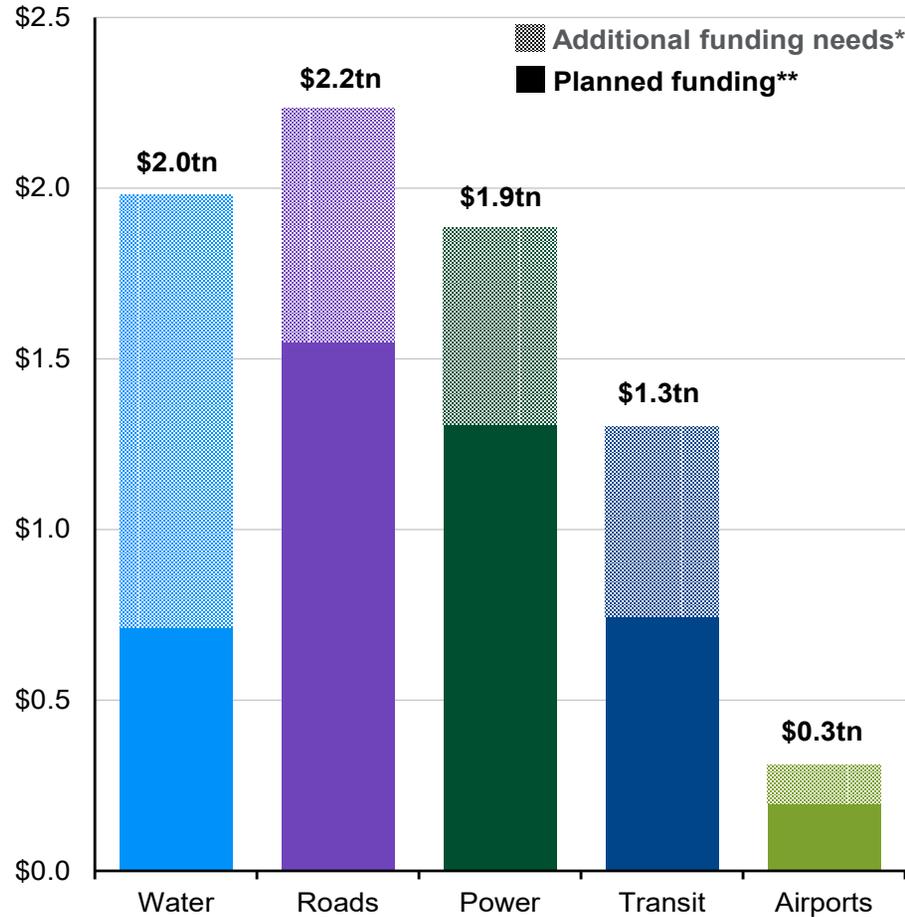


Source: MSCI, J.P. Morgan Asset Management. Real estate returns represented by the MSCI Global Property Fund Index. Data show rolling four-quarter returns from income and capital appreciation. The chart shows the full index history, beginning in 1Q09. Past performance is not a reliable indicator of current and future results. *Guide to Alternatives*. Data are based on availability as of November 30, 2025.

# The infrastructure investment cycle presents an extended opportunity

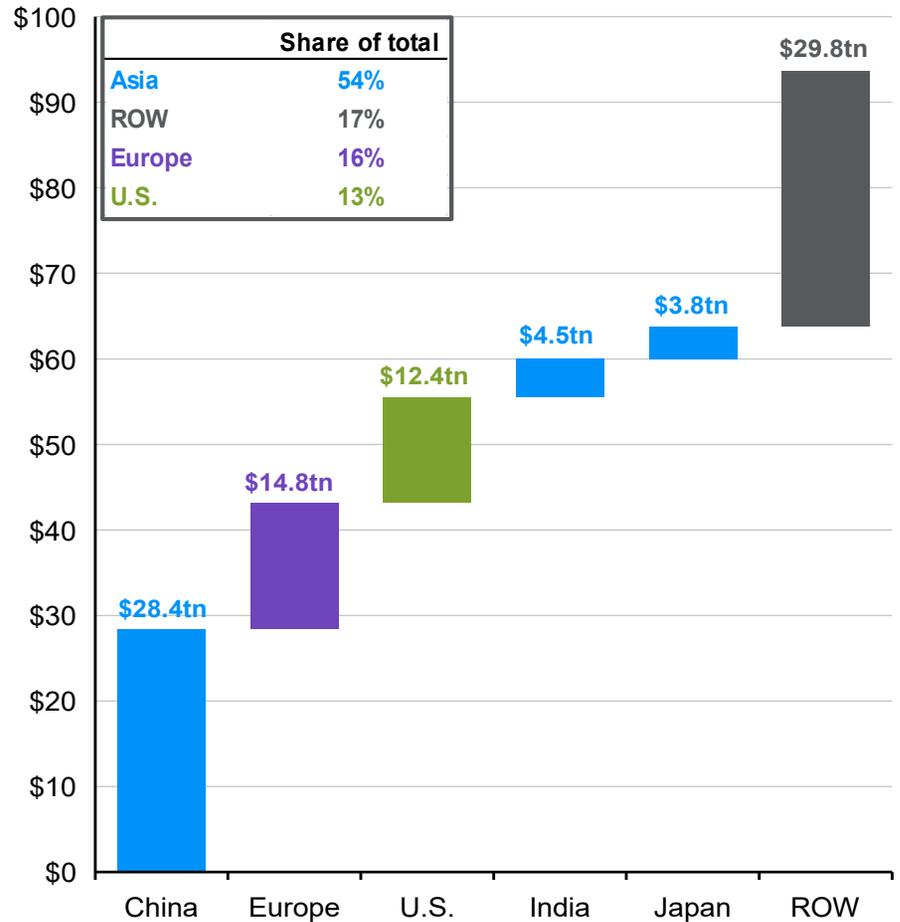
## U.S. infrastructure funding & funding gaps

USD trillions, 2024 – 2033, as of 2024



## Infrastructure investment needs by region

USD trillions, 2016 – 2040, constant 2016 prices



Source: American Society of Civil Engineers (ASCE), Global Infrastructure Hub by G20, J.P. Morgan Asset Management. (Left) Categories defined by the ASCE in the March 2025 "A Comprehensive Assessment of America's Infrastructure: 2025 Report Card for America's Infrastructure" report. \*Additional funding is the amount of funding needed to get each category to a "B" rating, or a state of "Good" repair, as defined by the ASCE. \*\*Planned public funding is the amount of investment from 2024 to 2033 that is currently in place by U.S. law. (Right) ROW = rest of world. *Guide to Alternatives*. Data are based on availability as of November 30, 2025.

# Private equity is a complement to public equity

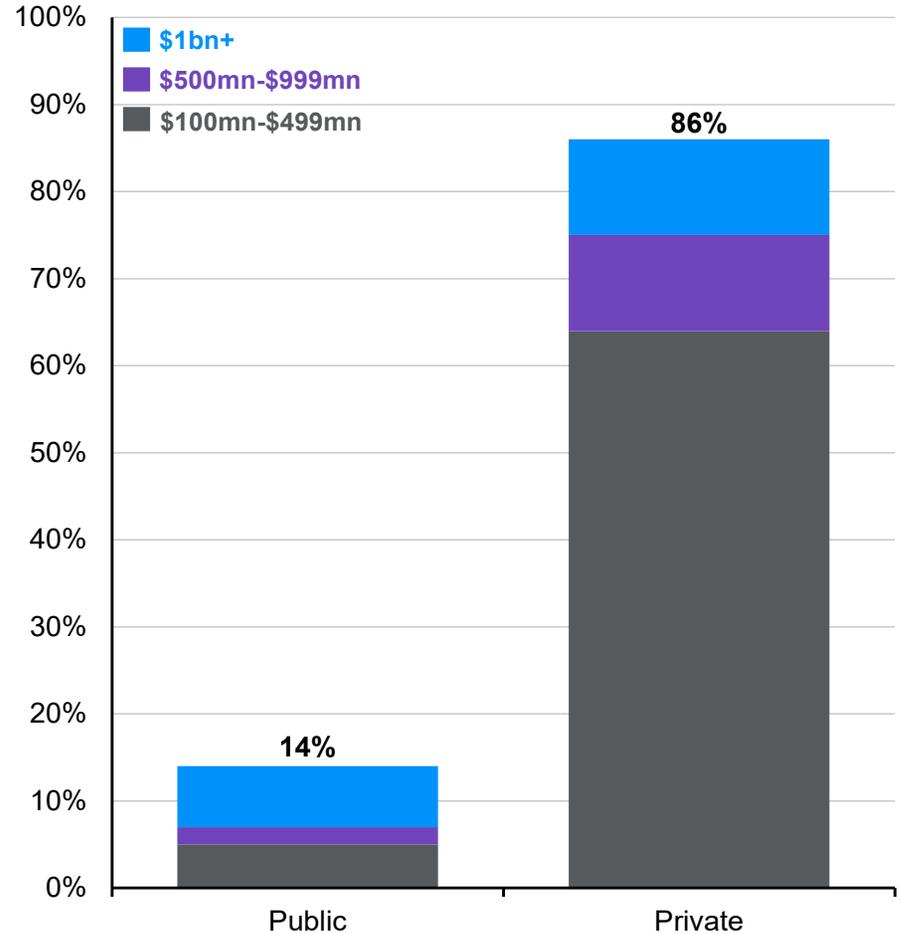
## Number of listed U.S. companies\* and market cap.

Count, S&P 500 market capitalization in USD trillions



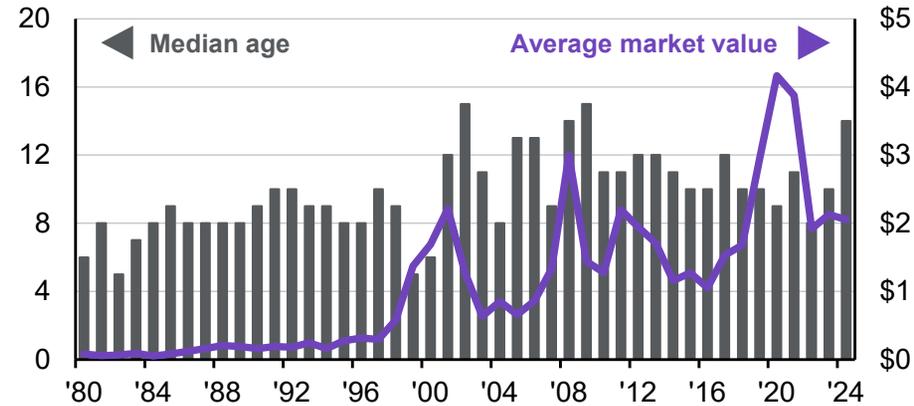
## U.S. companies split public vs. private

Share of companies with annual revenue greater than \$100mn



## Median age and average market value at IPO

Years, USD billions

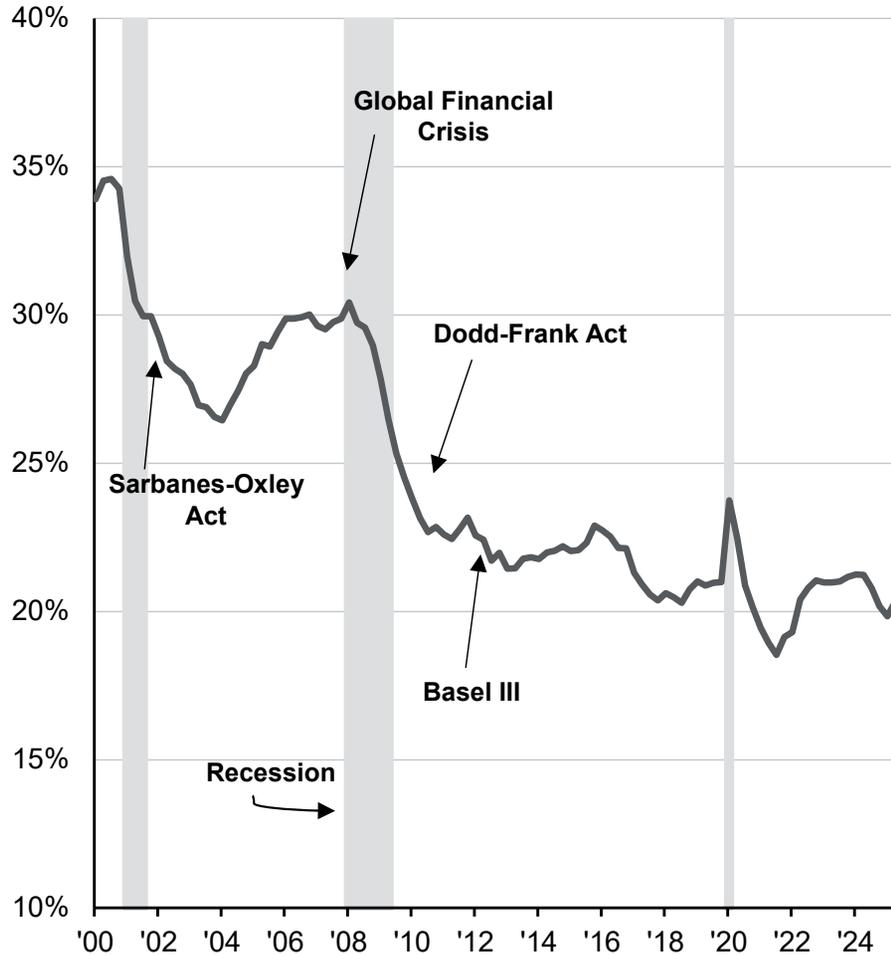


Source: Bain and Company, FactSet, Jay Ritter – University of Florida, S&P Capital IQ, World Federation of Exchanges, J.P. Morgan Asset Management. (Top left) \*Number of listed U.S. companies is represented by the sum of the number of companies listed on the NYSE and the NASDAQ. (Bottom left) Average market value is calculated by dividing the total market value at first closing price by the total number of IPOs for each period. The sample is IPOs with an offer price of at least \$5, excluding ADRs, unit offers, closed-end funds, REITs, natural resource limited partnerships, small best efforts offers, banks and S&Ls and stocks not listed on CRSP (CRSP includes Amex, NYSE and NASDAQ stocks). *Guide to Alternatives*. Data are based on availability as of November 30, 2025.

# Private credit has emerged since the global financial crisis

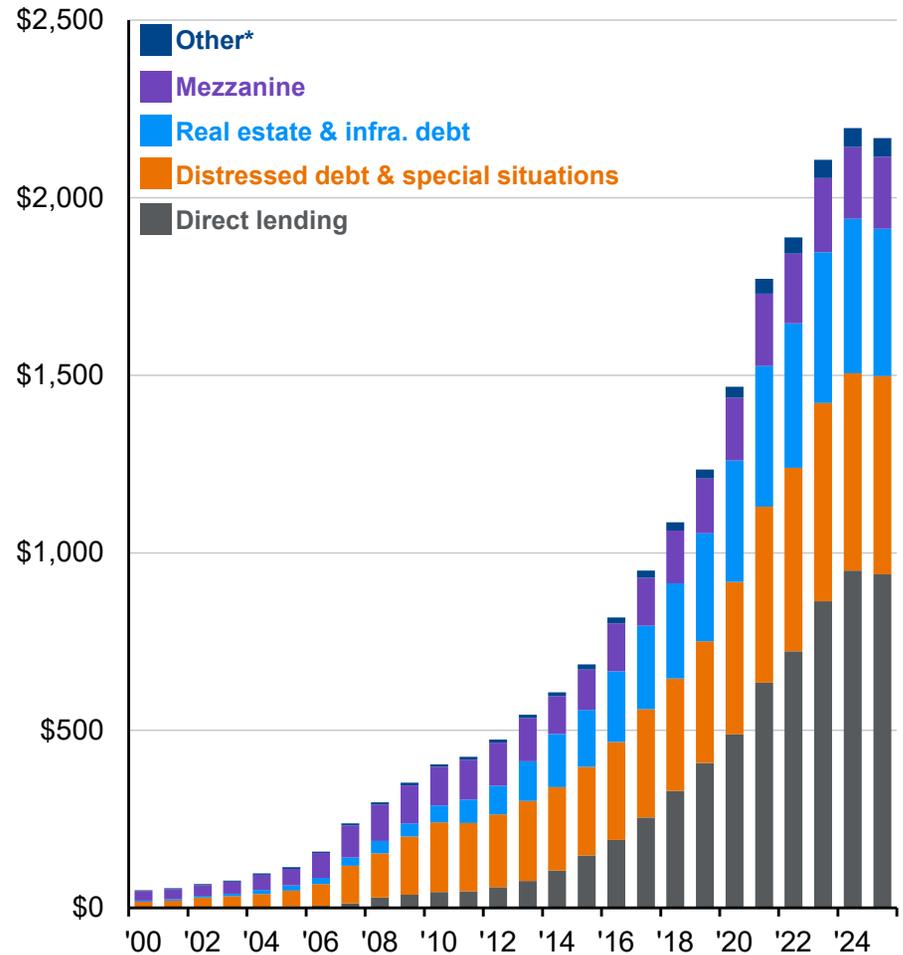
## U.S. bank lending

Share of total nonfinancial corporate debt, 1Q00 – 2Q25



## Global private credit AUM by type

USD billions, end of period



Source: Federal Reserve, Preqin, J.P. Morgan Asset Management. (Right) 2025 data are as of 1Q25. \*Other includes venture debt and fund of funds. *Guide to Alternatives*. Data are based on availability as of November 30, 2025.

## Disclosure

---

This document is a general communication being provided for informational purposes only. It is educational in nature and not designed to be taken as advice or a recommendation for any specific investment product, strategy, plan feature or other purpose in any jurisdiction, nor is it a commitment from J.P. Morgan Asset Management or any of its subsidiaries to participate in any of the transactions mentioned herein. Any examples used are generic, hypothetical and for illustration purposes only. This material does not contain sufficient information to support an investment decision, and it should not be relied upon by you in evaluating the merits of investing in any securities or products. In addition, users should make an independent assessment of the legal, regulatory, tax, credit and accounting implications and determine, together with their own professional advisers, if any investment mentioned herein is believed to be suitable to their personal goals. Investors should ensure that they obtain all available relevant information before making any investment. Any forecasts, figures, opinions or investment techniques and strategies set out are for information purposes only, based on certain assumptions and current market conditions and are subject to change without prior notice. All information presented herein is considered to be accurate at the time of production, but no warranty of accuracy is given and no liability in respect of any error or omission is accepted.

It should be noted that investment involves risks, the value of investments and the income from them may fluctuate in accordance with market conditions and taxation agreements and investors may not get back the full amount invested. Both past performance and yields are not reliable indicators of current and future results.

J.P. Morgan Asset Management is the brand for the asset management business of JPMorgan Chase & Co. and its affiliates worldwide.

Telephone calls and electronic communications may be monitored and/or recorded.

Personal data will be collected, stored and processed by J.P. Morgan Asset Management in accordance with our privacy policies at <https://www.jpmorgan.com/privacy>.

This communication is issued in the U.S. by J.P. Morgan Investment Management Inc. or J.P. Morgan Alternative Asset Management, Inc., both regulated by the Securities and Exchange Commission.

For U.S. only: If you are a person with a disability and need additional support in viewing the material, please call us at 1-800-343-1113 for assistance.

Copyright 2024 JPMorgan Chase & Co. All rights reserved.

# Disclaimer

---

## For Reporting Purposes only

JPMAM Long-Term Capital Market Assumptions: Given the complex risk-reward trade-offs involved, we advise clients to rely on judgment as well as quantitative optimization approaches in setting strategic allocations. Please note that all information shown is based on qualitative analysis. Exclusive reliance on the above is not advised. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise of future performance. Note that these asset class and strategy assumptions are passive only – they do not consider the impact of active management. References to future returns are not promises or even estimates of actual returns a client portfolio may achieve. Assumptions, opinions and estimates are provided for illustrative purposes only. They should not be relied upon as recommendations to buy or sell securities. Forecasts of financial market trends that are based on current market conditions constitute our judgment and are subject to change without notice.

This material has been prepared for information purposes only and is not intended to provide, and should not be relied on for, accounting, legal or tax advice. The outputs of the assumptions are provided for illustration/discussion purposes only and are subject to significant limitations. “Expected” or “alpha” return estimates are subject to uncertainty and error. For example, changes in the historical data from which it is estimated will result in different implications for asset class returns. Expected returns for each asset class are conditional on an economic scenario; actual returns in the event the scenario comes to pass could be higher or lower, as they have been in the past, so an investor should not expect to achieve returns similar to the outputs shown herein. References to future returns for either asset allocation strategies or asset classes are not promises of actual returns a client portfolio may achieve. Because of the inherent limitations of all models, potential investors should not rely exclusively on the model when making a decision. The model cannot account for the impact that economic, market, and other factors may have on the implementation and ongoing management of an actual investment portfolio. Unlike actual portfolio outcomes, the model outcomes do not reflect actual trading, liquidity constraints, fees, expenses, taxes and other factors that could impact the future returns. The model assumptions are passive only – they do not consider the impact of active management. A manager’s ability to achieve similar outcomes is subject to risk factors over which the manager may have no or limited control. The views contained herein are not to be taken as advice or a recommendation to buy or sell any investment in any jurisdiction, nor is it a commitment from J.P. Morgan Asset Management or any of its subsidiaries to participate in any of the transactions mentioned herein. Any forecasts, figures, opinions or investment techniques and strategies set out are for information purposes only, based on certain assumptions and current market conditions and are subject to change without prior notice. All information presented herein is considered to be accurate at the time of production. This material does not contain sufficient information to support an investment decision and it should not be relied upon by you in evaluating the merits of investing in any securities or products. In addition, users should make an independent assessment of the legal, regulatory, tax, credit and accounting implications and determine, together with their own financial professional, if any investment mentioned herein is believed to be appropriate to their personal goals. Investors should ensure that they obtain all available relevant information before making any investment. Investment involves risks, the value of investments and the income from them may fluctuate in accordance with market conditions and taxation agreements and investors may not get back the full amount invested. Both past performance and yield are not a reliable indicator of current and future results.

J.P. Morgan Asset Management is the brand for the asset management business of JPMorgan Chase & Co. and its affiliates worldwide. To the extent permitted by applicable law, we may record telephone calls and monitor electronic communications to comply with our legal and regulatory obligations and internal policies. Personal data will be collected, stored and processed by J.P. Morgan Asset Management in accordance with our privacy policies at <https://am.jpmorgan.com/global/privacy>.

This communication is issued by the following entities: In the United States, by J.P. Morgan Investment Management Inc. or J.P. Morgan Alternative Asset Management, Inc., both regulated by the Securities and Exchange Commission; in Latin America, for intended recipients’ use only, by local J.P. Morgan entities, as the case may be; in Canada, for institutional clients’ use only, by JPMorgan Asset Management (Canada) Inc., which is a registered Portfolio Manager and Exempt Market Dealer in all Canadian provinces and territories except the Yukon and is also registered as an Investment Fund Manager in British Columbia, Ontario, Quebec and Newfoundland and Labrador. In the United Kingdom, by JPMorgan Asset Management (UK) Limited, which is authorized and regulated by the Financial Conduct Authority; in other European jurisdictions, by JPMorgan Asset Management (Europe) S.à r.l. In Asia Pacific (“APAC”), by the following issuing entities and in the respective jurisdictions in which they are primarily regulated: JPMorgan Asset Management (Asia Pacific) Limited, or JPMorgan Funds (Asia) Limited, or JPMorgan Asset Management Real Assets (Asia) Limited, each of which is regulated by the Securities and Futures Commission of Hong Kong; JPMorgan Asset Management (Singapore) Limited (Co. Reg. No. 197601586K), this advertisement or publication has not been reviewed by the Monetary Authority of Singapore; JPMorgan Asset Management (Taiwan) Limited; JPMorgan Asset Management (Japan) Limited, which is a member of the Investment Trusts Association, Japan, the Japan Investment Advisers Association, Type II Financial Instruments Firms Association and the Japan Securities Dealers Association and is regulated by the Financial Services Agency (registration number “Kanto Local Finance Bureau (Financial Instruments Firm) No. 330”); in Australia, to wholesale clients only as defined in section 761A and 761G of the Corporations Act 2001 (Commonwealth), by JPMorgan Asset Management (Australia) Limited (ABN 55143832080) (AFSL 376919). For U.S. only: If you are a person with a disability and need additional support in viewing the material, please call us at 1-800-343-1113 for assistance. Copyright 2024 JPMorgan Chase & Co. All rights reserved.

2e963557-8355-11f0-b657-a309fb9adf1a



# **SERS Asset Allocation Update**

## **February 2026**

*Farouki Majeed, Chief Investment Officer*

# Historical Asset Allocation - Issues



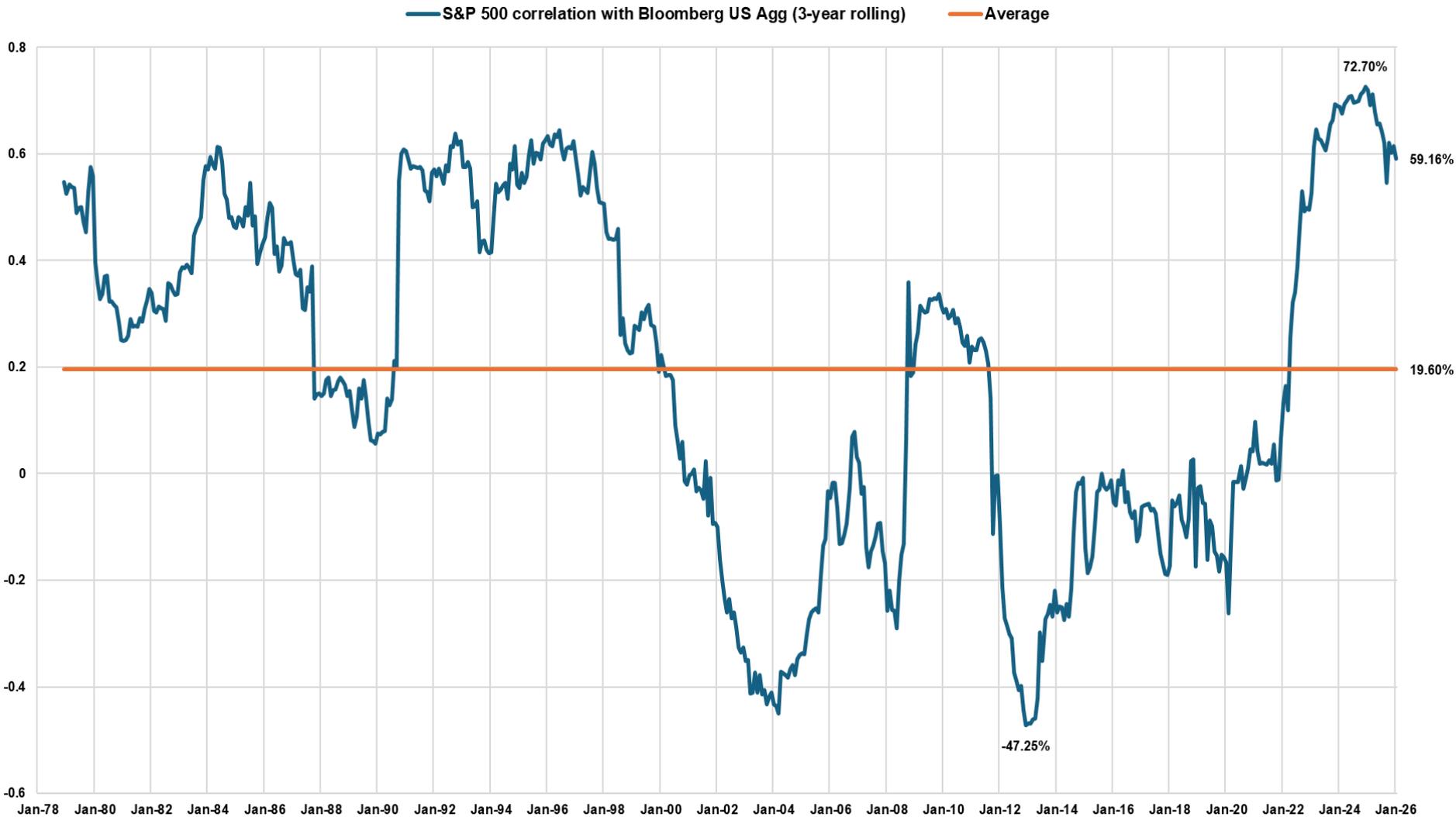
- Assumes risky assets have return premium in all periods.  
*- not the case in all 10-yr periods: 2000-2010 equity returns lower than bonds.*
- Assumes historical correlations to hold.  
*- correlations are not static and can spike in crisis periods; equity/bond correlations rose sharply in 2022-2025.*
- Results in higher allocation to return oriented risky assets (equities).  
*- risk of large drawdowns as in 2008, 2022.*
- Results in portfolio designed to perform in stable or rising growth environments with low inflation.
- Portfolio will disappoint in recessionary, inflationary or deflationary periods.
- Asset diversification and risk diversification is not the same; Equities account for higher % of total risk than their asset weight.
- Volatility in funding gap.

# SERS Risk Report As of 9/30/2025

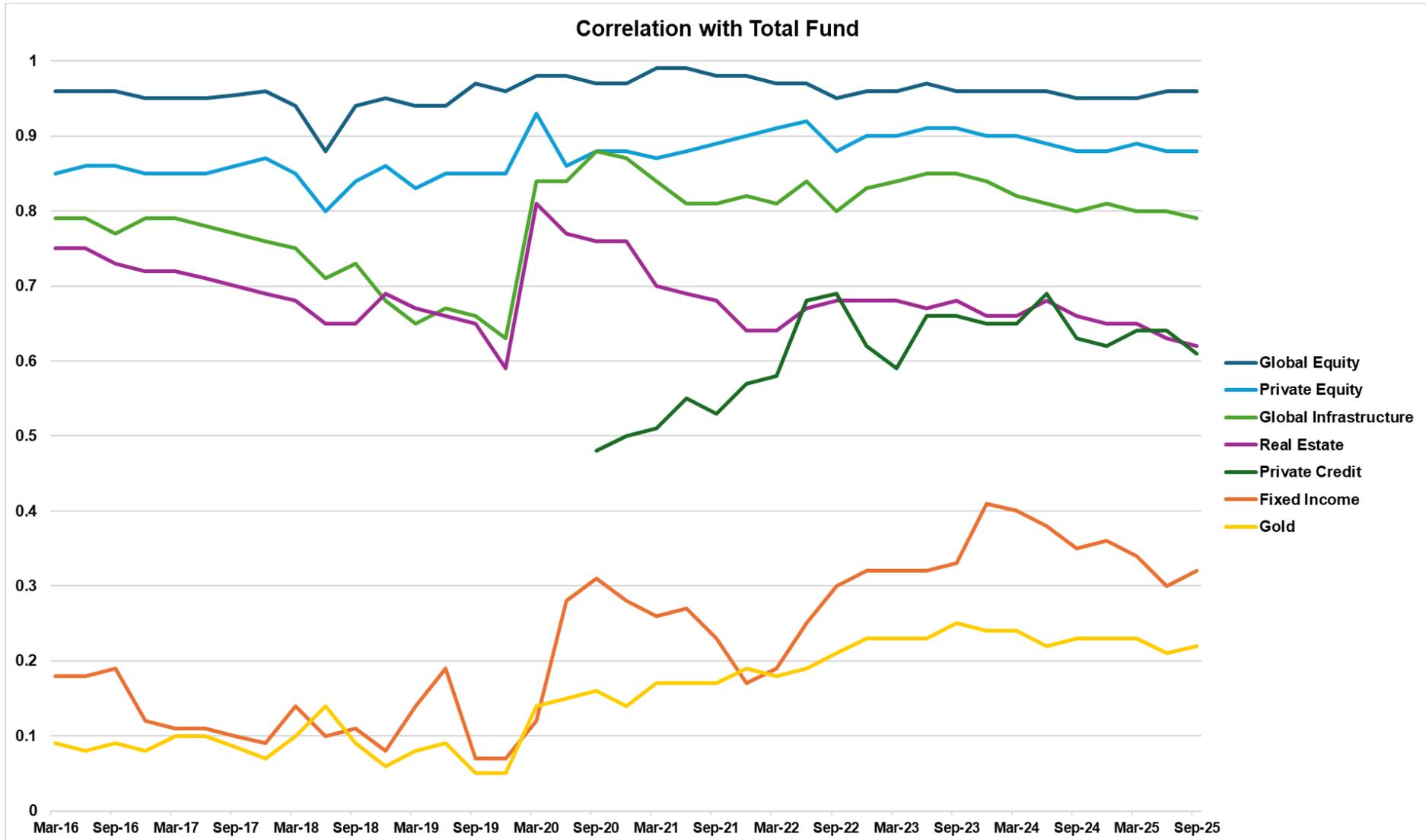


<b>Asset Class</b>	<b>Weight</b>	<b>Correlation to Total Fund</b>	<b>Total Risk</b>	<b>Risk Contribution</b>
Total Fund	100%	1.00	10.57	100%
Global Equities	44.2%	0.96	14.7	59.5%
Fixed Income	13.2%	0.32	5.2	2.1%
Private Credit	5.8%	0.61	5.7	1.9%
Private Equity	12.4%	0.88	19.3	19.8%
Infrastructure	6.5%	0.79	13.9	7.2%
Real Estate	10.3%	0.62	16.9	9.9%
Opportunistic & Tactical	3.2%	0.50	5.6	1.2%
Short-Term	4.3%	0.00	0.1	0.0%
Currency Overlay	0.0%	0.46	5.9	-0.9%
Direct Rebalance Overlay	0.1%	-0.92	9.5	-0.6%

# Historical correlation – S&P 500 / Bloomberg US Agg



# SERS Asset Class Correlation with Total Fund

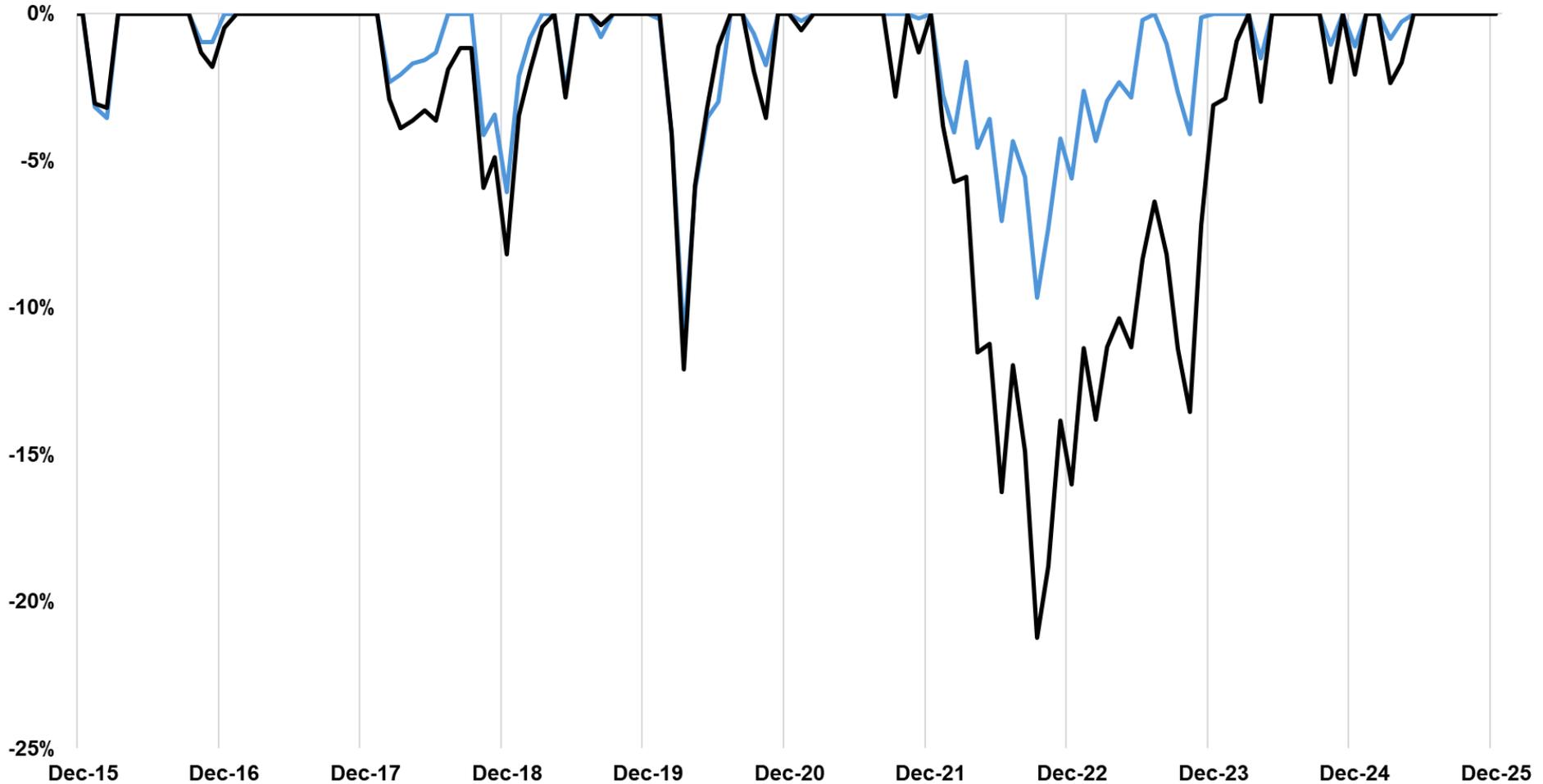


# SERS Total Fund Has Lower Drawdown Risk Than 60/40



—SERS Total Fund

—60% MSCI ACWI + 40% Bloomberg Agg. Index Composite



# Asset Performance and Economic Regimes



	<b>Growth</b>	<b>Inflation</b>
<b>Rising</b>	Global Equities REITS Commodities Corporate Credit Emerging Market Credit  <i>(Expansion)</i>	Commodities Inflation-Linked Bonds Gold  <i>(Inflationary)</i>
<b>Falling</b>	Nominal Government Bonds Inflation-Linked Bonds Gold  <i>(Recession)</i>	Nominal Government Bonds  <i>(Deflationary)</i>

# Initial Conditions and Subsequent Outcomes



	12/31/1985	12/31/1995	12/31/2005	12/31/2015	12/31/2025
<b>P/E (S&amp;P 500)</b>	14.28	18.08	18.07	22.18	29.49
<b>Dividend Yield (S&amp;P 500) (%)</b>	3.81	2.24	1.76	2.11	1.15
<b>10-Year Treasury Yield (%)</b>	9.19	5.65	4.42	2.09	4.21
<b>CPI (subsequent 10-year period)</b>	3.46	2.56	1.84	3.21	---
<b>Real GDP growth (subsequent 10-year period)</b>	2.89	3.42	1.59	2.54	---
<b>S&amp;P 500 returns (subsequent 10-year period)</b>	14.88	9.07	7.31	14.82	---

# Historical Cyclically-Adjusted P/E Ratio (CAPE)



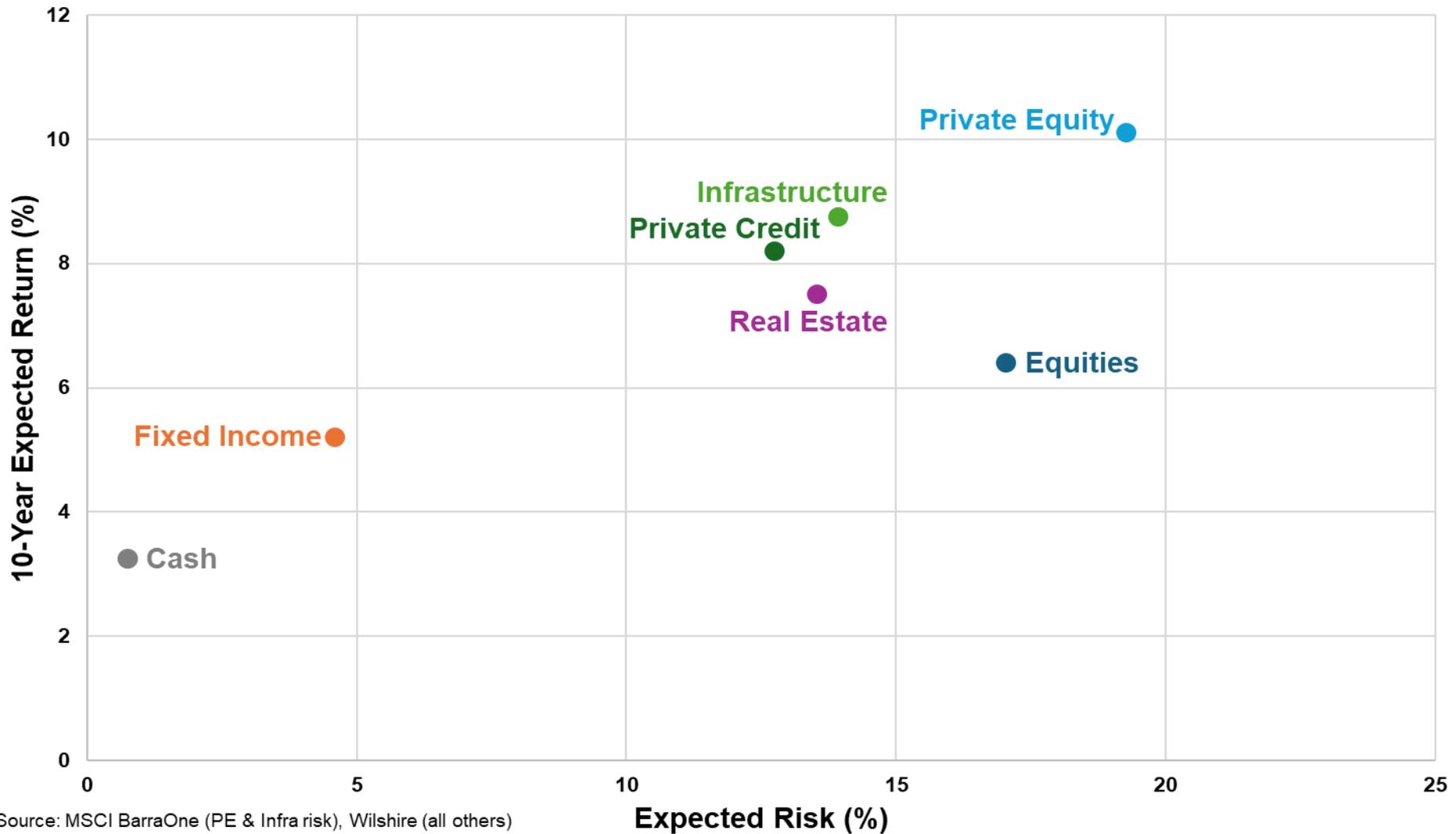
# 10-Year Capital Market Assumptions Comparison



## 10-Year Capital Market Assumptions Comparison

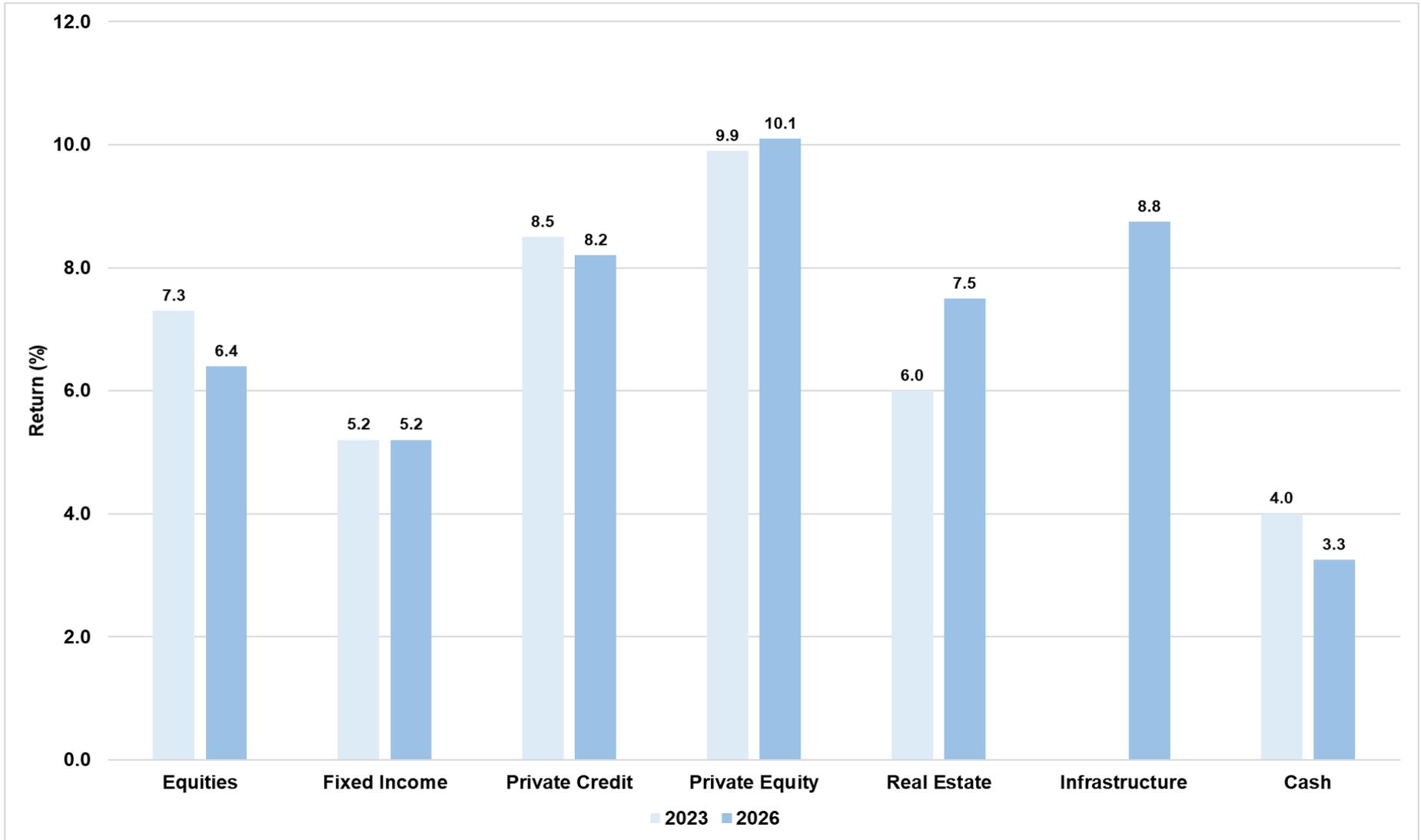
	Goldman		Northern			BCA	Ned Davis					Average	Risk (Wilshire / JPM)
	BlackRock	Sachs	Invesco	JP Morgan	Trust			Callan	RVK	Verus	Wilshire		
<b>Cash</b>	<b>3.8</b>	<b>3.2</b>	<b>3.4</b>	<b>3.1</b>	<b>3.3</b>	<b>3.7</b>	<b>3.3</b>	<b>3.0</b>	<b>3.7</b>	<b>3.3</b>	<b>3.4</b>	<b>0.8</b>	
<b>Global Equities</b>	<b>7.5</b>	<b>7.4</b>	<b>6.6</b>	<b>8.3</b>	<b>6.9</b>	<b>7.3</b>	<b>7.4</b>	<b>7.4</b>	<b>7.2</b>	<b>7.3</b>	<b>7.2</b>	<b>17.1</b>	
US Equities	6.9	7.6	5.4	8.1	6.8	6.9	6.7	7.4	6.0	6.5	6.7	17.0	
Non-US Dev. Market Equities	8.6	6.7	7.2	8.9	6.8	8.1	7.1	7.3	8.3	8.2	7.6	18.0	
Emerging Market Equities	8.0	8.2	10.1	9.7	6.9	8.2	8.0	7.5	10.8	9.3	8.7	26.0	
<b>Core Fixed Income</b>	<b>4.2</b>	<b>4.6</b>	<b>5.1</b>	<b>4.9</b>	<b>5.0</b>	<b>5.0</b>	<b>4.4</b>	<b>4.8</b>	<b>4.5</b>	<b>4.8</b>	<b>4.8</b>	<b>4.8</b>	
High-Yield	5.9	5.8	6.0	6.5	5.5	6.2	5.8	6.0	7.0	6.2	6.1	10.0	
Emerging Market Debt	5.4	6.1	6.1	7.0		6.9	5.5	5.4	6.6	7.1	6.2	10.5	
<b>Alts</b>													
Commodities		5.4	7.5	6.2		4.7	4.9	3.9	6.0	7.7	6.0	5.8	16.0
Gold				6.8		8.0	6.0				7.0	6.9	6.9
Private Credit	10.5			8.6	8.2			7.3	8.0	8.5	8.3	8.5	12.8
Private Equity	12.9	12.0		11.9	10.2	8.4		8.5	9.8	10.9	9.4	10.4	19.3
Private Infrastructure	11.2			7.0	8.3			6.4		9.5	8.8	8.5	14.0
Private Real Estate	5.8	9.1		8.8	7.9	9.9	6.0	6.3	6.3	7.9	6.7	7.5	13.6

# Ten-Year Expected Return and Risk

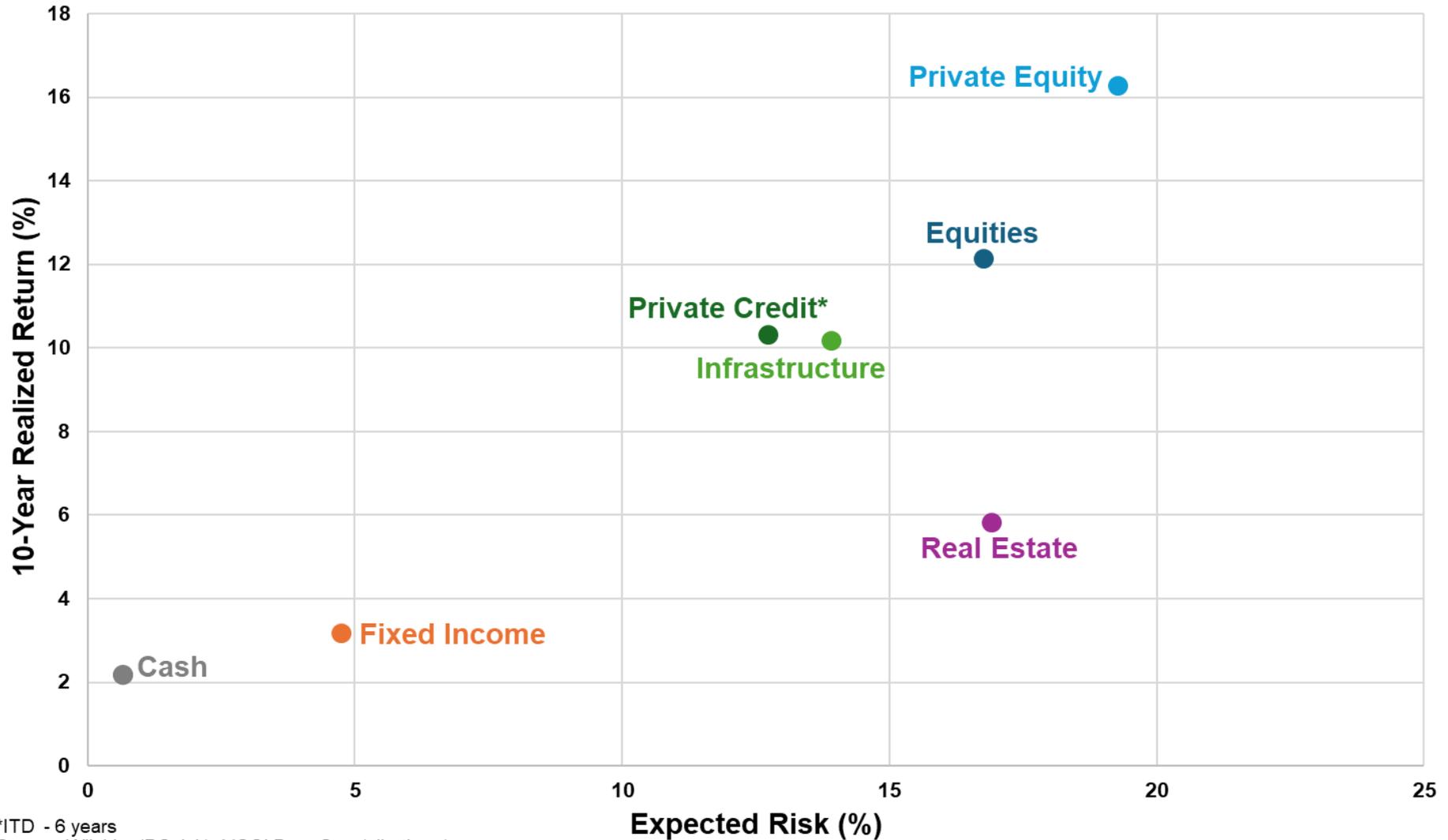


Source: MSCI BarraOne (PE & Infra risk), Wilshire (all others)

# Changes in Wilshire 10-Year Return Expectations



# Ten-Year SERS Realized Return and Risk



\*ITD - 6 years  
Source: Wilshire (PC risk), MSCI BarraOne (all others)

# SERS Historical Allocation



<b>Asset Class</b>	<b>2012</b>	<b>2016</b>	<b>2020</b>	<b>2023</b>	<b>2025</b>
U.S. Equities	22.5%	22.5%			
Non-U.S. Equities	22.5%	22.5%			
Global Equities			45%	40%	40%
Private Equity	10%	10%	12%	14%	14%
Fixed-Income	19%	19%	19%	18%	18%
Real Estate	10%	15%	17%		13%
Infrastructure					7%
Real Assets				20%	
Global Hedge Funds/MAS	15%	10%			
Private Credit			5%	5%	5%
Cash	1%	1%	2%	3%	3%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

# Asset Allocation Changes since 2012



- US/Non-US equal weight changed to Global index weight in 2020.  
*- GE returns positively impacted by this change as US weight increased and US returns were higher.*
- Private Equity target was increased from 10% to 14%.
- Real Assets target (RE & Infrastructure) increased from 10% to 20%.
- Infrastructure carved out of RA with 7% target.
- Private Credit was increased from 0% to 5%.
- Increases to Infrastructure and Private Credit came out of Hedge fund allocation being reduced from 15% in 2012 to 0% in 2020.
- Infrastructure and Private Credit generated higher returns than HF since the change improving total fund returns.

**Wilshire**

Prepared for



# 2026 Board Workshop: Asset/Liability Modeling

Joanna Bewick, CFA, Managing Director  
Christopher Tessman, Senior Vice President

February 2026

## Contents & Agenda

Background

Overview of Asset-Liability Modeling

Efficient Frontier Analysis

Supplemental Data: Bucketing, Factor Analysis,  
Liquidity Modeling & Economic Regime Switching

Linkage to Liabilities

Trends in Asset Allocation

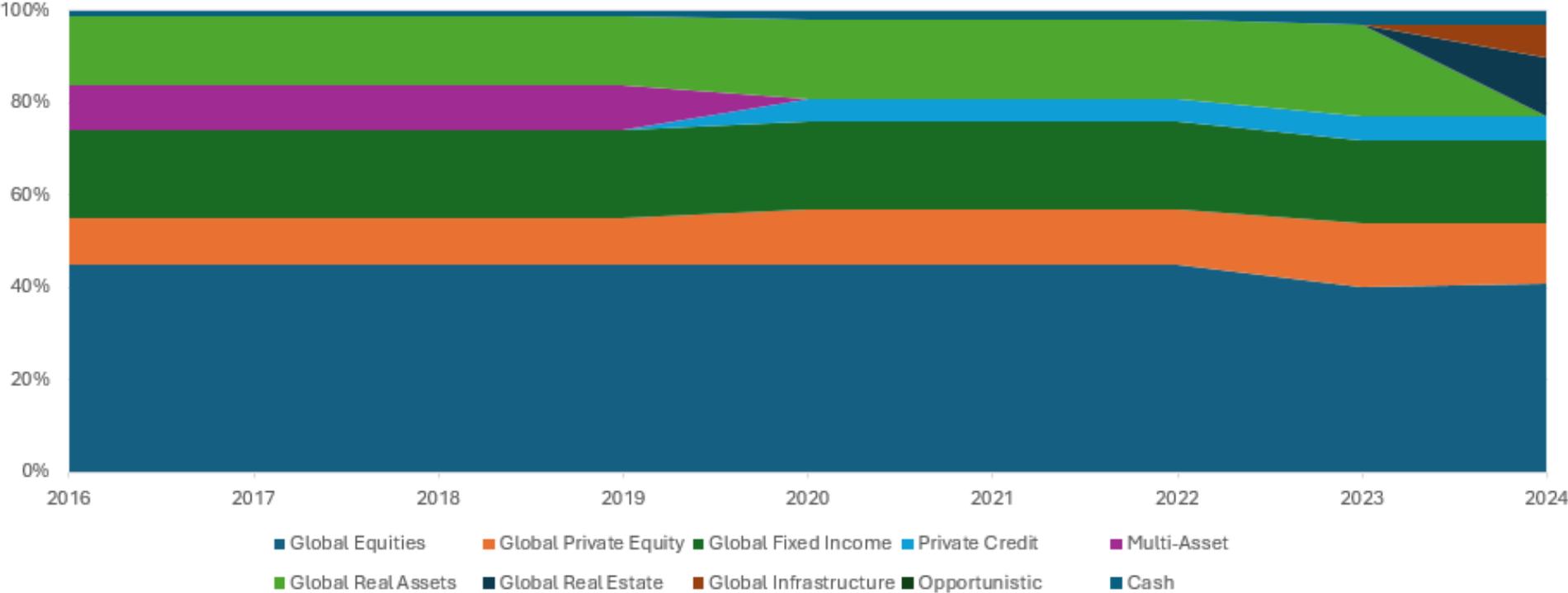
# Background

## Background

### The 2025-2026 Asset-Liability Study will occur over several phases

- December 2025 and January 2026
  - OH SERS team and Wilshire map the project and complete foundational work
- February 2026
  - Review asset class expected return and risk assumptions with the Board
- March 2026
  - Review asset-only optimization
  - Asset-only optimization serves as a useful tool in comparing risk/return trade-off among various alternative policy portfolios
- April 2026
  - Introduce SERS' liability information to the modeling process and finalize a recommendation to Board

# OH SERS 10-Year Asset Allocation Trends



## 10-Year Asset Allocation Trends

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Global Equities	45%	45%	45%	45%	45%	45%	45%	40%	40%	40%
Global Private Equity	10%	10%	10%	10%	12%	12%	12%	14%	14%	14%
Global Fixed Income	20%	19%	19%	19%	19%	19%	19%	18%	18%	18%
Private Credit	0%	0%	0%	0%	5%	5%	5%	5%	5%	5%
Multi-Asset	10%	10%	10%	10%	0%	0%	0%	0%	0%	0%
Global Real Assets	15%	15%	15%	15%	17%	17%	17%	20%	0%	0%
Global Real Estate	0%	0%	0%	0%	0%	0%	0%	0%	13%	13%
Global Infrastructure	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%
Opportunistic	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cash	0%	1%	1%	1%	2%	2%	2%	3%	3%	3%

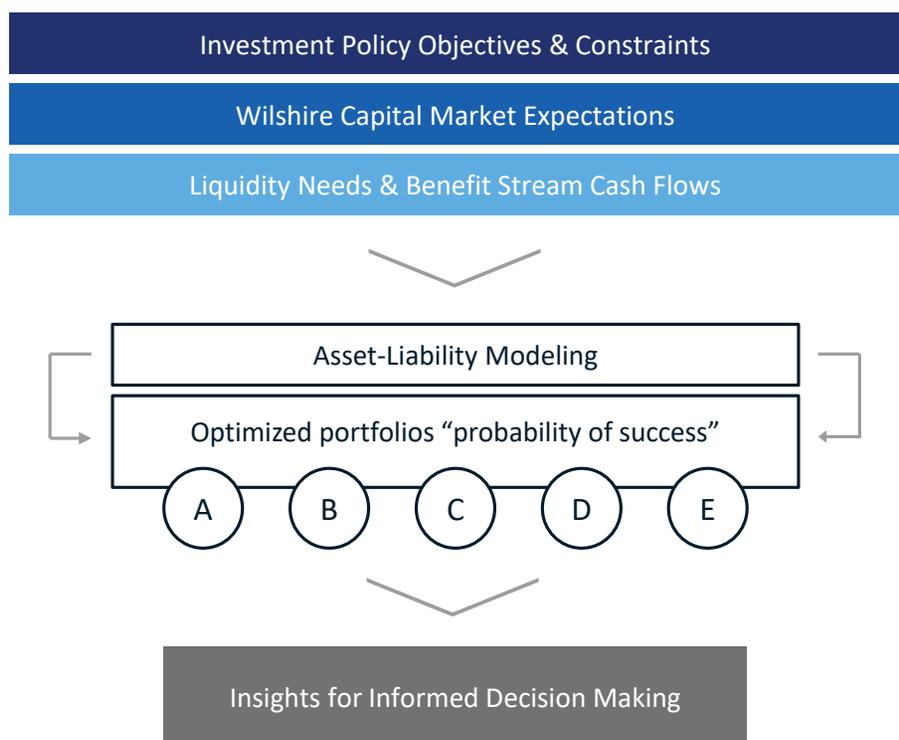
### Asset-Liability Management (ALM) Studies in 2016/2017, 2020, 2023, 2026

# Asset Liability Modeling

## Asset-Liability Management (ALM) Study

*“An asset-liability management study (ALM study) is an in-depth, strategic analysis used primarily by institutional investors (pensions, insurance firms) to determine an optimal investment portfolio by modeling the interaction between assets (investments) and liabilities (future benefit payments or debts). It evaluates how different asset allocations impact long-term funding levels, risks, and, for pensions, the sustainability of contributions.”*

## Asset-Liability Management (ALM) Study: Inputs, Process & Outputs



Asset allocation drives >90% of portfolio return variation

A rigorous evaluation of key characteristics instills confidence that the portfolio is positioned for long-term success. Critical outputs of the process include:

- Funded Status Analysis
- Contribution Requirements
- Expected Risk and Return
- Downside Protection/Drawdown Risk
- Economic Factor Exposure
- Component Contribution to Portfolio Risk and Return
- Stress Testing and Scenario Analysis

## What is “Asset-Liability Modeling”?

Mathematical process simulating thousands of combinations of asset classes

Among the thousands of portfolio combinations, identify the portfolios that offer the highest return for a specific risk level → AKA “Mean Variance Optimization”

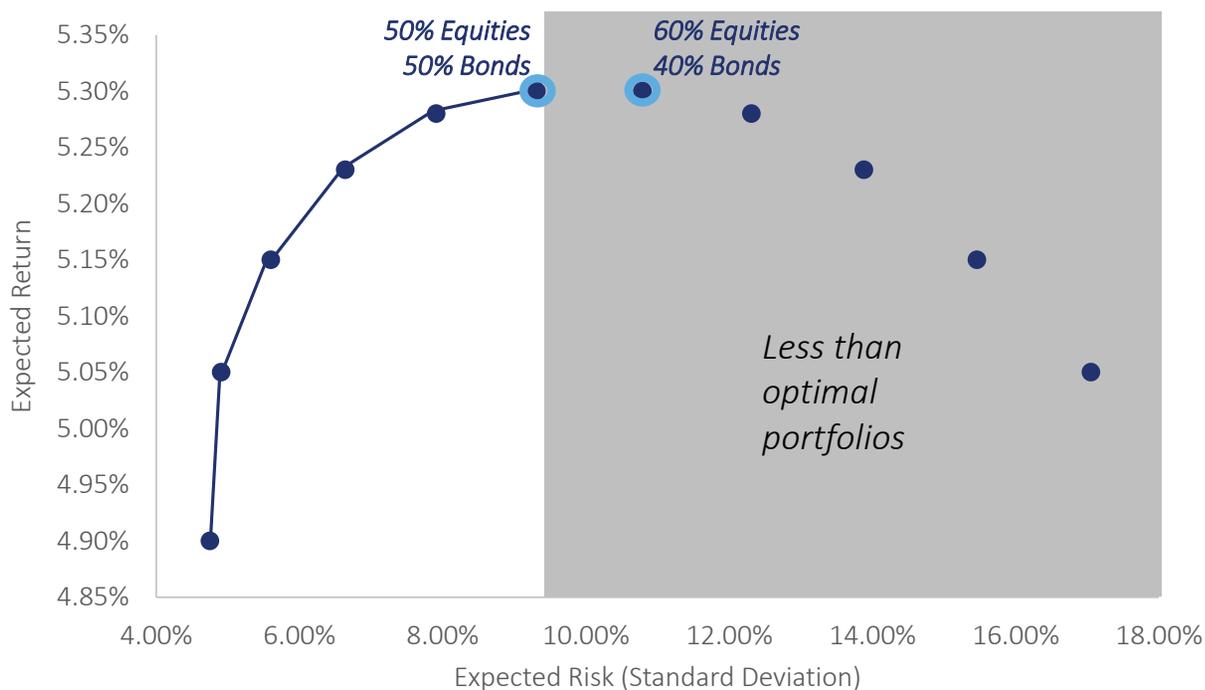
The highest return portfolios for each level of risk are mapped on the “Efficient Frontier”

Test the “optimal portfolios” and the effect they have on liabilities



## Efficient Frontier: Optimal Combination of Risk & Return

Efficient Frontier: Two Asset Portfolio



Global Equities	Core Bonds	Expected Return	Expected Risk	Return Per Unit of Risk
0%	100%	4.90%	4.75%	1.03
10%	90%	5.05%	4.91%	1.03
20%	80%	5.15%	5.60%	0.92
30%	70%	5.23%	6.64%	0.79
40%	60%	5.28%	7.91%	0.67
50%	50%	5.30%	9.31%	0.57
60%	40%	5.30%	10.79%	0.49
70%	30%	5.28%	12.31%	0.43
80%	20%	5.23%	13.88%	0.38
90%	10%	5.15%	15.46%	0.33
100%	0%	5.05%	17.05%	0.30

100% Core Bonds



100% Global Equities

Return and risk assumptions are estimated as of December 31, 2025.

## Benefits & Challenges of Diversification

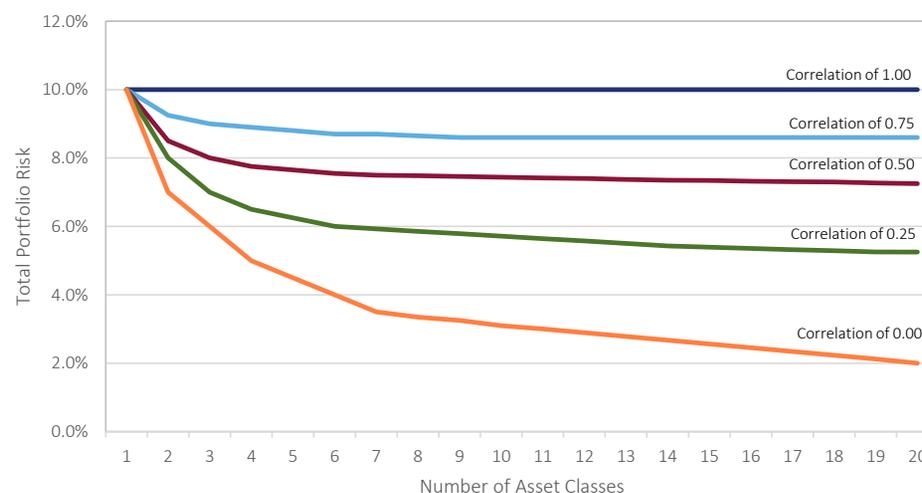
Investors must take a thoughtful approach to diversification

- DINO (Diversification in name only)
- Diminishing marginal benefit by simply adding asset classes, even with uncorrelated assets

Utilize a factor-based and bucketing approach to asset allocation decisions

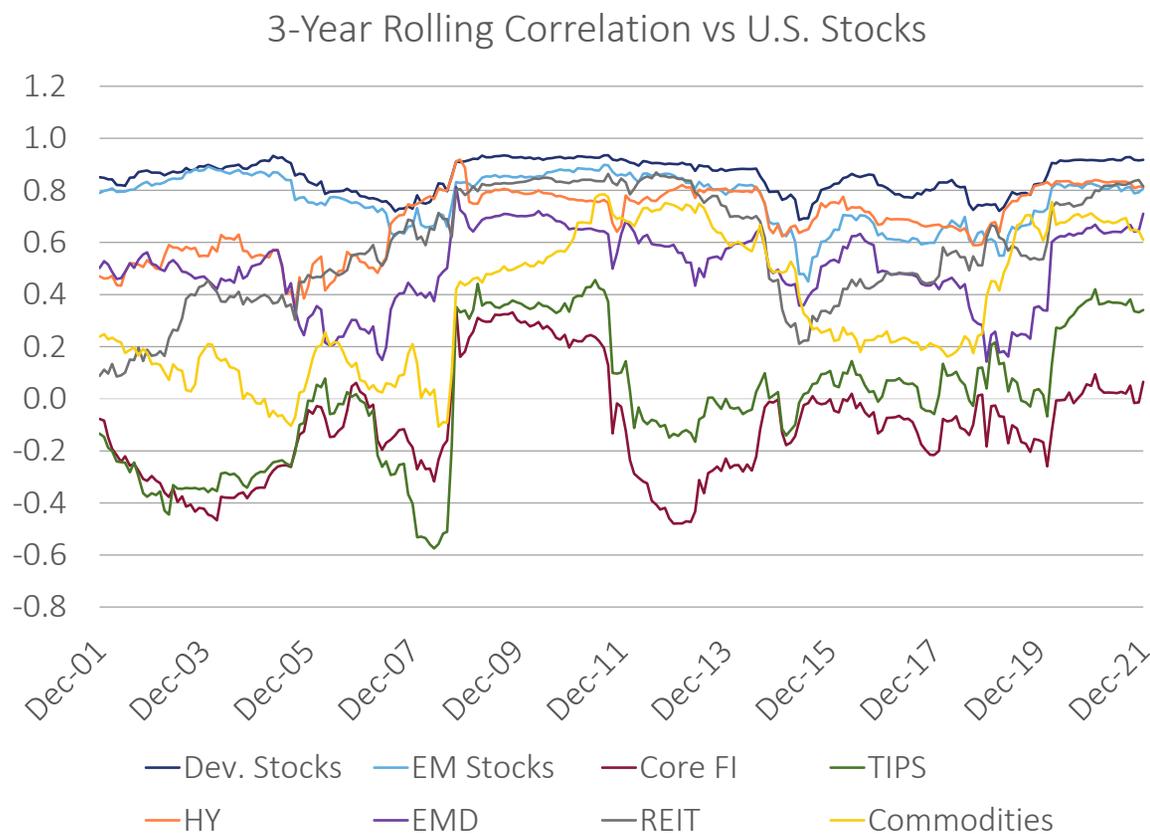
- Concept of grouping asset classes together that perform similarly in various market environments
- Emphasize asset class economic factors

Impact of Correlation on Risk Reduction



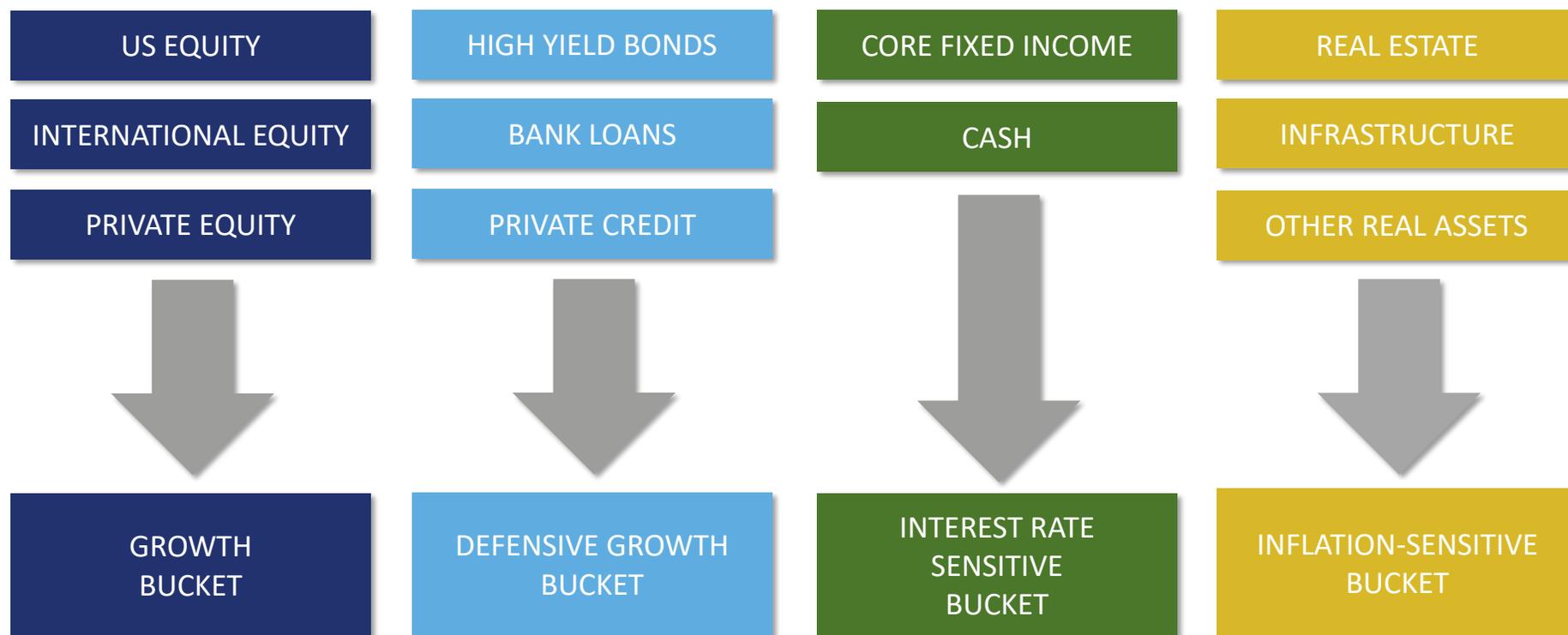
## Correlation Instability

- Mean variance optimization relies on stable correlations to produce truly efficient portfolios
- History shows that correlations are unstable through time

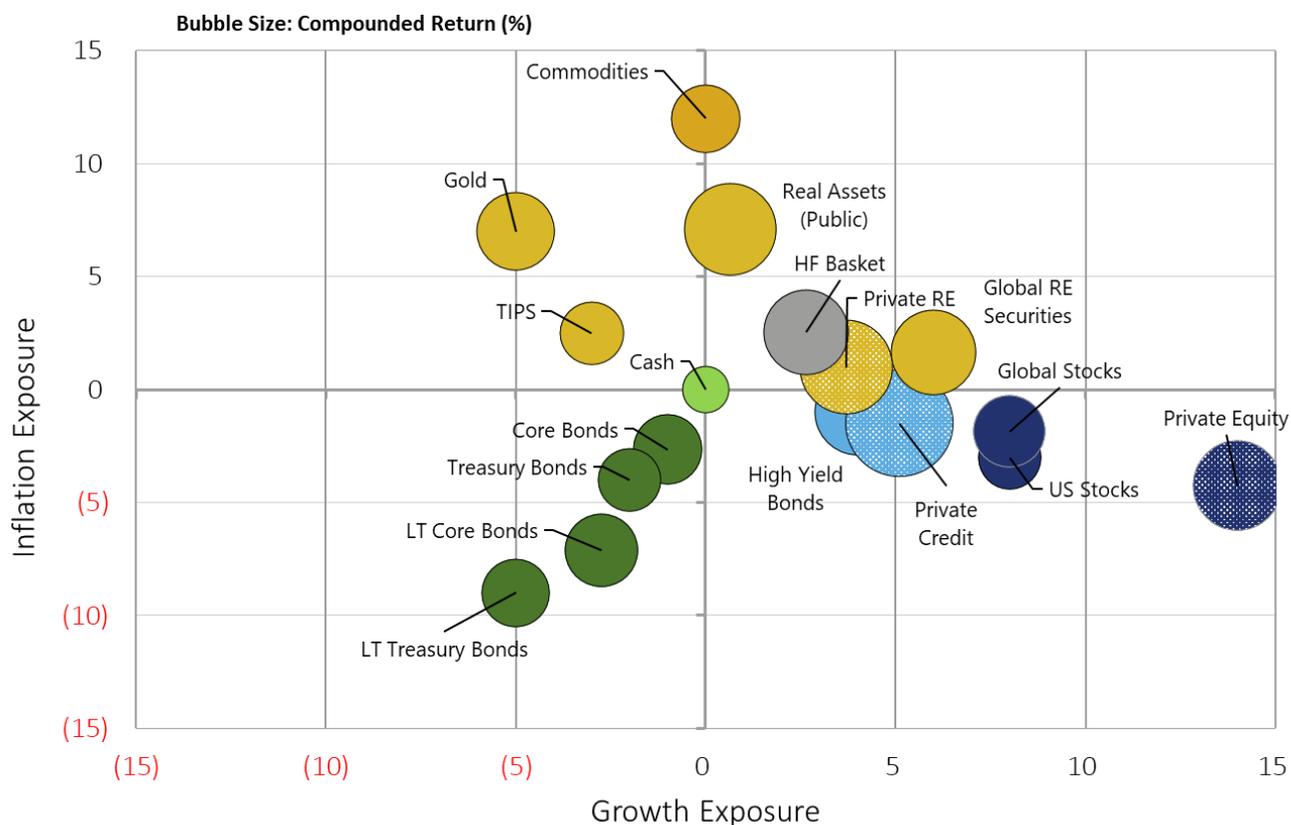


Data Source: Bloomberg.

## Wilshire's Bucketing Approach



## Economic Factor Exposure



Concentrated factor tilts can represent portfolio vulnerability (e.g., reliance on growth markets)

To the extent possible, a portfolio with factor neutrality is desirable for weathering unexpected future market environments

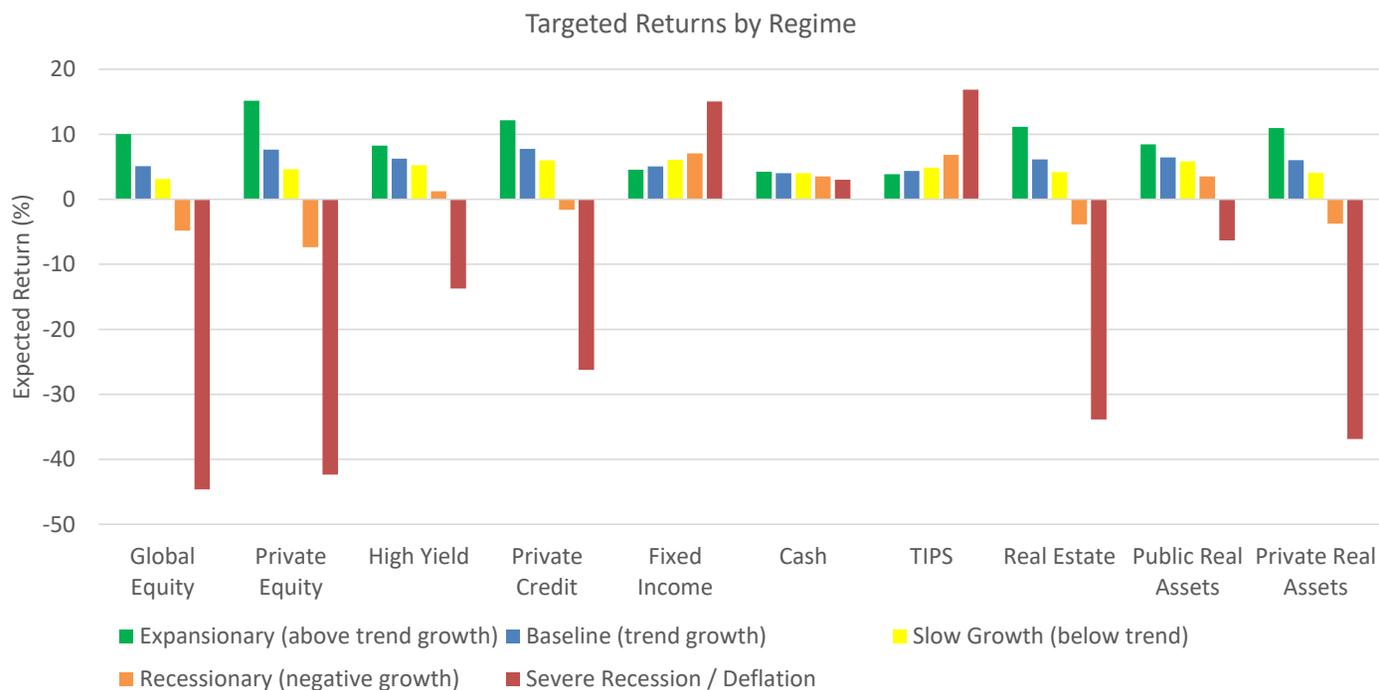
## Liquidity Metric

- Quantified on scale from 0% (low liquidity) to 100% (high liquidity)
- Designed to capture general notion of marketable versus private/off-market transactions
  - Marketable asset classes typically reflect a 90% or 100%
  - Private asset classes reflect 0%
- Goal is to reflect the tradability of assets, which is helpful in connecting these values back to our definitional framework (i.e., to quantify the differences between Convertible Liquidity and Delayed Liquidity)

Typically, mathematical optimization does not consider liquidity, but good pension plan governance **MUST**.

Wilshire's proprietary model incorporates liquidity needs.

## Economic Regime Modeling (Asset Classes)

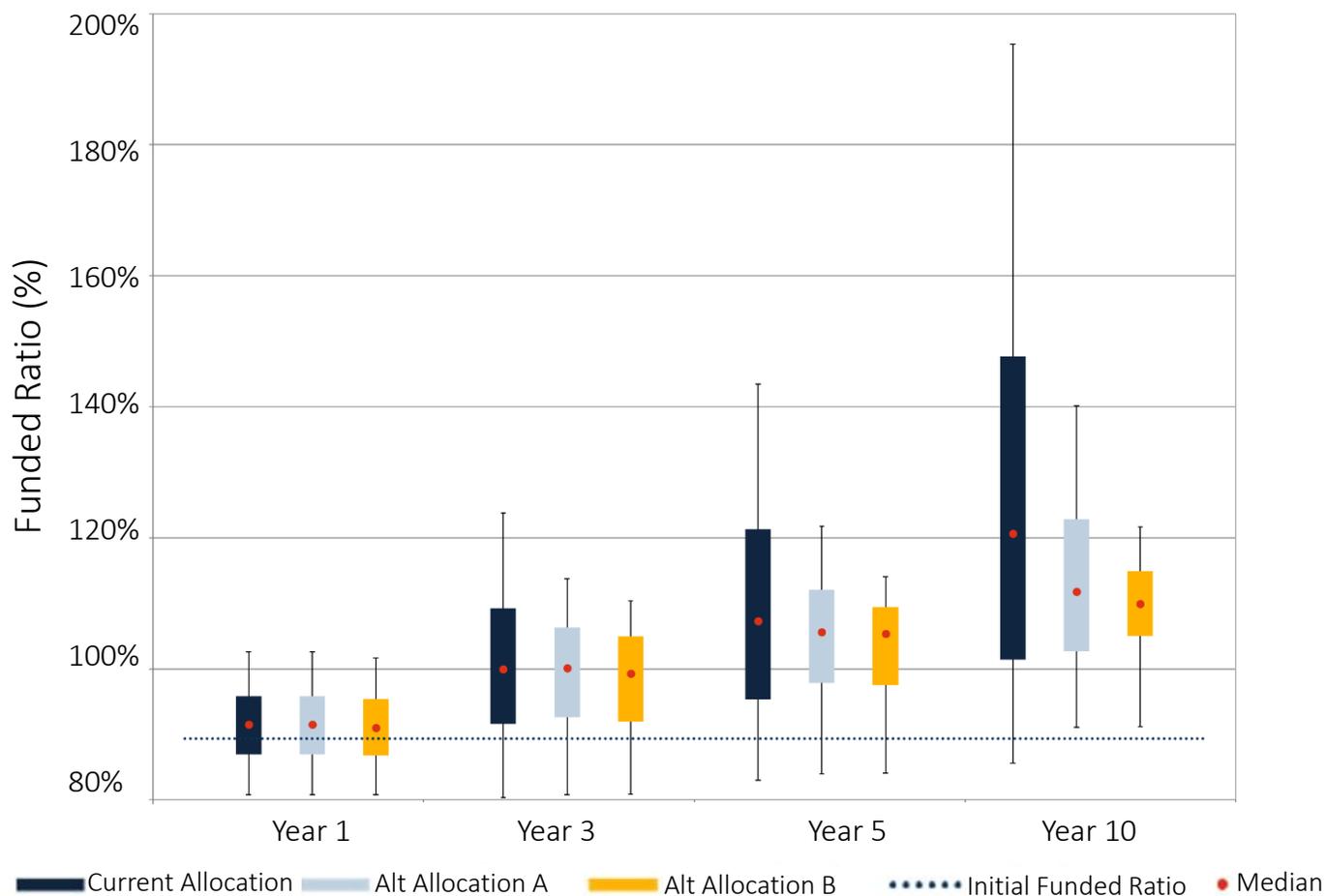


Data Source: Wilshire Compass. The framework discussed here is hypothetical and does not represent the investment performance or the actual accounts of any investors or any funds. The results achieved in our simulations do not guarantee future investment results. It is possible that the actual results of an investor who invests in the manner these projections suggest will be better or worse than the projections, and that an investor may lose money by investing in the manner the projections suggest.

## Incorporating Liabilities

Practical output demonstrating how various asset allocations impact the funded ratio.

Analysis also calculates annual contribution requirements.



## Asset Allocation Trends

### Modest forward-looking returns for public equities

- Public Equities → Private Assets

### Deglobalization, inflation, market concentration and other risks drive dispersion and volatility

- Nimble governance and decision making → Total Portfolio Approach
- Revisit multi-asset strategies/hedge funds

### Pursuit of uncorrelated return streams

- Real Assets
- Bitcoin/Crypto?

### Reassessment of fixed income given rates volatility and Federal debt levels

- Higher interest rates post-COVID
- Less benchmark aware fixed income → In 2024, OH SERS transitioned to the Bloomberg Universal Index
- Private credit

## Asset-Liability Modeling: A Flexible Process

### Focused on Ohio SERS' Distinct Characteristics and Priorities

- Sizeable pool of assets
- Maturity of the System
- Cash flows including contributions and net outflows

Rigorously developed capital market assumptions for risk, return, and correlation

### Mathematical Optimization

### Wilshire's Asset Allocation Differentiators

- Bucketing
- Factor Exposures
- Liquidity Metrics
- Regime Modeling

Practical output showing the range of liability consequences for each proposed portfolio

# Appendix

# Q4 2025 Correlation Matrix

	Equity						Fixed Income						Real Assets						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit	Dev ex-US Bond (Hdg)	US RES	Global RES	Private RE	Cmdty	Real Assets	US CPI
Compound Return (%)	4.45	5.45	5.70	5.80	5.05	6.30	3.25	4.90	5.15	4.45	6.05	7.45	3.25	5.80	5.95	6.55	4.80	6.90	2.30
Expected Risk (%)	17.00	18.00	26.00	19.15	17.05	29.65	0.75	4.75	9.95	6.00	10.00	12.75	4.00	17.50	16.55	13.95	16.00	12.20	1.75
Cash Yield (%)	1.20	2.70	2.05	2.50	1.65	0.00	3.25	5.75	5.85	5.15	9.70	4.70	4.40	4.05	4.05	2.95	3.25	3.75	0.00
Growth Exposure	8.00	8.00	8.00	8.00	8.00	14.00	0.00	-0.95	-2.55	-3.00	4.00	5.10	-1.00	6.00	6.00	3.70	0.00	2.85	0.00
Inflation Exposure	-3.00	-1.00	3.00	0.15	-1.95	-4.25	0.00	-2.60	-6.95	2.50	-1.00	-1.50	-3.00	1.00	1.65	1.00	12.00	5.20	1.00
<b>Correlations</b>																			
US Stock	1.00																		
Dev ex-US Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-US Stock	0.84	0.96	0.89	1.00															
Global Stock	0.98	0.90	0.83	0.93	1.00														
Private Equity	0.72	0.63	0.61	0.66	0.73	1.00													
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.06	0.00	1.00												
Core Bond	0.27	0.13	0.00	0.08	0.21	0.30	0.18	1.00											
LT Core Bond	0.30	0.15	0.00	0.10	0.24	0.31	0.11	0.95	1.00										
TIPS	-0.05	0.00	0.15	0.06	-0.01	-0.03	0.20	0.60	0.47	1.00									
High Yield Bond	0.54	0.39	0.49	0.46	0.53	0.31	-0.10	0.24	0.32	0.05	1.00								
Private Credit	0.68	0.55	0.58	0.60	0.68	0.44	0.00	0.23	0.30	0.00	0.76	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.16	0.17	0.26	0.10	0.68	0.66	0.39	0.26	0.22	1.00						
US RE Securities	0.57	0.47	0.44	0.49	0.56	0.49	-0.05	0.17	0.22	0.10	0.56	0.62	0.05	1.00					
Global RE Securities	0.62	0.55	0.52	0.58	0.63	0.54	-0.05	0.17	0.21	0.11	0.61	0.67	0.04	0.99	1.00				
Private Real Estate	0.55	0.45	0.45	0.48	0.55	0.50	-0.05	0.18	0.24	0.09	0.58	0.63	0.05	0.79	0.79	1.00			
Commodities	0.25	0.34	0.39	0.38	0.31	0.28	0.00	-0.03	-0.04	0.25	0.29	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.62	0.63	0.65	0.68	0.67	0.57	-0.03	0.24	0.25	0.32	0.64	0.69	0.06	0.79	0.83	0.77	0.63	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.12	-0.10	0.10	-0.12	-0.12	0.15	-0.08	0.00	-0.08	0.05	0.04	0.05	0.44	0.21	1.00

## Expected Returns

The forward looking ten-year expected return of the current OH SERS asset allocation policy is 6.35%<sup>1</sup> as of December 31, 2025. Expected Standard Deviation is 13.35%

- Expectation utilizes Wilshire’s Capital Market Assumptions, which are based on the median observation or a 50% likelihood.
- For reference, the forward-looking return assumptions are 5.05% for global equities and 5.10% for global fixed income → “Negative Equity Risk Premium”

### What Does This Mean?

- On average, Current Policy can expect to return 6.35%, annualized, over the next ten years
- Does not include value added (deducted) from active management decisions in the portfolio

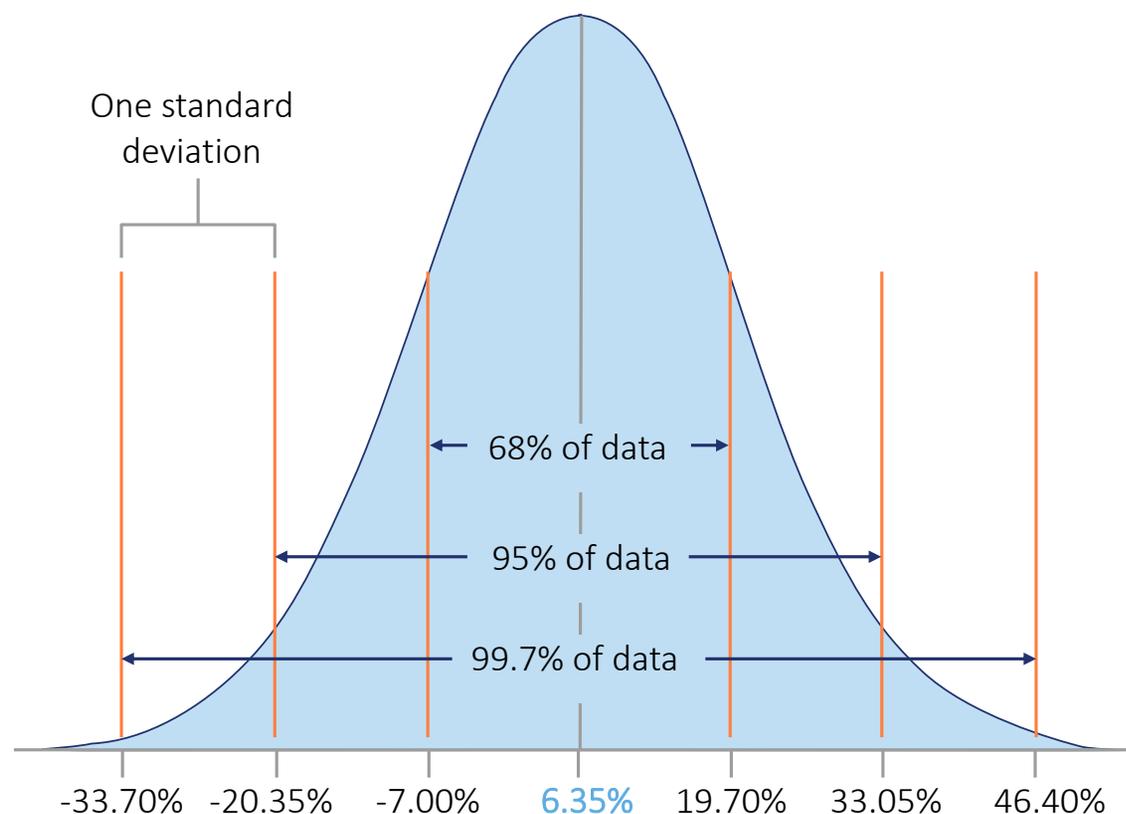
1. 6.35% is the expected geometric return for the next 10 years as of December 31, 2025. The expected arithmetic rate of return is 7.15%. The 3-year expected returns are 7.35% (geometric) and 8.20% (arithmetic). Arithmetic returns provide a simple average but ignore compounding, while geometric returns (Compound Annual Growth Rate) account for compounding and volatility, making them a more realistic measure of an investment's true, long-term performance, especially when returns fluctuate significantly. The geometric mean is always lower than the arithmetic mean for volatile assets and reflects the actual wealth growth, whereas the arithmetic mean suggests a higher expected return for a single period.

## Standard Deviation – The Expected Distribution of Returns

At right is the expected return distribution for a portfolio with 13.35% standard deviation.

### What Does This Mean?

- *Standard deviation* is used to quantify risk, as it measures variation or dispersion around a central point (In this case, the central point is the expected return)
- Recall the ten-year expected return figure of 6.35% with standard deviation of 13.35%
- Statistically, 68% of the time the return is expected to be within +/- 1 standard deviation of 6.35% or between -7.00% and 19.70%
- 95% of the time the return should be within +/- 2 standard deviations of 6.35%, or between -20.35% and 33.05%



For illustrative purposes only.

## Expected Correlations

Correlation is a statistical measure—ranging from -1.0 to +1.0—that defines how two different asset classes, sectors, or securities move in relation to one another.

### The Correlation Scale

- Positive Correlation (+0.1 to +1.0): Investments tend to move in the same direction. A +1.0 indicates a "perfect" positive correlation, where assets move in lockstep.
- No Correlation (0): There is no consistent, linear relationship between the two assets. Their price movements are independent of one another.
- Negative Correlation (-0.1 to -1.0): Assets move in opposite directions. If one goes up, the other tends to go down. A -1.0 is a "perfect" negative correlation, which is rare but ideal for reducing risk.

Investors seek low or negative correlations to build a resilient, diversified portfolio.

Correlation = +1.0



Correlation = 0.0



Correlation = -1.0

## Need for Constraints

### Practical diversification

- Optimizer will not differentiate between public and private markets / factor exposure / role in portfolio
- Asset class roles (growth, defensive, inflation mitigation) are examples of practical portfolio considerations

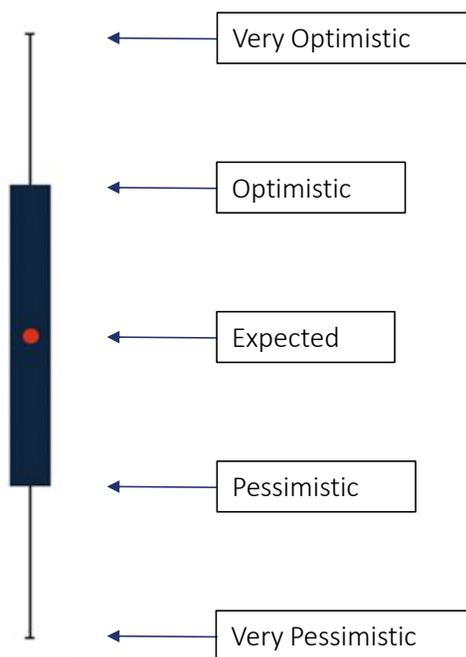
### Liquidity

- Private markets tend to have higher return expectations partially due to illiquidity premium
- In an optimization framework, private asset classes are very attractive based on risk/return inputs
- However, mean-variance optimization ignores the need for liquidity

### Investability

- Investments in private market strategies take time to fully implement
- Implementation challenges in some sectors to deploy significant portion of the portfolio

## Box and Whisker Graphs



In each year of the simulation, there are 5,000 independent economic trial results.

- Expected: 50% of the potential scenarios result in higher than this value and 50% results in lower
- Very optimistic: Only 5% of the scenarios result in higher than this value and 95% result in lower
- Optimistic: Only 25% of the scenarios result in higher than this value and 75% result in lower
- Pessimistic: 75% of the scenarios results in higher than this value and 25% result in lower
- Very pessimistic: 95% of the scenarios result in higher than this value and 5% result in lower

Source: Wilshire.

# Memo

To: SERS Retirement Board

From: Richard Stensrud, Executive Director

CC: Karen Roggenkamp, Deputy Executive Director  
Marni Hall, CPA, Chief Financial Officer

Date: February 11, 2026

Re: Actuarial Risk Analysis Report

---

Reflecting the Board's ongoing commitment to sustainability, the Board annually receives a report from SERS' actuary, CavMac Actuarial Consulting Services (CavMac), on the actuarial-related risks to the long term sustainability of the pension fund. This report builds upon the annual actuarial valuation as of June 30, 2025 and provides the detailed analysis of risk required by Actuarial Standards of Process (ASOP) 51.

The risks assessed in the report are both quantitative and qualitative in nature. The analysis includes scenario modeling of the possible impact of different future outcomes of key demographic and economic risk considerations.

Given that SERS is a 'mature' retirement system, the report discusses key measurements related to the maturity level of the system, including:

- The ratio of active members to benefit recipients.
- The asset volatility ratio (the level of plan assets to covered payroll).
- Cash flow.
- The amount of the total liability that is retiree-related.

The report also models the projected impact of possible changes in several key metrics, including:

- SERS' active member level.
- The payroll upon which contributions are made.
- The impact of different levels of future Cost-of-Living Adjustments (COLAs).
- Longer life expectancy.
- Investment return risk, including:
  - The order in which returns are experienced.
  - Low returns for a sustained period.
  - Single year investment collapse.
  - Changes to the investment return assumption.

The risk associated with potential reductions in active member and payroll levels are particularly relevant given the possible repeal of property taxes and the impact of that on school funding and operations.

Finally, the report includes stochastic modeling on the variability of investment returns on projected investment returns, funded ratio and cash flow.

Overall, it is the actuary's conclusion that SERS' risk profile has improved since the last risk report. (See page 3 of the report)

Todd Green of CavMac will present the report and will be available to answer any questions you might have.

I hope this information is helpful.

# **SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO**



## **Risk Analysis Report**

---

**Prepared as of June 30, 2025**



February 5, 2026

Board of Trustees  
School Employees Retirement System of Ohio  
300 East Broad Street, Suite 100  
Columbus, OH 43215-3746

**Re: Risk Analysis Report**

Dear Members of the Board:

At your request, we have performed a study of the actuarially-related risks faced by the School Employees Retirement System of Ohio (SERS). This report is designed to support and expand on the latest actuarial valuation report that we prepare annually for basic benefits valuation for SERS. While the exhibits and graphs shown in this report are based on the June 30, 2025 SERS actuarial valuation, the analysis of the results and the discussion of the implications for SERS and its stakeholders are expected to remain substantially unchanged for the next few years.

The primary objective of this report is to provide the analysis of risk, as required under Actuarial Standard of Practice Number 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions*. There are other risks that SERS faces, including issues such as cyber security, a catastrophe to the physical location, embezzlement, and many others. These are outside the scope of our analysis, which focuses only on those risks relating to the variance in the measurement of the benefit obligations as well as the contribution rates. There is no specific action by the SERS Board either required or expected in response to this report, although it is possible that a deeper understanding of the risks faced by SERS may prompt some additional discussion or study.

In preparing our report, we utilized the data, methods, assumptions, and benefit provisions described in the June 30, 2025 actuarial valuation of SERS. That report should be consulted for a complete description of how our work was performed. Some of the results in this report are based upon modifying one or more of the valuation assumptions as noted in the discussion of the analysis being performed. In particular, the minimum employer contribution, regardless of funded status in the projections presented in this report, is 10% of annual payroll.

The risk to the Health Care Fund is outside the scope of this report.

In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.



February 5, 2026

Page 2

The consultants who worked on this assignment are pension actuaries with significant public plan experience. In addition, the signing actuaries are independent of the System and the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate. The valuation, on which this analysis was based, was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board. Furthermore, the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonable based on the actual experience of the System. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

We respectfully submit the following report and look forward to discussing it with you.

Todd B. Green ASA, EA, FCA, MAAA  
President

Beverly V. Bailey, ASA, EA, FCA, MAAA  
Senior Actuary

DRAFT



## TABLE OF CONTENTS

---

	Certification Letter	
<b>Section 1</b>	Overview .....	1
<b>Section 2</b>	Maturity Measures .....	4
<b>Section 3</b>	Qualitative Analysis .....	10
<b>Section 4</b>	Qualitative Analysis – Demographic Assumptions .....	15
<b>Section 5</b>	Qualitative Analysis – Economic Assumptions .....	21

DRAFT





## SECTION 1 – OVERVIEW

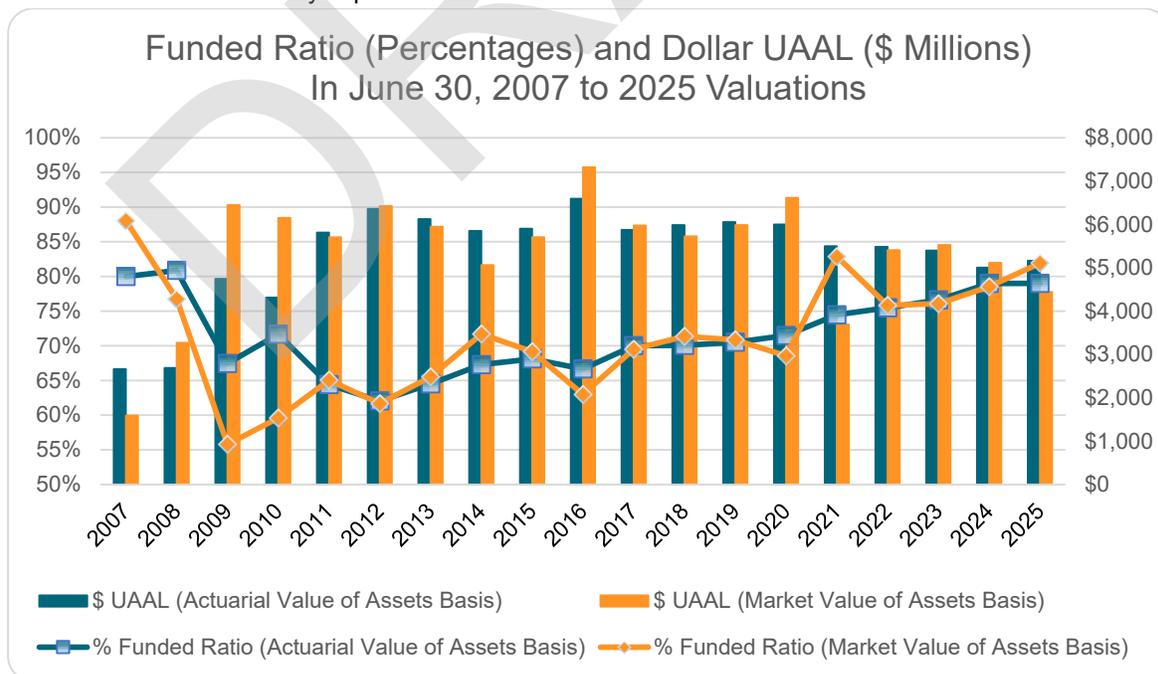
### Actuarial Standard of Practice Number 51 (ASOP 51)

Actuarial Standards of Practice (ASOPs) are issued by the Actuarial Standards Board and are binding for credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. ASOP 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions*, applies to funding valuations, actuarial projections, and actuarial cost studies of proposed plan changes.

A typical retirement system faces many different risks. The greatest risk for a retirement system is the inability to make benefit payments when due. If system assets are depleted, benefits may not be paid which could create legal and litigation risk. The term “risk” is most commonly associated with an outcome with undesirable results. However, in the actuarial world risk is defined as uncertainty. The actuarial valuation process uses many actuarial assumptions to project how future contributions and investment returns will meet the cash flow needs for future benefit payments. Of course, we know that actual experience will not unfold exactly as anticipated by the assumptions and that uncertainty, whether favorable or unfavorable, creates risk. ASOP 51 defines risk as the potential of actual future measurements deviating from expected future measurements due to actual experience that is different than the actuarial assumptions.

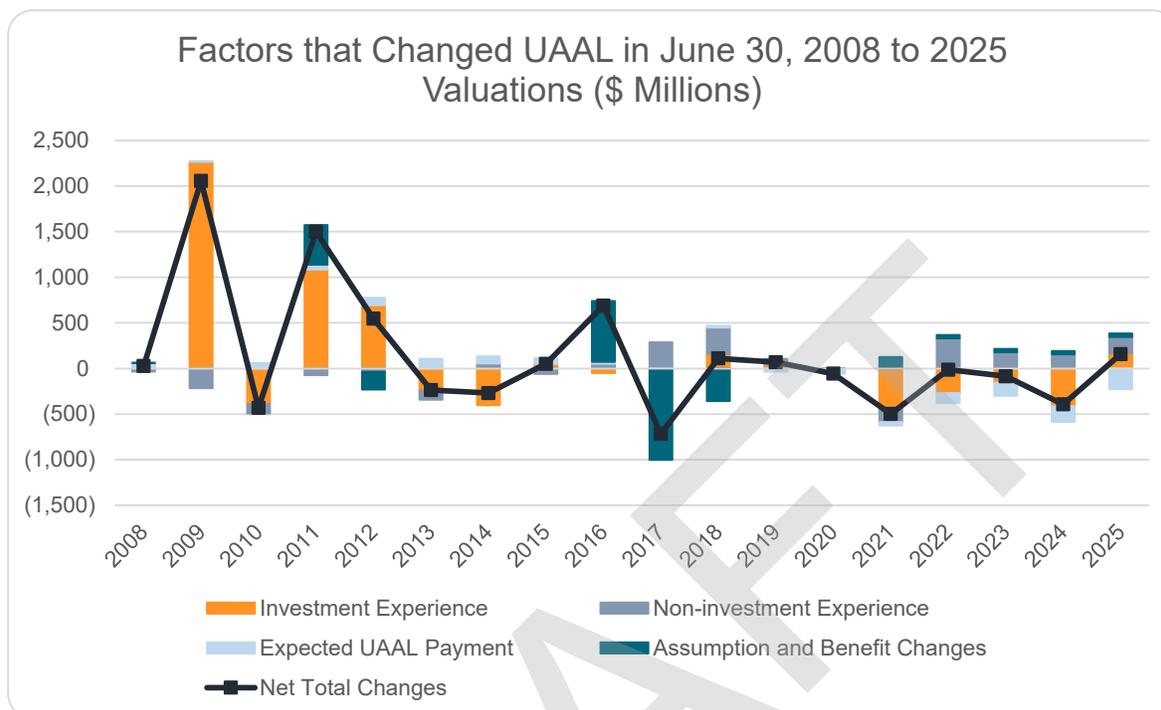
### Factors that have Historically Impacted Funded Status and Employer Contribution Rates

The funding ratios and the unfunded actuarial accrued liabilities (UAAL) for the past 19 valuations from June 30, 2007 to June 30, 2025 were measured on both an actuarial and market value of assets basis, and the factors that caused changes in the UAAL are shown in the charts on the following pages. Since 2012, the funded ratio has steadily improved.





## SECTION 1 – OVERVIEW



### Identifying Risks

The first step in a project such as this is to identify the significant risks that affect how SERS liabilities are measured and contributions determined. Some risks, such as investment return for a funded retirement plan, are obvious, but there are others that are not as clear. There is no definition of “significant” to clearly define which risks should be considered, nor is it possible to tell in advance whether certain risks are significant or not.

The identification of risks is also specific to the retirement plan being studied. Different plans expect different risks. Thus, this analysis for SERS is uniquely prepared for SERS and the risks it faces.

### Assessing Risks

In this report, we consider a variety of risks faced by SERS. A common theme for most retirement plans is that risks change as a plan matures. Because this is a fundamental issue, ASOP 51 gives special attention to requiring the disclosure of appropriate measures of how a plan is maturing. In the section of this report that considers maturity measures, we provide a number of illustrations to help demonstrate this trend.

There are some risks that are inherently difficult to quantify, as well as some risks that are addressed by the way in which a system is designed to react. In our section on qualitative measures, we discuss some of these risks. We also discuss how the SERS contribution rate policy is designed to help address the way in which SERS faces risks.





## SECTION 1 – OVERVIEW

---

Finally, we conclude this report with some numerical assessment of some significant demographic and economic risks. The point of this analysis is to provide some perspective on the magnitude of the risks faced by SERS.

### Conclusions

Risk is not necessarily a negative concept. As humans, we regularly take risks such as driving in an automobile because we believe that the gain to be received outweighs the possible negative consequences. We do, however, take steps to mitigate the risk by looking both ways at an intersection before proceeding, wearing seatbelts, etc. We do these things because we have some understanding of the sources of risk. The goal of this report is to help SERS understand the major risks facing SERS funding, thereby allowing a reasoned approach to determining how to move into the future if negative experience emerges.

In our opinion there has been an improvement in the risk profile of SERS since the previous risk study was performed. The major causes attributing to this improvement are:

- Investment performance since June 30, 2024 has increased the market value of assets by \$1,437 million.
- Employer and member contributions are tied to covered payroll. As covered payroll increases, contributions to SERS increase. Since June 30, 2024, covered payroll increased by 4.12% compared to the assumed rate of 1.75%.
- The Board adopted funding policy has accelerated the funding of Basic Benefits by approximately \$1,110 million since June 30, 2015.



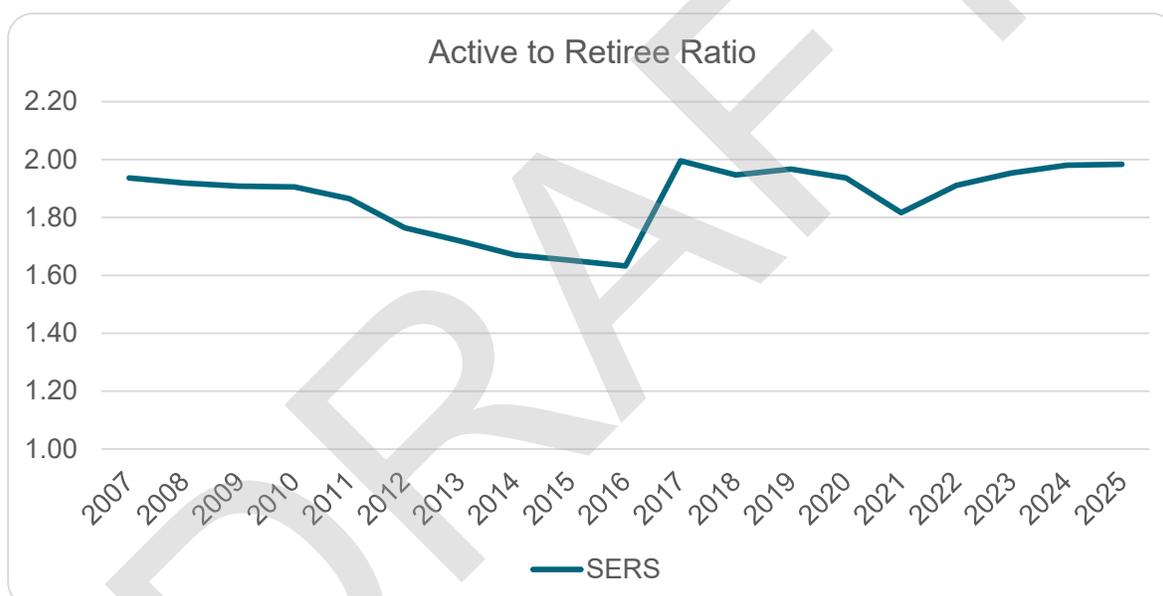


## SECTION 2 – MATURITY MEASURES

SERS was created in 1937. The aging of the population, including the retirement of the baby boomers, has created a shift in the demographics of most retirement systems. This change is not unexpected and has, in fact, been anticipated in the funding of the retirement systems. Even though it was anticipated, the demographic shift and maturing of the plans have increased the risk associated with funding the systems. There are different ways to measure and assess the maturity level of a retirement system and we will discuss several in this section of the report.

### Historical Active to Retiree Ratio

One way to assess the maturity of the system is to consider the ratio of active members to retirees. In the early years after a retirement system is established, the ratio of active to retired members will be very high as the system is largely composed of active members. As the system matures over time, the ratio starts to decline. A very mature system often has a ratio near or below one. In addition, if the size of the active membership declines over time, it can accelerate the decline in the ratio.





## SECTION 2 – MATURITY MEASURES

### Asset Volatility Ratio

As a retirement system matures, the size of the market value of assets increases relative to the covered payroll of active members on which the System is funded. The size of the plan assets relative to covered payroll, sometimes referred to as the asset volatility ratio (AVR), is an important indicator of the contribution risk for the System. The higher this ratio, the more sensitive a plan's contribution rate is to investment return volatility.

Even though the System is funded with statutory contribution rates, these measures are still meaningful as an indication of the expected pressure on the portion of the statutory employer funding required for pension benefits.

The asset volatility measure reflects the change to contributions which would be necessary to offset the impact of a change in the market value of assets. The following tables show the historical trend for the asset volatility ratio for SERS.

Fiscal Year End	Market Value of Assets (\$ Millions)	Covered Payroll (\$ Millions)	Asset Volatility Ratio
6/30/07	\$11,711.2	\$2,603.3	4.50
6/30/08	10,793.5	2,651.8	4.07
6/30/09	8,134.1	2,787.4	2.92
6/30/10	9,071.9	2,842.7	3.19
6/30/11	10,619.2	2,852.4	3.72
6/30/12	10,331.7	2,788.2	3.71
6/30/13	11,300.5	2,746.8	4.11
6/30/14	12,820.9	2,759.3	4.65
6/30/15	12,797.2	2,845.4	4.50
6/30/16	12,451.6	2,932.2	4.25
6/30/17	13,613.6	3,302.8	4.12
6/30/18	14,270.5	3,332.4	4.28
6/30/19	14,544.1	3,462.5	4.20
6/30/20	14,419.6	3,477.6	4.15
6/30/21	17,840.1	3,622.1	4.93
6/30/22	16,962.7	3,994.7	4.25
6/30/23	17,558.8	4,298.7	4.08
6/30/24	18,704.5	4,547.3	4.11
6/30/25	20,141.8	4,734.7	4.25

As the System's Market Value of Assets increases, market gains and losses due to over or under-performance as compared to the expected return generate impacts to the unfunded liability in dollar amount that are generally a significant percentage of covered payroll. To illustrate, as of the 2025 measures, a 3% market rate of return (4% below the 7% assumption) would produce an asset loss in dollar amount approximately equaling 17.00% of payroll (4.25 times 4%). As asset gains and losses are recognized over four years and the impact of these gains and losses on the plan's required funding are spread over the amortization period, this measure is only to provide the scale of the risks associated with asset performance relative to covered payroll.





## SECTION 2 – MATURITY MEASURES

---

### Historical Cash Flows

Plans with negative cash flows will experience increased sensitivity to investment return volatility. Cash flows, for this purpose, are measured as contributions less benefit payments and expenses. If the System has negative cash flows and experiences returns below the assumed rate, there are fewer assets to be reinvested to earn the higher returns that typically follow.

Negative net cash flow in pension plans can range from a benign outcome to a serious warning sign depending on two key factors: the plan's funding status and the sponsor's capacity to make current and future contributions. Funding status is measured via the system's liabilities, which are disclosed in the annual actuarial valuations, while sponsor capacity reflects fiscal strength and budgetary projection.

The guidance for negative cash flow can be categorized into three broad risk zones:

**Green – Well-Funded with High Contribution Capacity:** Negative net cash flow here is typically not a concern. Well-funded plans that meet benefit obligations and maintain disciplined contributions can sustain operations even if investment performance causes temporary cash flow deficits. The sponsor's ability to continue strong future contributions mitigates long-term risk.

**Yellow – Underfunded with Medium Contribution Capacity:** Plans in this range (approximately 60–80% funded) are at a tipping point. Negative net cash flow begins to signal a material risk because benefit payouts outpace growth available to close funding gaps. If the sponsor can increase contributions, the plan may improve; if not, it drifts toward greater risk.

**Blue – Mature, Less Than 60% Funded with Limited Contribution Capacity:** This represents the most concerning scenario. When a plan is significantly underfunded and the sponsor cannot make up the shortfall, liabilities may grow faster than assets, threatening solvency over time. Immediate corrective action—such as increasing contributions or reevaluating plan benefits—is critical. Failure to act can lead to insolvency and may negatively impact the sponsor's credit rating.

Across all situations, the capacity of the plan sponsor to make up shortfalls is the pivotal determinant of whether negative net cash flow is a warning sign or a manageable outcome. In our opinion, SERS is in the green.

*Source: Negative Cash Flow: Red Flag or Read Hearing? | PNC Insights*

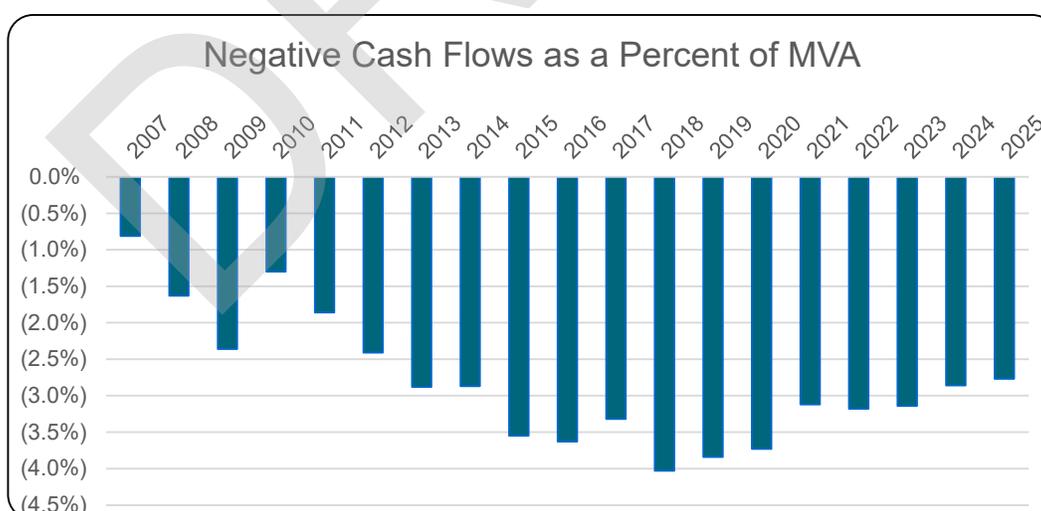




## SECTION 2 – MATURITY MEASURES

The historical negative cash flow are shown below:

Fiscal Year End	Market Value of Assets (MVA)	Contributions	Benefit Payments and Expenses	Net Cash Flow	Net Cash Flow as a Percent of MVA
6/30/07	\$11,711,235,288	\$791,898,275	\$886,970,001	(\$95,071,726)	(0.81%)
6/30/08	10,793,470,372	563,517,862	739,766,146	(176,248,284)	(1.63%)
6/30/09	8,134,107,324	586,857,670	778,564,059	(191,706,389)	(2.36%)
6/30/10	9,071,931,012	703,697,035	821,895,581	(118,198,546)	(1.30%)
6/30/11	10,619,175,301	682,413,480	879,772,413	(197,358,933)	(1.86%)
6/30/12	10,331,658,392	696,696,215	945,748,626	(249,052,411)	(2.41%)
6/30/13	11,300,482,029	695,112,180	1,020,260,801	(325,148,621)	(2.88%)
6/30/14	12,820,884,107	700,720,177	1,068,606,495	(367,886,318)	(2.87%)
6/30/15	12,797,184,030	701,545,178	1,156,439,511	(454,894,333)	(3.55%)
6/30/16	12,451,630,823	750,747,397	1,202,843,730	(452,096,333)	(3.63%)
6/30/17	13,613,638,590	804,424,396	1,255,785,189	(451,360,793)	(3.32%)
6/30/18	14,270,515,748	759,945,694	1,334,666,485	(574,720,791)	(4.03%)
6/30/19	14,544,076,104	809,896,173	1,367,920,194	(558,024,021)	(3.84%)
6/30/20	14,419,598,627	843,900,853	1,381,761,865	(537,861,012)	(3.54%)
6/30/21	17,840,046,988	830,633,505	1,387,181,011	(556,547,506)	(3.12%)
6/30/22	16,962,691,005	900,194,639	1,439,199,522	(539,004,883)	(3.18%)
6/30/23	17,558,801,466	955,568,535	1,506,966,541	(551,398,006)	(3.14%)
6/30/24	18,704,520,334	1,009,062,087	1,544,226,076	(535,163,989)	(2.86%)
6/30/25	20,141,753,886	1,060,240,207	1,618,453,648	(558,213,441)	(2.77%)





## SECTION 2 – MATURITY MEASURES

---

### Liability Maturity Measurements

As discussed earlier, most public sector retirement systems, including SERS, have been in operation for over 80 years. As a result, they have aging plan populations indicated by a decreasing ratio of active members to retirees and a growing percentage of retiree liability when compared to the total. While the ratio of active members to retirees has been relatively steady in recent years, the retiree liability to the total accrued liability exceeds 60%, which has improved from 62% and is projected to continue to modestly improve in the future toward 55% over the next 30 years. With more of the total liability residing with retirees, investment volatility has a greater impact on the funding of the System since it is more difficult to restore the System financially after losses occur when there is comparatively less payroll over which to spread the costs.

DRAFT

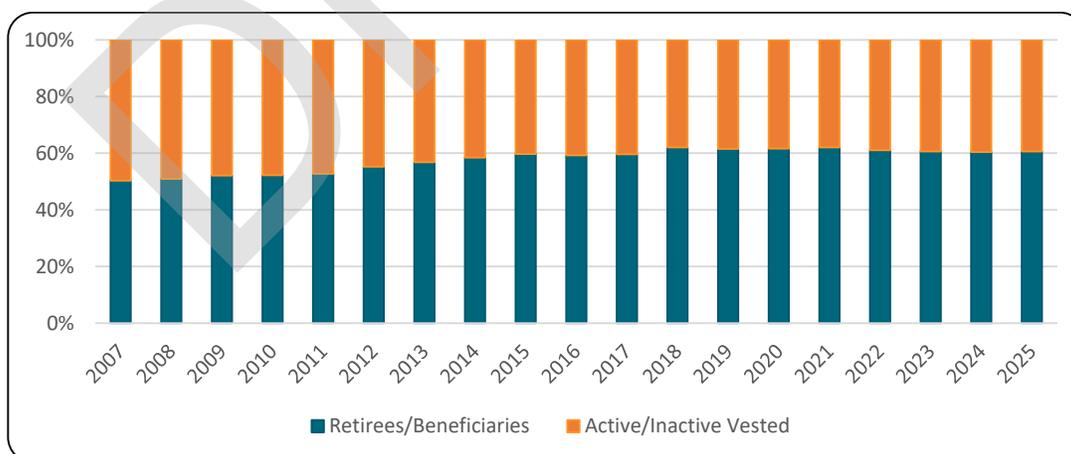




## SECTION 2 – MATURITY MEASURES

The charts below summarize the historical retiree percentage of the total accrued liability and the ratio of total accrued liability to covered payroll:

Fiscal Year End	Retiree Liability (a)	Total Actuarial Liability (b)	Retiree Percentage (a) / (b)	Covered Payroll (c)	Ratio (b) / (c)
6/30/07	\$6,688,590,916	\$13,303,223,045	50.3%	\$2,603,300,211	5.11
6/30/08	7,161,196,395	14,061,894,365	50.9%	2,651,800,981	5.30
6/30/09	7,591,581,493	14,581,977,247	52.1%	2,787,390,954	5.23
6/30/10	7,941,876,226	15,221,613,179	52.2%	2,842,660,159	5.35
6/30/11	8,605,491,444	16,325,004,259	52.7%	2,852,378,614	5.72
6/30/12	9,250,285,737	16,754,566,023	55.2%	2,788,153,585	6.01
6/30/13	9,793,009,567	17,247,161,078	56.8%	2,746,827,535	6.28
6/30/14	10,436,607,389	17,881,827,171	58.4%	2,759,281,606	6.48
6/30/15	11,047,009,232	18,503,280,961	59.7%	2,845,443,802	6.50
6/30/16	11,702,282,405	19,770,708,121	59.2%	2,932,236,551	6.74
6/30/17	11,679,469,034	19,588,417,687	59.6%	3,302,805,662	5.93
6/30/18	12,398,898,951	19,997,700,966	62.0%	3,332,395,171	6.00
6/30/19	12,628,920,814	20,527,251,448	61.5%	3,462,524,396	5.93
6/30/20	12,948,507,140	21,033,809,319	61.6%	3,477,578,726	6.05
6/30/21	13,345,595,908	21,529,757,004	62.0%	3,622,097,199	5.94
6/30/22	13,657,627,450	22,371,468,812	61.1%	3,994,657,693	5.60
6/30/23	13,996,648,497	23,084,316,697	60.6%	4,298,689,195	5.38
6/30/24	14,387,097,724	23,820,116,970	60.4%	4,547,315,949	5.24
6/30/25	14,898,501,861	24,584,159,753	60.6%	4,734,707,838	5.19





## SECTION 3 – QUALITATIVE ANALYSIS

ASOP 51 provides that the assessment of risk does not necessarily have to be quantitative but may be qualitative. This report will provide quantitative analysis for SERS in a later section, but first we will discuss the overall assessment of risk for SERS from a qualitative perspective.

### (1) Contribution Rate Funding Policy

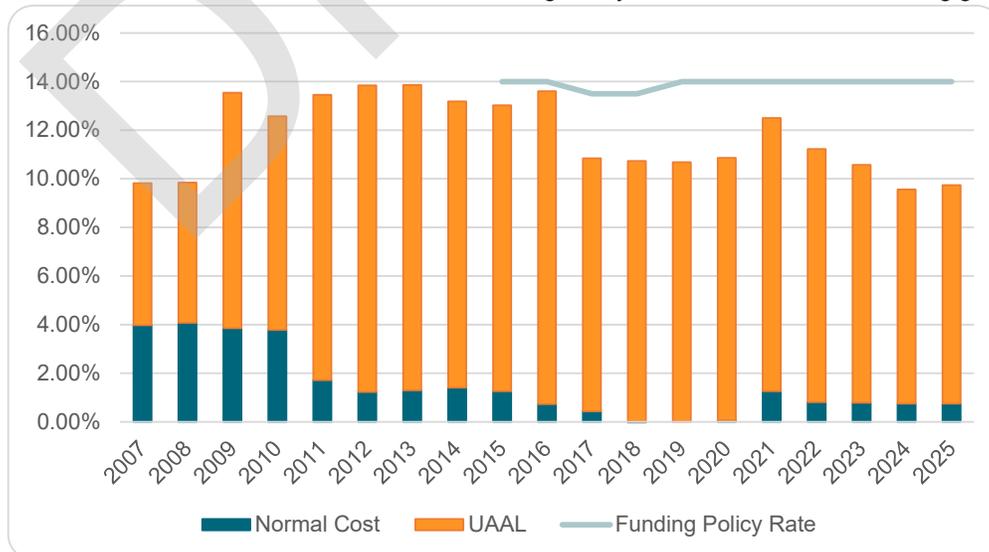
The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding.

Effective June 30, 2015, changes were made to funding policy to meet the competing goals of providing healthcare and improving SERS' long term funding as quickly as possible.

The funding policy establishes a minimum level of funding for basic benefits, however, the Board retains the discretion to allocate additional funding. If the funded ratio is less than 70%, the entire 14% employers' contribution shall be allocated to SERS' basic benefits. If the funded ratio is 70% but less than 80%, at least 13.50% of the employers' contribution shall be allocated to SERS' basic benefits, with the remainder (if any) allocated to the Health Care Fund. If the funded ratio is 80% but less than 90%, at least 13.25% of the employers' contribution shall be allocated to SERS' basic benefits, with the remainder (if any) allocated to the Health Care Fund. If the funded ratio is 90% or greater, the Health Care Fund may receive any portion of the employers' contribution that is not needed to fund SERS' basic benefits.

SERS Contribution Rate Funding Policy should be considered as a positive factor in risk assessment because it accelerates funding of the Basic Benefits. Since July 1, 2015, the Board has allocated the entire 14% of payroll employer contribution to Basic Benefits except for the periods beginning July 1, 2017 and July 1, 2018 when the Board allocated 13.50% of compensation to Basic Benefits. This is a positive factor in that it accelerated the funding of Basic Benefits by an estimated \$1,110 million.

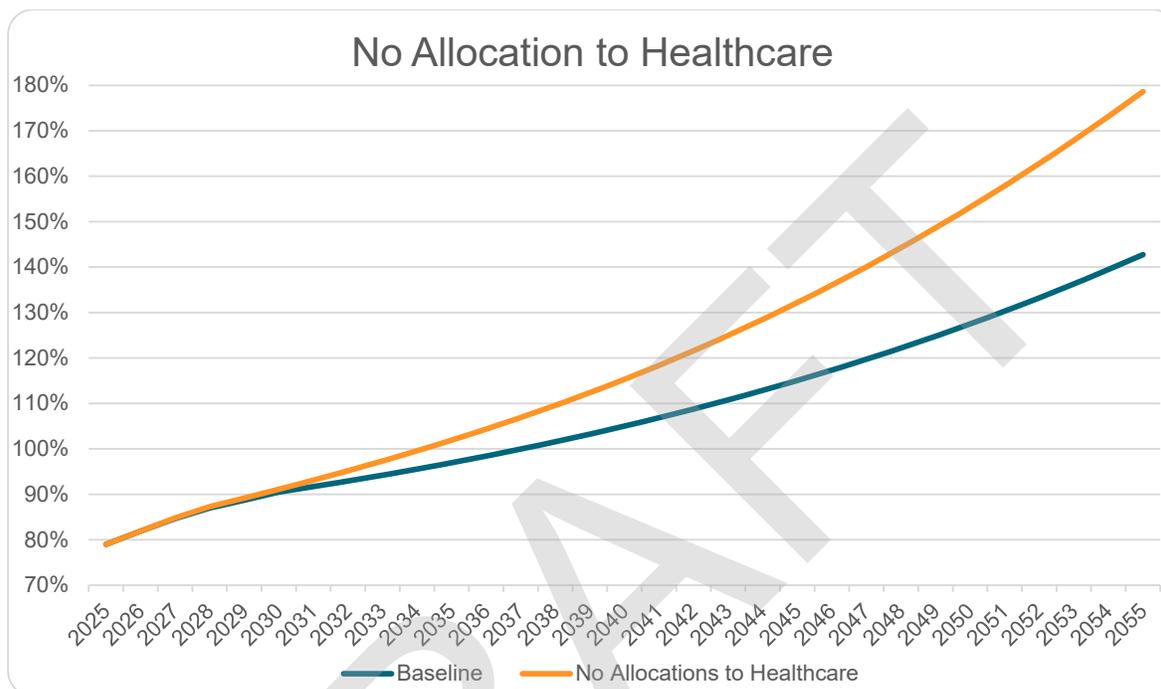
A historical summary of the actual contribution rate, split between the normal cost and the remaining amount available to fund the UAL, and the Funding Policy Rate is shown in the following graph:





## SECTION 3 – QUALITATIVE ANALYSIS

The chart below shows the projected funded ratio of SERS if no portion of the employer contribution is allocated to healthcare over the entire projection period. The Baseline scenario demonstrates the projected funded ratio under the current funding policy, with a minimum employer contribution equal to 10% of compensation. Over the projection period, this improved the funded ratio from 143% to 179%.



### (2) Amortization Policy

Actuarial assumptions are intended to be long-term estimates, so even if experience follows the assumption over the long-term, short-term fluctuations are to be expected. When this occurs, and when changes to the actuarial assumptions, methods, or benefit structure occur, any deviation in the unfunded actuarial accrued liability is financed based on the provisions of the amortization policy.

#### SERS Amortization Policy

The SERS Board shall establish a period of not more than thirty years to amortize the SERS unfunded actuarial accrued pension liability. If in any year the period necessary to amortize the unfunded actuarial accrued pension liability exceeds thirty years, as determined by the annual actuarial valuation required by section 3309.21 of the Revised Code, the Board, not later than ninety days after receipt of the valuation, shall prepare and submit to the Ohio Retirement Study Commission and the standing committees of the Ohio House of Representatives and the Ohio Senate with primary responsibility for retirement legislation, a report that includes the following information:

- (A) The number of years needed to amortize the unfunded actuarial accrued pension liability as determined by the annual actuarial valuation;





## SECTION 3 – QUALITATIVE ANALYSIS

---

- (B) A plan approved by the Board that indicates how the Board will reduce the amortization period of the unfunded actuarial accrued pension liability to not more than thirty years;
- (C) Whether the Board has made any progress in meeting the thirty-year amortization period.

The remaining amortization period as of June 30, 2025 is 19 years. The amortization payments are calculated as a level percentage of payroll assuming payroll will grow at 1.75%.

As an alternative, there is an amortization method called layered amortization. The layered amortization method establishes a series of “layered” amortization bases. The first “layer” is the System’s initial unfunded actuarial accrued liability established on June 30, 2025. With each additional valuation, the incremental change in the unfunded actuarial accrued liability is amortized over a new closed period. This results in a series of “layered” amortization bases. When added together, the sum of the “layered” amortization bases equal the total unfunded actuarial accrued liability of the retirement system. The resulting total amortization payment is the sum of the “layered” amortization payments for each base. Layered amortization is the model practice for retirement systems that are funded through actuarial determined employer contributions. SERS is funded through fixed contribution rates. State statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. The current amortization method is consistent with *A Public Policy Practice Note on Fixed Rate Pension Funding, February 2023* published by the American Academy of Actuaries. Although we believe the current amortization policy provides the necessary flexibility to calculate stable actuarial determined contributions and meets the requirements established by the Ohio Retirement Study Commission, in the next experience study, we will investigate layered amortization further to determine if it provides additional value and or transparency.

SERS amortization policy should be considered as a positive factor in risk assessment because it requires the Board to take action if the amortization period exceeds 30 years.





## SECTION 3 – QUALITATIVE ANALYSIS

### *(3) Payroll Growth Assumption and Active Membership*

When the actuarial valuation is performed each year, it determines the funded ratio, unfunded actuarial accrued liability and the contribution rates needed to fully fund the System based on SERS funding policy. The contributions needed (normal cost plus UAAL amortization) are expressed as a percent of payroll, which is consistent with how contributions are collected. Because the amortization payment on the unfunded actuarial accrued liability is determined using the level percent of payroll methodology, an assumption must be used to develop the payment stream for the amortization of the UAAL.

The funding of the System could be impacted if there was a material shift in the SERS active membership. When the payroll of SERS does not grow at the assumed rate, it requires an increase in the amortization rate to maintain the amortization schedule. While the dollar amount of the UAAL amortization payment might be the same, the amortization payment as a percent of payroll would increase to result in the same payment amount. Given the statutory limit on the employers and member contributions rates, sustained declines in payroll over a long time could prevent maintaining the amortization schedule. In addition, experience losses due to other sources, such as investment returns, would exacerbate the System decline in funding progress.

### *(4) Cost of Living Adjustments*

Effective January 1, 2018, the cost-of-living adjustment changed from a fixed 3.0% to a cost-of-living adjustment (COLA) that is indexed to CPI-W not greater than 2.5% with a floor of 0%. Before granting a cost-of-living increase, the Board may adjust the percentage of any increase if the Board's actuary, in its annual actuarial valuation, or in other evaluations, determines that an adjustment does not materially impair the fiscal integrity of the retirement system or is necessary to preserve the fiscal integrity of the retirement system.

The enactment of SB 8 granted authority to the Board to decide how many anniversaries a new benefit recipient must achieve before they become eligible to receive a COLA. The Board exercised its authority and established that benefit recipients must wait until the fourth anniversary to become eligible for a COLA. This change became effective for benefits commencing on or after April 1, 2018.

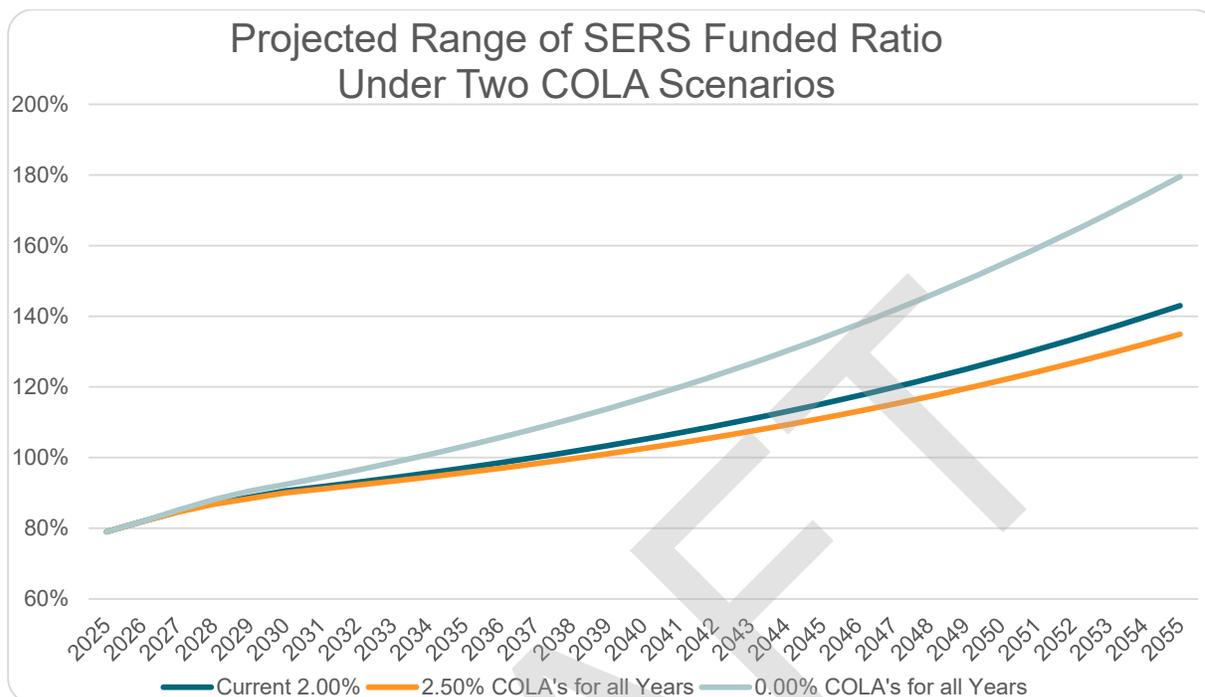
The authority granted to SERS in regard to cost-of-living adjustments should be considered a positive factor in risk assessment. If additional contributions to the System are unlikely, the only alternative to alter trends in the projected funded status are temporary or permanent benefit reductions. Granting the Board this authority allows SERS to act quickly rather than rely on the legislative process to address an issue and mitigate a portion of the risk.

In the most recent experience study, we recommended an assumed cost-of-living adjustment (COLA) of 2.00% for valuation purposes. The inflation assumption was recommended in a period of persistently low inflation. Since then, inflation has exceeded assumed inflation. The chart below shows the range in the projected funded ratio of SERS if the Board were to adopt 2.50% COLA's over the entire projection period and the projected funded ratio of SERS if the Board were to adopt 0.00% COLA's over the entire projection period. The funded ratio ranges from 135% to 180%. If future COLA's are equal to the assumed rate of 2.00%, the funded ratio is projected to be 143%.





## SECTION 3 – QUALITATIVE ANALYSIS



## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS



There are a number of risks inherent in the funding of a defined benefit plan. These include:

- demographic risks such as mortality, payroll growth, aging population including impact of baby boomers, and retirement ages;
- economic risks, such as investment return and inflation;
- contribution risk, i.e., the potential for contribution rates to be too high for the plan sponsor/employer to pay; and
- external risks such as the regulatory and political environment.

The various risk factors for a given system can have a significant impact – favorable or unfavorable – on the actuarial projection of liabilities and contribution rates. Under ASOP 51, the actuary is required to include plan-specific commentary regarding the risks that are identified. However, such comments can be qualitative rather than quantitative. In this section of the report, we include quantitative analysis to assist with a better understanding of some of the key risks for SERS.

### Demographic Risks

Demographic risks are those arising from the actual behavior of members differing from that expected based on the actuarial assumptions. These changes may arise when a significant portion of members is influenced to take some particular action due to employer or governmental actions, when there are improvements in medicine that affect broad groups of retirees, when societal trends encourage new behavior, or they may simply be random. Examples include early retirement windows, new drugs to treat common diseases, or trends across society to work longer before retiring. Many of these risks are minor in nature since they unfold gradually and generally have a small impact on a retirement system. Some, however, are comparatively more significant and warrant additional discussion.

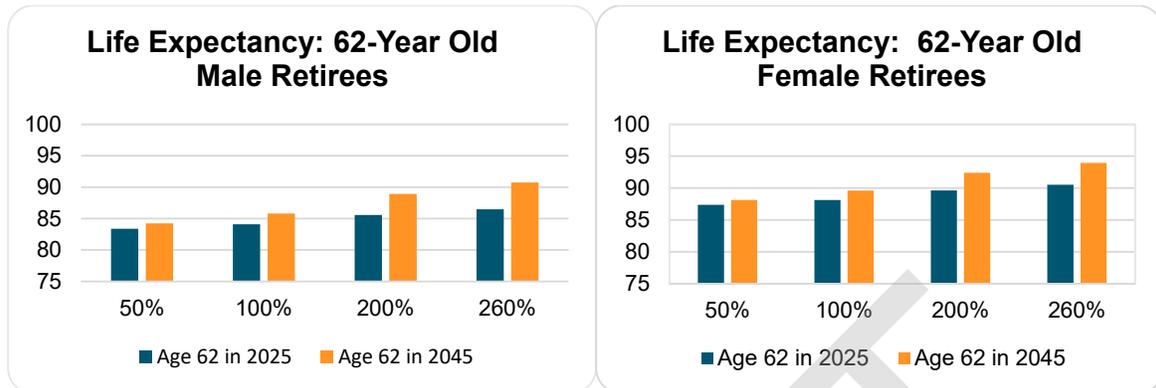
#### *Mortality Risk*

A key demographic risk for all retirement systems, including SERS, is improvement in mortality (longevity) greater or less than anticipated. While the actuarial assumptions used in the valuation reflect small, continuous improvements in mortality experience each year, and these assumptions are evaluated and refined in every experience study, the risk arises because there is a possibility of some sudden shift, perhaps from a significant medical breakthrough that could quickly impact life expectancy and increase liabilities. Likewise, there is some possibility of a significant public health crisis that could result in a significant number of additional deaths in a short time period, which would also be significant, although more easily absorbed.

The mortality projection scale used for the valuation is somewhat more complex than this, but it suffices for illustration to think of the current mortality improvement assumption as being about 1% per year. To consider longevity risk, we considered the impact of faster improvements in life expectancies of 2.0 and 2.6 times as much improvement, along with only half as much improvement. As the following charts illustrate, a greater improvement factor greatly increases the life expectancy over time.



## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS



In performing valuations, we do not directly use life expectancy values, but rather apply the mortality rates at each age directly. For 2025, if the mortality improvement scale were cut in half (to a 0.5% per year improvement), the liabilities would decrease by about 1% at age 62, while if the mortality improvement scale were doubled (resulting in approximately a 2% per year improvement), liabilities at age 62 would increase approximately 2%. Over the next 20 years, the impact of either change would roughly double. Note that these changes in mortality improvement are noticeable departures from historical norms, but they are plausible.

The table below illustrates the impact on the June 30, 2025 valuation if the mortality assumption was updated to reflect a reduced expectation of mortality improvement and an increased expectation of future mortality improvement. The reduction in mortality improvement was reflected by applying one half of the current mortality projection scale and the increase in expected mortality improvement was reflected by doubling the current projection scale.

	Current Mortality Assumption	Reduced Expected Mortality Improvement	Increased Expected Mortality Improvement
Employer Normal Contribution Rate	0.75%	0.44%	1.31%
UAL Amortization Rate	<u>8.99%</u>	<u>8.16%</u>	<u>10.61%</u>
Total Employer Rate	9.74%	8.60%	11.92%
Amortization Period	19 Years	19 Years	19 Years
Funded Ratio	79.00%	80.57%	76.14%



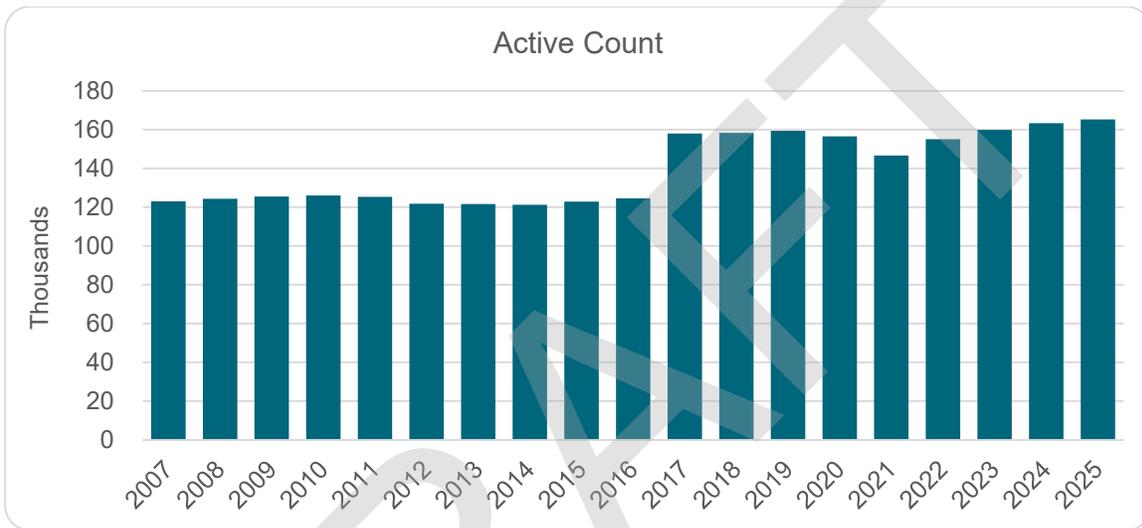
## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS



### Active Population Growth or Decline Risks

Valuations consider the data on a single date and do not make a direct assumption regarding future members, with the exception of the amortization method's assumption of payroll increases that inherently assumes a constant population size. However, the reality is that if the active membership increases or decreases, there will be corresponding increases or decreases in the actuarial contribution rate.

The following graphs show the historical count and covered payroll for active members in each membership group:



## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS

---



A decline in SERS' active membership could occur for a number of reasons. If the local school systems experience severe and prolonged fiscal challenges, the number of school employees might be reduced. Alternatively, if there is a decline in the student population, it could reduce the need to maintain the current level of school employees. Another possibility that could impact the number of active members is a shift in the way education is delivered, with higher utilization of online teaching. Regardless of the cause for the decline, a substantial decrease in the active membership by itself could be mitigated.

In the event of a significant decrease in population, the payroll used to amortize the UAAL is unlikely to grow at the assumed rate. This will, in turn, increase the actuarial contribution rate, although not the contribution dollar amount, needed to pay off the UAAL. Referring to the maturity measures shown earlier in the report, it should be evident that lower payroll will increase the Asset Volatility Ratio. Of course, an increase in active membership would conversely decrease the Asset Volatility Ratio.

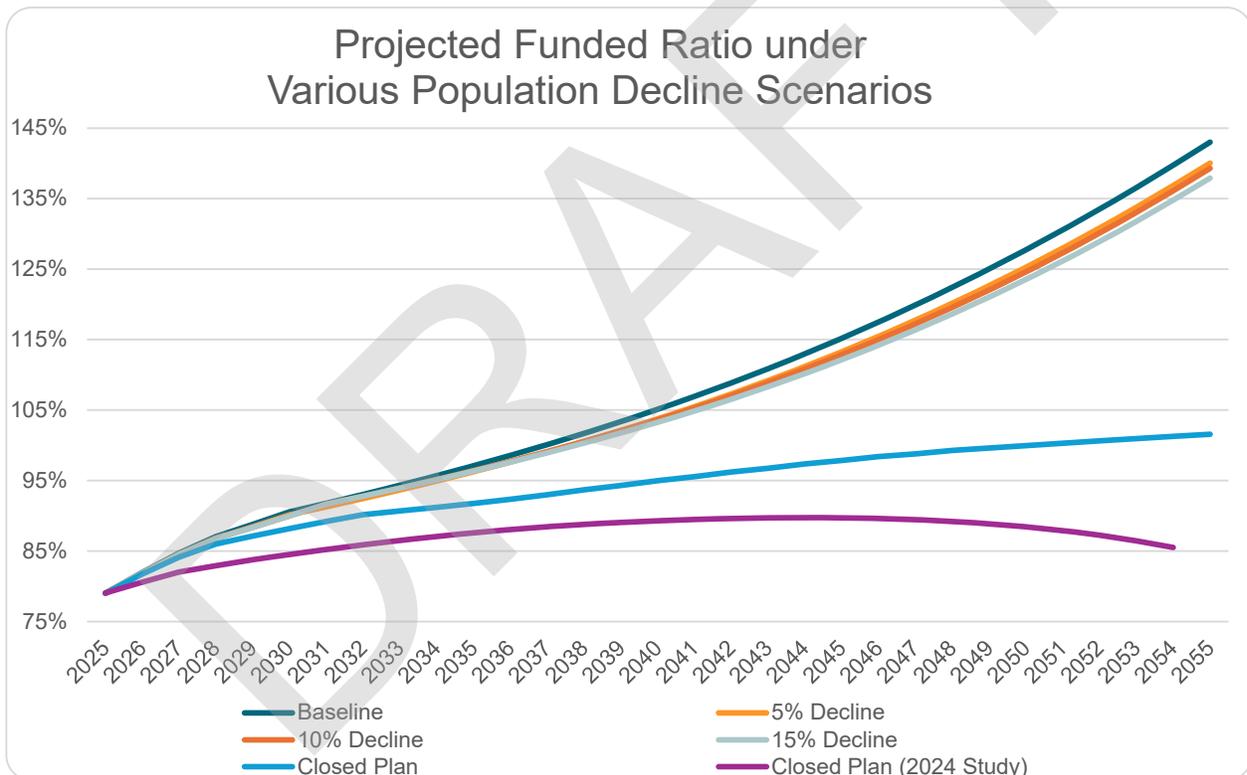
DRAFT



## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS



The chart below illustrates the projected funded ratio based on four population reduction scenarios. The first assumes an immediate 5% reduction in the population followed by no further reduction in active membership. The second assumes an immediate 5% reduction in the population followed by additional 1% reductions in the active population until the total reduction in the active workforce is 10%. The third scenario assumes an immediate 5% reduction in the population followed by additional 1% reductions in the active population until the total reduction in the active workforce is 15%. The final scenario represents a worst-case in which the System is closed to new entrants. Since employer and member contributions to the system are set in statute, any reduction in the workforce reduces the income stream to SERS, thereby prolonging the amount of time SERS will need to achieve 100% funded status. As you can see, if SERS was closed to new entrants the System's funded ratio continues to trend to 100%. For comparison purposes, this represents an improvement from last year's study in which the funded ratio was projected to increase to 90% and then decline to 86%. Please note, these population scenarios are not combined with investment returns that are less than the assumed rate of return of 7.00%. A population decline scenario combined with prolonged low returns or a shock return would produce significantly different results than those shown in the chart below.



## SECTION 4 – QUANTITATIVE ANALYSIS – DEMOGRAPHIC ASSUMPTIONS



### *Other Demographic Risks*

Changes to retirement and termination rates are likely to occur through time as the nature of the workforce and societal expectations shift. For instance, over the past decade or so, we have observed a general shift in retirement patterns in which retirements are occurring later. This may be a function of prior plan changes to eligibility, economic considerations, expectations of longer life in retirement, a proportionate decrease in physically-demanding jobs, or changes in family composition. Such changes do affect the funding of the plan, but generally these changes are minor and gradual and are reflected in modified assumptions resulting from regular experience studies.

More significant changes in demographic assumptions are likely to be influenced by something significant such as a legislative change. Obviously, some changes in SERS provisions or state employment rules could quickly change behavior patterns, but these would probably be anticipated as part of the legislation. Externally, a significant change in Social Security or Medicare provisions could change retirement patterns if the changes were implemented rapidly. These changes are not ones that can be easily quantified because the timing of such events, the impact of the event on behavior, and the magnitude of the behavior change cannot be anticipated.

As an extreme example, the table below illustrates the impact on the June 30, 2025 valuation if current retirement patterns changed abruptly in that 100% of active members retired upon obtaining first eligibility for an unreduced retirement.

	Current Valuation Assumptions	Accelerated Retirement Pattern
Employer Normal Contribution Rate	0.75%	1.21%
UAL Amortization Rate	<u>8.99%</u>	<u>10.59%</u>
Total Employer Rate	9.74%	11.80%
Amortization Period	19 Years	19 Years
Funded Ratio	79.00%	76.16%





## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### Investment Return Risk

Investment risk volatility is the greatest risk facing SERS, as well as most public retirement systems today. In 2025 the average yield on the 10-year treasury was 4.29%. Compared to the current assumed rate of return of 7.00%, the risk premium is 2.71%. When investment returns are below the expected return (investment return assumption), the unfunded actuarial accrued liability increases, which prolongs the time period necessary for SERS to achieve full funding. Likewise, returns above the expected return, which are easier to absorb, decrease the unfunded actuarial accrued liability and reduce the period necessary for SERS to achieve full funding. Because of the inherent volatility of most retirement system investment portfolios, there is, therefore, volatility in the plan's funded status and contribution requirements.

To understand the impact of investment volatility, we present a sequence of projections, based on the model prepared for SERS as part of the valuation each year. These "deterministic" projections use one or more selected scenarios to help illustrate certain key concepts. Following these projections, we show a summary of the results of a "stochastic" projection in which 1,000 equally plausible random scenarios are run and summarized.

#### *Risk Due to Return Order*

The long-term funding outcome is impacted not only on the returns but also the order in which they occur. In other words, a "good" return followed by a "bad" return can lead to a different result than the same "bad" return followed by the same "good" return. While this may not be intuitive at first, the concept makes sense once it is realized that there are net cash flows out of the system.

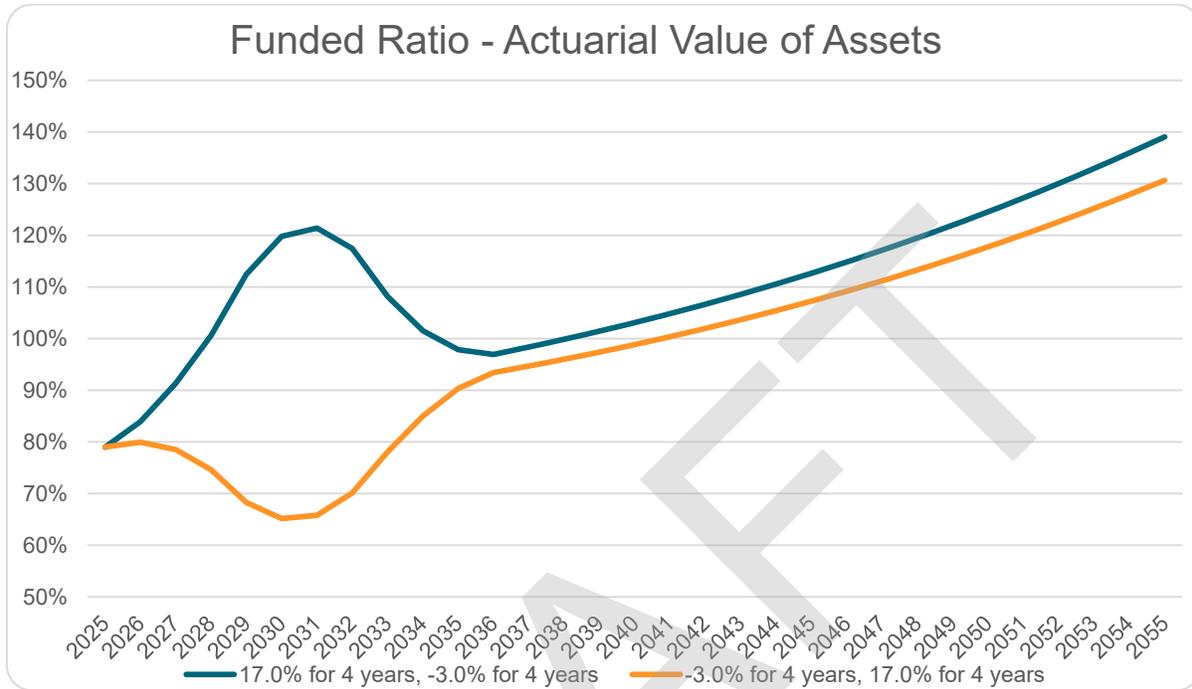
To illustrate this concept, consider the funded ratio for SERS under two different scenarios. In each case, there are four years of returns that are 17.0% (10.0% above the assumed 7.0% return). There are also four years of -3.0% returns (10.0% below the assumed return). In one case, we assume the four good years come before the four bad years, while in the other case, we assume that the four bad years are followed by the four good years.





## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

The following graph shows the results:



At the end of the projection, the high return followed by low return scenario has a funded ratio of 139%, while the low return followed by a high return is 130% funded. The order of the returns leads to a \$4.0 billion dollar difference in market value (\$64.9 billion vs. \$60.9 billion). While the scenarios displayed here are artificial, they do illustrate that the return order matters.

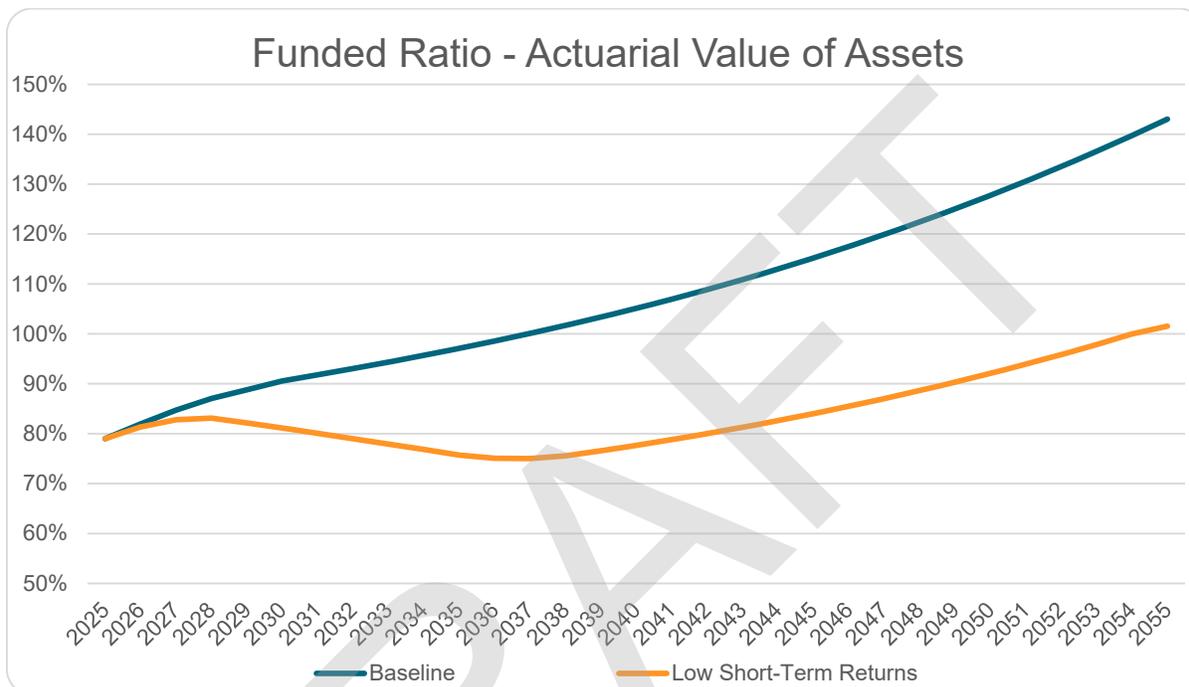




## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### Risk of Low Returns for Sustained Period

It is important to determine the potential impact of low returns over a sustained period on SERS funding. We want to examine the scenario, that returns will be 4.0% for the next 10 years, and 7.00% thereafter. The following graphs shows the impact of prolonged low returns on the funded ratio SERS.



*In this scenario, the low returns for the next 10 years cause the funded ratio to decline to 75% in 2037, after which the funded ratio begins to improve. Ultimately, the funded ratio improves due returns returning to the assumed rate of 7.00%.*





## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### *Risk of Shock in a Single Year*

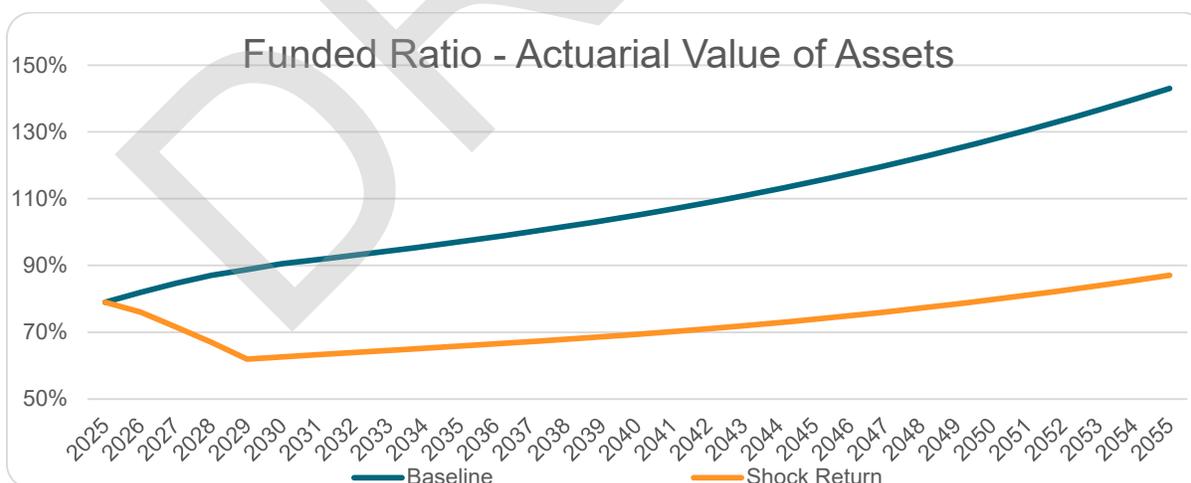
From late 2007 through early 2009, the financial markets crashed both in the U.S. and abroad resulting in the most impactful loss due to investment return ever experienced by SERS. The return on the market value of assets for FY 2009 was -22.9% and this single year dropped the funded status on a market value basis by more than 20%. Like many other systems around the country, SERS and the State of Ohio responded with changes in the benefit structure. Coupled with the financial market recovery, significant progress has been made in improving the situation.

Even with SERS' current Contribution Rate Funding Policy and the progress made toward improving the funding, there is still risk from another shock of this magnitude in a single year. The impact of such an event would be different depending on when it occurs. As the System matures and assets grow in comparison to payroll (increasing the asset volatility ratio), severe investment declines will have a greater impact on the actuarial contribution rate.

To study the impact of a similar shock, we modeled a repeat of 2009 with its -22.9% return in FY 2025, but 7.0% returns in every other year.

First, the probability of such a return in a single year is around 0.5% to 0.6% - meaning an event that occurs maybe every 150 to 200 years. Second, market crashes have been historically followed by significant rebounds in the following few years that have recovered significant portions of the losses. Third, SERS and its stakeholders have a history of proactively addressing significant problems by making changes in the benefit provisions and/or funding policies. This is not to minimize the risk of a shock. Rather, it is a reminder that the risk can be addressed in multiple ways.

Please note, the graph below is an improvement from the previous study when the shock return led to an ultimate funded ratio of 75% compared to 86% in this study.



*In this scenario, the funded ratio drops significantly in the initial years. Note that this graph is based on the actuarial value of assets, so the smoothing mechanism delays the recognition of the return over several years. The funded ratio declines as the loss is recognized and then begins to improve throughout the rest of the projection period.*

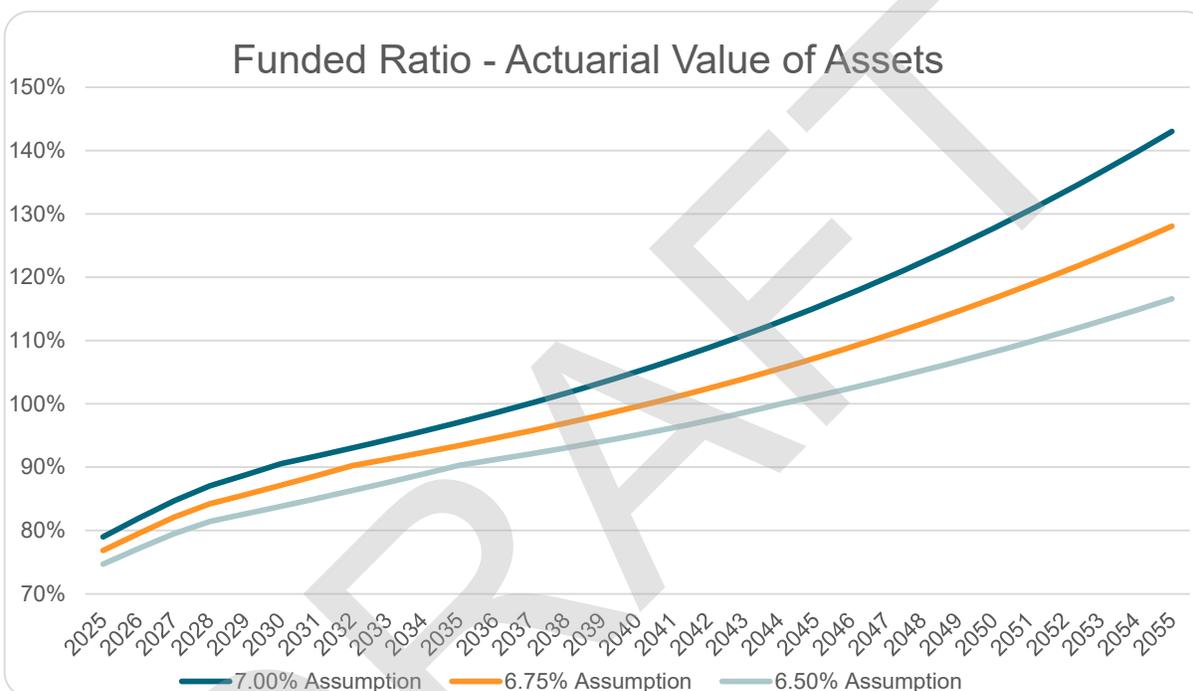




## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### Sensitivity Analysis

The valuation results are sensitive to the set of economic assumptions used to estimate the System's liabilities. In all scenarios considered thus far, the baseline results are those based on the assumption that all of the current actuarial assumptions (those used in the June 30, 2025 actuarial valuation) will be met in the future. To illustrate the sensitivity of the valuation results to different investment return assumptions, we have modeled the results if the investment return assumption is changed from 7.00% to 6.75% or 6.50%, with no other change in the set of economic assumptions. These illustrations further reflect that the assumed rate of return is actually earned in all years and use the current Contribution Rate Funding Policy.



*As would be expected, the 7.0% assumption has the highest funded ratio, largely because the liabilities are the lowest and the assets grow at the highest rate. As should be expected, the 6.5% assumption results in the lowest funded ratio due to the increased measure of liabilities and the lowest annual returns.*





## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

Another way to perform sensitivity analysis is to look at how results would unfold if the assumptions remain unchanged, but actual experience varies. Of course the assumptions would eventually be updated to reflect actual experience, so this type of analysis is useful only when shorter periods of time are considered. In the following charts, rates of return from 5.0% to 8.0% are considered. The impact is shown using a “heat map” in which the results are color coded from green (most favorable) to red (least favorable) to help visually show trends.

In this analysis, the current investment return assumption is not changed, but the impact of differing actual returns over the next ten years is studied.

	Funded Ratio at June 30 Valuation										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
5.00%	79%	82%	83%	84%	84%	84%	84%	84%	84%	83%	83%
5.25%	79%	82%	84%	85%	85%	85%	85%	85%	85%	85%	85%
5.50%	79%	82%	84%	85%	85%	86%	86%	86%	87%	87%	87%
5.75%	79%	82%	84%	85%	86%	87%	87%	88%	88%	89%	89%
6.00%	79%	82%	84%	86%	87%	87%	88%	89%	90%	91%	91%
6.25%	79%	82%	84%	86%	87%	88%	89%	90%	91%	91%	92%
6.50%	79%	82%	84%	86%	88%	89%	90%	91%	92%	92%	93%
6.75%	79%	82%	85%	87%	88%	90%	91%	92%	93%	94%	96%
7.00%	79%	82%	85%	87%	89%	91%	92%	93%	94%	96%	97%
7.25%	79%	82%	85%	87%	89%	91%	93%	94%	96%	98%	99%
7.50%	79%	82%	85%	88%	90%	92%	94%	96%	98%	100%	102%
7.75%	79%	82%	85%	88%	90%	92%	94%	97%	99%	101%	103%
8.00%	79%	82%	85%	88%	91%	93%	96%	98%	100%	103%	106%

The yellow that predominates the left side of the charts indicates that the system is starting from a position that is comparatively in the middle of the outcomes. Higher returns lead to higher funded ratios, indicated by the green color in the lower right, while lower returns lead to lower funded ratios, as indicated in the red in the upper right.





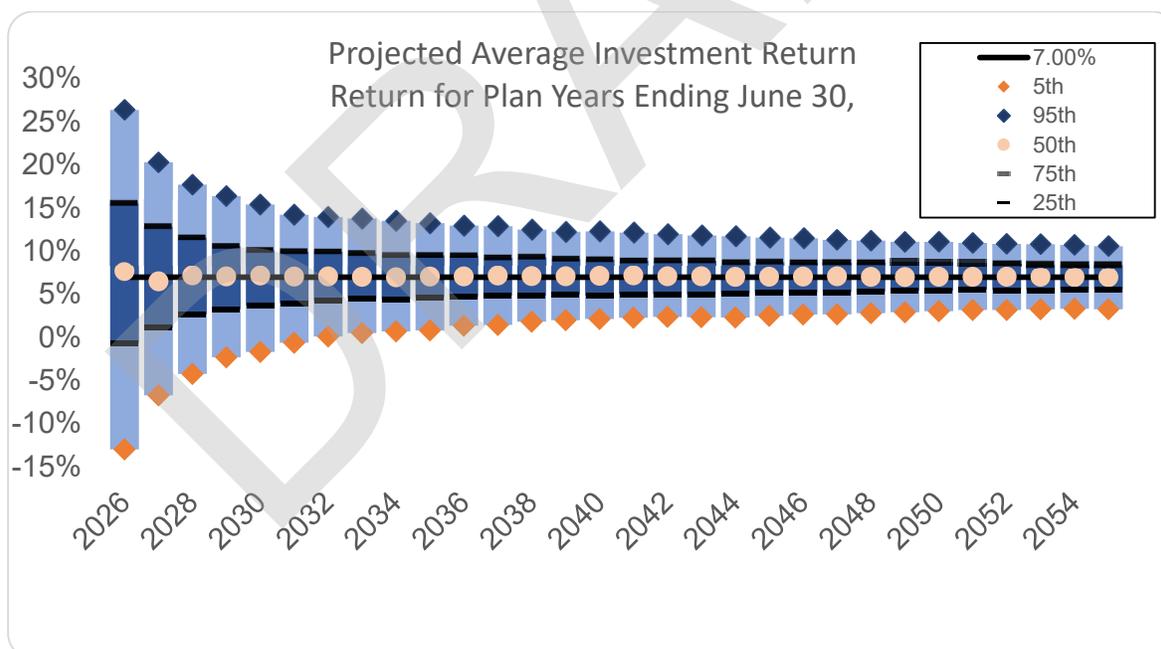
## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### Variability of Returns – Stochastic Modeling

Deterministic modeling is helpful to compare different scenarios, which can lead to a better understanding of the funding dynamics of the system. Missing in this analysis is an understanding of the likelihood of various scenarios and the plausible range of outcomes from the anticipated volatility associated with the asset allocation. These issues are handled with the more robust approach of stochastic modeling, in which investment performance is varied, based on the expected distribution of portfolio returns. Rather than obtaining a single result, this approach develops the results for many plausible scenarios, so that the distribution of outcomes can be considered.

For this modeling, we generated 1,000 30-year scenarios for the SERS's portfolio based on the expected compound return of 7.00% and standard deviation of 12.17% and assumed that each year's returns are independent. For each simulation, the asset, liabilities, and actuarial contribution rate were modeled for the next 30 years.

The chart below is based on the expected return and standard deviation noted above. We utilize those assumptions to produce the percentile ranks of expected returns over 30 years. Focusing on the longer time spans, the analysis indicates that over the next 30 years there is a 25% chance that the cumulated rate of return will be below 5.54% and a 25% chance it will be above 8.46%. In other words, there is a 50% chance the cumulative market returns over the next 30 years will be between 5.54% and 8.46%. The 50<sup>th</sup> percentile compound average investment return over the next 30 years is 7.00%.





## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS

### Probability of Low Funding Ratios

Because of issues such as asset liquidity and the ability to withstand severe market volatility, low funded ratios are a concern. Consequently, understanding the likelihood of the occurrence of a low funded ratio can be helpful to the Board's considerations. The following tables show the probability of being below a given level during the specified period.

	Ratio <40%	Ratio <50%	Ratio <60%	Ratio <70%	Ratio <80%
2025 – 2030	0%	0%	1%	4%	36%
2025 – 2035	0%	1%	3%	8%	32%
2025 – 2040	1%	2%	5%	11%	30%

It is important to note that these are probabilities of the event occurring at any point during the period. There are scenarios in which the first few years may have low investment returns, leading to a low funded ratio, but due to strong investment returns in later years, the funding ratio after 10 or 15 years may be over 100%. Nonetheless, such scenarios would count in this table as an occurrence of a low funded ratio.

In general, there is a less than 5% chance that the funded ratio will decline below 60% over the next 15 years, and about a 10% chance that it will drop below 70% during the next 15 years. The result of this stochastic analysis reveals that the System's current momentum of funding progress would require a significant decline in market returns, which are less likely, in order to expect a decrease in the current funded ratio in the future.

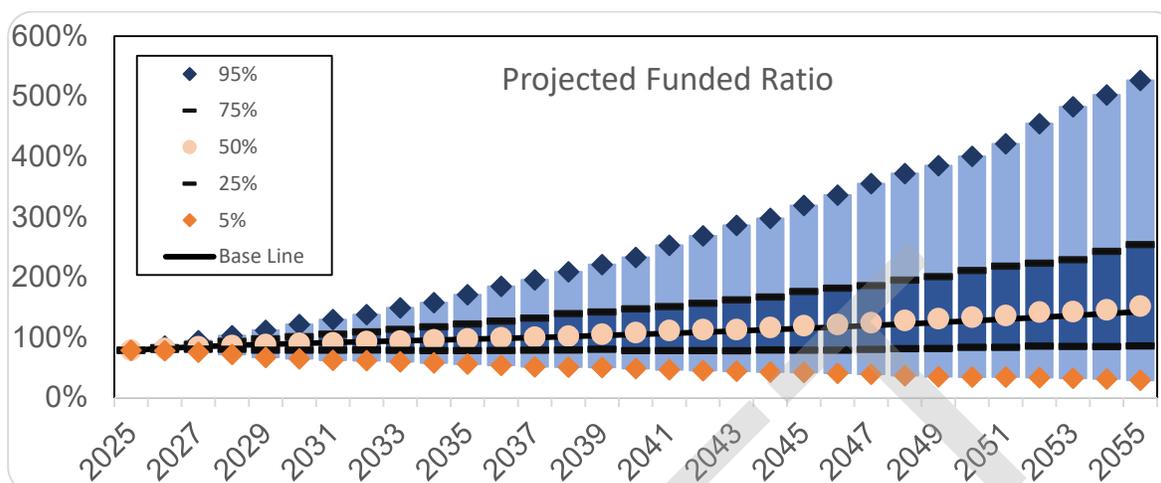
### Distributions of Outcomes

To this point, the discussion of stochastic modeling has focused on the probability of selected outcomes. It can also be useful to examine the distribution of outcomes for insight into the risk associated with investment returns. The following charts show the distribution for the next 30 years of the funded ratio and the negative cash flow. The darker blue portion of the bar represents the range between the 25<sup>th</sup> and 75<sup>th</sup> percentiles, or the middle 50% of results. A black line in the middle of the blue portion indicates the median (50<sup>th</sup> percentile) result. The lighter blue portion of the bars extend to show the 5<sup>th</sup> and 95<sup>th</sup> percentile ranges.



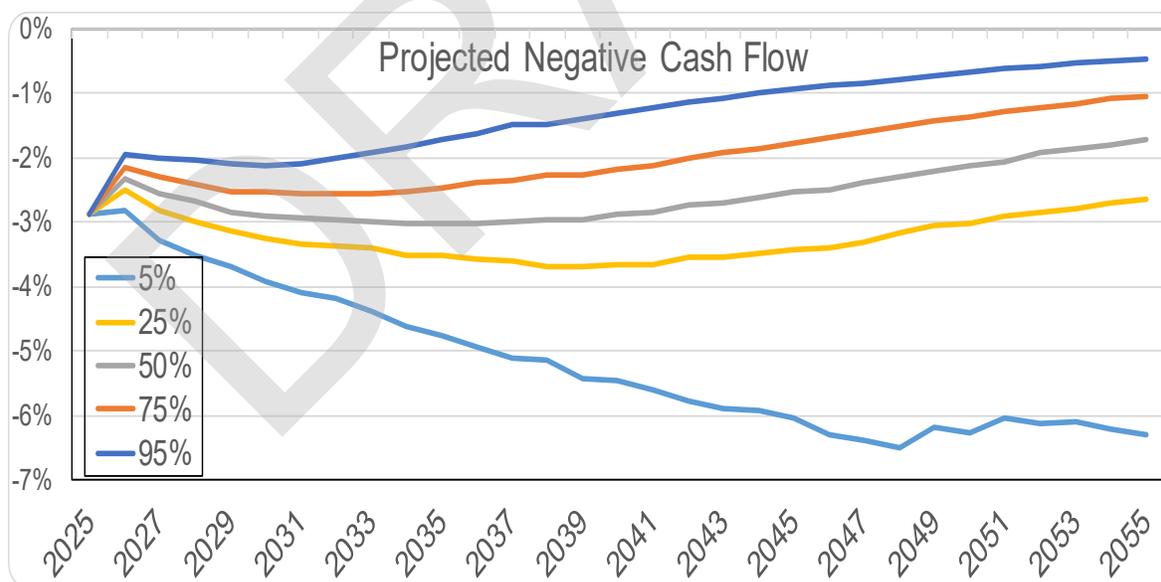


## SECTION 5 – QUANTITATIVE ANALYSIS – ECONOMIC ASSUMPTIONS



This graph indicates that in 10 years, the middle 50% of possible outcomes are between 79% and 123% funded. There is a 5% chance of being more than 171% funded, and a 5% chance of being less than 56% funded. Of course, should these less likely events occur, changes would most likely be made, thus changing the results.

Negative cash flow is when benefit payments and expenses exceed contributions. This is perfectly normal in a prefunded pension system that is mature. Please refer to our previous discussion regarding negative cash flow.



The median negative cash flow tends to -3.03%, while the 25<sup>th</sup> percentile tends to -3.70% over the next 13 years which is followed by improvement in the negative cash flow over the rest of the projection period. This is a contributing factor to the fact that the median funded ratio exceeds 100% in the projected funded ratio chart above.





# SECURE

## Your Financial Future

### School Employees Retirement System of Ohio Risk Assessment as of June 30, 2025

Todd Green, ASA, EA, FCA, MAAA



# Examples of Risk

Actuary is to identify risks that may affect the Plan's future financial condition

## Investment

- Potential that return will be different than expected

## Longevity/Demographics

- Potential that mortality or demographic experience will be different than expected

## Covered Payroll

- Potential that covered payroll will not increase as assumed (especially important if UAL is amortized as level percent of payroll)

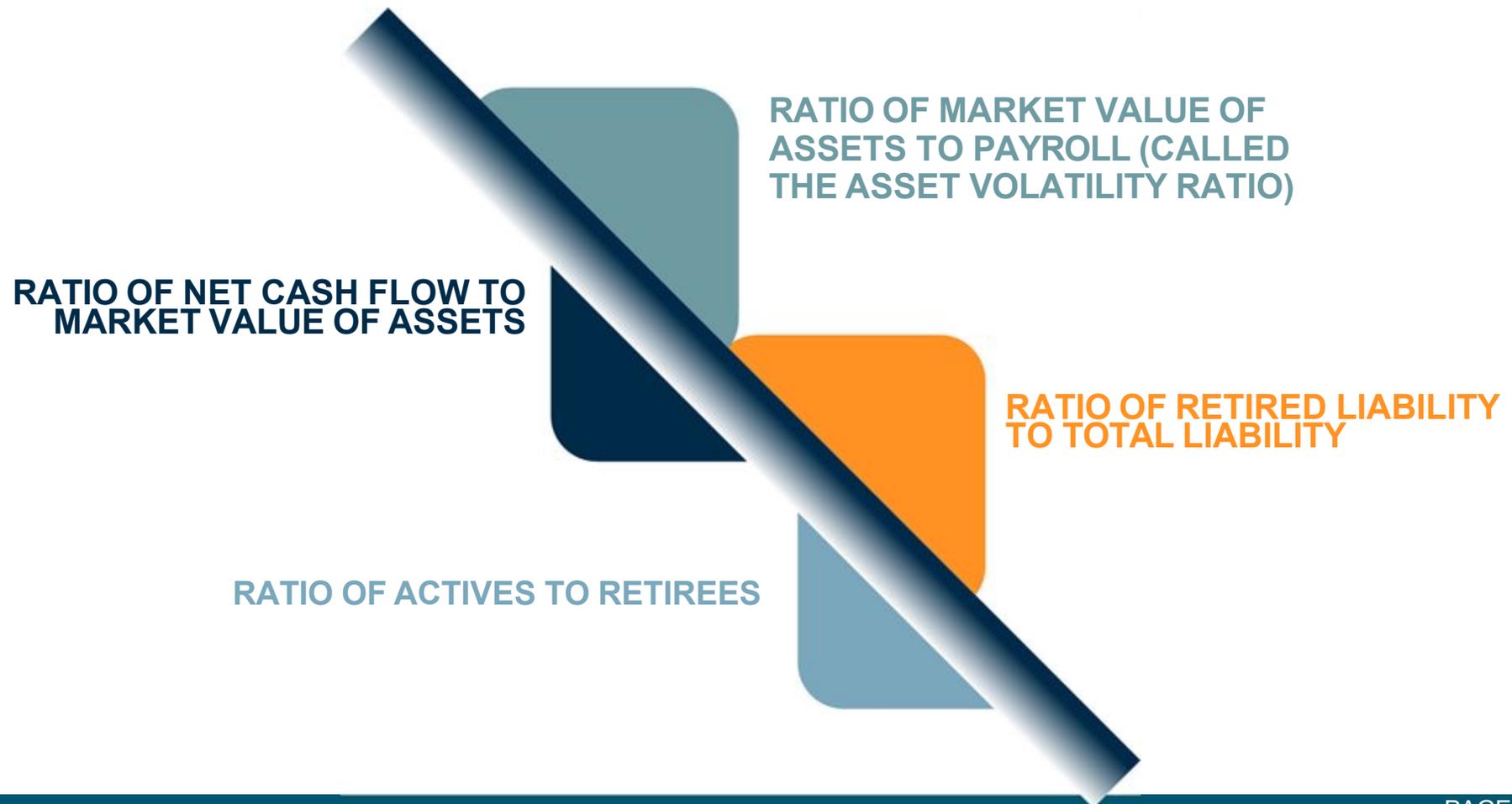
## Active Population

- Potential for number of active members to decline or plan closed to new entrants

## Contribution Rate

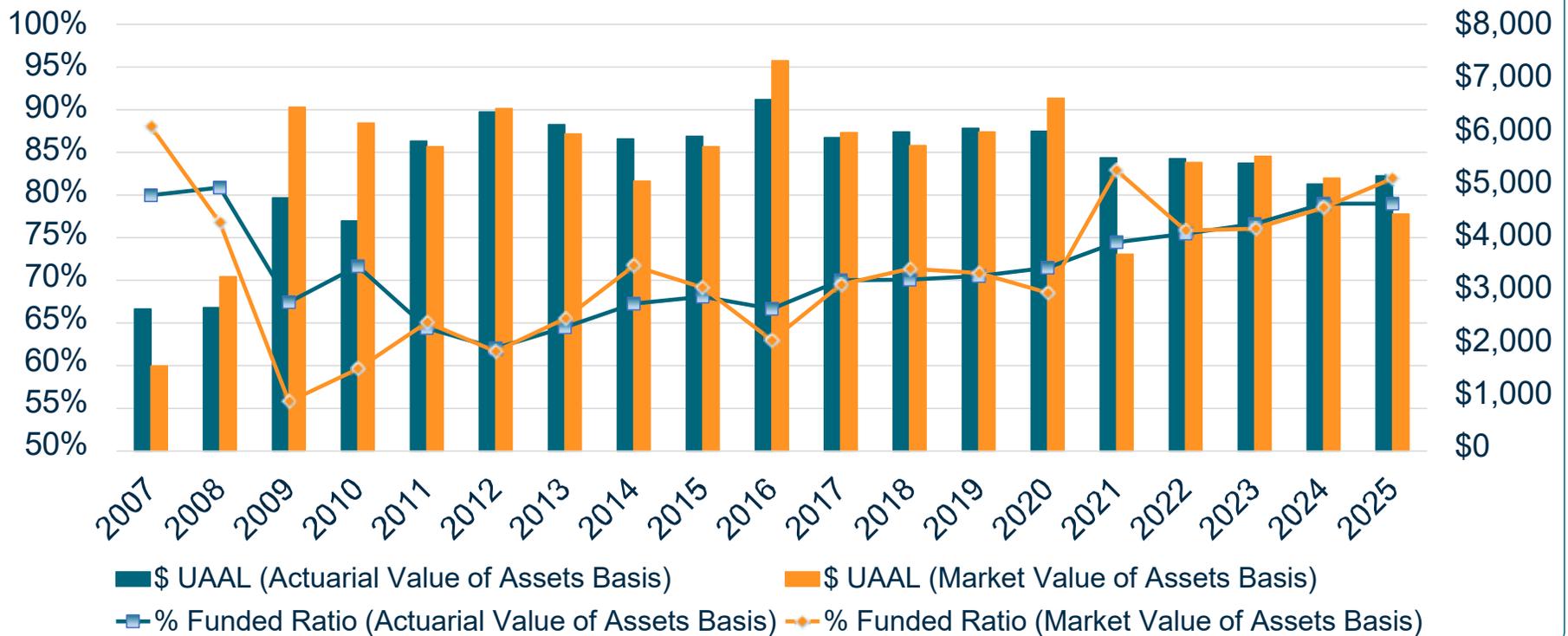
- Potential for contribution rates to be too high for the plan sponsor/employer to pay

# Risk Measurements – Plan Maturity



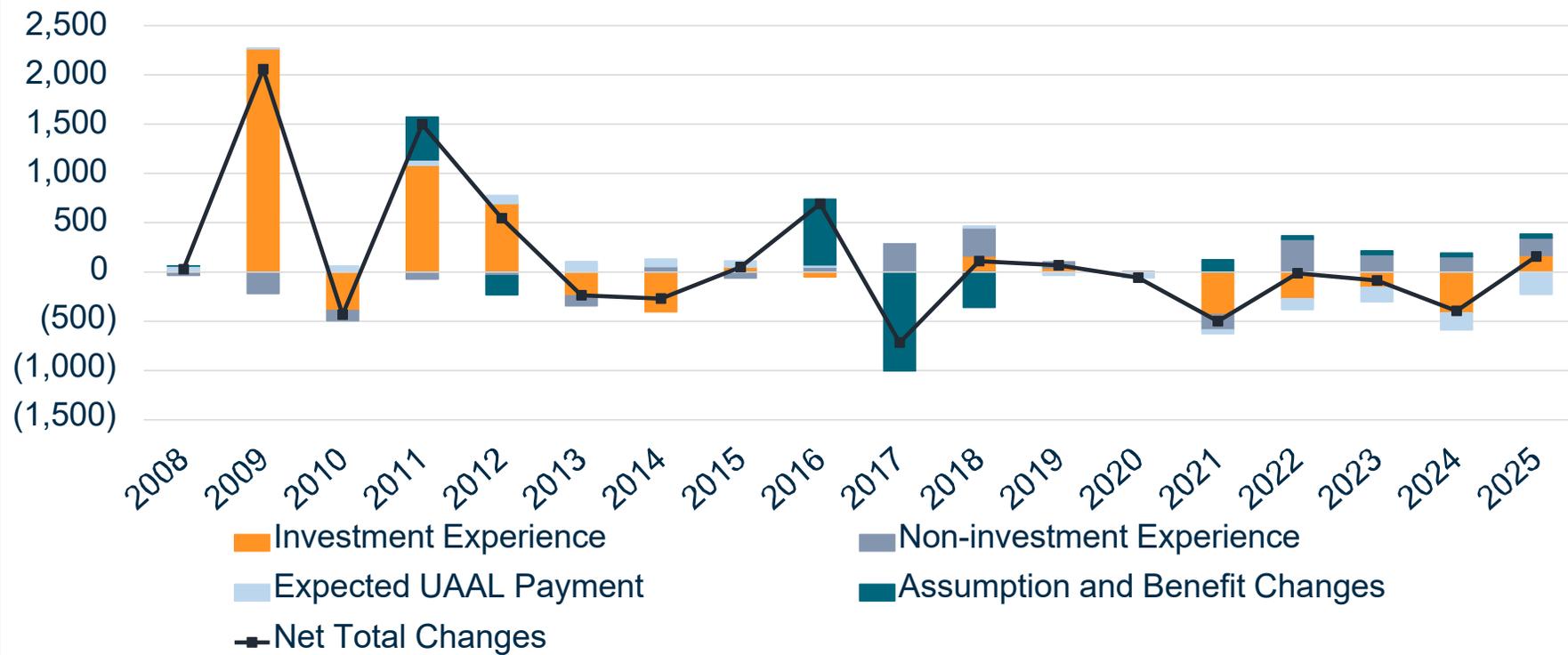
# Experience Look-Back

Funded Ratio (Percentages) and Dollar UAAL (\$ Millions)  
In June 30, 2007 to 2025 Valuations



# Experience Look-Back

Factors that Changed UAAL in June 30, 2008 to 2025 Valuations  
(\$ Millions)

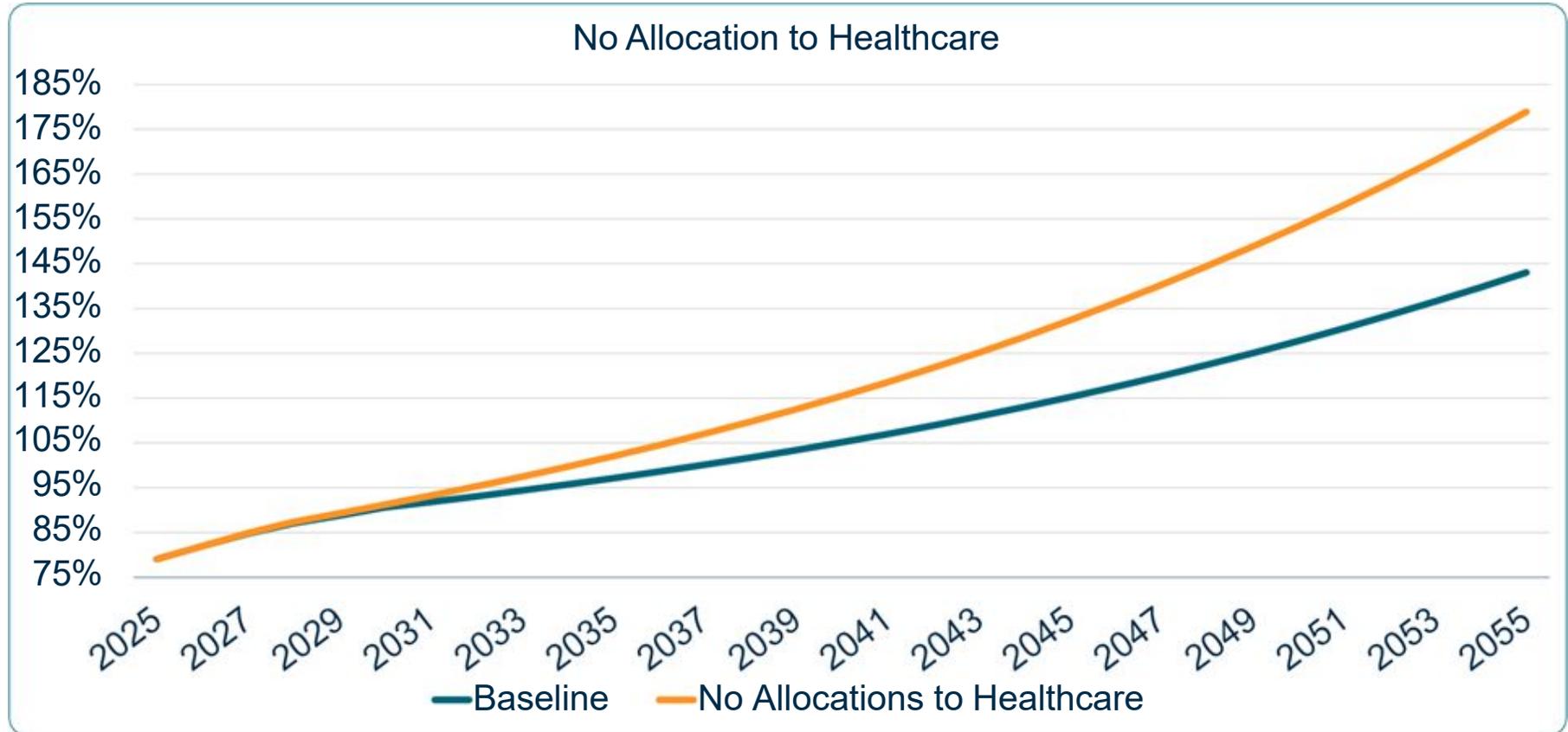


- Funding Policy
- Amortization Policy
- Size of active membership and growth in total covered payroll

## FUNDING POLICY

- The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding.
- Effective June 30, 2015, changes were made to funding policy to meet the competing goals of providing Healthcare and improving SERS' long term funding as quickly as possible.
- Funding policy is a positive factor
- For the risk analysis, we assumed the minimum employer contribution allocated to Basic Benefits is 10% of covered payroll.

# Qualitative Assessment



## AMORTIZATION POLICY

- The SERS Board shall establish a period of not more than thirty years to amortize the SERS unfunded actuarial accrued pension liability. If in any year the period necessary to amortize the unfunded actuarial accrued pension liability exceeds thirty years, as determined by the annual actuarial valuation required by section 3309.21 of the Revised Code, the board, not later than ninety days after receipt of the valuation, shall prepare and submit to the Ohio Retirement Study Commission and the standing committees of the Ohio House of Representatives and the Ohio Senate with primary responsibility for retirement legislation a report that includes the following information:
  - The number of years needed to amortize the unfunded actuarial accrued pension liability as determined by the annual actuarial valuation;
  - A plan approved by the board that indicates how the board will reduce the amortization period of the unfunded actuarial accrued pension liability to not more than thirty years;
  - Whether the board has made any progress in meeting the thirty-year amortization period.

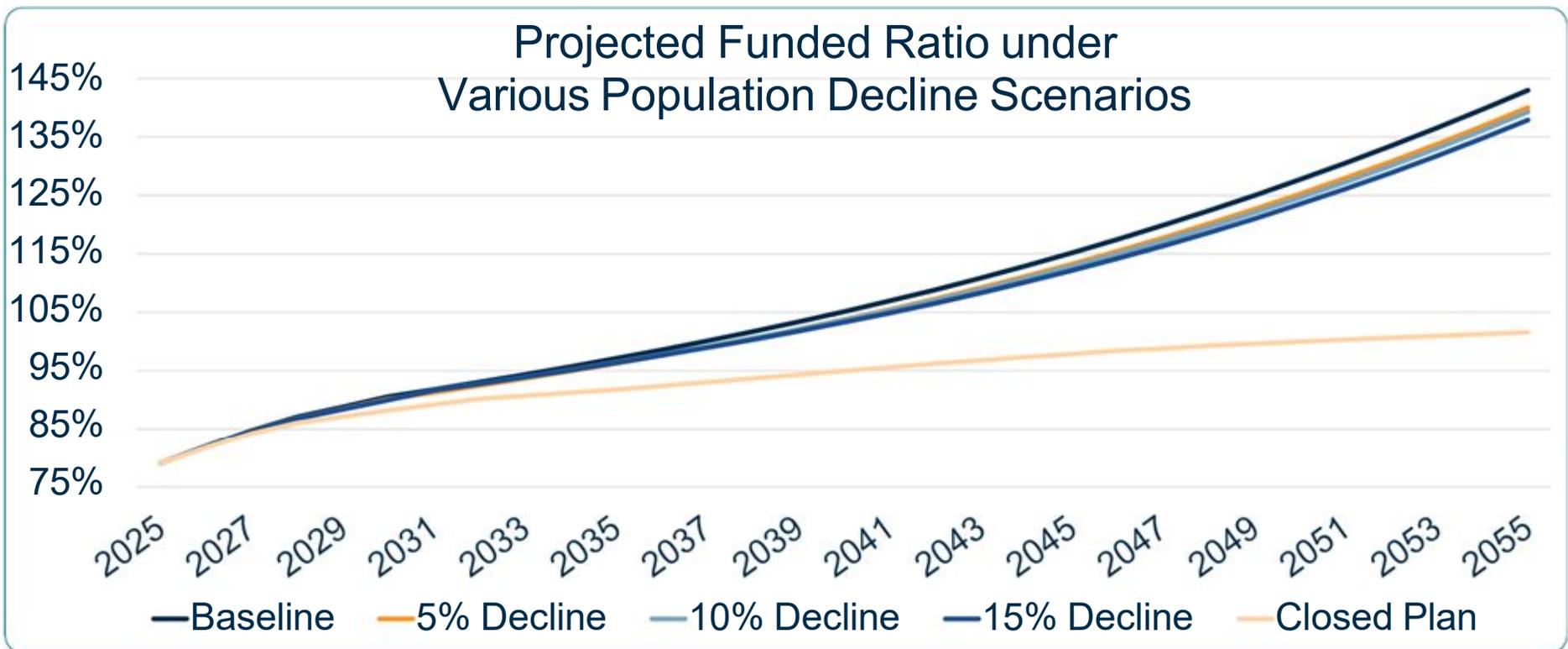
## LAYERED AMORTIZATION

- Establishes a series of “layered” amortization bases
- The first layer is the System’s initial UAL established on June 30, 2025
- With each additional valuation, the incremental change in the UAL is amortized over a new closed period
- Results in a series of “layered” amortization bases
  - When added together, the sum of the “layered” amortization bases equal the total UAL
  - The total amortization payment is equal to the sum of the amortization payments for each of the “layered” amortization bases
- Will consider during next experience study

## SIZE OF ACTIVE MEMBERSHIP AND GROWTH IN TOTAL COVERED PAYROLL

- UAL amortized as level percent of payroll so an assumption (1.75%) is used to anticipate future changes in payroll
- If active membership decreases or salary increases are less than assumed, covered payroll may not increase as assumed
- Forces the UAL contribution rate to increase
- Last experience study reduced the payroll growth assumption which improves the risk profile of the System
  - Limits risk to SERS due to payroll growth

# Stress Testing – Population Decline



A reduction in population will result in a reduction in covered payroll which will reduce the funding available to the System since employer contributions are limited to 14% of payroll which will ultimately increase the amount of time necessary to completely amortize the unfunded liability

## **MORTALITY RISK: CHANGES IN LONGEVITY**

- Valuation assumption anticipates small, continuous improvements in mortality each year in the future (generational mortality)
- This assumption is reviewed and evaluated in each experience study
- Risk is the possibility of a shift to longer life expectancy

## MORTALITY RISK: CHANGES IN LONGEVITY

	Current Mortality Assumption	Reduced Expected Mortality Improvement	Increased Expected Mortality Improvement
Employer Normal Contribution Rate	0.75%	0.44%	1.31%
UAL Amortization Rate	<u>8.99%</u>	<u>8.16%</u>	<u>10.61%</u>
Total Employer Rate	9.74%	8.60%	11.92%
Amortization Period	19 Years	19 Years	19 Years
Funded Ratio	79.00%	80.57%	76.14%

## **OTHER DEMOGRAPHIC RISKS: RETIREMENT**

- Shifts in retirement patterns
- This assumption is reviewed and evaluated in each experience study
- As with mortality, the risk is the possibility of a shift in retirement patterns

- **DEMOGRAPHIC RISK: CHANGES IN RETIREMENT PATTERNS**

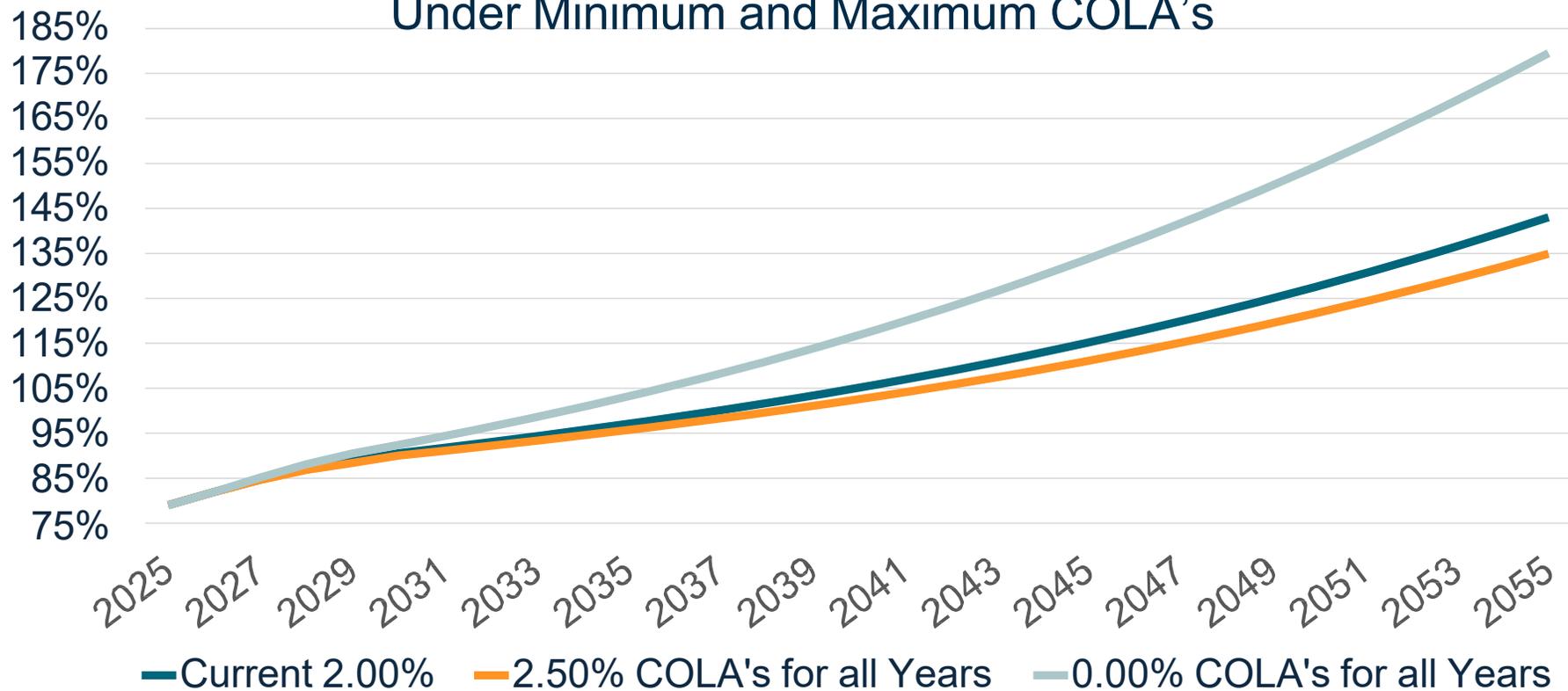
	<b>Current Valuation Assumptions</b>	<b>Accelerated Retirement Pattern</b>
Employer Normal Contribution Rate	0.75%	1.21%
UAL Amortization Rate	<u>8.99%</u>	<u>10.59%</u>
Total Employer Rate	9.74%	11.80%
Amortization Period	19 Years	19 Years
Funded Ratio	79.00%	76.16%

## COST OF LIVING ADJUSTMENTS

- Before granting a cost-of-living increase, the Board may adjust the percentage of any increase if the Board's actuary, in its annual actuarial valuation, or in other evaluations, determines that an adjustment does not materially impair the fiscal integrity of the retirement system or is necessary to preserve the fiscal integrity of the retirement system.
- The enactment of SB 8 granted authority to the Board to decide how many anniversaries a new benefit recipient must achieve before they become eligible to receive a COLA.
- The authority granted to SERS regarding cost-of-living adjustments is considered a positive factor in this risk assessment. Granting the Board this authority allows SERS to act proactively rather than rely on the legislative process to address an issue and mitigate a portion of the risk.

# Qualitative Assessment

## Projected Range of Funded Ratio Under Minimum and Maximum COLA's



Identifying interactions between inputs that are not self-evident

1

Communicating uncertainties using simple examples or graphs

2

“Prediction” is not the goal of modeling. Models are useful as a tool for analyzing the system’s objectives and strategies as well as effective as a decision-making tool

# Usefulness of Models In Risk Assessment

Answering  
“what if” or  
comparative  
questions

3

Identifying  
sensitivities of  
outputs to  
compare to  
inputs, providing  
guidance on  
areas that  
require  
additional  
analysis

4

Revealing  
inconsistencies,  
discrepancies, or  
limitations

5

# Limitations of Modeling

## Simplification

All models are simplifications of how experience will unfold in the real world

## Experience

Actual experience will almost certainly be different and more complex than any scenarios modeled

## Intention

Be careful to understand what a model is intended to communicate

# Sensitivity Analysis

Analysis or simulation designed to illustrate the range of potential results when actual experience is different than expected, based on assumptions

Vary the rate of return incrementally over specified period

1

Compare results under better/worse than expected scenarios, e.g., current investment return assumption plus scenarios of +1% and -1% returns

2

Compare results under different sets of assumptions

3

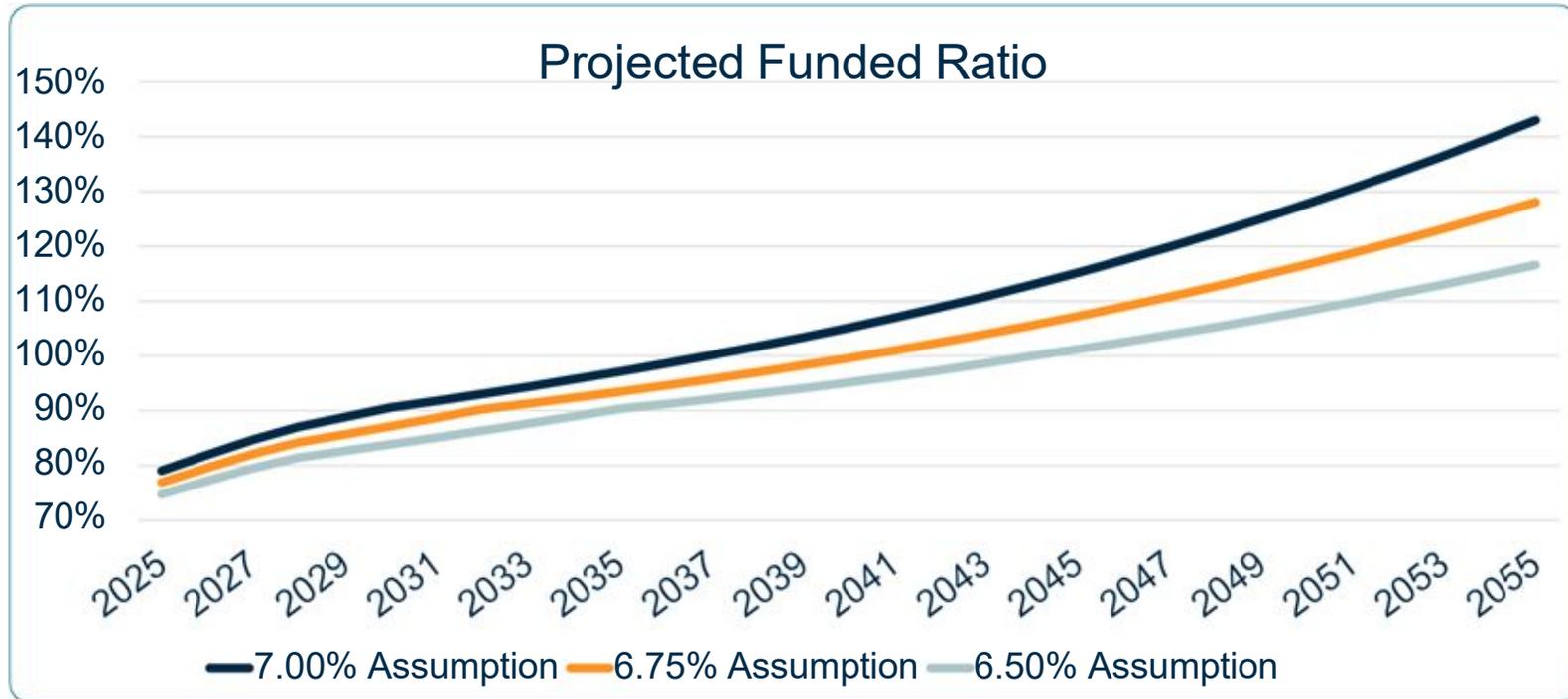
# Sensitivity Analysis

Current investment return assumption is not changed, but the impact of differing actual returns over the next 10 years

	Funded Ratio as of June 30,										
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
<b>5.00%</b>	79%	82%	83%	84%	84%	84%	84%	84%	84%	83%	83%
<b>5.25%</b>	79%	82%	84%	85%	85%	85%	85%	85%	85%	85%	85%
<b>5.50%</b>	79%	82%	84%	85%	85%	86%	86%	86%	87%	87%	87%
<b>5.75%</b>	79%	82%	84%	85%	86%	87%	87%	88%	88%	89%	89%
<b>6.00%</b>	79%	82%	84%	86%	87%	87%	88%	89%	90%	91%	91%
<b>6.25%</b>	79%	82%	84%	86%	87%	88%	89%	90%	91%	91%	92%
<b>6.50%</b>	79%	82%	84%	86%	88%	89%	90%	91%	92%	92%	93%
<b>6.75%</b>	79%	82%	85%	87%	88%	90%	91%	92%	93%	94%	96%
<b>7.00%</b>	79%	82%	85%	87%	89%	91%	92%	93%	94%	96%	97%
<b>7.25%</b>	79%	82%	85%	87%	89%	91%	93%	94%	96%	98%	99%
<b>7.50%</b>	79%	82%	85%	88%	90%	92%	94%	96%	98%	100%	102%
<b>7.75%</b>	79%	82%	85%	88%	90%	92%	94%	97%	99%	101%	103%
<b>8.00%</b>	79%	82%	85%	88%	91%	93%	96%	98%	100%	103%	106%

# Assumed Rate of Return (ARR): Sensitivity Analysis

The 7.00% ARR (blue line) has the highest funded ratio because liabilities/costs are lowest, and assets grow more quickly than in the other two scenarios. Under 6.50% and 6.75% ARR, SERS achieves 100% funded in 2045 and 2041 respectively compared to 2037 under 7.00% ARR.



# Stress Testing

## STRESS TEST

An analysis or simulation designed to determine the ability of a financial institution to manage an economic crisis or certain stressors

## IDENTIFY

Stressors to the System

## OPTIMIZE

Policies and procedures (assumptions, funding policy, and perhaps benefits)

## IMPROVE

Sustainability and educate stakeholders of potential risks

# Typical Procedure for Stress Test

Project historical crisis data into the future and simulate what would happen to system's funding

1

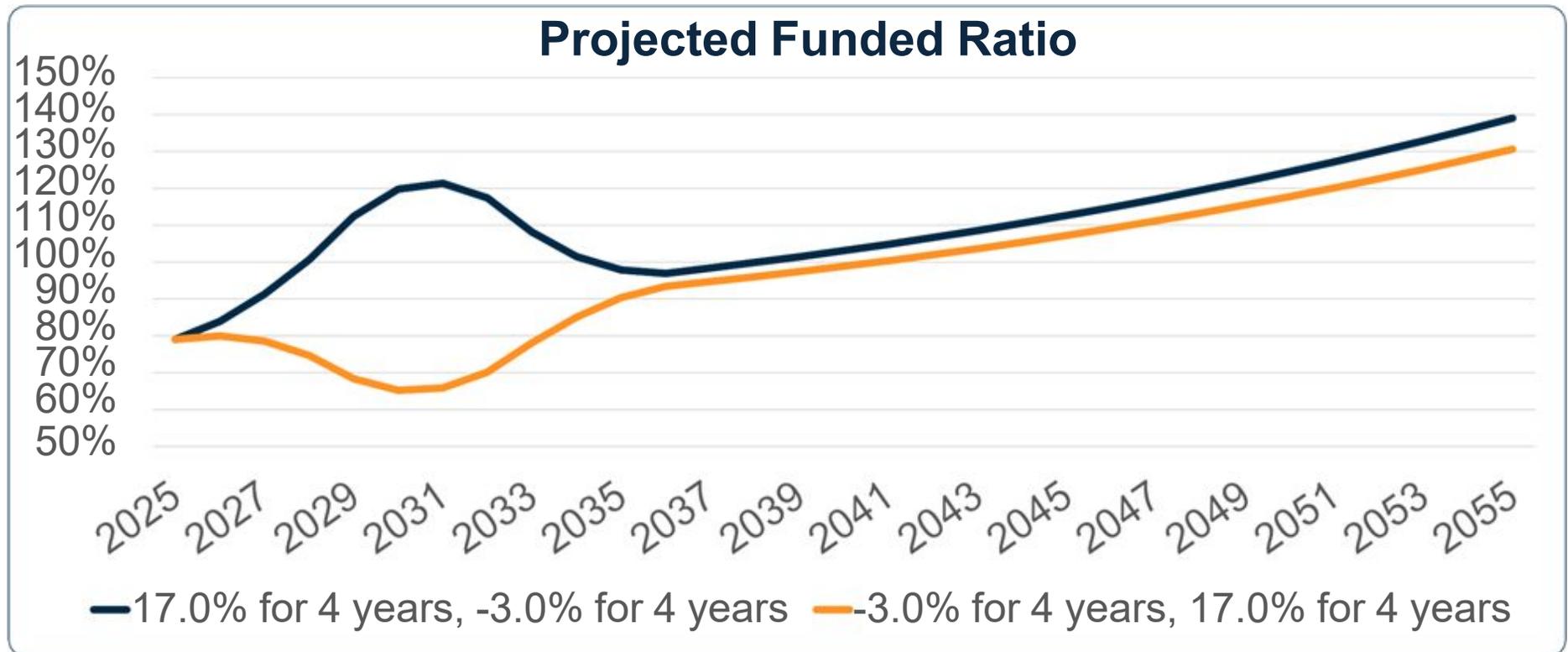
Deterministic projections using one set of assumed returns

2

Take several sets of economic scenarios and project and compare key actuarial metrics

3

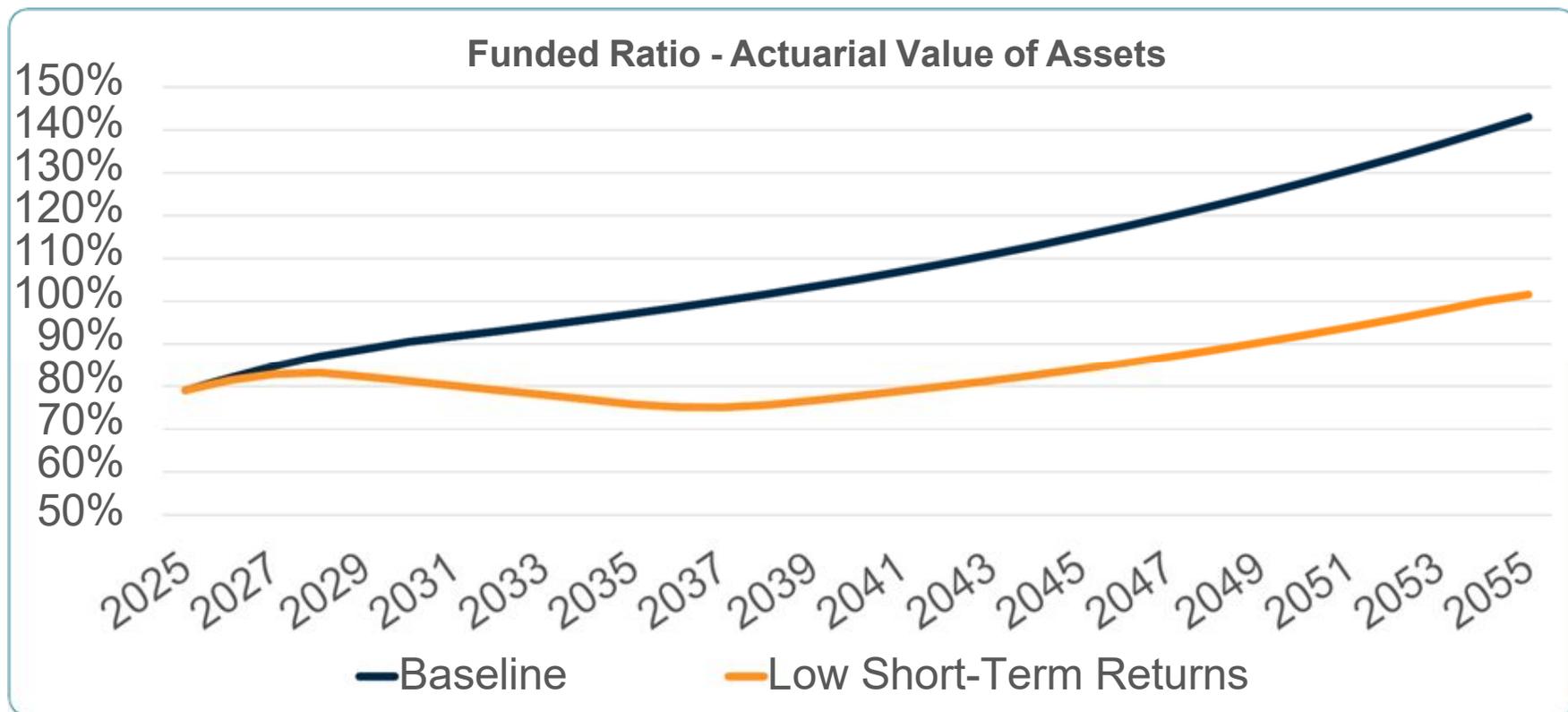
# Stress Testing: Order of Returns



The same geometric return occurs over this period, but when low returns occur first, it results in a difference of \$4.0 billion in asset value.

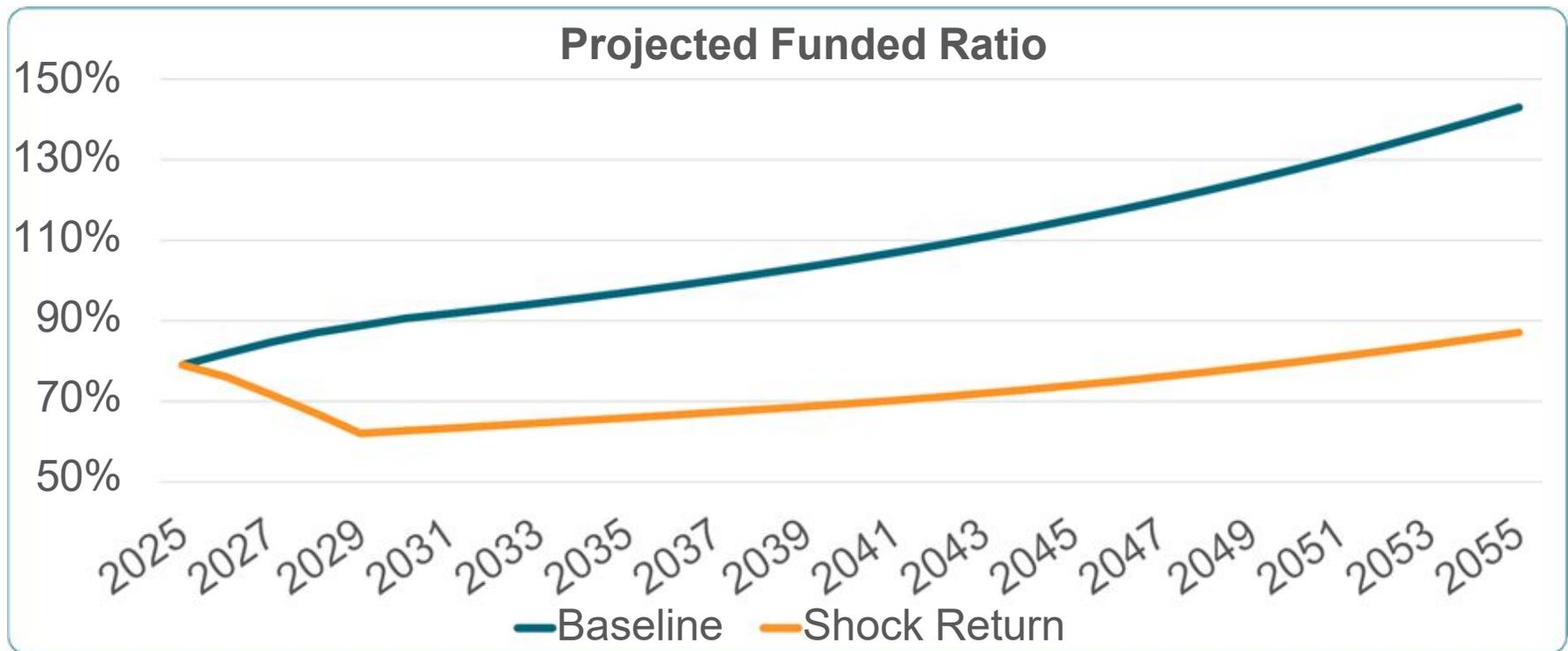
# Stress Testing: Low Returns for Sustained Period

Low returns for the next 10 years cause the funded ratio to decline to 75% in 2037, after which the funded ratio begins to improve. Ultimately, the funded ratio improves due to returns returning to the assumed rate of 7.00%.



# Stress Testing: Shock Return

Under this scenario the plan suffers a -22.9% return in 2026 without a subsequent market recovery, the funded ratio stabilizes at 62% and begins to improve over projection period. The shock return leads to an ultimate funded ratio of 87%, compared to 75% in the prior study.



- Stochastic modeling is the most sophisticated analysis available for investment return impact and provides the Board better information on likelihood of future actuarial outcomes.
- This analysis produces a distribution of possible future valuation results, directly reflecting the impact of investment return volatility on funding over time.

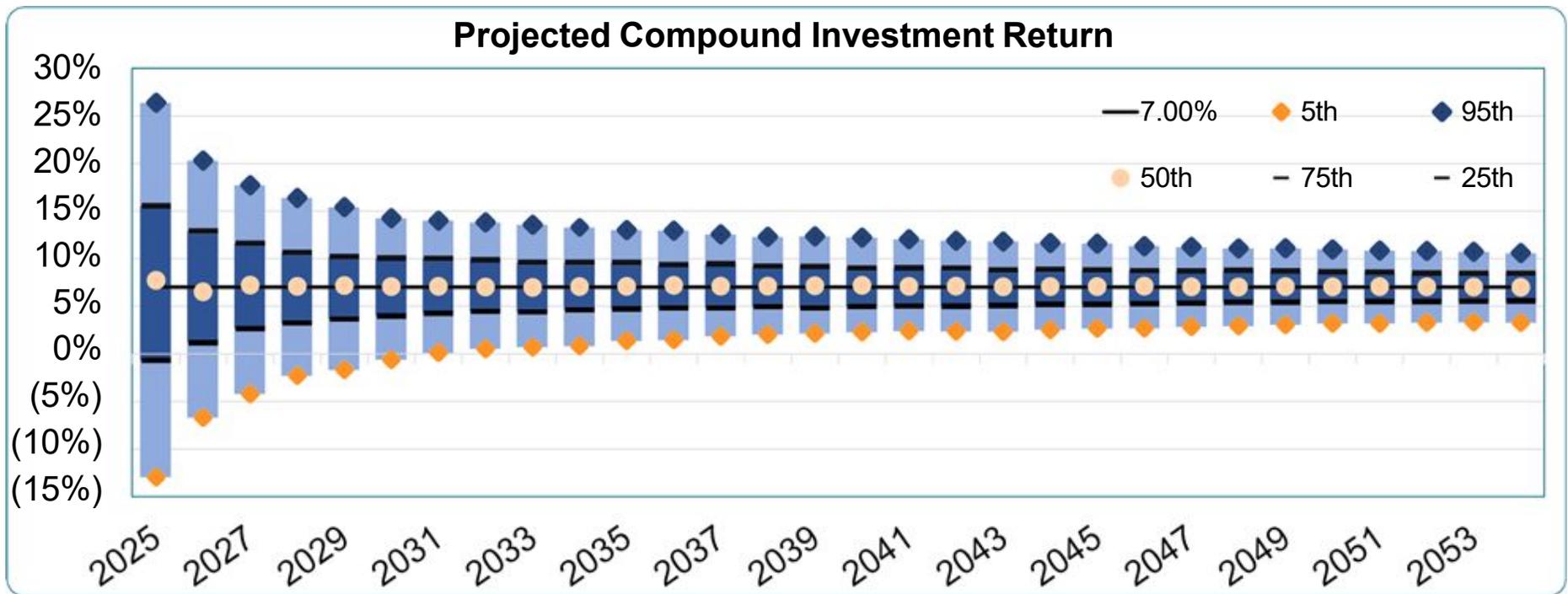
# Stochastic Analysis

Probability of funded ratio being lower than a certain threshold at any time during the projection period.

	Ratio <40%	Ratio <50%	Ratio <60%	Ratio <70%	Ratio <80%
2025 – 2030	0%	0%	1%	4%	36%
2025 – 2035	0%	1%	3%	8%	32%
2025 – 2040	1%	2%	5%	11%	30%

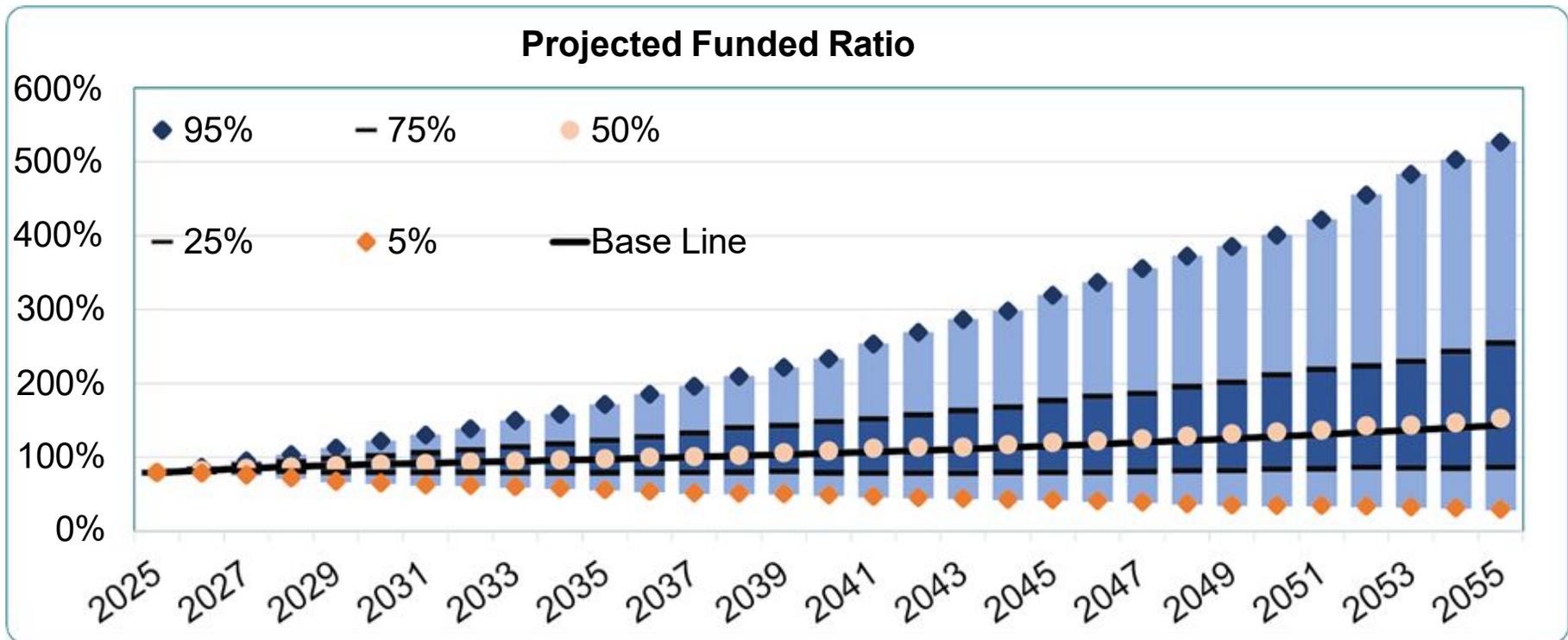
# Stochastic Analysis: Compound Return

The chart below is based on the 7.00% expected return with a 12.17% standard deviation. We utilize those assumptions to produce the percentile ranks of expected returns over 30 years. The analysis indicates that over the next 30 years there is a 50% chance the 30-year compound return will be between 5.54% and 8.46%. The median compound return is 7.00%



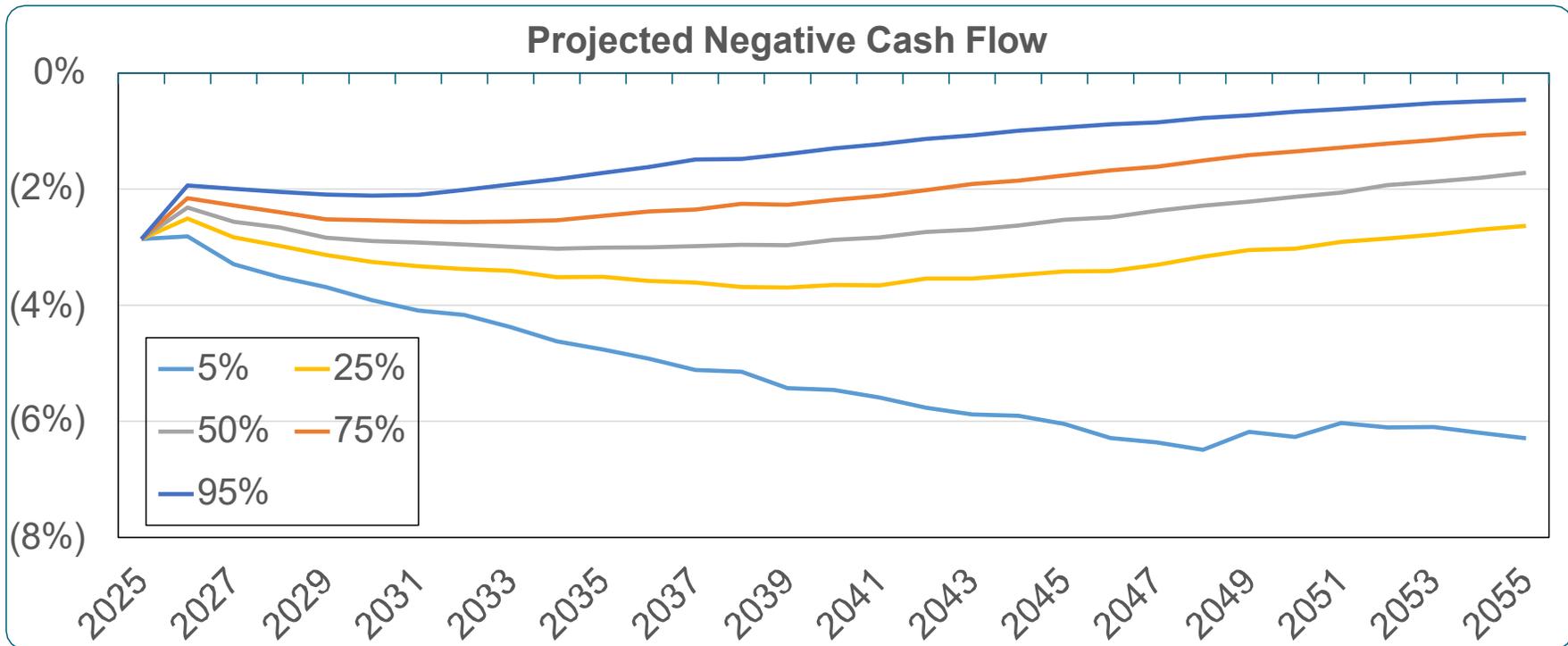
# Stochastic Analysis: Funded Ratio

This graph indicates that in 10 years, the middle 50% of possible outcomes are between 79% and 123% funded. There is a 5% chance of being more than 171% funded, and a 5% chance of being less than 56% funded.



# Stochastic Analysis: Negative Cash Flow

The median negative cash flow tends to -3.03% over the next 13 years, followed by an improvement over the rest of the projection period. This is a contributing factor to the fact that the median funded ratio is 100% in the projected funded ratio chart on the previous page.



# Summary Comments

- Improved risk profile since the June 30, 2024 Assessment due to:
  - Investment performance since June 30, 2024 has increased the market value of assets by \$1.437 billion.
  - Since 2015, the Board’s funding policy has accelerated the funding of Basic Benefits by \$1.110 billion
  - Since June 30, 2023, covered payroll grew by 4.1% compared to the assumed rate of 1.75%
- Sustained higher than anticipated COLA’s do have a long-term impact to expected funding levels.
- Although the risk study indicates that SERS can sustain a single “shock” return like the one experienced in fiscal year ended 2009 or a sustained period of low returns, the Board would need to closely monitor the condition of the System to maintain sustainability.
- Funding Policy and the authority granted to SERS regarding cost-of-living adjustments are two significant tools to assist the Board in mitigating risk.

# Summary Comments

- While the risk profile of SERS has improved due to actions taken by the Board and positive investment performance, SERS needs to continue to monitor the risks facing SERS.



**THANK  
YOU**

# Memo

**To:** Retirement Board  
**From:** Richard Stensrud  
**cc:** Karen Roggenkamp, Chris Collins, Joe Marotta  
**Date:** February 11, 2026  
**Re:** **Board Workshop Session – Mandatory Participation in Social Security**

---

The idea of mandatory coverage for public employees in states currently not participating in Social Security has surfaced from time to time since the early 1960s. With the recent repeal of WEP and GPO, and the increase in Social Security costs that results from those changes, the topic is once again getting attention.

A common theme of the advocates for mandatory participation in Social Security is that mandatory coverage would strengthen the long-term solvency of Social Security. Central to the view of many of these advocates, is that state and local governments should abandon their defined benefit retirement plans and replace them with a combination of Social Security and a defined contribution plan that shifts all the risk of retirement security to employees. Accordingly, they gloss over the multiple ways in which mandatory participation would negatively impact employees, employers and public employee retirement systems.

Tom Lussier will shed light on this negative financial impact, and in doing so, will help prepare the Board and SERS' stakeholders for engagement if the efforts to impose mandatory coverage gain traction.

Tom is the Administrator of the Coalition to Preserve Retirement Security (CPRS) and has served in this capacity since 2003. The CPRS is the leading voice and preeminent organization in Washington, DC dedicated to opposing efforts to force public employers and their workers to participate in Social Security. CPRS members include major public employee retirement systems and national, state and local employee, employer, and retiree organizations. Their mission is to protect the current structure of public sector retirement programs. SERS is a member of CPRS and SERS' staff serve on the CPRS Board.

In addition to his role at CPRS, Tom serves as president of The Lussier Group, LLC, a governmental affairs consulting firm focused on public employee pension and health benefits. He has more than 26 years of experience as a legislator and administrator in Massachusetts State government, including serving as Executive Director and CEO of the Massachusetts Teachers' Retirement System for 19 years and four terms in the Massachusetts House of Representatives.



# Ramifications of Mandatory Social Security Contributions

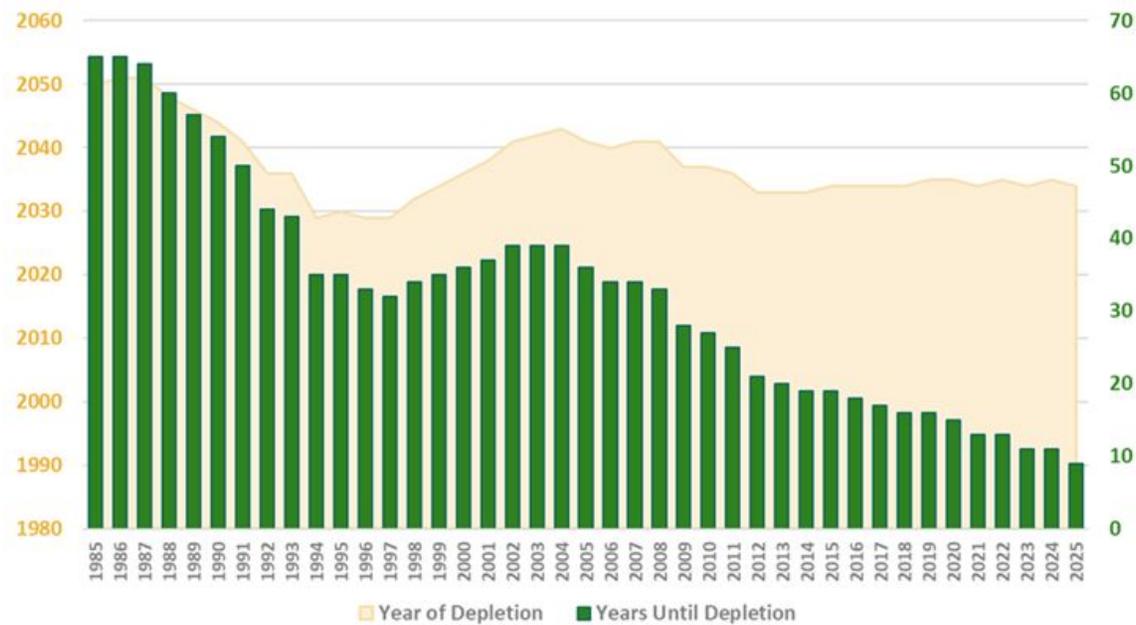
Columbus, OH  
Friday, February 20, 2026



## Why now?

- The solvency of the Social Security Trust Fund
- The political implications of WEP-GPO repeal
- Renewed proposals to mandate Social Security coverage on all new State and Local public employees

# 40-Year History of Social Security's Trust Fund Reserve



## Social Security Fairness Act (WEP and GPO)

The Social Security Fairness Act repealed the Windfall Elimination Provision (WEP) and the Government Pension Offset (GPO) which worked toward clawing back benefits, so repeal increased future Social Security outlays. Without corresponding changes to inflows or taxes, this hastens the projected Trust Fund Reserve insolvency date.

Analysis done by the Congressional Budget Office estimates that the **Social Security Fairness Act would accelerate the projected insolvency of the Trust Fund Reserves by approximately six months.**

# The Threat

- Senate amendment (Senator Chuck Grassley R-IO) during consideration of the Social Security Fairness Act - *December 20, 2024*
- Girard Miller – “The first step, from a fairness and budget math standpoint, would be for Congress to require all new hires of state and localities to participate in Social Security.” *Governing.com – January 21, 2025*

# The Threat

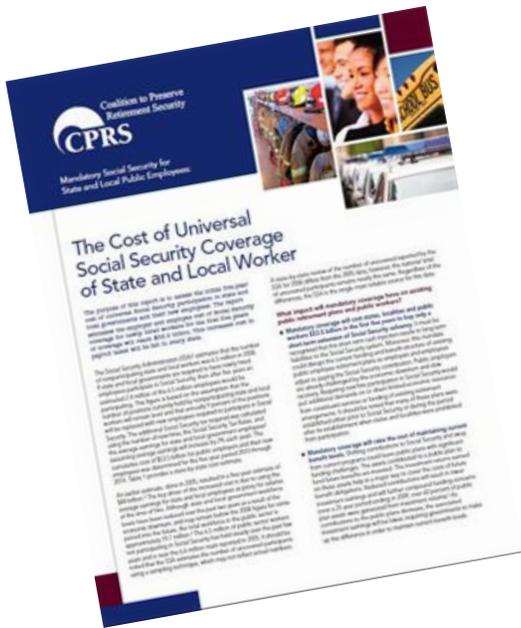
- Alicia Munnell – “... extend Social Security coverage to the 25% to 30% of state and local workers who are not covered by Social Security.” *MarketWatch* – January 25, 2025
- “Effective on January 1, 2032, all newly hired employees of state and local governments who are not part of the Social Security system would be covered by Social Security.” *Fixing Social Security - Blueprint For A Bipartisan Solution, Center for Health Policy at Brookings* – February 11, 2025

# The Threat

- “Social Security revenue will increase if all new state and local government employees are required to participate.” *Social Security funding needs could translate to new municipal pension risks, Moody’s Ratings – January 2026*
  - *State and local governments will essentially have three broad choices...*
    - *Option One – Do Nothing*
    - *Option Two – Create a new benefit tier within existing retirement systems*
    - *Option Three – Close current retirement systems to new entrants*

# Action Plan

- Mobilize the CPRS Coalition
- Build a broad base of Strategic Partners
- Update the CPRS Study – The Cost of Mandating Social Security Coverage on the Public Sector – *The Negative and Unintended Consequences for State and Local Employees and Their Employers*
- Develop a Congressional Outreach and Education Plan
- Present a Congressional Briefing



# The Cost of Mandating Social Security Coverage on the Public Sector

The Negative and Unintended Consequences for State and Local Employees and Their Employers

**CPRS** **Segal**

# Key Takeaways for 2026 Report

Mandatory Social Security participation for all state and local government (public sector) employees would result in several adverse consequences, including (but not limited to) the following:

- Increase costs for public employees, plan sponsors, and ultimately taxpayers, including an estimated \$45–\$60 billion in new contributions over the next five years
- Affect current public retirement plans, resulting in possible decreased plan funding, decreased member benefits and plan freezes or closures
- Replace local discretion with a federal mandate, which would limit the ability of state and local governments to effectively manage their diverse workforces
- Fail to effectively address ongoing Social Security funding concerns



# Cost Analysis of Impact of Mandatory Social Security, Five-Year Cumulative for 2025–2029

State	Employees Not Covered by Social Security	Five Year Cumulative Cost
Alabama	5,070	\$ 43,898,230
Alaska	33,473	\$ 373,254,273
Arizona	13,046	\$ 128,028,842
Arkansas	4,144	\$ 32,282,637
California	949,111	\$ 12,712,759,408
Colorado	249,913	\$ 2,583,817,624
Connecticut	53,005	\$ 612,615,013
Delaware	2,032	\$ 19,748,102
Florida	57,018	\$ 543,693,499
Georgia	106,939	\$ 952,134,006
Hawaii	13,418	\$ 135,418,802
Idaho	2,644	\$ 20,668,266
Illinois	320,063	\$ 3,273,593,548
Indiana	11,566	\$ 96,725,816
Iowa	3,319	\$ 27,777,329
Kansas	5,179	\$ 40,289,460
Kentucky	58,160	\$ 478,782,546
Louisiana	188,881	\$ 1,465,251,145
Maine	36,927	\$ 291,905,632
Maryland	17,006	\$ 195,786,867
Massachusetts	315,796	\$ 3,658,237,643
Michigan	16,085	\$ 150,747,014
Minnesota	11,757	\$ 115,530,731
Mississippi	3,946	\$ 29,873,630
Missouri	65,996	\$ 533,979,862
Montana	1,058	\$ 8,610,070

State	Employees Not Covered by Social Security	Five Year Cumulative Cost
Nebraska	3,640	\$ 32,215,913
Nevada	106,530	\$ 1,149,267,997
New Hampshire	13,911	\$ 118,979,030
New Jersey	20,359	\$ 237,155,161
New Mexico	7,435	\$ 69,690,308
New York	4,533	\$ 58,199,874
North Carolina	4,670	\$ 43,348,232
North Dakota	1,822	\$ 13,951,138
Ohio	558,282	\$ 5,217,103,011
Oklahoma	7,910	\$ 64,439,126
Oregon	3,516	\$ 38,147,905
Pennsylvania	21,204	\$ 217,250,032
Rhode Island	12,827	\$ 142,821,795
South Carolina	1,165	\$ 10,058,810
South Dakota	411	\$ 2,930,801
Tennessee	18,551	\$ 159,555,021
Texas	859,907	\$ 8,151,586,374
Utah	14,335	\$ 124,867,144
Vermont	541	\$ 5,281,564
Virginia	7,242	\$ 70,219,490
Washington	21,600	\$ 278,011,126
West Virginia	3,566	\$ 26,550,999
Wisconsin	8,076	\$ 69,401,423
Wyoming	3,281	\$ 28,812,789
<b>Total</b>	<b>4,250,862</b>	<b>\$ 44,855,255,058</b>

## “All politics is local!”

- The Segal Report will make a strong national argument against mandatory Social Security coverage... it will show this to be a 50-state issue.
- As a companion to our national Segal Report, CPRS will be asking our members and friends to develop state- or local-based impact statements.
- Our goal is to publish a supplement white paper that puts real faces on the impact of this unfunded federal mandate – demonstrating this is a non-partisan issue that impacts employees, retirees, employers, and the taxpayers who fund these benefits.

Tom Lussier  
CPRS Administrator  
tlussier@lgva.net  
978-835-5424

[www.RetirementSecurity.org](http://www.RetirementSecurity.org)



**ADJOURNMENT (R)**

\_\_\_\_\_ moved that the SERS Retirement board adjourn to meet on Thursday, March 19, 2026, for the next regularly scheduled meeting.

The meeting adjourned at \_\_\_\_\_ a.m./p.m.

\_\_\_\_\_  
James Rossler – Chair

\_\_\_\_\_  
Richard Stensrud - Secretary