SERS 2025 Board Workshop
Wednesday, February 19, 2025

Join Zoom Meeting
https://ohsers.zoom.us/j/95618771395?pwd=pu04LIrw0h7AQAB8TIwUCxjNkcc2kc.1

Meeting ID: 956 1877 1395 **Password:** 12345

To Join by Phone, Dial: **(301) 715-8592** and enter the **Meeting ID:** 956 1877 1395 and

Password: 12345 when prompted.

8:30 a.m. – 8:35 a.m.	**Introduction/Overview**	**Richard Stensrud, SERS Executive Director**
8:35 a.m. – 9:45 a.m.	**Monetary Masala Educational Session under R.C. 171.50 and 3309.051**	**Dr. Anirban Basu - Chairman & CEO Sage Policy Group, Inc.**
9:45 a.m. – 10:00 a.m.	**Break**	
10:00 a.m. – 11:00 a.m.	**Economic Market Snapshot Educational Session under R.C. 171.50 and 3309.051**	**Goldman Sachs**
11:00 a.m. – 12:00 p.m.	**Pension Sustainability Educational Session under R.C. 171.50 and 3309.051**	**CavMac**
Noon – 12:45 p.m.	**Lunch**	
12:45 p.m. – 1:45 p.m.	**Asset Allocation Educational Session under R.C. 171.50 and 3309.051**	**Farouki Majeed & Wilshire Associates**
1:45 p.m. – 2:00 p.m.	**Break**	
2:00 p.m. – 3:00 p.m.	**Healthcare Issues Educational Session under R.C. 171.50 and 3309.051**	**Nossaman**
3:00 p.m. – 3:15 p.m.	**Closing Remarks**	**Richard Stensrud, SERS Executive Director**

FY2025 SERS Board Roll Call

Matthew King	_____
Catherine Moss	_____
Jeanine Alexander	_____
Jeffrey DeLeone	_____
James Haller	_____
James Rossler	_____
Aimee Russell	_____
Frank Weglarz	_____
Daniel Wilson	_____

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

Career Brief

Anirban Basu is the Chairman and CEO of Sage Policy Group, Inc., an economic and policy consulting firm headquartered in Baltimore, Maryland with an office in Orlando, Florida. The firm provides strategic analytical services to energy suppliers, law firms, medical systems, government agencies, and real estate developers among others.

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.

He has taught at several universities, most frequently at Johns Hopkins University. He currently teaches History of Economic Thought at Goucher College as their Distinguished Economist in Residence.

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, 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.

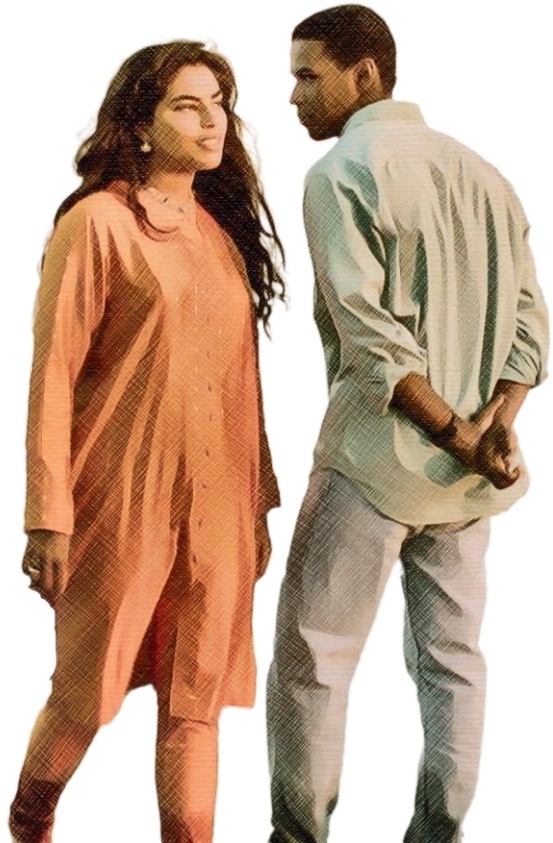
Monetary Masala

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

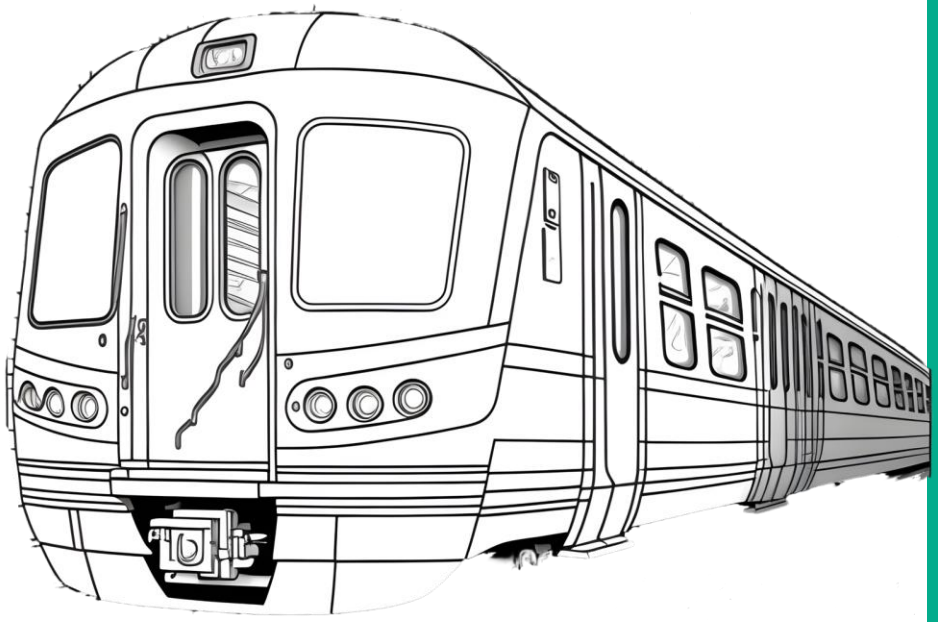
On Behalf of

School Employees
Retirement System of Ohio

February 19, 2025



The Taking of Inflation 2.0



The Taking of Pelham 123 (2009)—Denzel Washington as Train Dispatcher

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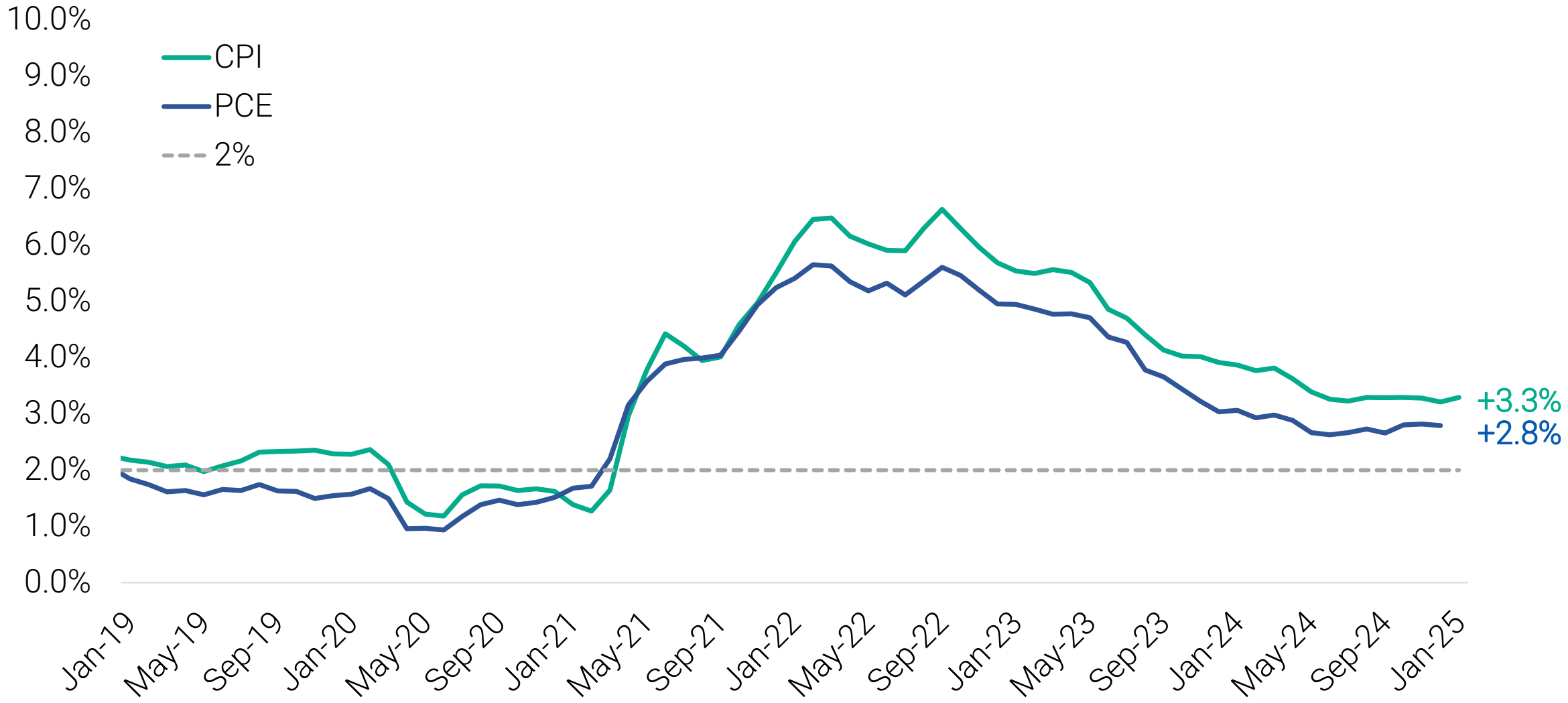
Core CPI & PCE, 12-Month % Change (SA)

January 2019 – December 2024/January 2025



Source: U.S. Bureau of Labor Statistics; U.S. Bureau of Economic Analysis *Core: All items less food and energy

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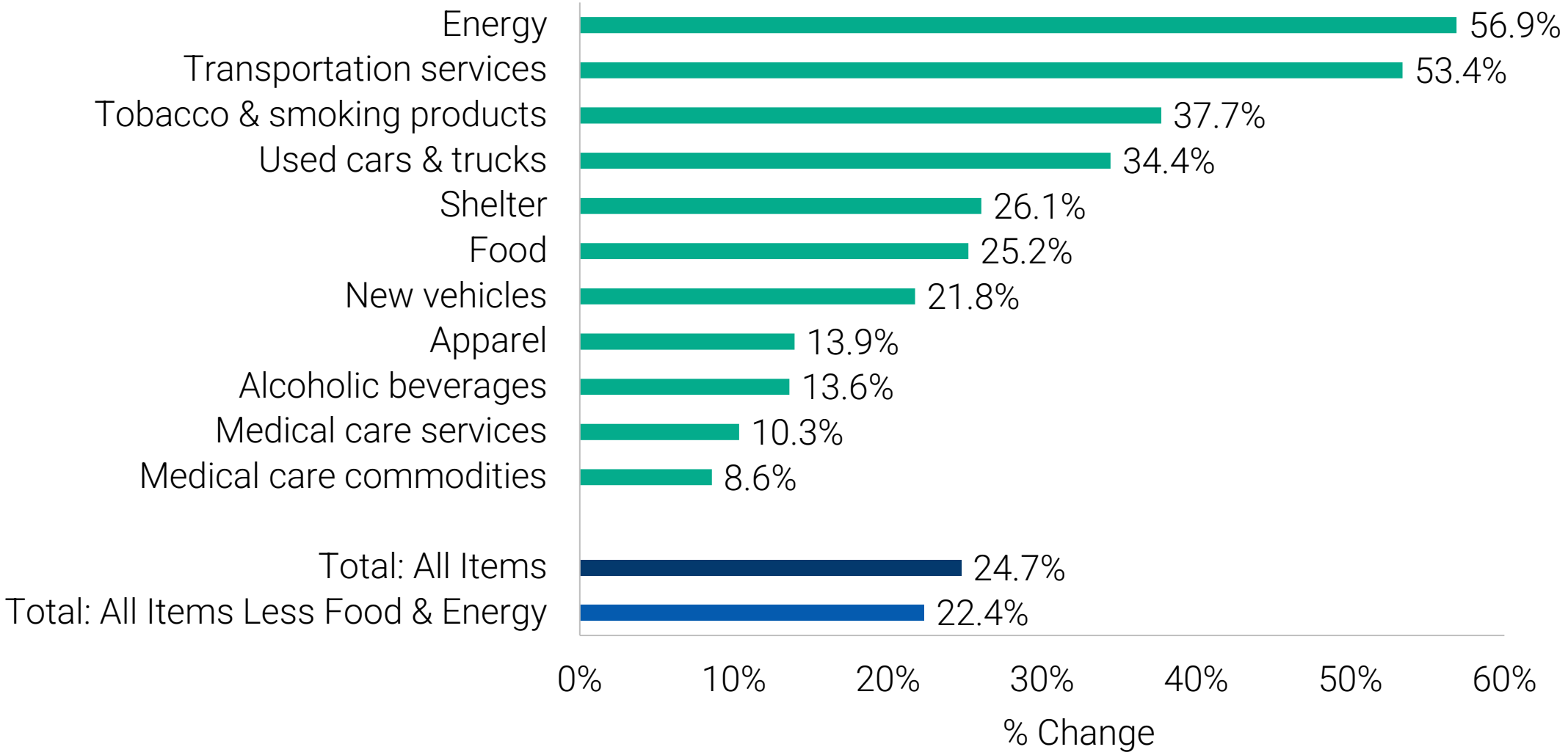
Consumer Price Index, Select Categories (SA)

% Change May 2020 v. January 2025



Source: U.S. Bureau of Labor Statistics

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The Manhattan Candidate

2024 Trump Campaign Economic Policy Proposals

- Extend the expiring 2017 Tax Cuts and Jobs Act (TCJA) – *inflationary*
- Additional reduction in the corporate tax rate to 15% – *inflationary*
- Eliminate income taxes on Social Security benefits – *inflationary*
- Eliminate taxes on tips – *inflationary*
- 10% to 25% across-the-board tariff on imports – *inflationary*
- Mass deportation of all undocumented migrants – *inflationary*

*The Manchurian Candidate (2004)—Denzel Washington as Major Bennett Marco

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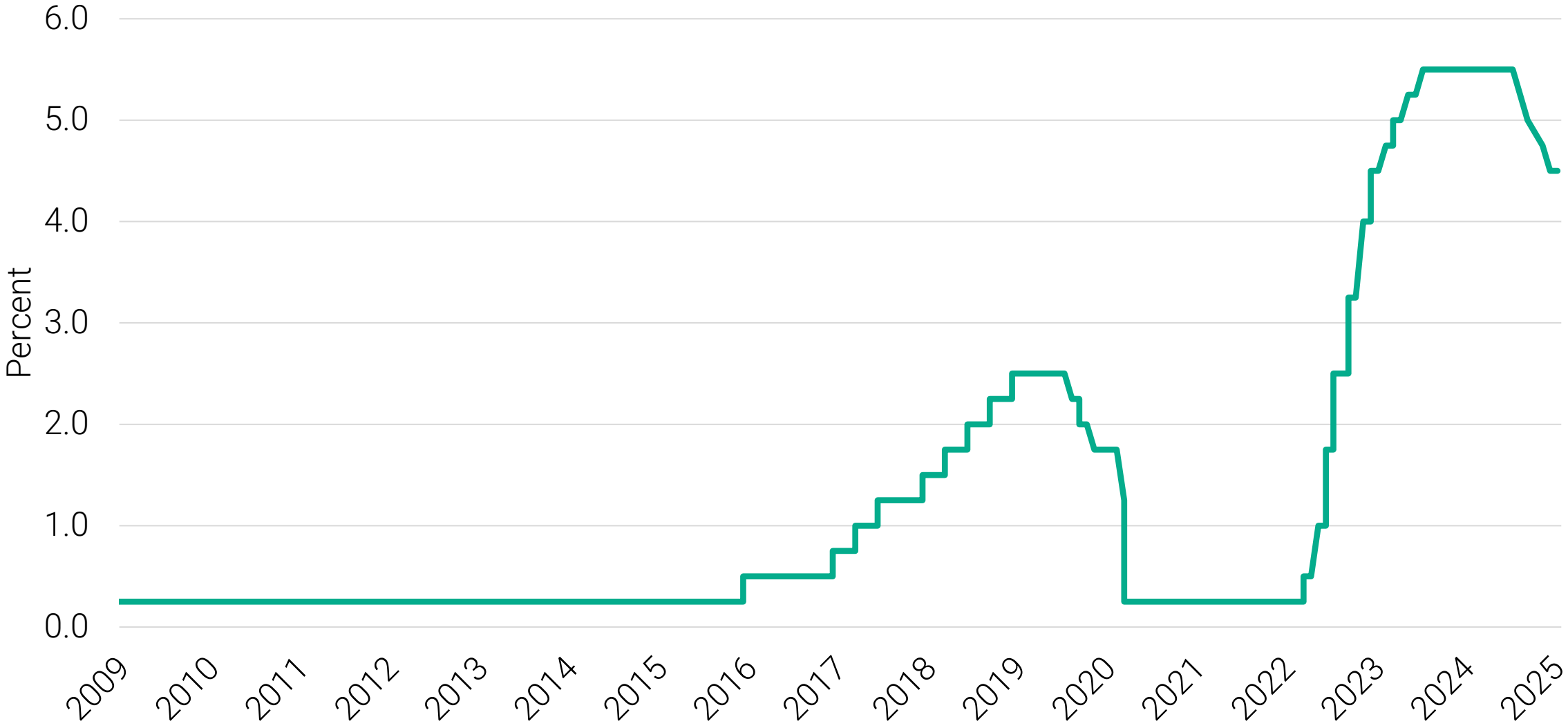
Federal Funds Rate, Target Rate Upper Limit, 2009 – 2025



Source: Board of Governors of the Federal Reserve System

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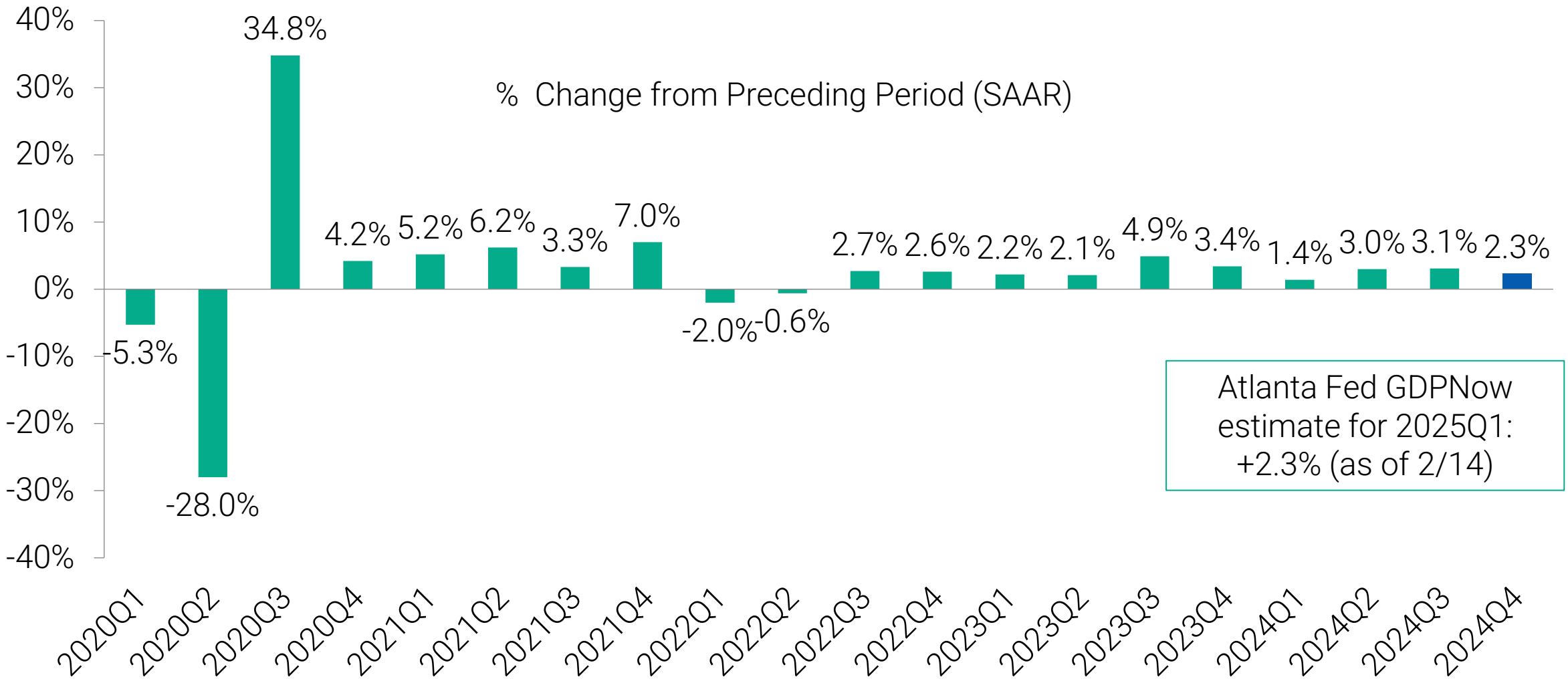
U.S. Gross Domestic Product Growth, 2020 – 2024Q4



Atlanta Fed GDPNow estimate for 2025Q1: +2.3% (as of 2/14)

Source: U.S. Bureau of Economic Analysis *2024Q4: 1st (advance) estimate

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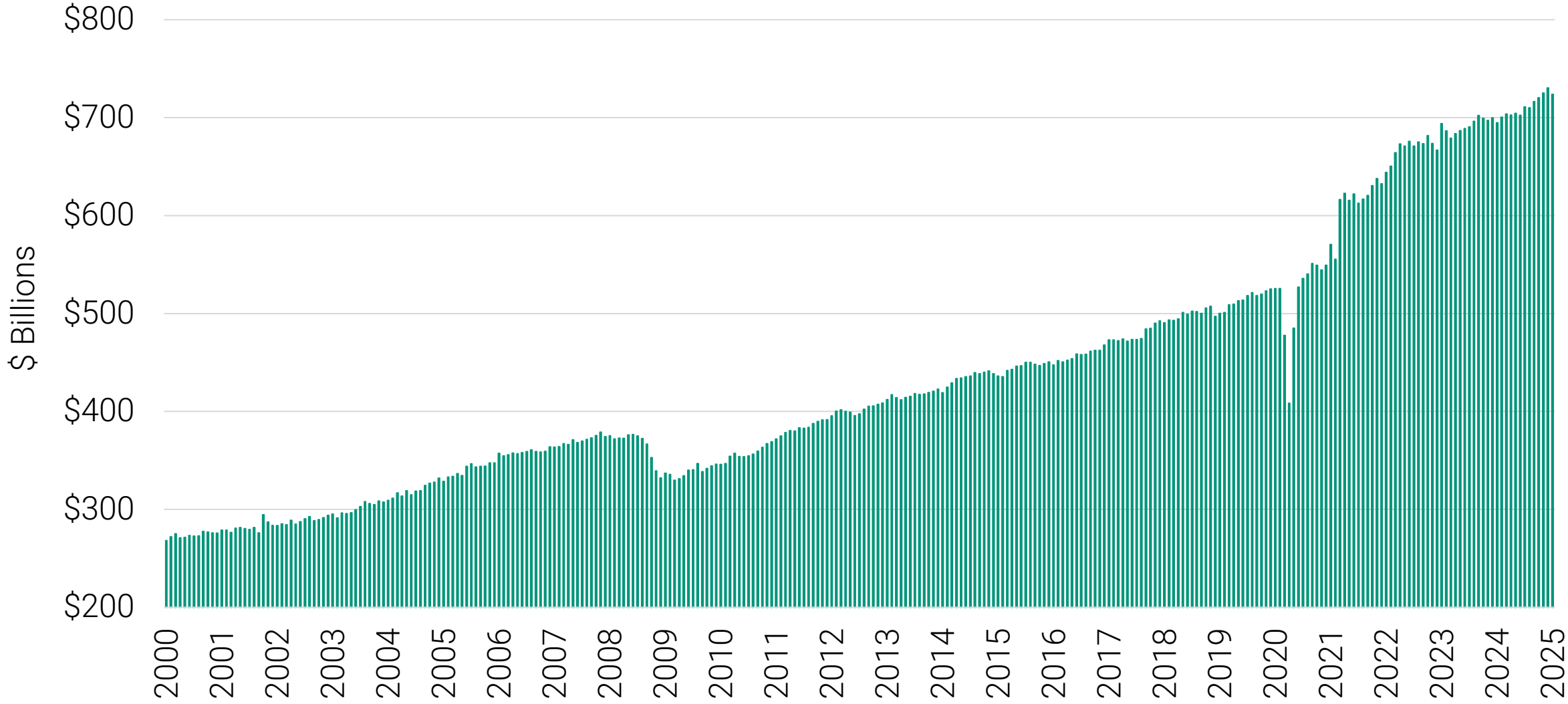
They Got Game

U.S. Retail Sales, 2000 – January 2025



Source: U.S. Census Bureau

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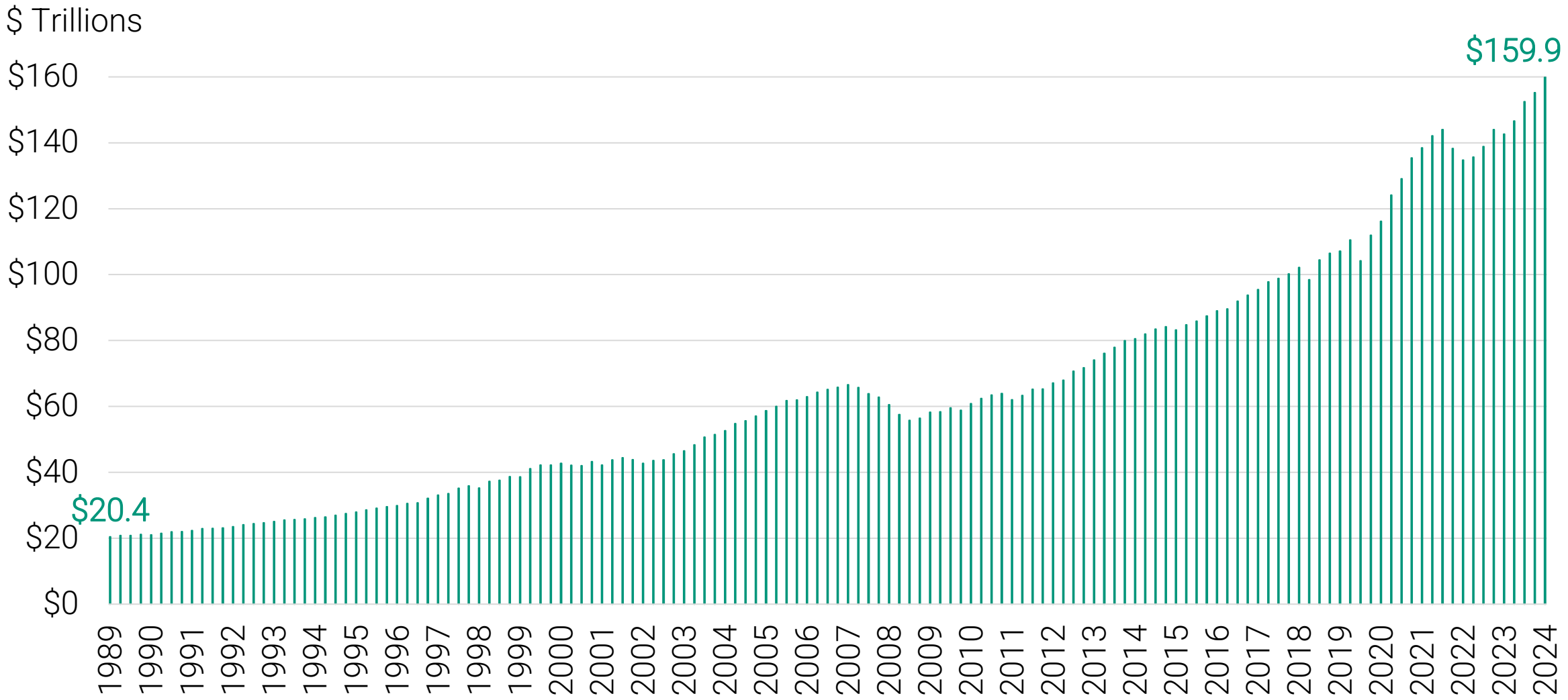
Total U.S. Household Wealth, 1989 – 2024



Source: Federal Reserve Board, Distributional Financial Accounts (DFAs)

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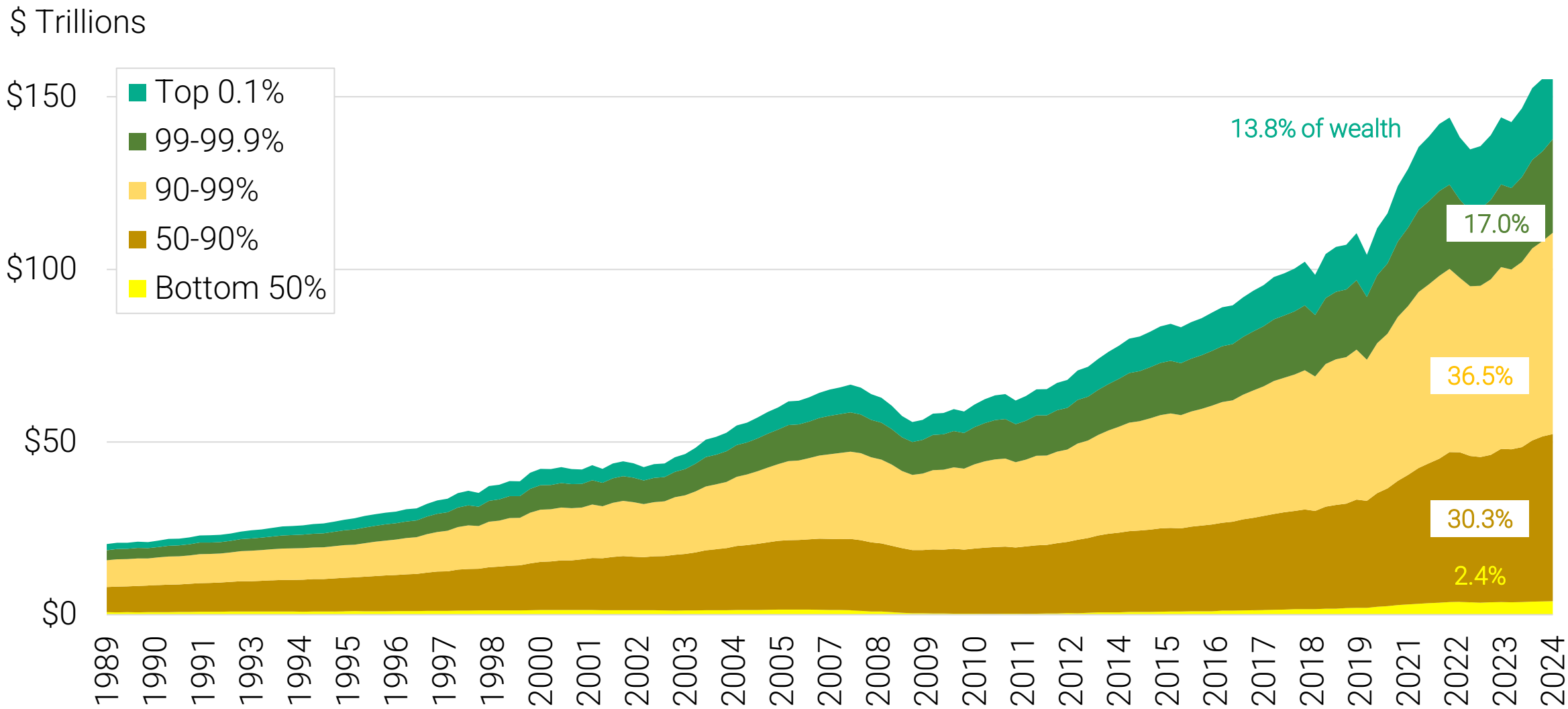
U.S. Household Wealth by Wealth Percentile Group, 1989 – 2024



Source: Federal Reserve Board, Distributional Financial Accounts (DFAs)

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The Equalizer

The Equalizer (2014, 2018, and 2023)—Denzel Washington as mystery man Robert McCall

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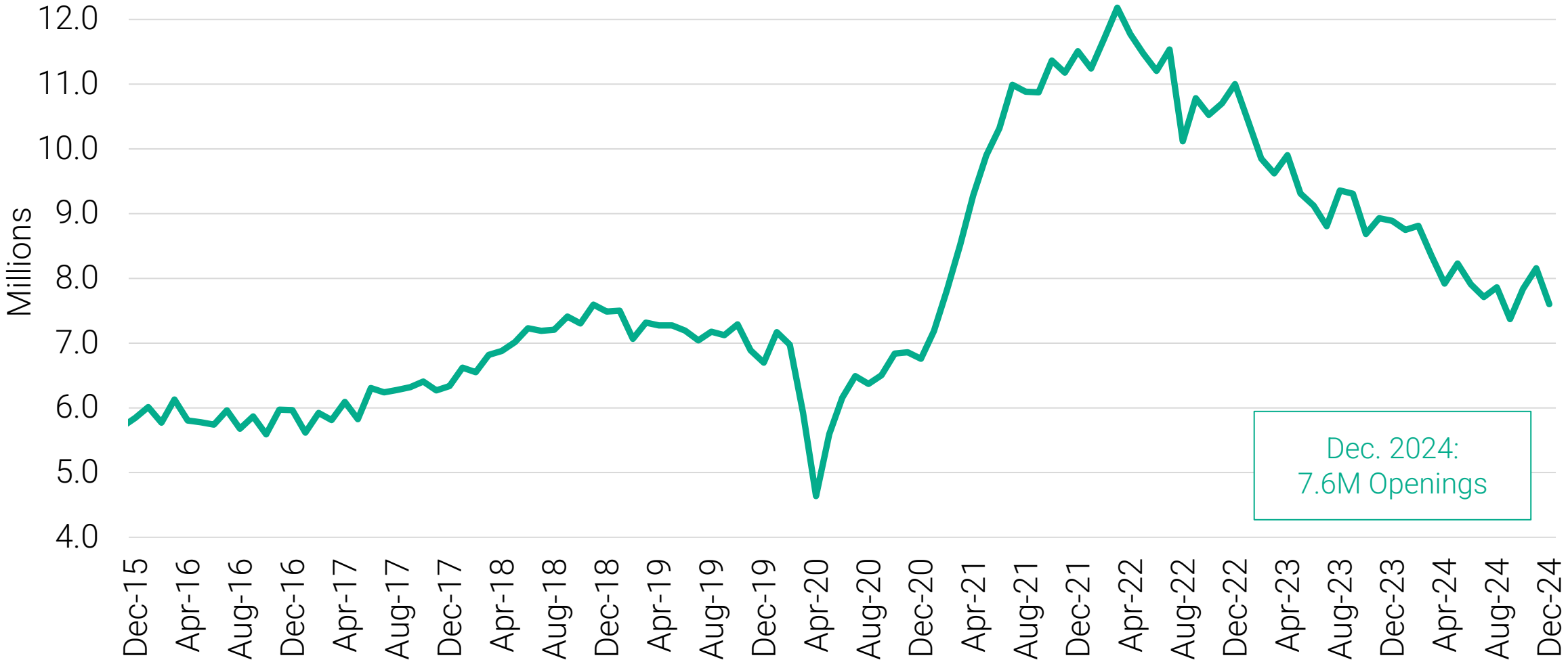
U.S. Job Openings, 2015 – December 2024



Source: U.S. Bureau of Labor Statistics

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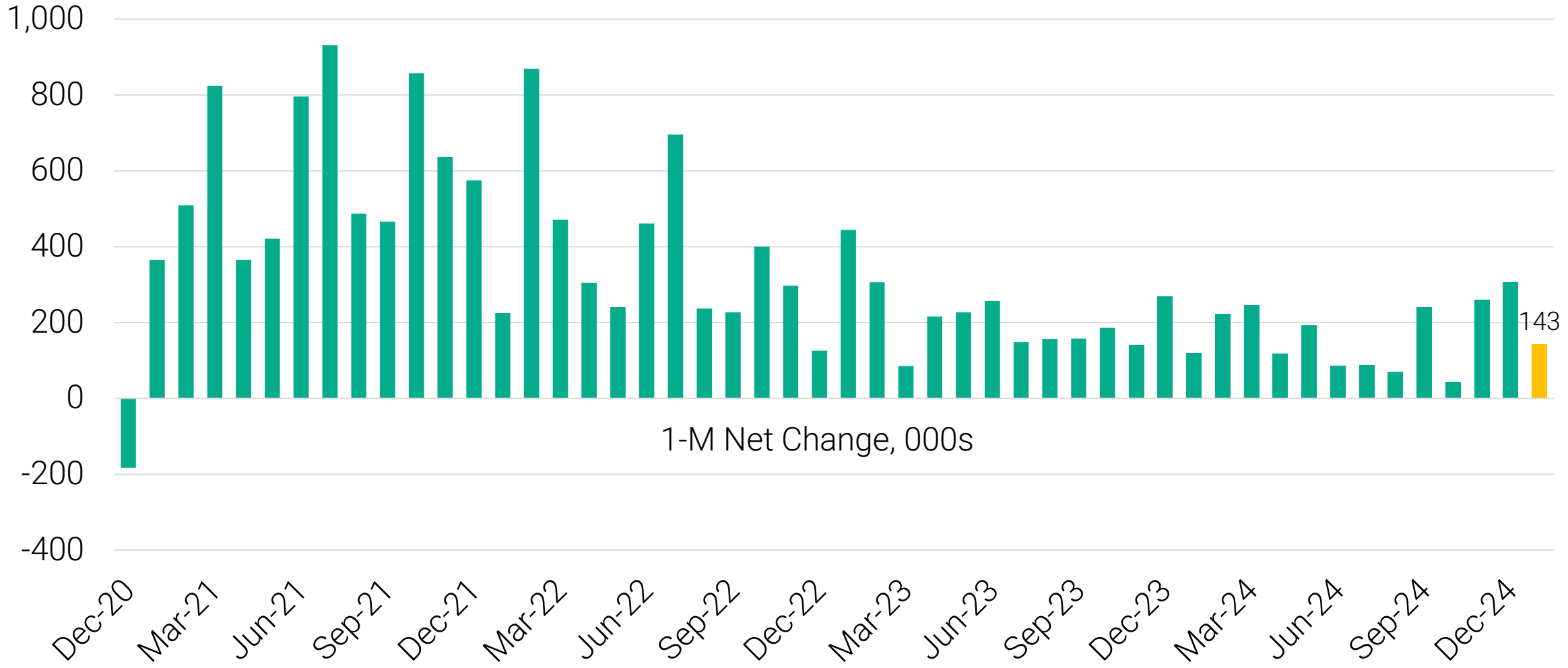
U.S. Job Growth, Monthly

December 2020 – January 2025



Source: U.S. Bureau of Labor Statistics

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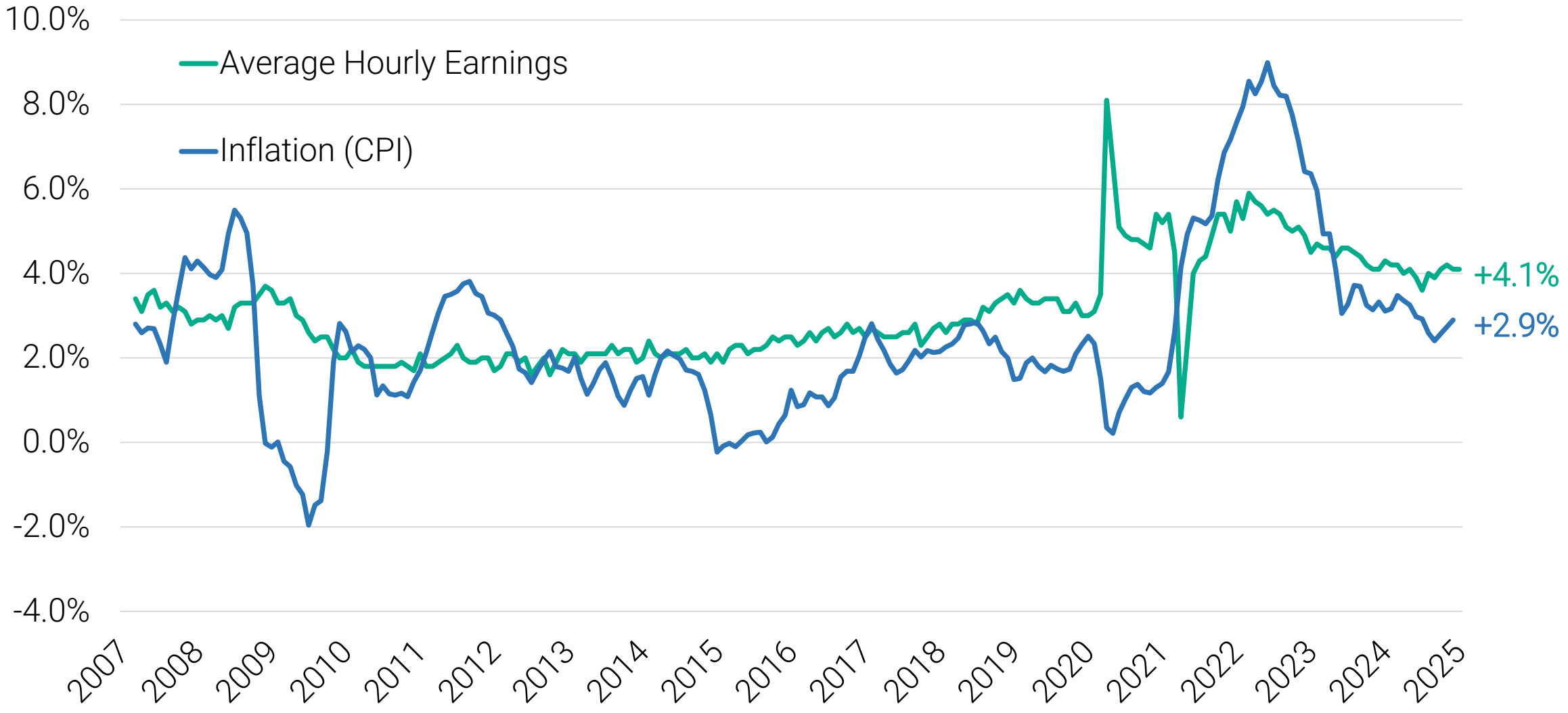
U.S. Wage Growth v. Inflation

YOY % Change, 2007 – December 2024/January 2025



Source: U.S. Bureau of Labor Statistics

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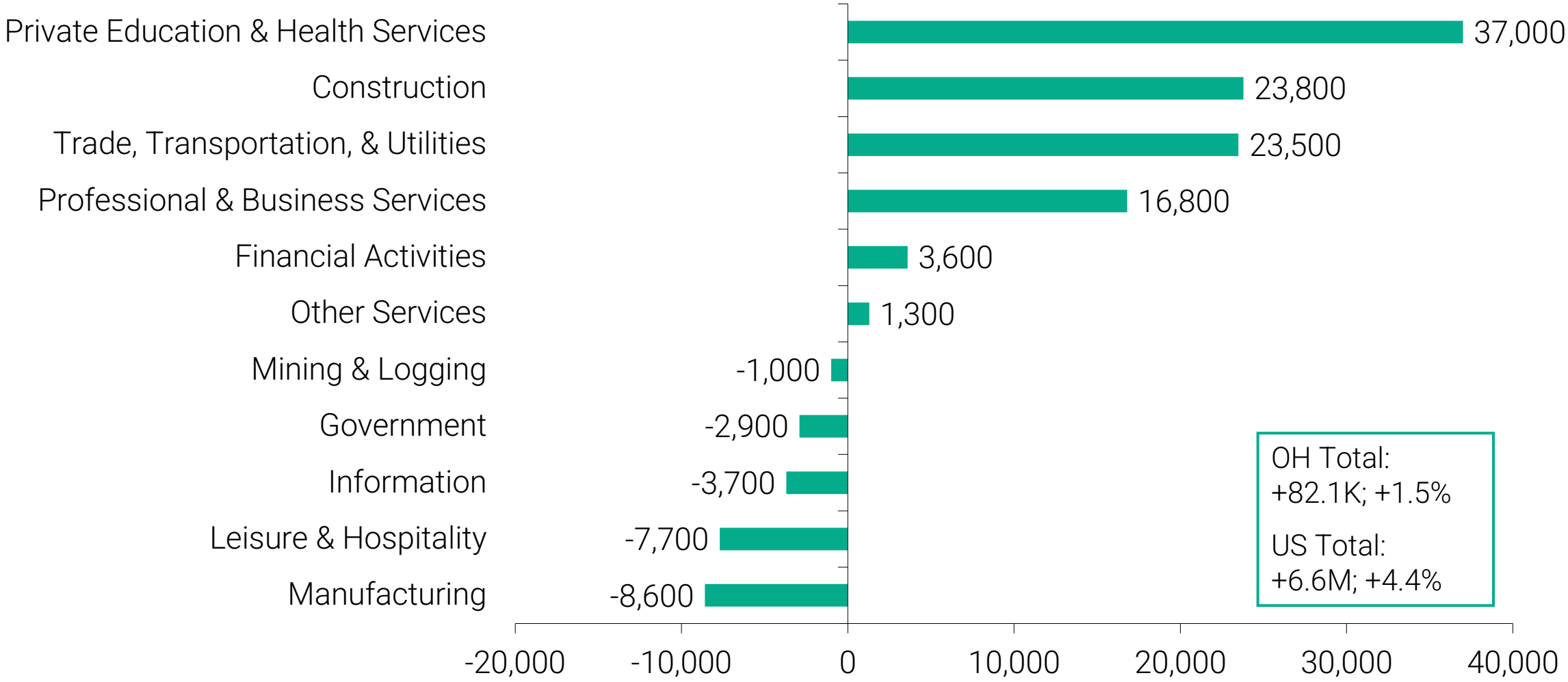
Ohio Nonfarm Employment

February 2020 v. December 2024 Absolute Change

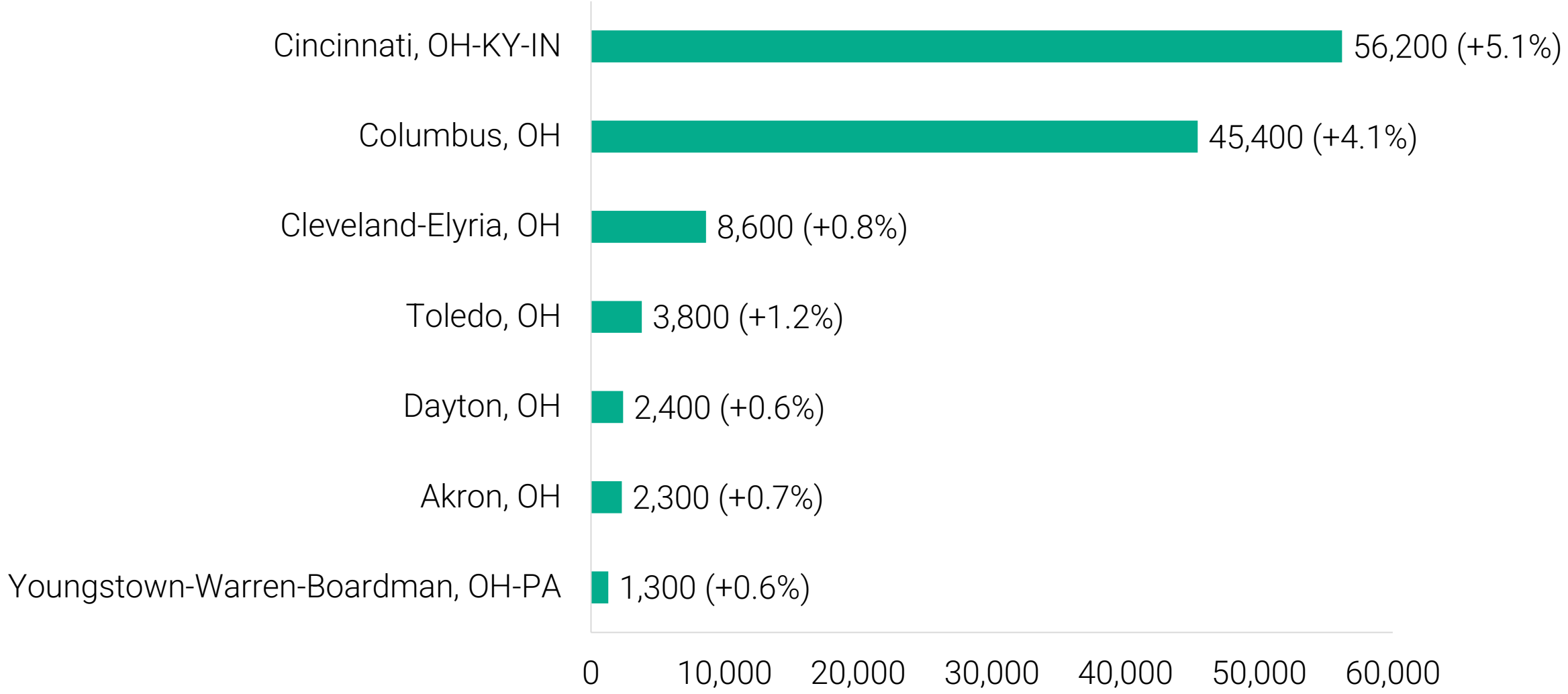


*According to the Local Area Unemployment Statistics (LAUS) program OH lost 5,674 jobs between February 2020 and December 2024.

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

Nonfarm Employment, Select MSAs

February 2020 v. December 2024



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

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Employment Growth, 25 Largest Metros

February 2020 v. December 2024 % Change

Rank	MSA	%
1	Dallas-Fort Worth-Arlington, TX	14.0%
2	Phoenix-Mesa-Scottsdale, AZ	12.1%
3	San Antonio-New Braunfels, TX	11.8%
4	Tampa-St. Petersburg-Clearwater, FL	11.6%
5	Charlotte-Concord-Gastonia, NC-SC	11.3%
5	Orlando-Kissimmee-Sanford, FL	11.3%
7	Houston-The Woodlands-Sugar Land, TX	9.7%
7	Riverside-San Bernardino-Ontario, CA	9.7%
9	Miami-Fort Lauderdale-West Palm Beach, FL	9.0%
10	Atlanta-Sandy Springs-Roswell, GA	8.4%
11	Denver-Aurora-Lakewood, CO	7.1%
12	Philadelphia-Camden-Wilm., PA-NJ-DE-MD	6.2%
13	St. Louis, MO-IL	4.7%

Rank	MSA	%
14	New York-Newark-Jersey City, NY-NJ-PA	4.3%
14	San Diego-Carlsbad, CA	4.3%
16	Seattle-Tacoma-Bellevue, WA	2.9%
17	Chicago-Naperville-Elgin, IL-IN-WI	2.3%
17	Washington-Arlington-Alexandria, DC-VA-MD-WV	2.3%
19	Detroit-Warren-Dearborn, MI	1.6%
20	Los Angeles-Long Beach-Anaheim, CA	1.1%
21	Baltimore-Columbia-Towson, MD	1.0%
22	Portland-Vancouver-Hillsboro, OR-WA	0.9%
23	Boston-Cambridge-Nashua, MA-NH	0.8%
24	Minneapolis-St. Paul-Bloomington, MN-WI	0.1%
25	San Francisco-Oakland-Hayward, CA	-0.6%

Source: Bureau of Labor Statistics
Current Employment Statistics (CES) Survey. Note: data are not seasonally adjusted.

U.S. % Change 2/2020 v. 12/2024: +4.4%

Unemployment Rates, 25 Largest Metros, December 2024

Rank	MSA	%
1	Minneapolis-St. Paul-Bloomington, MN-WI	2.5%
2	Baltimore-Columbia-Towson, MD	2.7%
3	Miami-Fort Lauderdale-West Palm Beach, FL	2.8%
3	Washington-Arlington-Alexandria, DC-VA-MD-WV	2.8%
5	Orlando-Kissimmee-Sanford, FL	3.0%
6	Phoenix-Mesa-Scottsdale, AZ	3.1%
7	St. Louis, MO-IL	3.2%
7	Tampa-St. Petersburg-Clearwater, FL	3.2%
9	Atlanta-Sandy Springs-Roswell, GA	3.3%
9	Charlotte-Concord-Gastonia, NC-SC	3.3%
11	San Antonio-New Braunfels, TX	3.4%
12	Dallas-Fort Worth-Arlington, TX	3.5%

Rank	MSA	%
12	Philadelphia-Camden-Wilm., PA-NJ-DE-MD	3.5%
12	Seattle-Tacoma-Bellevue, WA	3.5%
15	Boston-Cambridge-Nashua, MA-NH	3.9%
16	San Francisco-Oakland-Hayward, CA	4.0%
17	Houston-The Woodlands-Sugar Land, TX	4.1%
18	Portland-Vancouver-Hillsboro, OR-WA	4.2%
19	New York-Newark-Jersey City, NY-NJ-PA	4.3%
19	San Diego-Carlsbad, CA	4.3%
21	Chicago-Naperville-Elgin, IL-IN-WI	4.4%
22	Denver-Aurora-Lakewood, CO	4.6%
23	Detroit-Warren-Dearborn, MI	4.7%
24	Riverside-San Bernardino-Ontario, CA	4.9%
25	Los Angeles-Long Beach-Anaheim, CA	5.2%

Source: Bureau of Labor Statistics
Local Area Unemployment Statistics (LAUS) program. Note: data are not seasonally adjusted

U.S. Unemployment Rate—Dec: 4.1% | Jan: 4.0%

Devil in a Bunch of Data

Devil in a Blue Dress (1995)—Denzel Washington as Easy Rawlins

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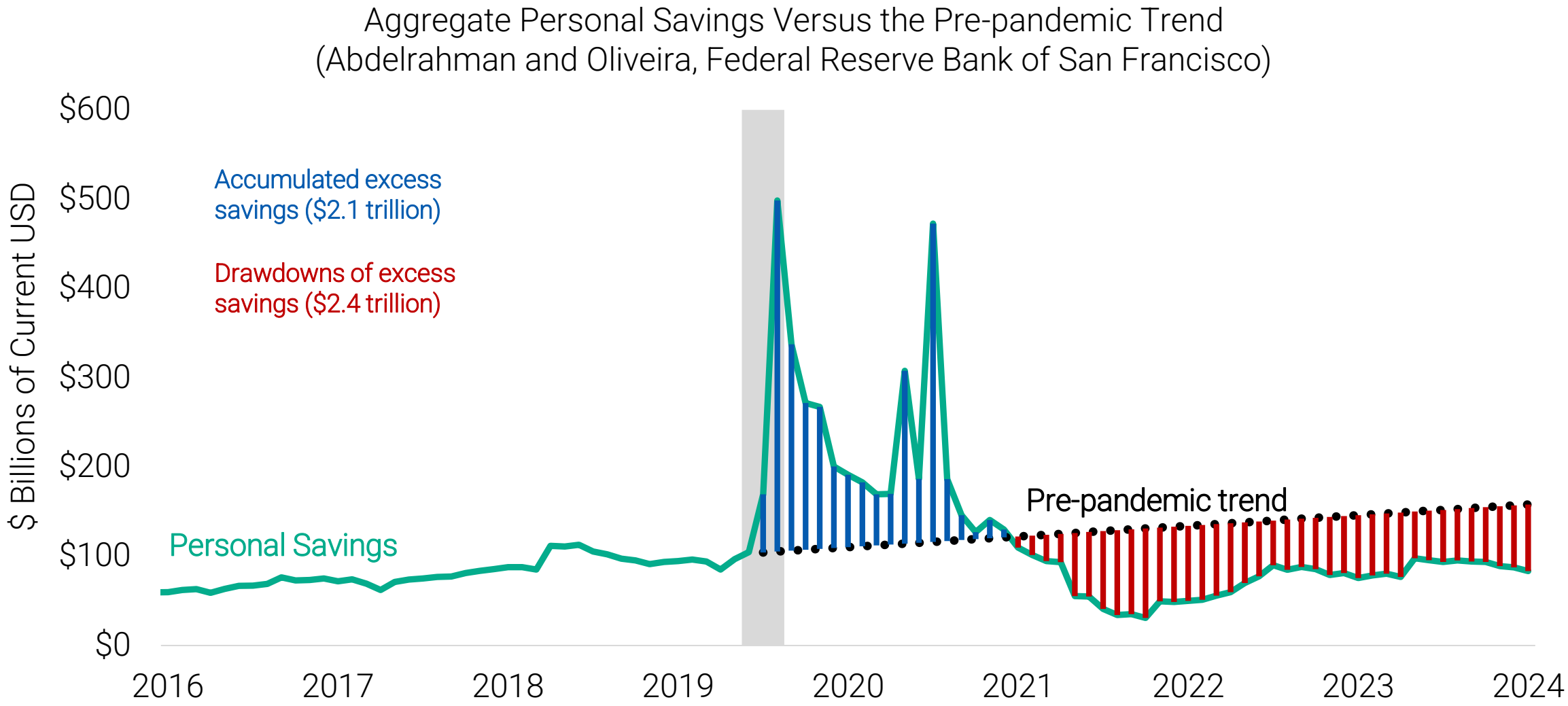
Drawdown of Pandemic Related Excess Savings



Source: Federal Reserve Bank of San Francisco

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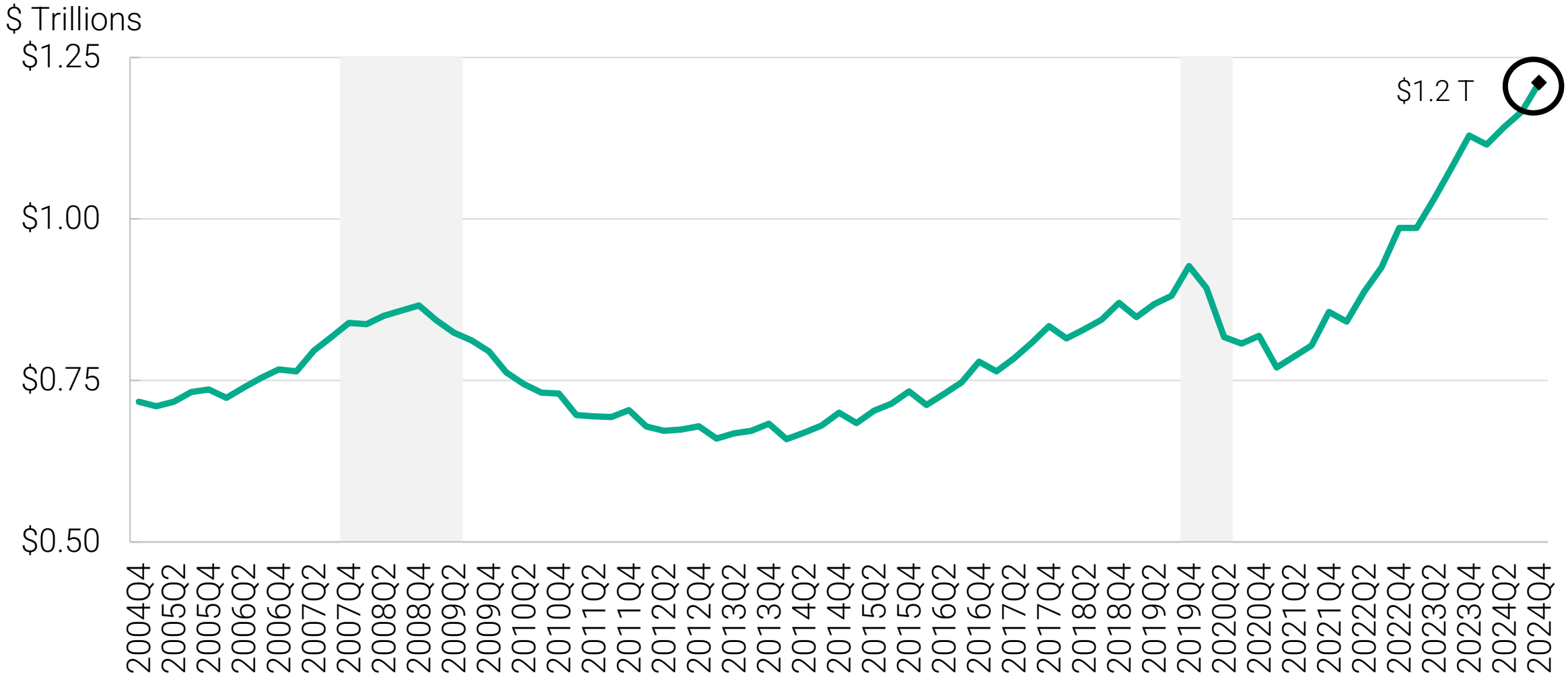
U.S. Credit Card Debt, 2004 – 2024



Shaded areas indicate U.S. recessions

Source: FRED; New York Fed Consumer Credit Panel/Equifax

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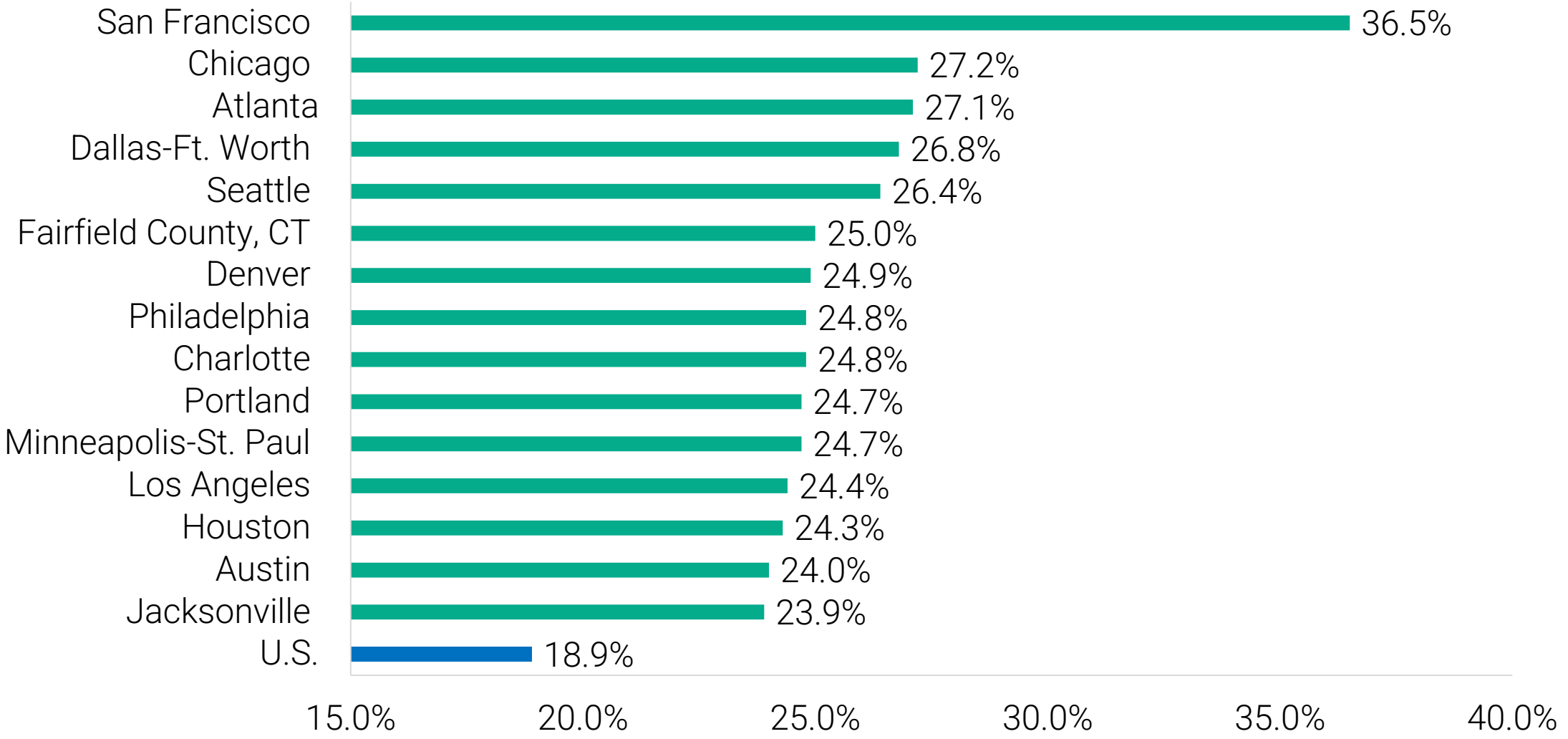
Highest Office Vacancy Rates, 2024Q4



Source: CBRE

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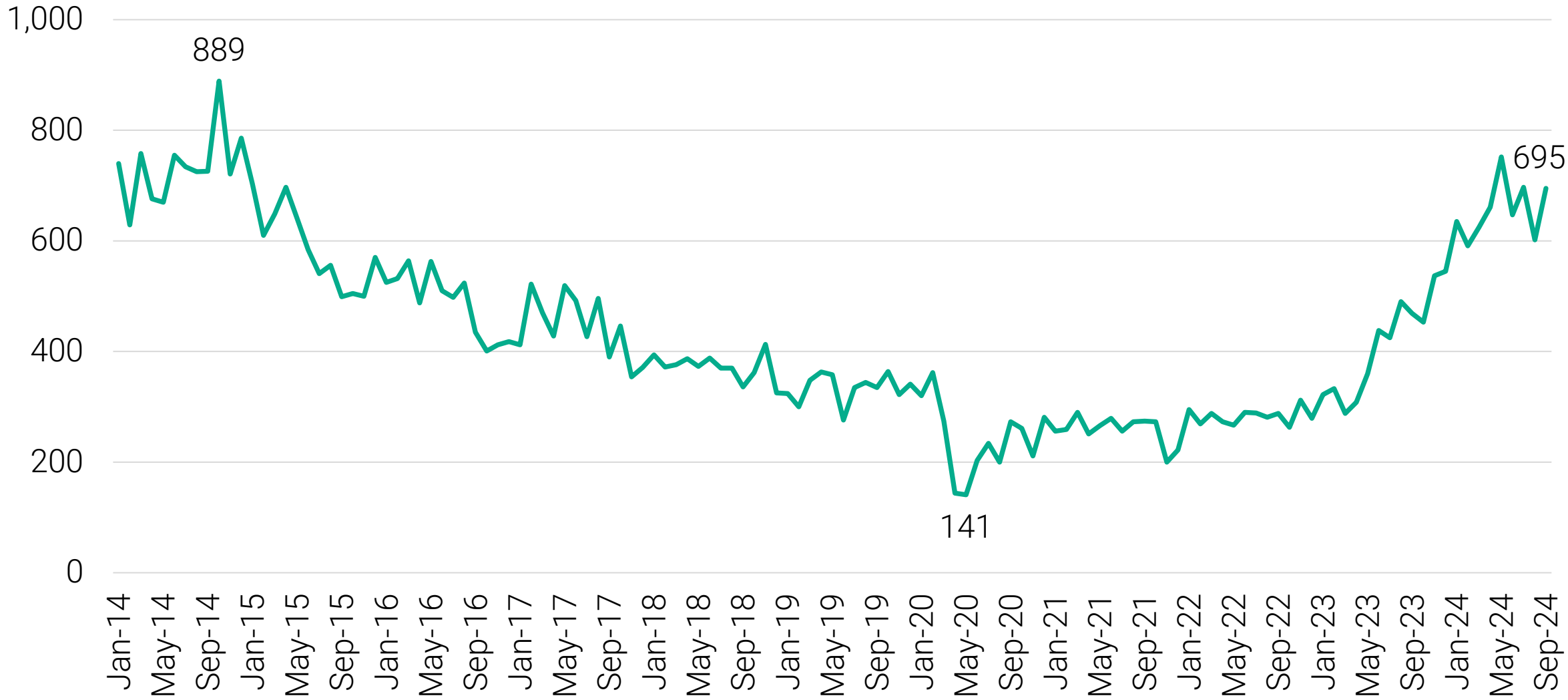
U.S. Commercial Foreclosures, 2014 – 2024



Source: ATTOM

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Fences

Fences (2016)—Denzel Washington as Troy Maxson, Pittsburgh sanitation worker

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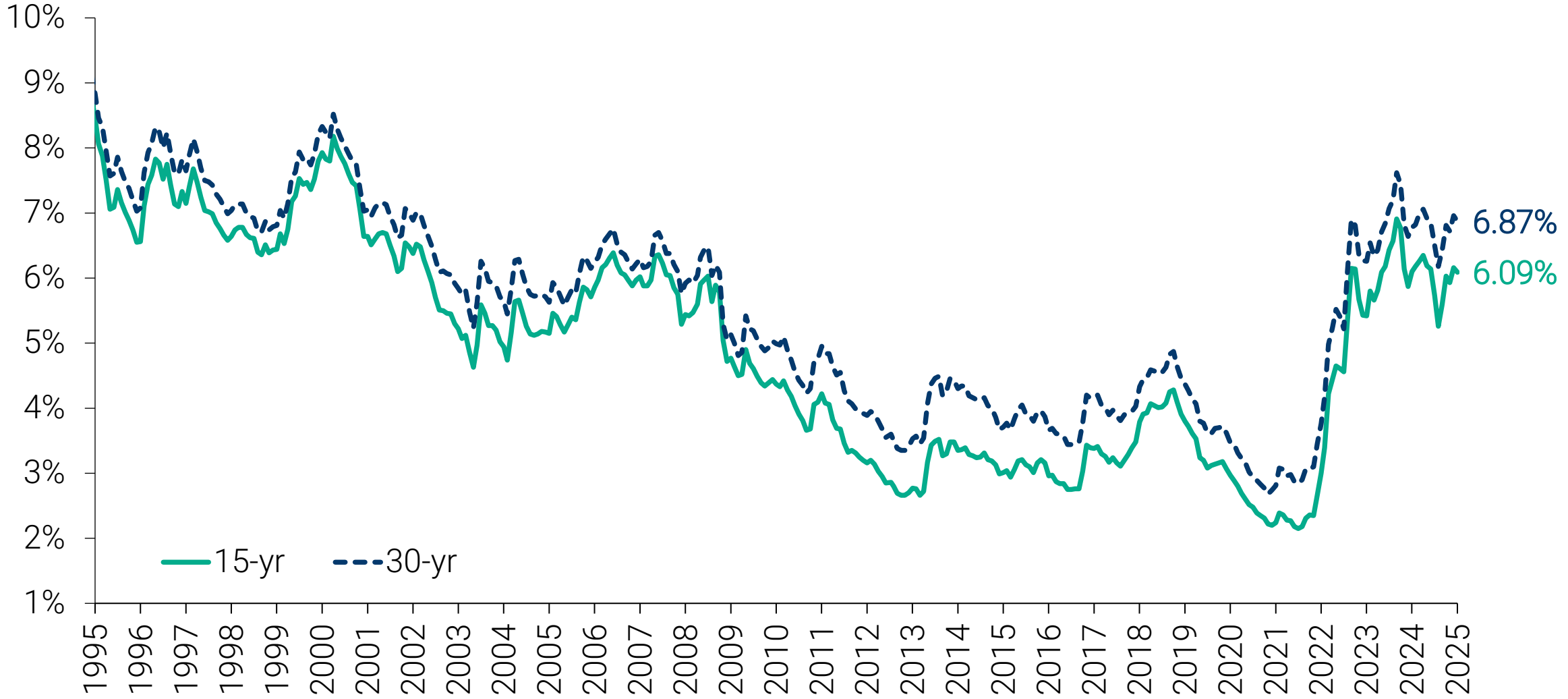
U.S. 15-Year & 30-Year Fixed Mortgage Rates

1995 – February 2025*



Source: Freddie Mac *Week ending 2/13/2025

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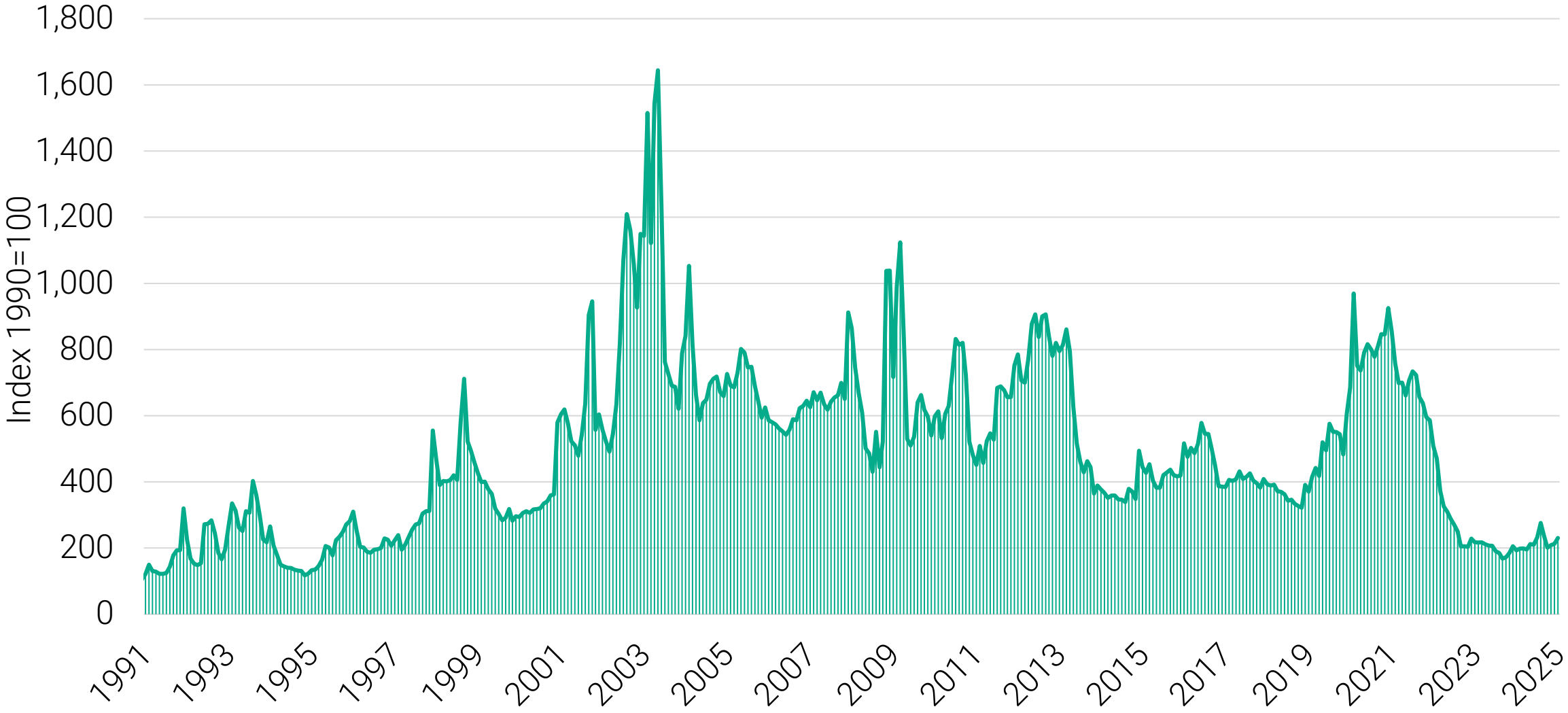
U.S. Mortgage Loan Applications Composite Index

1991 – February 2025



Source: Mortgage Bankers Association (MBA)

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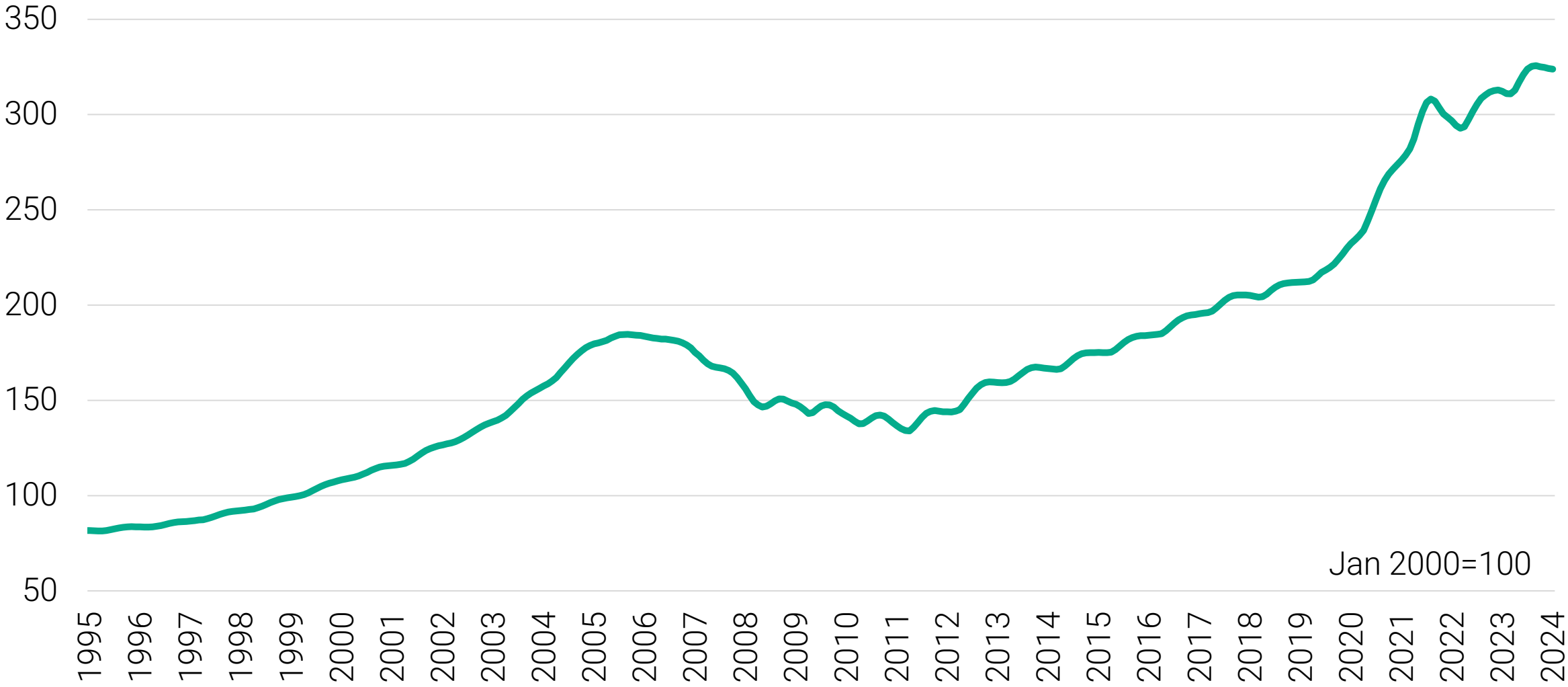
S&P Case-Shiller Home Price Index

1995 – November 2024



Source: Standard & Poor's

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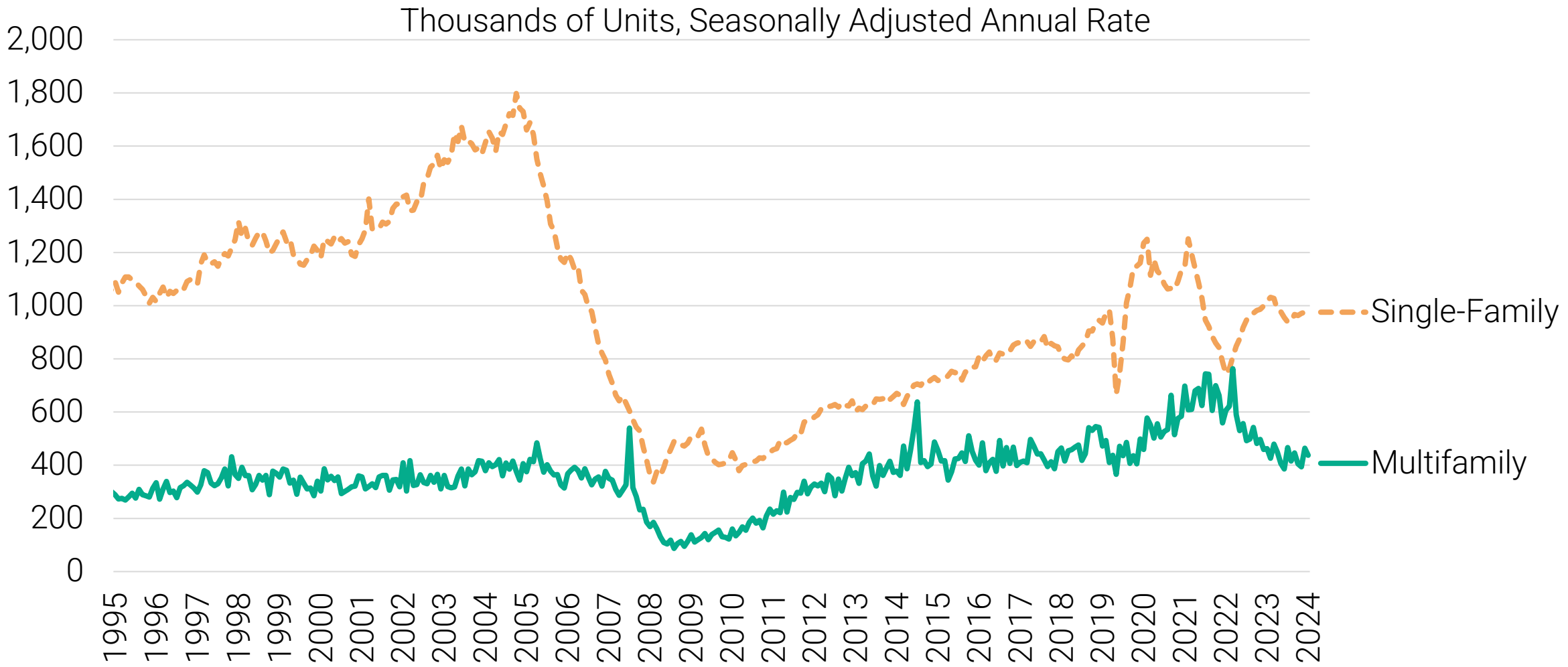
U.S. Residential Building Permits

1995 – December 2024



Source: U.S. Census Bureau

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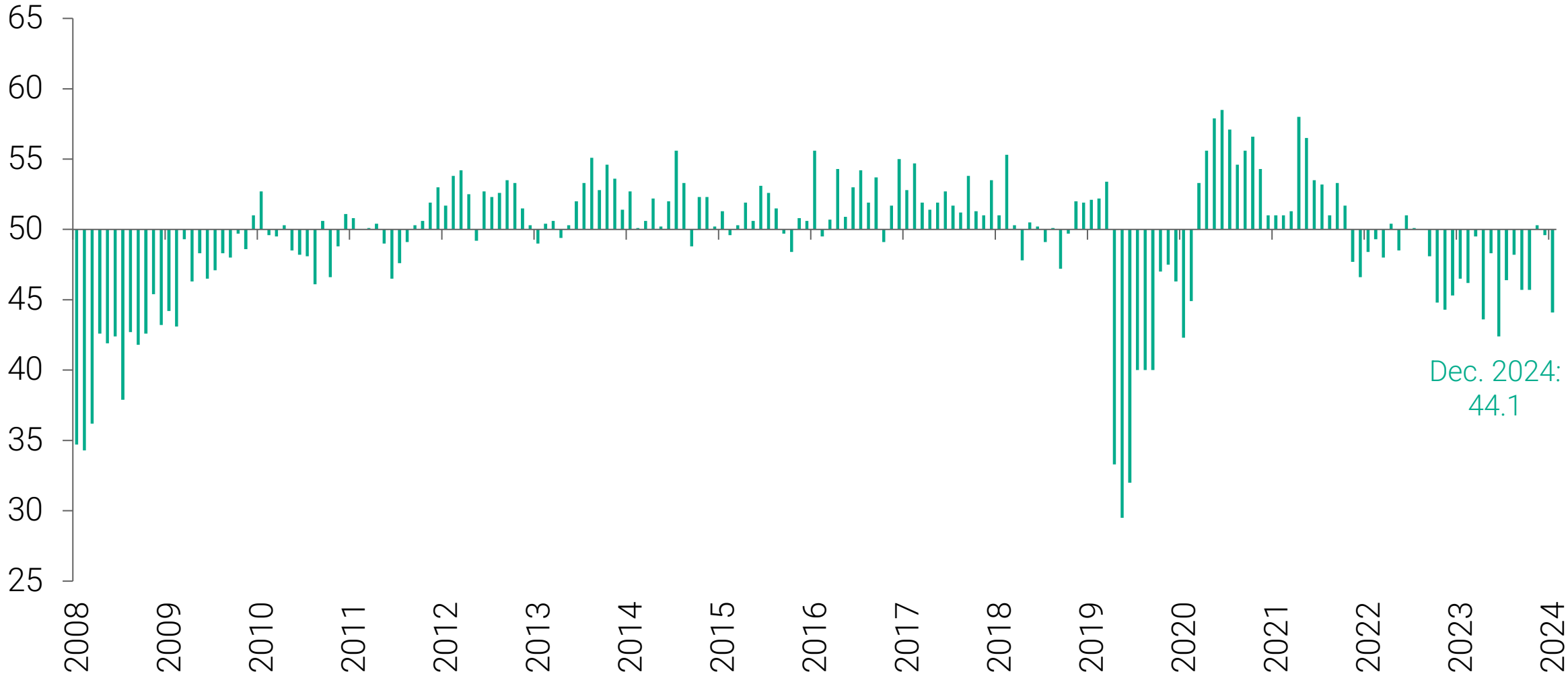
Architecture Billings Index

2008 – December 2024



Source: The American Institute of Architects

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Glory

Glory (1989)—Denzel Washington as Trip, a member of the 54th Massachusetts infantry regiment

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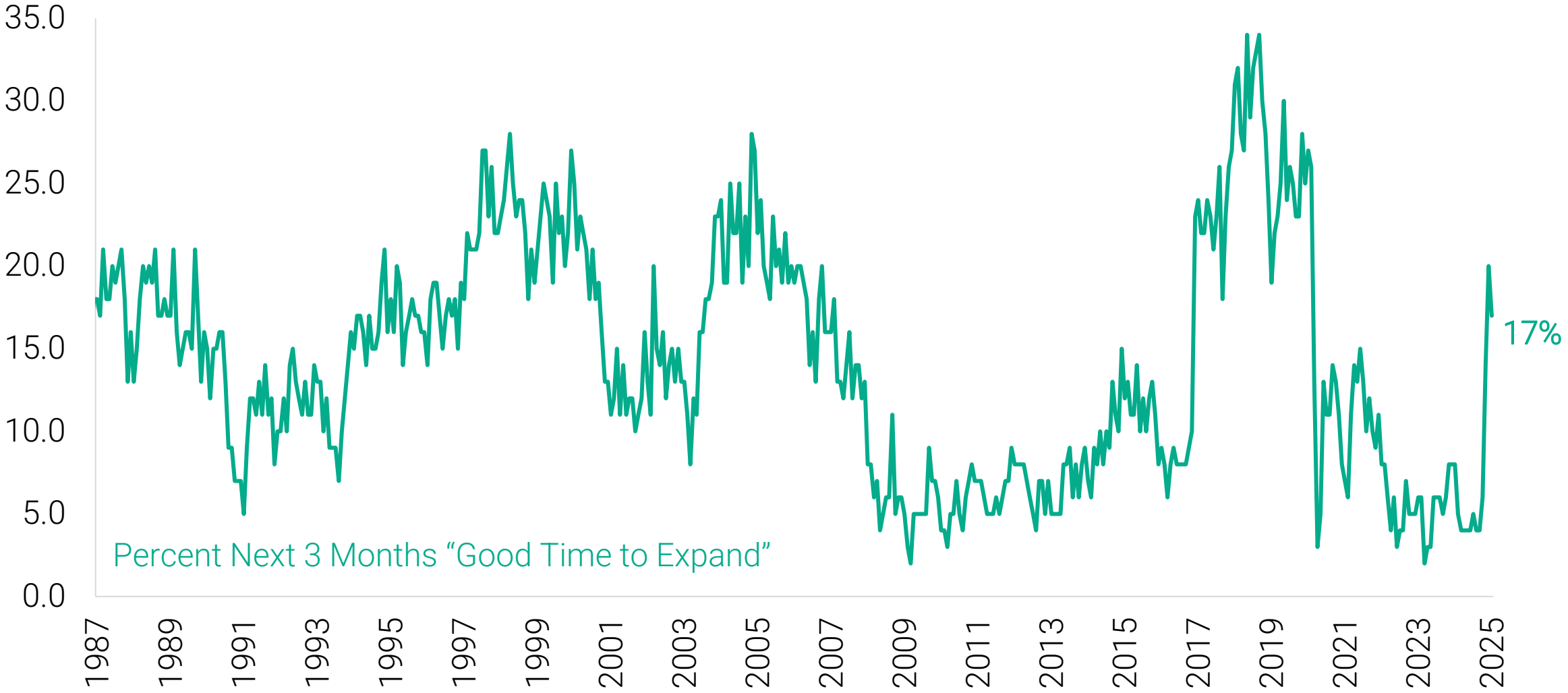
NFIB Index of Small Business Optimism

1987 – January 2025



Source: National Federation of Independent Business (NFIB)

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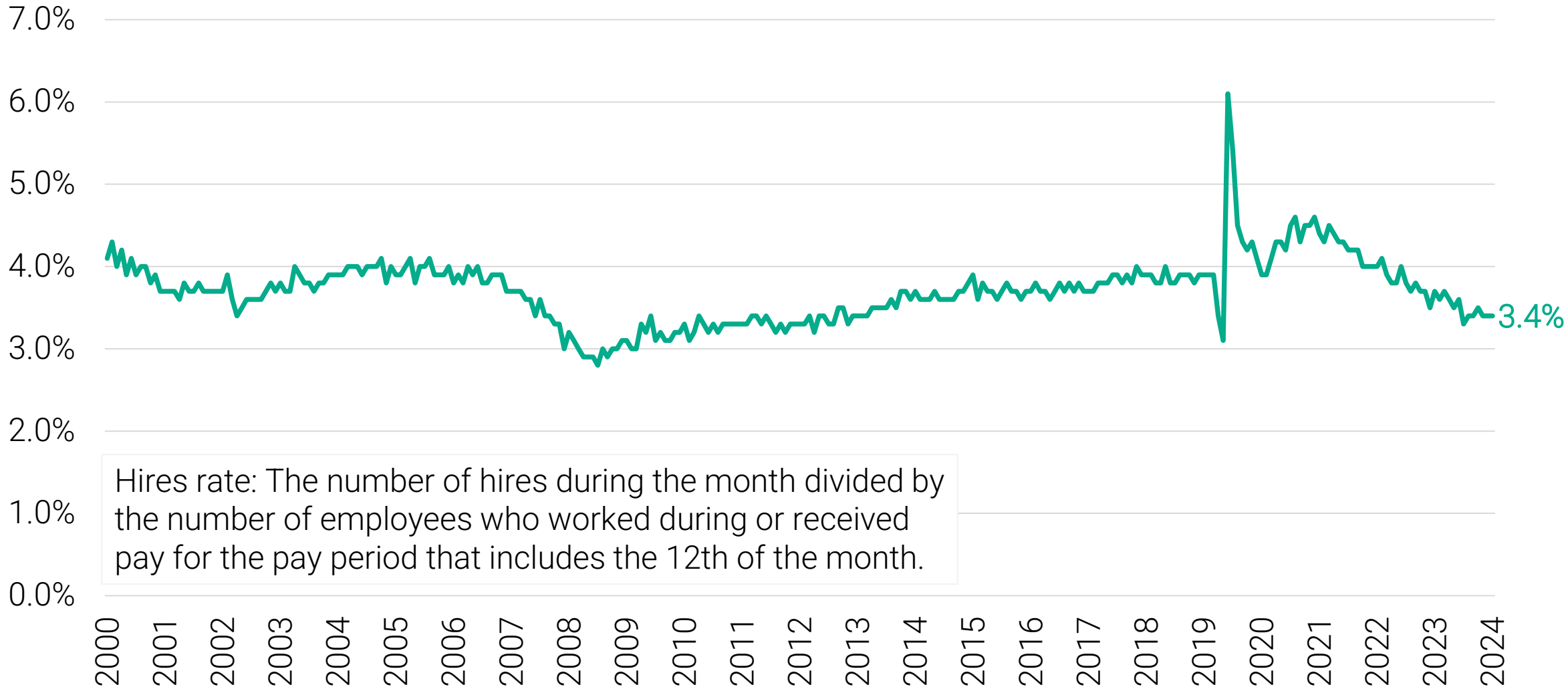
U.S. Hires Rate, 2000 – December 2024



Hires rate: The number of hires during the month divided by the number of employees who worked during or received pay for the pay period that includes the 12th of the month.

Source: U.S. Bureau of Labor Statistics

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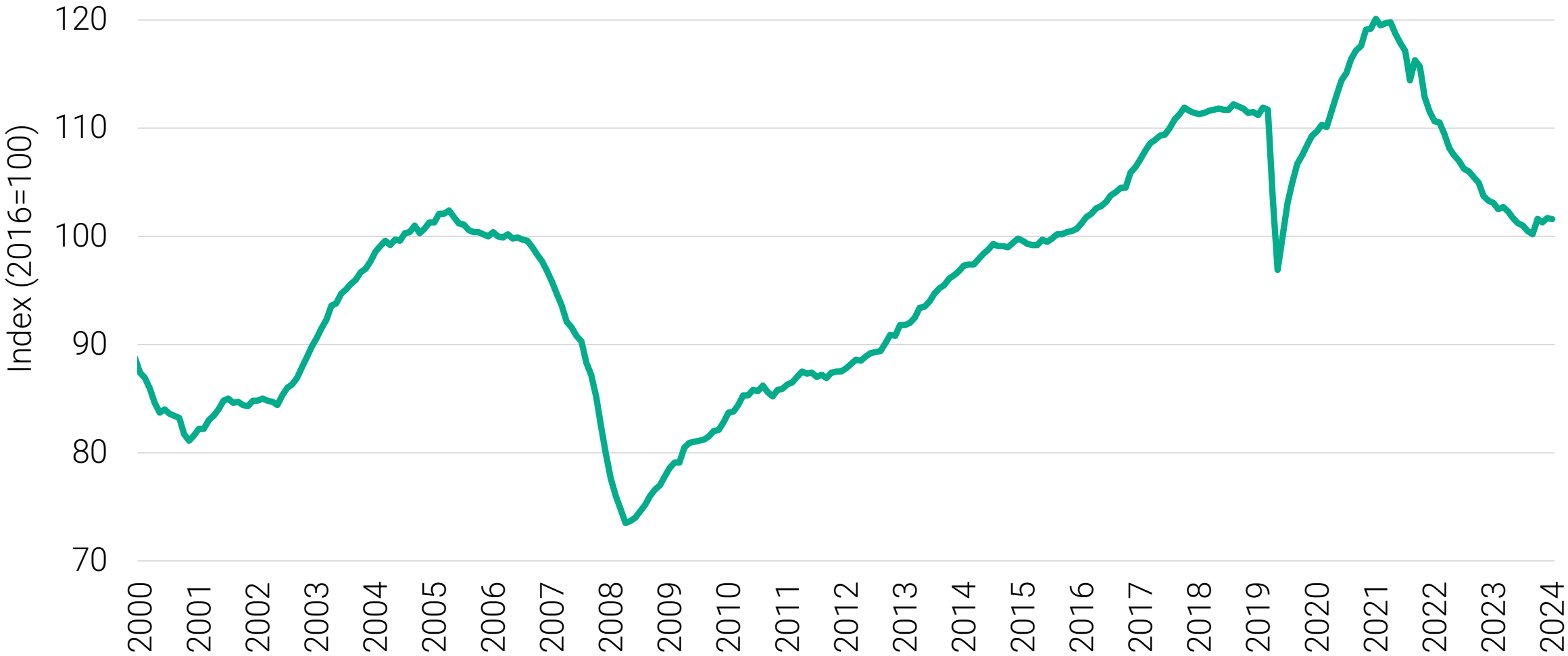
Conference Board: U.S. Leading Economic Index

2000 – December 2024



Source: The Conference Board

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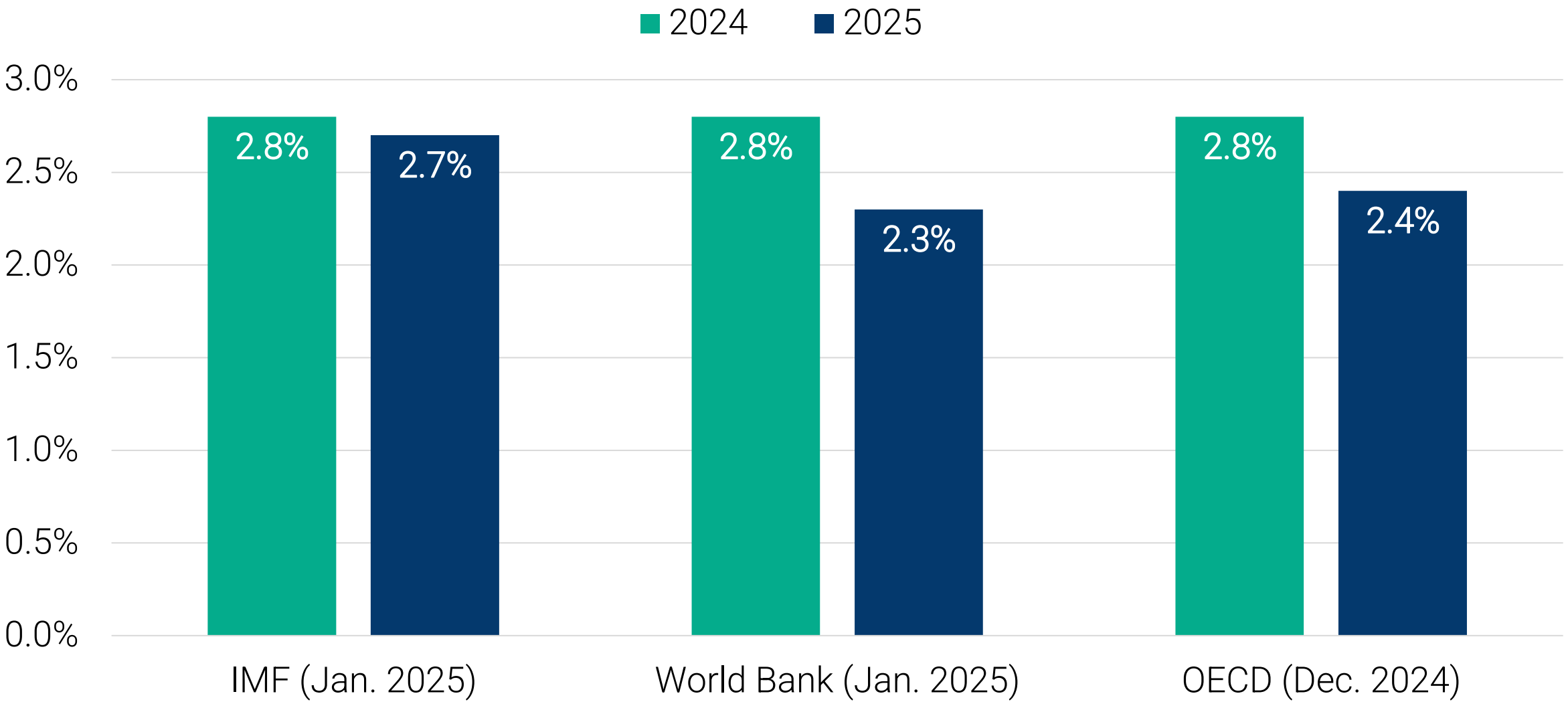
Major Economic Forecasts for U.S. GDP Growth



Source: IMF; OECD; World Bank

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Out of Time

Could U.S. Economy Surprise to the Downside?

- Inflation poised to stage a comeback;
- Interest rates will be higher for longer;
- Many consumers now exhausted financially, and circumstances could worsen;
- Are asset prices overextended?
- So forecast is for growth in 2025, but there are risks, including rising interest rates and falling asset prices.

*Out of Time (2003)—Denzel Washington as police chief Matt Lee Whitlock

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Thank You

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- A monthly Q&A session
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Q&A

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Goldman Sachs Asset Management

Market Snapshot
Tales, Tells, and Tails

Market Strategy | Strategic Advisory Solutions

January 2025

Goldman Sachs Asset Management

Elizabeth Burton

Managing Director, Goldman Sachs Asset Management

- Elizabeth is a managing director and client investment strategist in the Client Solutions Group within Goldman Sachs Asset Management. In her role, she advises institutional clients on their investment strategy and portfolio objectives, working alongside global client advisors and product strategists across public and private markets. Elizabeth joined Goldman Sachs in 2022 as a managing director.

- Prior to joining the firm, Elizabeth was chief investment officer at the Employees' Retirement System of the State of Hawaii. Before that, she served as a managing director in the Quantitative Strategies Group at the Maryland State Retirement Agency, where she was responsible for the agency's absolute return portfolio and oversaw risk management. Earlier in her career, Elizabeth held positions as an investor, economist, and consultant in payments M&A advisory as well as a fixed income trader.

- Elizabeth serves on the Board of Directors of the Chartered Alternative Investment Association (CAIA). In addition, she serves on the board of the Hill School.

- Elizabeth earned a BA in Politics and French from Washington and Lee University in 2004 and an MBA in Finance and Econometrics and Statistics from the University of Chicago in 2011. She is a charterholder of CAIA.

Macro

Tales, Tells, and Tails

Economic Growth

- In absolute terms, economic data continues to be solid.
- Lack of systemic financial imbalances.

Inflation

- The last leg of inflation reduction is proving slow and may be potentially delayed by looming tariff policy.

Labor

- The previously tight US labor market has largely rebalanced with most of the realignment happening via a reduction in job openings rather than job losses.
- The next wave of labor market shifts will prove critical to policy makers.

Monetary Policy

- We expect the Fed to cut rates to 3.50-3.75% by June of 2026. While the path will be data dependent, it would appear clear that current rates are restrictive, but tariffs may flatten the Fed's reaction function.

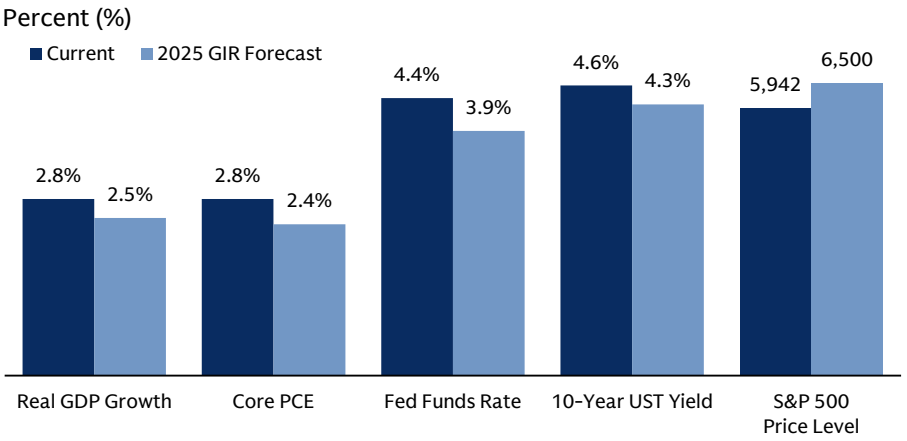
General Policy

- Given limited, albeit, unified GOP control, we expect front-loaded policy efforts in areas of trade, immigration, taxes, and regulation.
- Markets have heightened awareness towards the deteriorating US public debt profile.

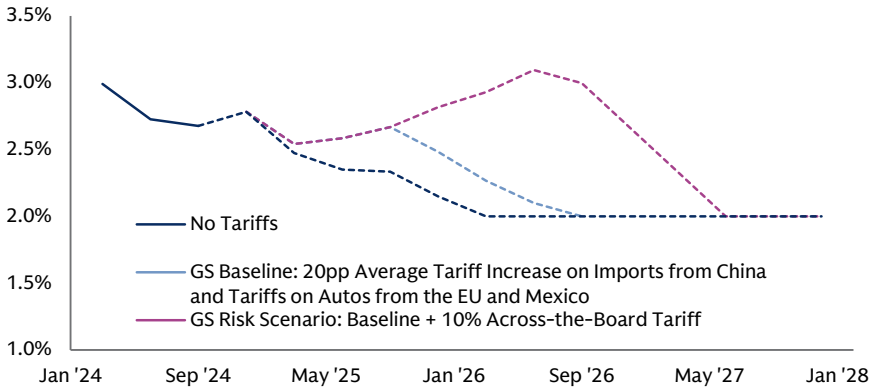
Bottom Line

- Late-cycle conditions are likely to persist. While many investors may hope for a reduction in macro complexity, this is likely to be the new normal. We would emphasize sticking to the plan.

All Eyes On 2025



Inflation Scenarios Under Tariffs



Sources: Federal Reserve Economic Data, Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. Top Chart Notes: As of January 13, 2025. Bottom Chart Notes: As of December 31, 2024. Chart shows potential inflation outcomes under different tariff scenarios. The economic and market forecasts presented herein are for informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. **Past performance does not guarantee future results, which may vary.**

Global Growth Forecasts

Moving towards trend growth globally

Real GDP Growth

Percent Change YoY	2024	2025 (f)		2026 (f)		Potential
		GS	Cons	GS	Cons	GS
US	2.8	2.5	2.1	2.3	2.0	2.3
Euro Area	0.8	0.8	1.0	1.0	1.2	1.4
Japan	-0.2	1.2	1.2	1.1	0.9	0.9
UK	0.8	1.0	1.4	1.3	1.5	1.7
China	4.9	4.5	4.5	4.0	4.2	3.0
Developed Markets	**1.8**	**1.8**	**1.7**	**1.8**	**1.7**	**2.0**
Emerging Markets	**3.9**	**3.9**	**3.9**	**3.8**	**3.9**	**3.6**
World	**2.7**	**2.7**	**2.6**	**2.6**	**2.6**	**2.7**

Our views

- **Globally**, we see limited recession risk and inflation progress slowing.
- The **US** macro backdrop remains stable, though policy measures will be moving to the forefront.
- While not entering a recession, the **Euro area** will likely be on the softer side of growth as it finds itself at the intersection of US policy and geopolitical uncertainty.
- **UK** growth will likely be stable and front-end loaded with some spillovers from Euro area growth and US policy entering the mix.
- We maintain our long-standing optimism about **post-pandemic normalization** with labor markets rebalancing and inflation trending lower, within striking distance of central bank targets.

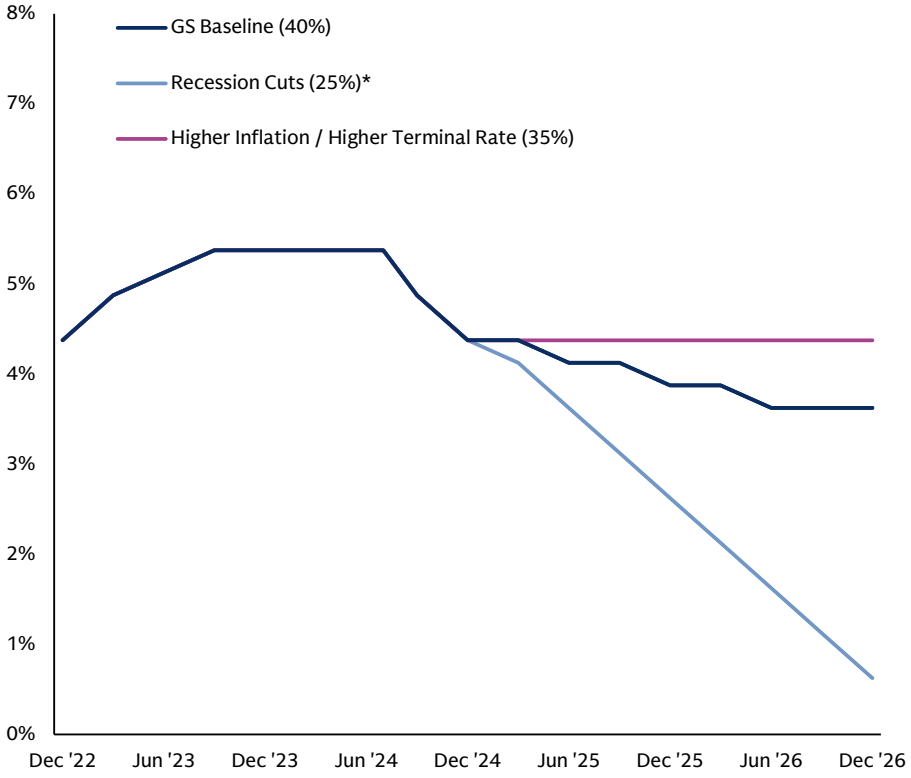
Source: Bloomberg, Goldman Sachs Global Investment Research, and Goldman Sachs Asset Management. As of January 6, 2024. "GDP" refers to gross domestic product. "f" refers to forecast. "Cons." refers to consensus expectations. "YoY" refers to year over year. Some forecasts may be shaded to highlight data points. "Potential" refers to the GS long-run estimate for full-year 2034 GDP growth. All forecasts refer to Goldman Sachs Global Investment Research. "Our views" refers to Strategic Advisory Solutions, Goldman Sachs Asset Management. The economic and market forecasts presented herein are for informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. **Past performance does not guarantee future results, which may vary.**

Monetary Policy

Despite tariff unknowns we expect the Fed to further normalize rates and labor data to remain a focus

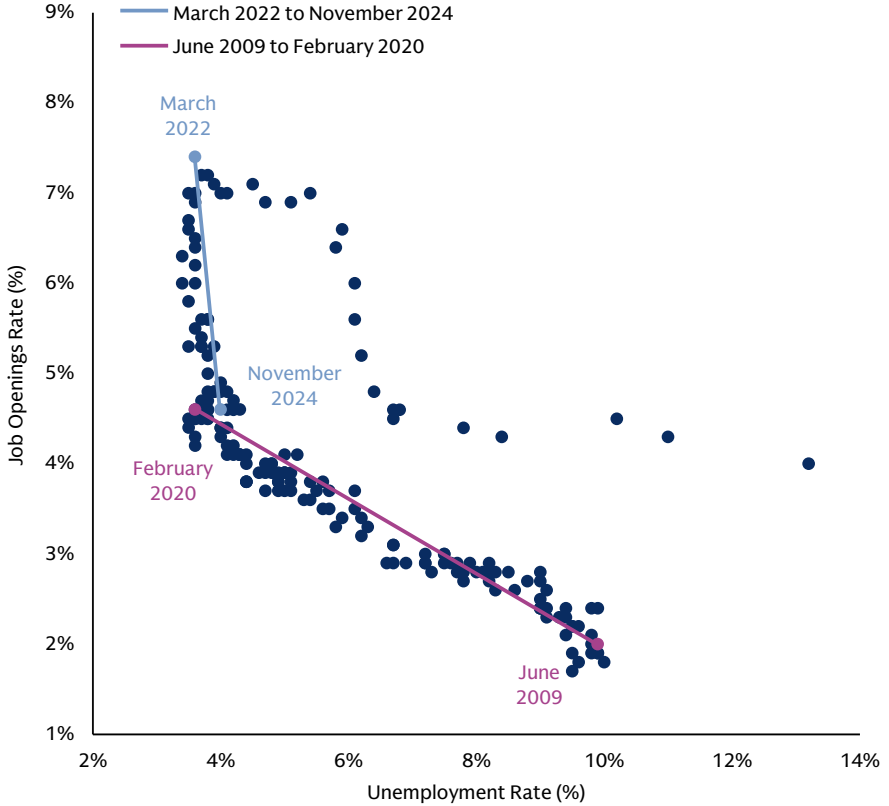
Potential Policy Rate Path

Forecasted Fed Funds Rate Scenario Analysis (%)



The Pain-Free Labor Adjustments Are Over

Unemployment and Job Openings Rates (June 2009 - September 2024, %)



Left Chart Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of January 13, 2024. *The recession scenario shows unrealistically slow cuts to capture many sub-scenarios of recessions starting at various points in time. The recession scenarios reflect a subjective recession probability of 15% over the next 12 months and continued elevated risks thereafter. "Terminal rate" refers to the peak spot where the benchmark interest rate will come to rest before the central bank begins trimming it back. Right Chart Source: St. Louis Federal Reserve. As of November 31, 2024. Chart shows the unemployment rate and job openings rate from June 2009 through September 2024. Each plot reflects the unemployment rate (x-axis) and job openings rate (y-axis) for each month of data.
Past performance does not guarantee future results, which may vary.

General Policy Outlook

US Politics

Post-inauguration policy will be focused on protectionism, border security, tax provisions, and oversight

Trade

Base Case: The new US administration enacts a 20pp average increase in the effective tariff rate on China, increased tariffs on autos from the EU and Mexico, and a 3.4pp increase in the effective tariff rate.

Risk Case: New US administration increases effective tariff rate by 10pp on all imports, while potentially revoking Permanent Normal Trade Relations with China (requires legislative action).

Immigration

Base Case: Net immigration slows to 750k/year on the back of increased funding and tighter law enforcement.

Risk Case: Selective deportation of immigrants with criminal records and/or forced deportations of up to 2.1mm individuals.

Fiscal

Base Case: Republicans leverage red honeymoon to enact:

1. Full extension of expiring Trump tax cuts in early 2025
2. Expand SALT deduction
3. Exclude select taxes from overtime and tips
4. Lower corporate tax for domestic manufacturers to 15%
5. Reinstate more generous corporate incentives
6. Allow enhanced ACA subsidies to expire
7. Set limitations on green subsidies

Regulation

Base Case: Republicans focus on three key areas:

1. Antitrust: Enforcement eases slightly with scrutiny around tech sector likely continuing
2. Energy: Easier approval for new energy projects, growing LNG exports, and removing restrictions on greenhouse gas emission
3. Financial: Near-term easing of regulatory burden on consumer finance firms alongside medium-term easing of capital and liquidity requirements

Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. "LNG" refers to Liquefied Natural Gas. As of December 31, 2024. For illustrative purposes only.

Equity Views

Equities

US equities will likely be resilient, but select opportunities exist across and within the asset class

US Equity

- GIR's YE 2025 S&P 500 target is 6500, informed by a solid macro backdrop and earnings momentum.
- More moderate long-term views are governed by high current valuation and market concentration. While we expect market leadership to broaden across and down capitalization, the Mag 7 can continue to outperform.

International DM

- International equities may offer attractive opportunities for exposure to value, cyclicality, and yield at a cheaper price, though selectivity will matter.

EM

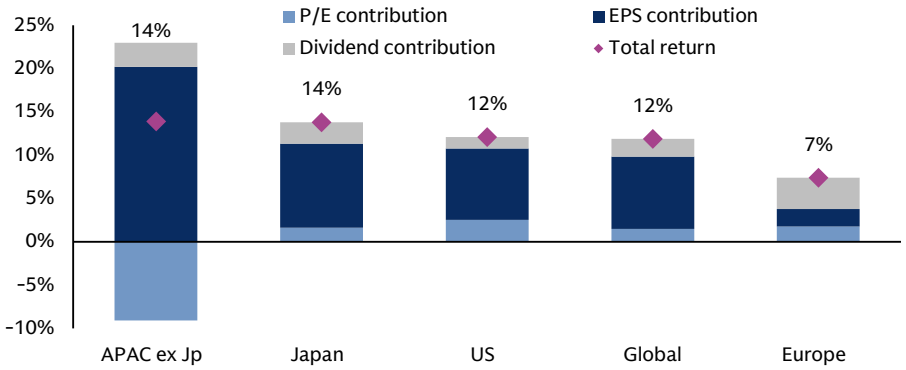
- Shifts in US fiscal and trade policy could drive weakness in EM growth, while higher-for-longer US rates may create a challenging mix for EM. China continues to face 3D challenges (debt, demographics, and de-risking), alongside likely tariff headwinds.
- EM equities with strong domestic micro fundamentals, insulation from US protectionist policy risks, and local policy support are best placed to outperform.

Private Equity

- A stabilizing macro backdrop and a recalibration of investor expectations may act as catalyst for a more normalized deal-making environment in 2025, positioning the industry better for both exits and new capital deployment.

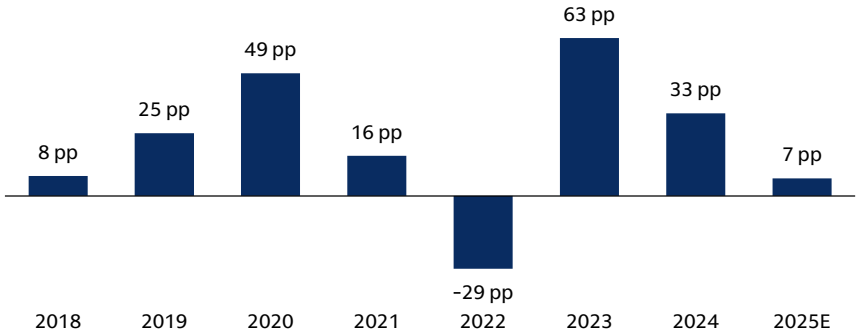
Likely Key Driver of Equity Returns in 2025: Earnings

2025 Equity Market Total Return Breakdown (%)



Closing The Gap

Relative Return of Mag 7 vs S&P 493 (pp)



Top Chart Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of January 3, 2025. Chart shows 12-mo total return forecasts. Figures are in local currency. Bottom Chart Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of December 31, 2024. "We" refers to Goldman Sachs Asset Management. The economic and market forecasts presented herein are for informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. **Past performance does not predict future returns and does not guarantee future results, which may vary.** For illustrative purposes only. Please see additional disclosures at the end of this presentation.

S&P 500 Core Views

Equities

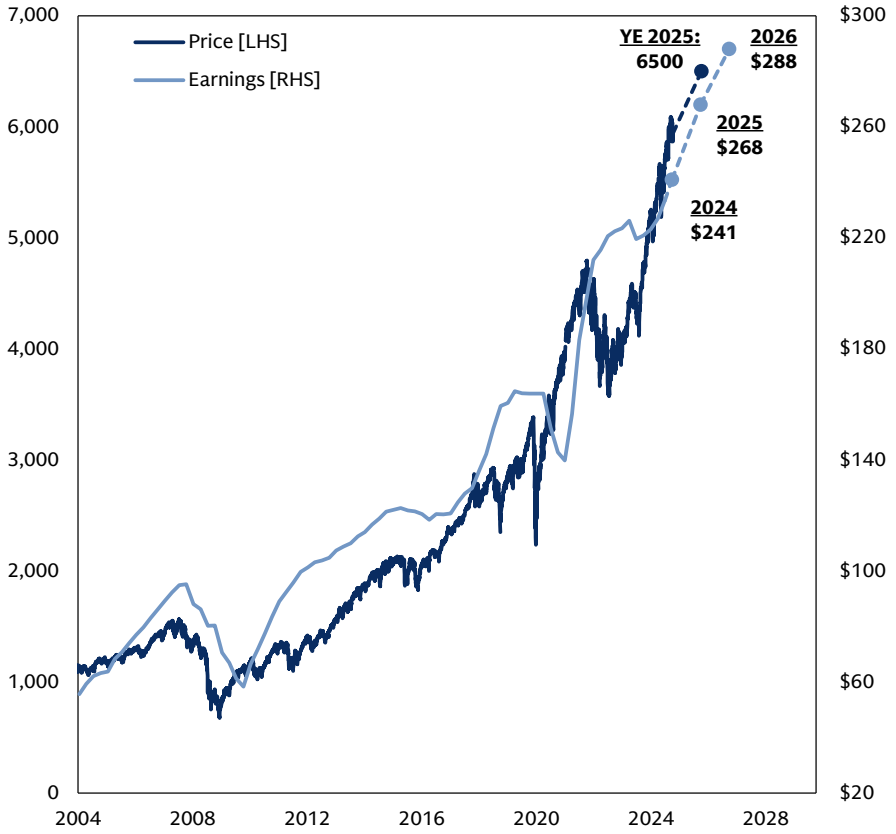
Our S&P 500 2025 year-end target is 6500 given strong macro, though we are priced for perfection

More of the Same:

- Resilient Macro (15% Recession Probability)
- Normalization Fed Cutting Cycle
- Strong Earnings (2025: $268)
- Favorable Seasonals (Nov/Dec +7% Post-Election)
- Share Buybacks ($1 Trillion)
- Absence of Financial Bubbles

Bear Market Bottom	Number of Years of Following Bull Market
May 1970	2.6
October 1974	6.2
August 1982	5.0
December 1987	12.3
October 2002	5.0
March 2009	11.0
March 2020	1.8
October 2022	**2.3**

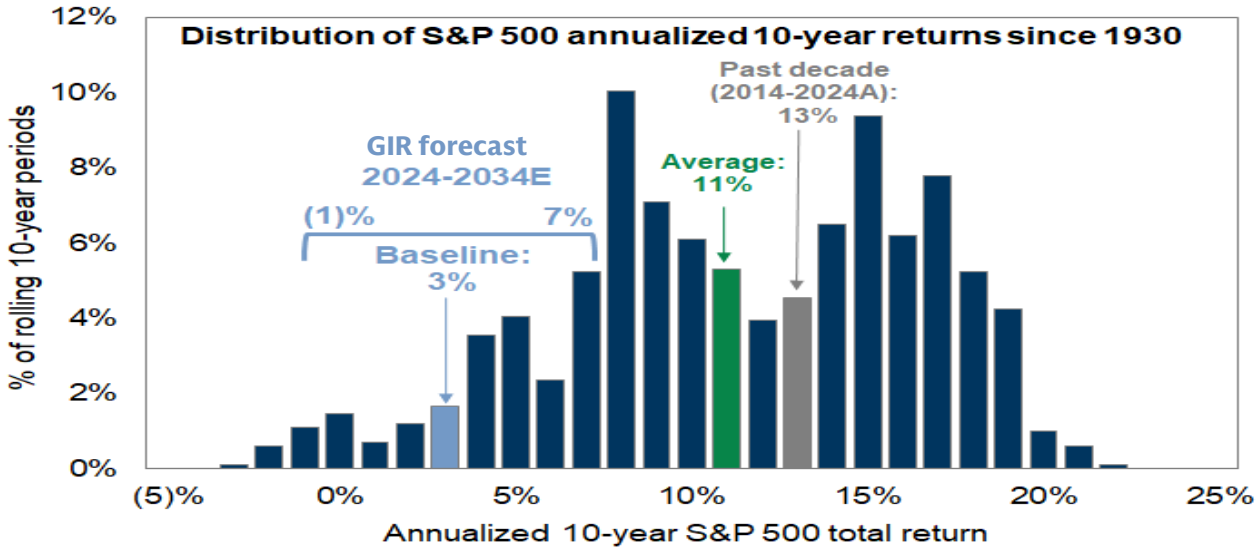
S&P 500 Price and Earnings Targets



Source: Goldman Sachs Global Investment Research, and Goldman Sachs Asset Management. As of January 3, 2024. "Our" and "we" refers to GS Global Investment Research and Goldman Sachs Asset Management. "Bear market" refers to a period when a market experiences prolonged price declines. "Bull market" refers to a period when a market experiences prolonged price inclines. "P/E" refers to Price-to-Earnings ratio. "Fed" refers to Federal Reserve. For illustrative purposes only. The economic and market forecasts presented herein are informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. **Past performance does not predict future returns and does not guarantee future results, which may vary.**

Forecasts: US Equity

Below Trend: The S&P 500 has roughly a 72% probability of trailing bonds and a 33% likelihood of lagging inflation through 2034.



MODELING FORWARD RETURNS:

- GIR estimates the S&P 500 will deliver an annualized nominal total return of 3% during the next 10 years (7th percentile since 1930) High valuation and concentration are structural.
- GIR's forecast would be 4 pp greater than our baseline if we exclude a variable for market concentration.
- GIR expects the return structure of the stock market will broaden in the future. Today's extremely high market concentration suggests that the S&P 500 equal-weight benchmark (SPW) is likely to outperform the cap-weighted aggregate index (SPX) during the next decade by an annualized 200 bp-800 bp.

Source: Bloomberg, Goldman Sachs Asset Management and Goldman Sachs Global Investment Research. As of October 18, 2024. The economic and market forecasts presented herein are for information purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. **Past performance does not predict future returns and does not guarantee future results, which may vary.**

Fixed Income Views

Fixed Income

With attractive current yields and further rate cuts likely ahead, opportunity exists in fixed income

Rates

- Moderating growth and decelerating inflation may be supportive of bonds across the curve.
- That said, US policy including mounting fiscal pressures may limit the rally on the long end.
- We expect interest rate curves to steepen gradually.

Credit

- The outlook is generally stable, though there is limited scope for further spread tightening.
- Corporate liquidity buffers appear resilient, and strong starting balance sheets may prevent meaningful credit deterioration.
- Ultimately, a combination of deteriorating fundamentals and weakening technicals is needed to catalyze a valuation reset. Neither scenario is in our baseline case for 2025.

Policy Rate Cuts

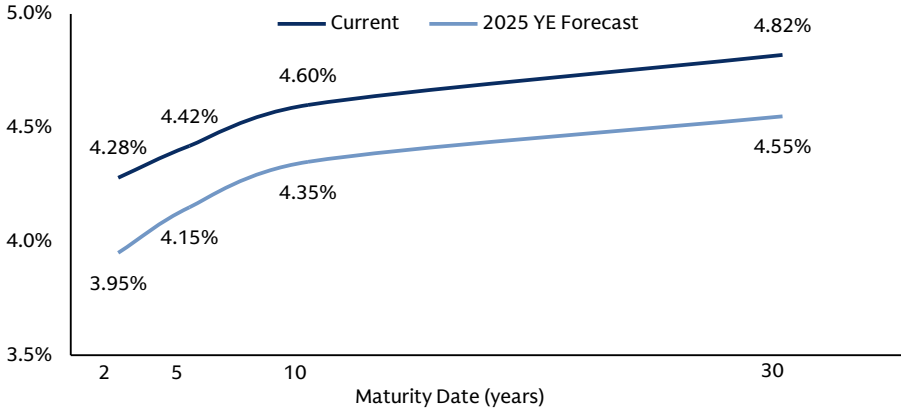
- We think a steepening bias is the right one for a world where the Fed is more focused on growth than inflation risks.
- We expect cuts from all G10 central banks except the BoJ in 2025.

Municipal Bonds

- Being mindful of tax legislation, munis may still benefit from attractive relative yields, stable credit, and investor demand for duration.

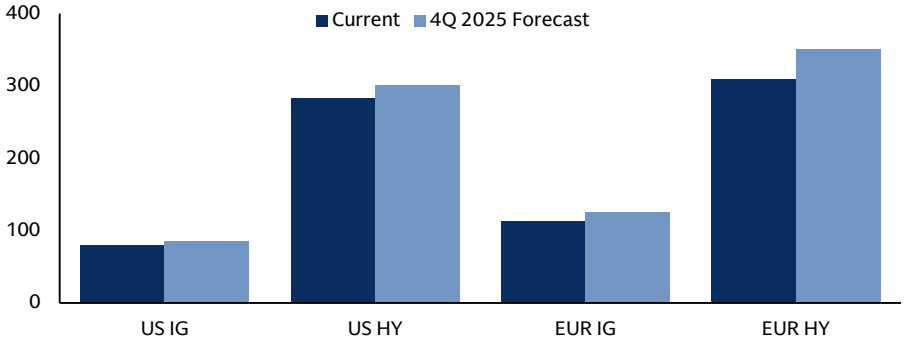
Slow and Steady Re-Steepening

US Treasuries Yield-to-Worst (%)



Credit Standstill

Credit Spread (bps)



Charts Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of January 3, 2025, or latest available. For illustrative purposes only. "We" refers to Goldman Sachs Asset Management. The economic and market forecasts presented herein are for informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. Goldman Sachs does not provide accounting, tax or legal advice. **Past performance does not predict future returns and does not guarantee future results, which may vary.** Please see additional disclosures at the end of this presentation.

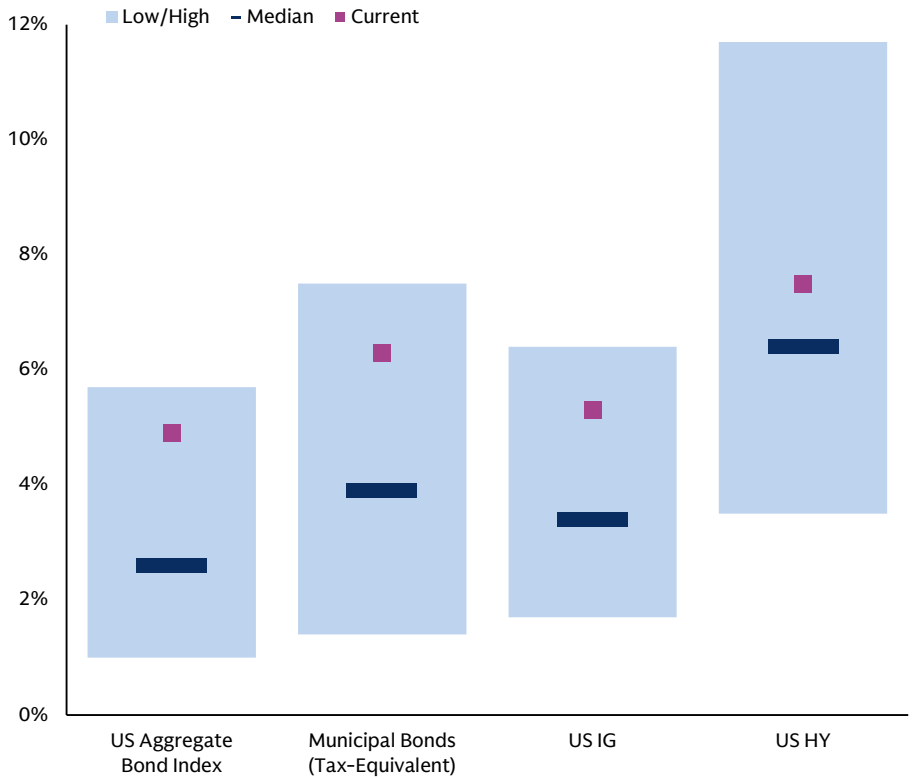
Yield is Only One Part of the Equation

Fixed Income

Core bonds offer attractive features today and may be relied on over correctly predicting rate cuts

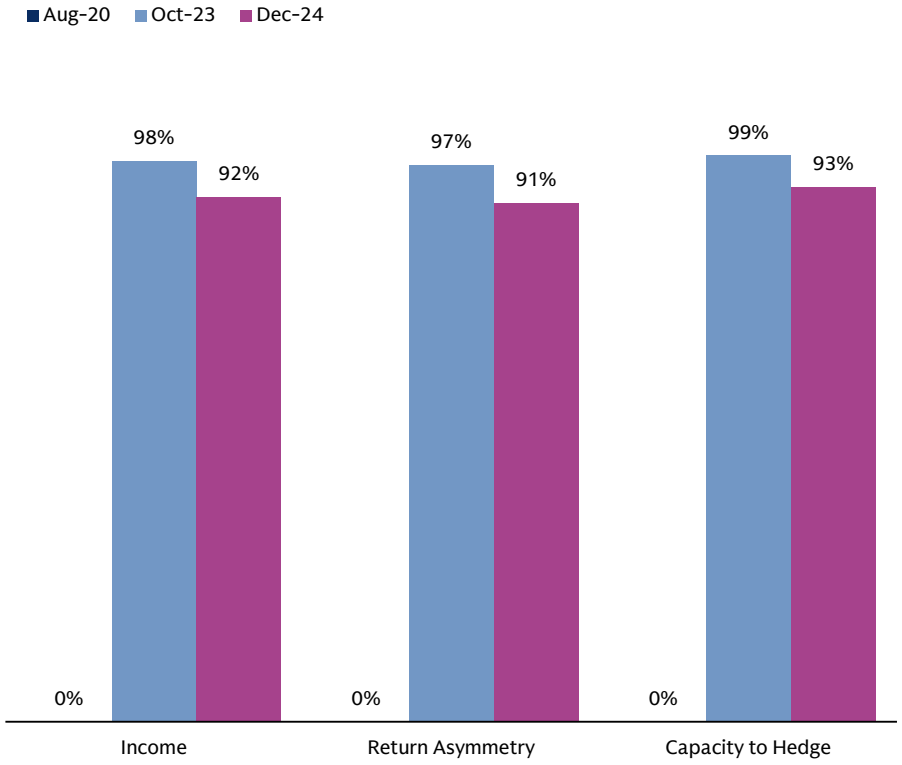
Above Average Yields

Yield to Worst (%, Prior Ten Years)



Bonds Have Come A Long Way

Benefits of Intermediate Fixed Income (Percentile, % 20-Year Trailing)



Left Chart Source: Bloomberg and Goldman Sachs Asset Management. As of December 31, 2024. Charts shows the minimum, maximum, median, and current yield-to-worst of various fixed income markets considering prior ten years of yields. Right Chart Source: Bloomberg and Goldman Sachs Asset Management. As of December 31, 2024. Chart shows the illustrative total return of a 10-Year US Treasury bond, calculated by summing the modified duration price impact of a 1pp change in rates with the bond's yield at the time. August 2020 was chosen as it was the month the 10-Year US Treasury yield hit an all-time low. The results are based on the historical returns of the indices used and no representation is made that an investor achieved similar results. The example provided does not reflect the deduction of investment advisory fees and expenses which would reduce an investor's return. The results will vary based on market conditions. **Past performance does not guarantee future results, which may vary.** Please see additional disclosures at the end of this presentation.

FX and Commodities

US policy shifts may lead to a 'stronger for longer' USD and hedging opportunities within commodities

FX

- **USD:** We expect the dollar to be 'stronger for longer' in 2025 as tariff risks and divergent growth prospects support USD strength. We had expected the dollar to gradually decline as global growth moved into better balance. However, Dollar challengers still struggle to mount a better case.
- **EUR:** The Euro Area faces a challenging set of circumstances and is highly vulnerable to global trade policy uncertainty. Bearish sentiment is already embedded into the currency, mostly due to investor pessimism regarding the macro trajectory.
- **JPY:** Gradual BoJ rate hikes are not an impediment towards a weaker Yen, which may allow for more sustained policy tightening.

Global FX Forecasts

	Current	GIR Forecast			LT GIR Forecast		
Currencies	**Spot**	**3m**	**6m**	**12m**	**2026**	**2027**	**2028**
EUR/USD	1.02	1.00	0.97	0.97	1.06	1.10	1.13
GBP/USD	1.22	1.23	1.22	1.20	1.29	1.28	1.28
USD/JPY	158	160	161	162	145	132	119
USD/CNY	7.20	7.40	7.50	7.50	7.30	7.10	6.90

Commodities

- The unusually wide range of potential US policy shifts in 2025 may strengthen the diversifying role of commodities in portfolios.
- Long gold and oil positions, in particular, can act as critical inflation and geopolitical hedges in tail scenarios, including tariff escalation, geopolitical oil supply disruptions, and debt fears.

Commodity Positions Can Act as Inflation Hedges

Inflation Shocks	Inflation Risks Post US Elections	Commodity Hedge
Positive Demand Shock (Bonds ↓)	Fiscal Easing	1. Industrial Medals 2. Oil 3. Copper/ Aluminum
Negative Supply Shock (Equities ↓; Bonds ↓)	Hawkish on Iran Oil Supply	1. Oil 2. Gold
Central Bank Credibility Loss/Geopolitics (Equities ↓; Bonds ↓)	Fed Subordination, Tariffs, and/or Debt Fears	1. Gold

Left Chart Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of January 13, 2025, or latest available. "LT" refers to Long-term. Right Chart Source: Goldman Sachs Global Investment Research and Goldman Sachs Asset Management. As of December 31, 2024. "We" refers to Goldman Sachs Asset Management. The economic and market forecasts presented herein are for informational purposes as of the date of this presentation. There can be no assurance that the forecasts will be achieved. For illustrative purposes only.

Private Markets – Private Equity

Observations and opportunities

OBSERVATIONS

- A stabilizing macro backdrop and a recalibration of investor expectations should act as a catalyst for a more normalized environment. This process is already underway
- A restored market balance and a continued strengthening of the dealmaking environment may make for an attractive entry environment for buyouts in the coming vintage—and, perhaps, in hindsight, for the past couple of fund vintages as well
- A recalibration in venture capital and growth equity may ultimately prove constructive to the industry and to upcoming vintages, albeit with some challenges for capital invested in recent years
- Practical realities suggest that the pace of the rebound is unlikely to be uniform, with some parts of the market more compelling than other

OPPORTUNITIES – BUYOUTS

- Many portfolio companies are now better positioned for exit at or near values in line with GPs' return targets.
- Investor confidence is returning as macro uncertainty moderates.
- The pace of the rebound is unlikely to be uniform, with larger companies potentially facing fewer viable exit options.
- With no obvious catalyst for systematic multiple expansion, operational value creation may remain the key driver of returns.
- Middle market strategies may offer the potential for the most attractive balance among upside potential from active management, scalability of value creation initiatives, downside mitigation in turbulent times, and a flexible, multi-dimensional exit strategy.
- With GPs having turned to creative solutions to drive distributions (dividend recaps, NAV financing, continuation vehicles), the quality of distributions over this period can help inform future manager selection.

OPPORTUNITIES – VENTURE CAPTIAL & GROWTH EQUITY

- With few large companies able to maintain their market leadership over time, the ability to invest in the leading companies of the future is key to the strategic case for venture capital and growth equity strategies.
- We anticipate a more constructive environment to deploy new capital after last decade's excesses.
- Valuations and growth expectations are normalizing.
- Muted fundraising has decreased overall dry powder, helping correct supply/demand imbalances.
- IPO backlog creates attractive backdrop to invest in category leaders.
- We see an increasing need for growth equity capital as venture-backed companies stay private for longer and require additional capital to fund transition from late-stage VC to freestanding enterprise.

Source: Goldman Sachs Asset Management, January 2025. Performance results vary depending on the client's investment goals, objectives, and constraints. There can be no assurance that the same or similar results to those presented above can or will be achieved. There is no guarantee that objectives will be met. Actual returns are likely to vary. For discussion purposes only.

Private Markets – Private Credit

Observations and opportunities

OBSERVATIONS

- Spread compression was driven by a significant uptick in supply of new capital against a backdrop of muted new-financing demand. With rates on the decline, we expect spreads to normalize as supply (inflows) and demand for new loans rebalance.
- An equilibrium may arise between demand for public and private financing, with companies choosing between lower cost of capital in public markets versus a more tailored capital structure and solution in private markets.
- Lower rates can support debt serviceability and mitigate stress, but dispersion in fundamentals will likely drive dispersion in ultimate outcomes. Dispersion will likely be amplified as recent recapitalization and refinancing activity comes to its ultimate conclusions.
- We see opportunities in hybrid capital—flexible financing solutions that can serve a range of situations – as well as in expanding portfolios to include real asset credit, directly-originated investment-grade credit, and asset finance.

OPPORTUNITIES – DEFUALT, DEBT SERVICE & DISPERSION

- Declining rates may paradoxically prove constructive to private credit, mitigating the supply/demand imbalance and normalizing spreads.
- An equilibrium between demand for public and private financing should arise, with companies choosing between lower cost of capital in public markets versus a more tailored capital structure and solution in private markets.
- Lower rates can support debt serviceability and mitigate stress, but dispersion in fundamentals will likely drive dispersion in ultimate outcomes.
- Dispersion will likely be amplified as recent recapitalization and refinancing activity comes to its ultimate conclusions.
- We see opportunities in hybrid capital—flexible financing solutions that can serve a range of situations.
- Investor interest in the asset class is growing and expanding to real asset credit, directly-originated investment-grade credit, and asset finance.

Source: Goldman Sachs Asset Management, January 2025. Performance results vary depending on the client's investment goals, objectives, and constraints. There can be no assurance that the same or similar results to those presented above can or will be achieved. There is no guarantee that objectives will be met. Actual returns are likely to vary. For discussion purposes only.

Private Markets – Real Estate

Observations and opportunities

OBSERVATIONS

- Financing costs have retreated from their recent peaks, mostly thanks to a downtick in both spreads and base rates. Overall, we expect lower rates to facilitate greater transaction activity, as lower cost of financing makes deal economics more attractive. This dynamic may have the most immediate impact in core / core-plus strategies, where the spread between the return on assets and the cost of debt is lower, but may ultimately benefit strategies across the risk-return spectrum.
- A rebound in transactions can help to quantify where "fair value" is. The adjustment process may prove painful to some assets; however, we view it as a necessary step on the way to broader market recovery and greater confidence in the asset class.
- The fundamental dynamics observed in real estate today are driven by the evolution of the market and secular trends around demographics, technology and the drive towards sustainability. Current market dynamics present opportunities to acquire select assets at attractive prices and grow net operating income through active management and accretive capital programs. There is also scope to develop, redevelop or reposition assets to cater to changing space demands.

OPPORTUNITIES

- Lower rates should facilitate transaction activity, most immediately in core/core-plus, given lower spread between return on assets and cost of debt.
- A rebound in transactions can help to quantify "fair value" – a process that may prove painful to some assets but necessary for broader market recovery and greater confidence in the asset class.
- We see attractive opportunities at intersection of secular trends and regional, sector, and asset-specific dynamics.
- US multifamily and industrial markets may see a better supply/demand balance as new construction pipelines are decreasing. Office bifurcation continues, with growing stress for lower quality assets.
- In Europe, there is a greater focus on uplifting assets and improving energy efficiency.
- In Japan, a confluence of macro tailwinds and ongoing structural changes have opened opportunities across logistics, hospitality, and residential.

Source: Goldman Sachs Asset Management, January 2025. Performance results vary depending on the client's investment goals, objectives, and constraints. There can be no assurance that the same or similar results to those presented above can or will be achieved. There is no guarantee that objectives will be met.. Actual returns are likely to vary. For discussion purposes only.

Private Markets – Infrastructure

Observations and opportunities

OBSERVATIONS

- Moderating inflation and heightened geopolitical issues present cash flow headwinds to assets whose revenue growth comes primarily from inflation sensitivity. Limited relief from the interest rate environment may further pressure core returns. Fundamental asset growth may become more critical to attractive upside generation.
- We see the middle market benefiting from a landscape that is being reconfigured by fundraising trends, offering an attractive balance of potential value creation from systematic operational initiatives and a wider array of exit strategies.
- We expect thematic opportunities to remain in focus, such as digital assets. With valuations heightened for many digital assets, careful asset selection is warranted.

OPPORTUNITIES

- As inflation moderates, we believe value-add strategies are better positioned with regard to fundamental asset growth than core/core-plus strategies, as the value-add business model derives more of its return from operational value creation initiatives.
- Fundraising is increasingly concentrated in the largest players, altering supply/demand dynamics in the asset class.
- Large cap players may experience greater competition to deploy capital.
- Midcap funds that can grow their investments can experience a more attractive exit backdrop, amplifying multiple expansion tailwinds.
- We expect secular trends – sustainability, technology, trade fragmentation, aging populations – to continue driving investment opportunities.
- Access points may bifurcate. Large core infrastructure assets could increasingly become the purview of evergreen structures; opportunistic assets may continue to be held primarily in drawdown funds, while value-add strategies can lend themselves to either structure.

Source: Goldman Sachs Asset Management, January 2025. Performance results vary depending on the client's investment goals, objectives, and constraints. There can be no assurance that the same or similar results to those presented above can or will be achieved. There is no guarantee that objectives will be met. Actual returns are likely to vary. For discussion purposes only.

Glossary

Additional Notes

Page 2 Notes: “Fed” refers to Federal Reserve. “GIR” refers to Goldman Sachs Global Investment Research. “GDP” refers to Gross Domestic Product. “Core PCE” refers to Personal Consumption Expenditures, excluding food and energy. “UST” refers to US Treasury.

Page 6 Notes: DM refers to Developed Markets. EM refers to Emerging Markets. Top Chart Notes: “APAC ex Jp” refers to the MXAPJ index, “Japan” refers to the TOPIX index, “US” refers to the S&P 500 index, “Global” refers to the MXWD index, and “Europe” refers to the STOXX 600 index.

Page 9 Notes: Right Chart shows the 10-Year US Treasury Note’s 20-year relative percentile across three characteristics on November 9, 2020 and November 9, 2023. The first characteristic is the security's yield. The second characteristic is the illustrative distribution of total returns if the 10-Year interest rate moves 1pp higher and 1pp lower. The illustrative total return in the case of a 1pp increase in the interest rate is calculated by adding the 10-Year US Treasury Note's yield to its respective modified duration price impact of a 1pp increase in interest rates. The illustrative total return in the case of a 1pp decrease in the interest rate is calculated by adding the 10-Year US Treasury Note's yield to its respective modified duration price impact of a 1pp decrease in interest rates. The distribution of total returns is calculated by dividing those two figures. The third characteristic is the ability of a 10-Year US Treasury Note to hedge an equity market drawdown via price appreciation assuming interest rates fall to 0%. This is calculated by multiplying the yield of a 10-Year US Treasury Note by its modified duration. Goldman Sachs Asset Management’s and Bloomberg’s products are not related, and Bloomberg has not endorsed either Goldman Sachs Asset Management or its products.

Page 11 Notes: “Tax alpha” refers to the return of a portfolio conducting tax-loss harvesting less the return of the portfolio not conducting tax-loss harvesting. “Alpha” refers to risk adjusted excess returns. “SMA” refers to separately managed account. “Magnificent 7” refers to NVDA, MSFT, AMZN, META, TSLA, AAPL, AND GOOG. “Correlation” refers to the amount by which two investments vary relative to each other.

Equities

The S&P 500 Index is the Standard & Poor’s 500 Composite Stock Prices Index of 500 stocks, an unmanaged index of common stock prices. The index figures do not reflect any deduction for fees, expenses or taxes. It is not possible to invest directly in an unmanaged index.

The Euro Stoxx 600 Index represents the performance of 600 publicly-traded companies based in one of 18 EU countries.

The TOPIX Index is a free-float adjusted market capitalization-weighted index that is calculated based on all the domestic common stocks listed on the Tokyo Stock Exchange First Section.

The MSCI Asia Pacific ex-Japan Index captures large and mid cap representation across 4 of 5 Developed Markets countries (ex Japan) and 9 Emerging Markets countries in the Asia Pacific region.

The MSCI World Index captures large and mid-cap representation across 23 Developed Markets (DM) countries*. With 1,397 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

Fixed Income

The 10-Year Treasury is a US Treasury debt obligation that has a maturity of 10 years.

The Bloomberg U.S. Aggregate Bond Index measures the performance of investment grade, U.S. dollar-denominated, fixed rate taxable bond market, including Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS, and CMBS.

The Bloomberg Municipal Bond Index tracks the market for tax-exempt municipal securities in the US.

Other

Euro Area refers to the Eurozone. The Eurozone is comprised of Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

Volatility is a measure of variation of a financial instrument’s price.

Risk Considerations and General Disclosures

Risk Considerations

Equity securities are more volatile than fixed income securities and subject to greater risks. Small and mid-sized company stocks involve greater risks than those customarily associated with larger companies.

Investments in foreign securities entail special risks such as currency, political, economic, and market risks. These risks are heightened in emerging markets.

Emerging markets securities may be less liquid and more volatile and are subject to a number of additional risks, including but not limited to currency fluctuations and political instability.

An investment in real estate securities is subject to greater price volatility and the special risks associated with direct ownership of real estate.

Investments in fixed-income securities are subject to credit and interest rate risks. Bond prices fluctuate inversely to changes in interest rates. Therefore, a general rise in interest rates can result in the decline in the bond's price. Credit risk is the risk that an issuer will default on payments of interest and principal. This risk is higher when investing in high yield bonds, also known as junk bonds, which have lower ratings and are subject to greater volatility. All fixed income investments may be worth less than their original cost upon redemption or maturity.

Buy-write strategies are subject to market risk, which means that the value of the securities in which it invests may go up or down in response to the prospects of individual companies, particular sectors and/or general economic conditions. They are also subject to the risks associated with writing (selling) call options, which limits the opportunity to profit from an increase in the market value of stocks in exchange for up-front cash at the time of selling the call option. In a rising market, the strategy could significantly underperform the market, and the options strategies may not fully protect it against declines in the value of the market.

Bonds are subject to interest rate, price and credit risks. Prices tend to be inversely affected by changes in interest rates.

Although Treasuries are considered free from credit risk, they are subject to interest rate risk, which may cause the underlying value of the security to fluctuate. Income from municipal securities is generally free from federal taxes and state taxes for residents of the issuing state. While the interest income is tax-free, capital gains, if any, will be subject to taxes. Income for some investors may be subject to the federal Alternative Minimum Tax (AMT).

Investments in commodities may be affected by changes in overall market movements, commodity index volatility, changes in interest rates or factors affecting a particular industry or commodity.

The currency market affords investors a substantial degree of leverage. This leverage presents the potential for substantial profits but also entails a high degree of risk including the risk that losses may be similarly substantial. Such transactions are considered suitable only for investors who are experienced in transactions of that kind. Currency fluctuations will also affect the value of an investment.

An investment in private credit and private equities is not suitable for all investors. Investors should carefully review and consider the potential investments, risks, charges, and expenses of private equity before investing. They are speculative, highly illiquid, involve a high degree of risk, have high fees and expenses that could reduce returns, and subject to the possibility of partial or total loss of capital. They are, therefore, intended for experienced and sophisticated long-term investors who can accept such risks.

Private equity and private credit investments are speculative, highly illiquid, involve a high degree of risk, have high fees and expenses that could reduce returns, and subject to the possibility of partial or total loss of fund capital; they are, therefore, intended for experienced and sophisticated long-term investors who can accept such risks.

An investment in Real Estate Investment Trusts ("REITs") involves certain unique risks in addition to those risks associated with investing in the real estate industry in general. REITs whose underlying properties are focused in a particular industry or geographic region are also subject to risks affecting such industries and regions. The securities of REITs involve greater risks than those associated with larger, more established companies and may be subject to more abrupt or erratic price movements because of interest rate changes, economic conditions, tax code adjustments, and other factors.

Infrastructure investments are susceptible to various factors that may negatively impact their businesses or operations, including regulatory compliance, rising interest costs in connection with capital construction, governmental constraints that impact publicly funded projects, the effects of general economic conditions, increased competition, commodity costs, energy policies, unfavorable tax laws or accounting policies and high leverage.

The above are not an exhaustive list of potential risks. There may be additional risks that are not currently foreseen or considered.

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Index Benchmarks

Indices are unmanaged. The figures for the index reflect the reinvestment of all income or dividends, as applicable, but do not reflect the deduction of any fees or expenses which would reduce returns. Investors cannot invest directly in indices.

The indices referenced herein have been selected because they are well known, easily recognized by investors, and reflect those indices that the Investment Manager believes, in part based on industry practice, provide a suitable benchmark against which to evaluate the investment or broader market described herein.

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Date of First Use: February 14, 2025. Compliance Code: 411931-OTU-2204890

School Employees Retirement System

Memo

To: SERS Retirement Board

From: Richard Stensrud, Executive Director

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

Date: February 10, 2024

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, 2024 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.

The report reviews SERS amortization policy in comparison to alternative policies such as layered amortization.

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.

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 marginally since the last risk report.

I hope this information is helpful.

SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO

Risk Analysis Report

Prepared as of June 30, 2024

CavMac
Actuarial Consulting Services

February 7, 2025

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 actuarial-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, 2024 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, 2024 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.

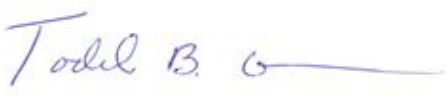
The risk to the Health Care Fund is outside the scope of this report.

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.

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

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SECTION 1 – OVERVIEW

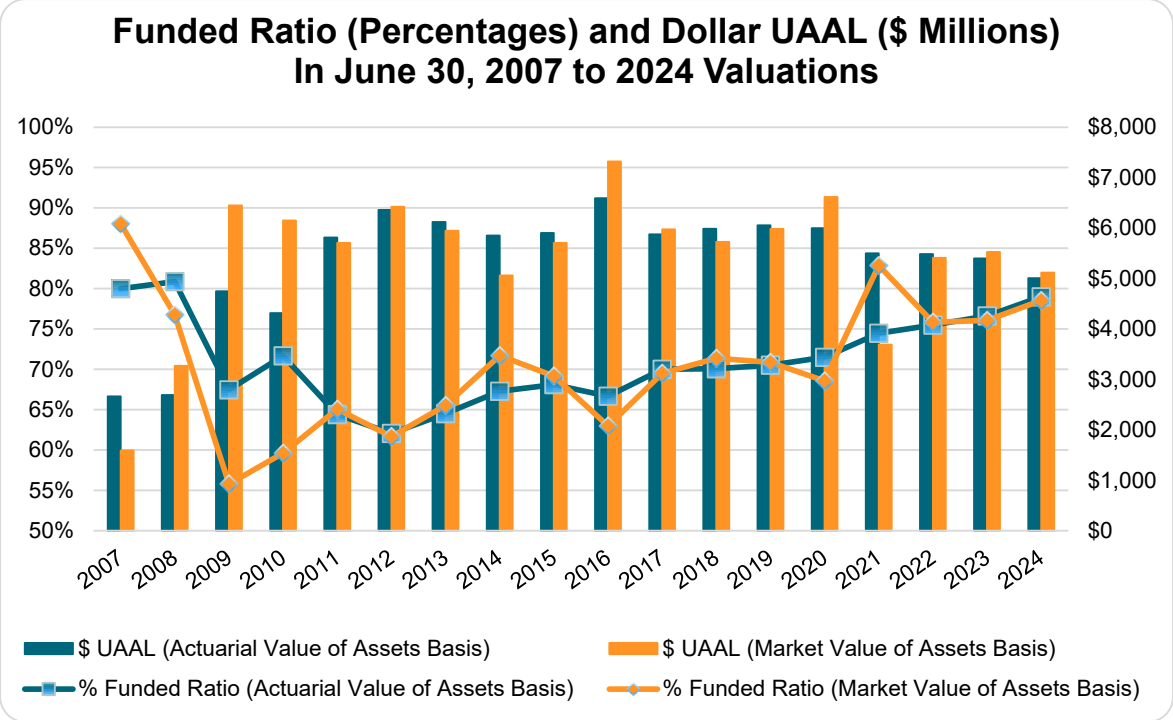
Actuarial Standard of Practice Number 51 (ASOP 51)

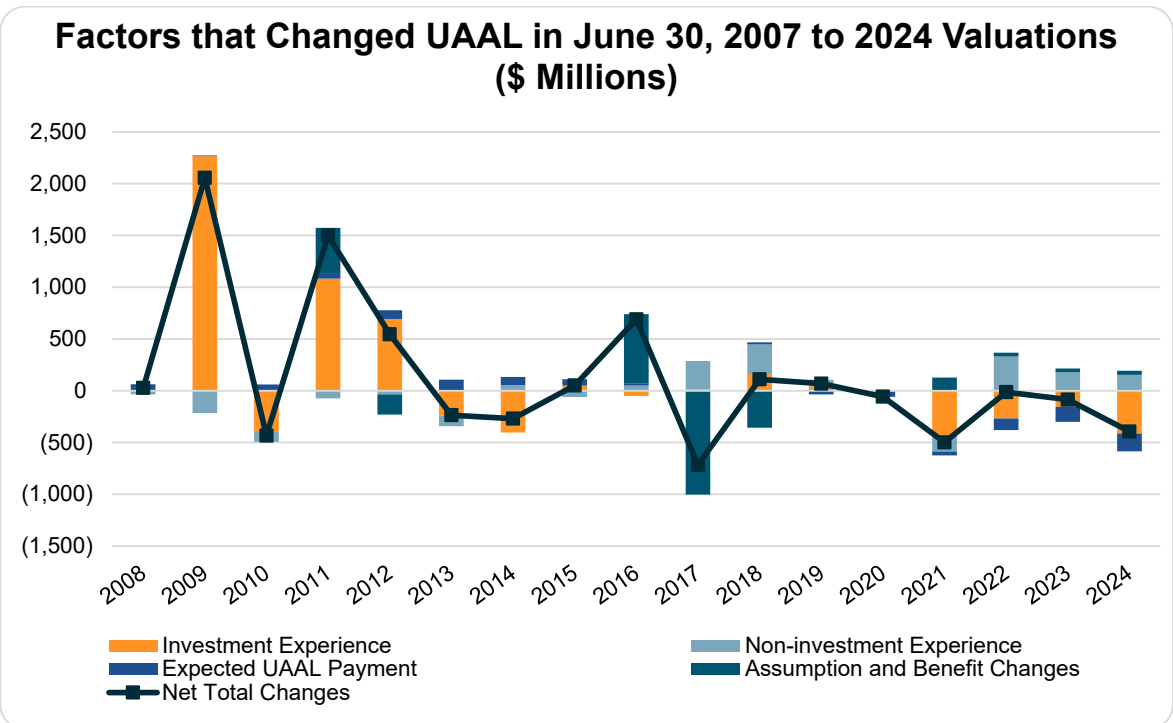
Actuarial Standards of Practice (ASOPs) are issued by the Actuarial Standards Board and are binding for credentialed actuaries practicing in the United States. These standards generally identify what the actuary should consider, document and disclose when performing an actuarial assignment. ASOP 51, *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 18 valuations from June 30, 2007 to June 30, 2024 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.


Funded Ratio (Percentages) and Dollar UAAL ($ Millions)
In June 30, 2007 to 2024 Valuations
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
$8,000
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
$ UAAL (Actuarial Value of Assets Basis)
$ UAAL (Market Value of Assets Basis)
% Funded Ratio (Actuarial Value of Assets Basis)
% Funded Ratio (Market Value of Assets Basis)


Factors that Changed UAAL in June 30, 2007 to 2024 Valuations
($ Millions)
2,500
2,000
1,500
1,000
500
0
(500)
(1,000)
(1,500)
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Investment Experience
Non-investment Experience
Expected UAAL Payment
Assumption and Benefit Changes
Net Total Changes

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.

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 a slight improvement in the risk profile of SERS since the previous risk study was performed. The major causes attributing to this improvement are:

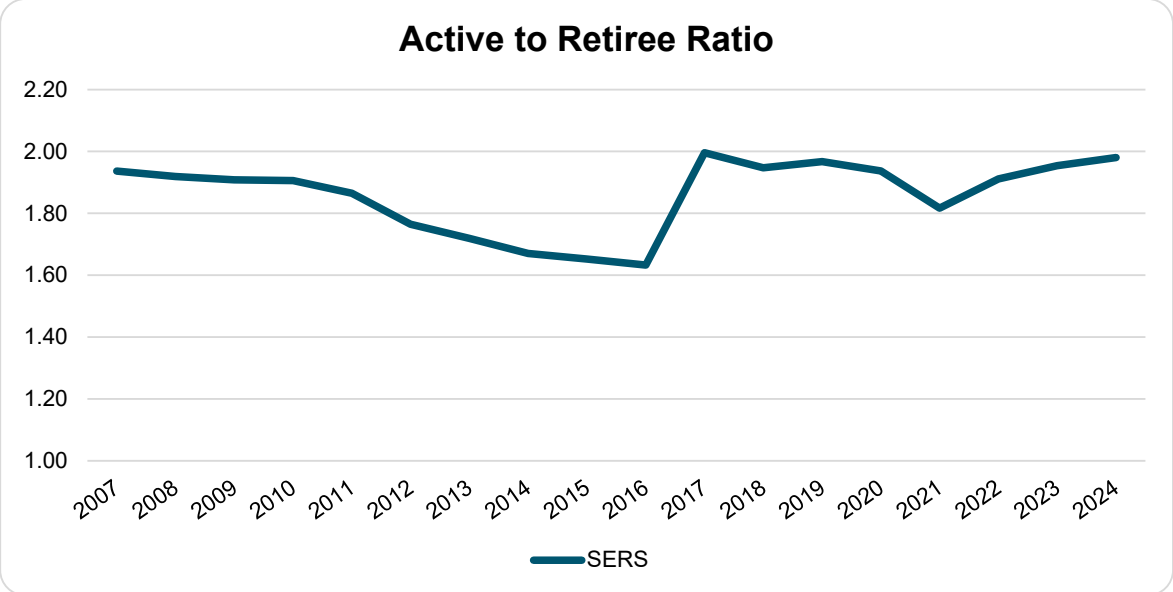
- Investment performance since June 30, 2023 has increased the market value of assets by $1,146 million.
- Employer and member contributions are tied to covered payroll. As covered payroll increases, contributions to SERS increase. Since June 30, 2023, covered payroll increased by 5.78% compared to the assumed rate of 1.75%.
- The Board adopted funding policy has accelerated the funding of Basic Benefits by approximately $922 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

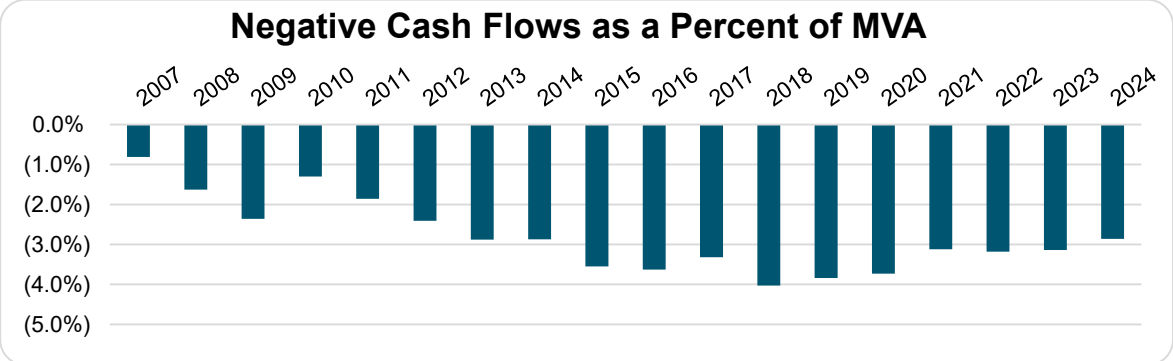
As the System's Market Value of Assets increases, market gains and losses due to over or under-performance as compared to the expected return generate impacts to the unfunded liability in dollar amount that are generally a significant percentage of covered payroll. To Illustrate, as of the 2024 measures, a 3% market rate of return (4% below the 7% assumption) would produce an asset loss in dollar amount approximately equaling 16.44% of payroll (4.11 times 4%). As asset gains and losses are smoothed 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. While any negative cash flow will produce such a result, it is typically a negative cash flow of more than 4% of market value that causes significant concerns.

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)	(3.73%)
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%)

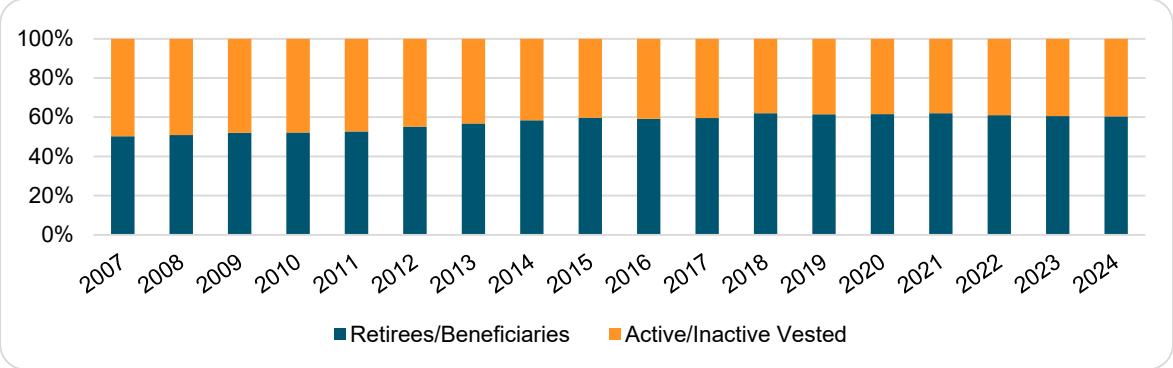


SECTION 2 – MATURITY MEASURES

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. The retirement of the remaining baby boomers over the next 6 years is expected to further exacerbate the aging of the retirement system population. 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 costs.

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



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

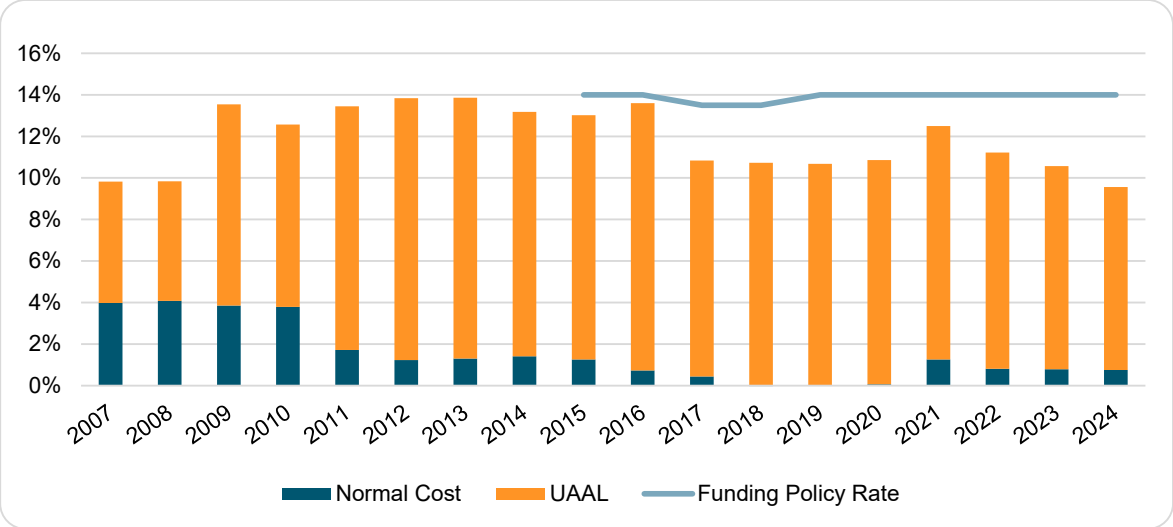
The statute sets a contribution cap of 24% of payroll: 14% from employers and 10% from employees. Employer contributions in excess of those required to support the basic benefits may be allocated to retiree health care funding.

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.

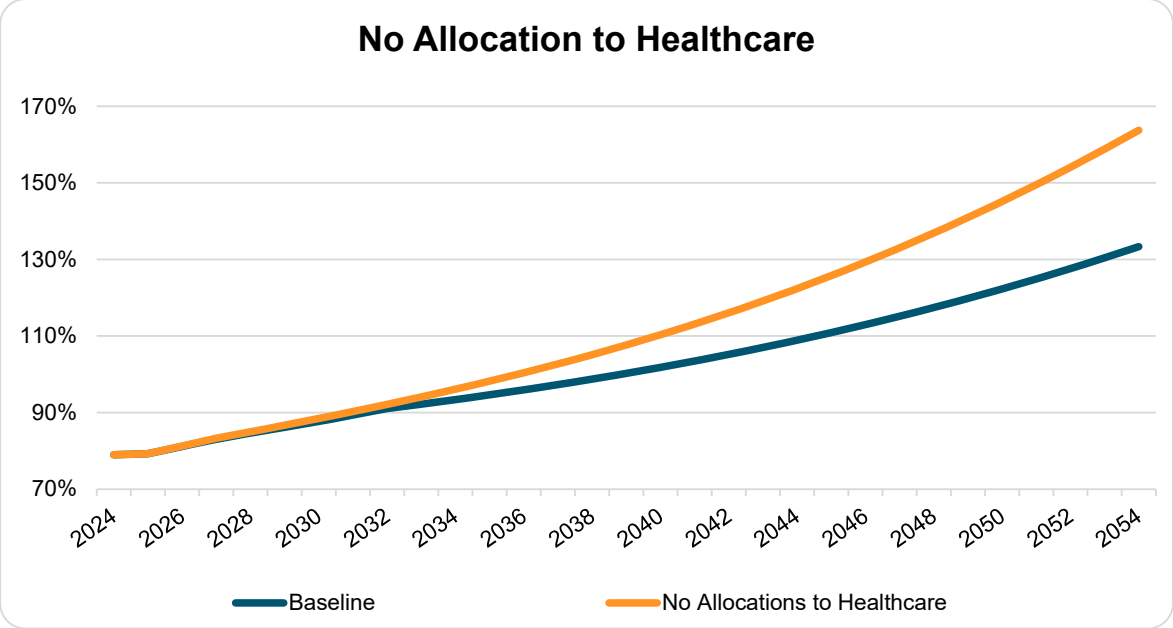
The funding policy establishes a minimum level of funding for basic benefits, however, the Board retains the discretion to allocate additional funding. If the funded ratio is less than 70%, the entire 14% employers' contribution shall be allocated to SERS' basic benefits. If the funded ratio is 70% but 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 $922 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:



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 133% to 164%.



(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;
(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, 2024 is 20 years. The amortization payments are calculated as a level percentage of payroll assuming payroll will grow at 1.75%.

In addition, we have reviewed an alternative 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, 2024. 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 actuarially 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. In our opinion, layered amortization is not suitable for SERS, since it is funded through fixed contributions. 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. 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.

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.

(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 current payroll growth assumption for SERS is 1.75% per year which implicitly assumes that the number of active members remains stable over time.

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.

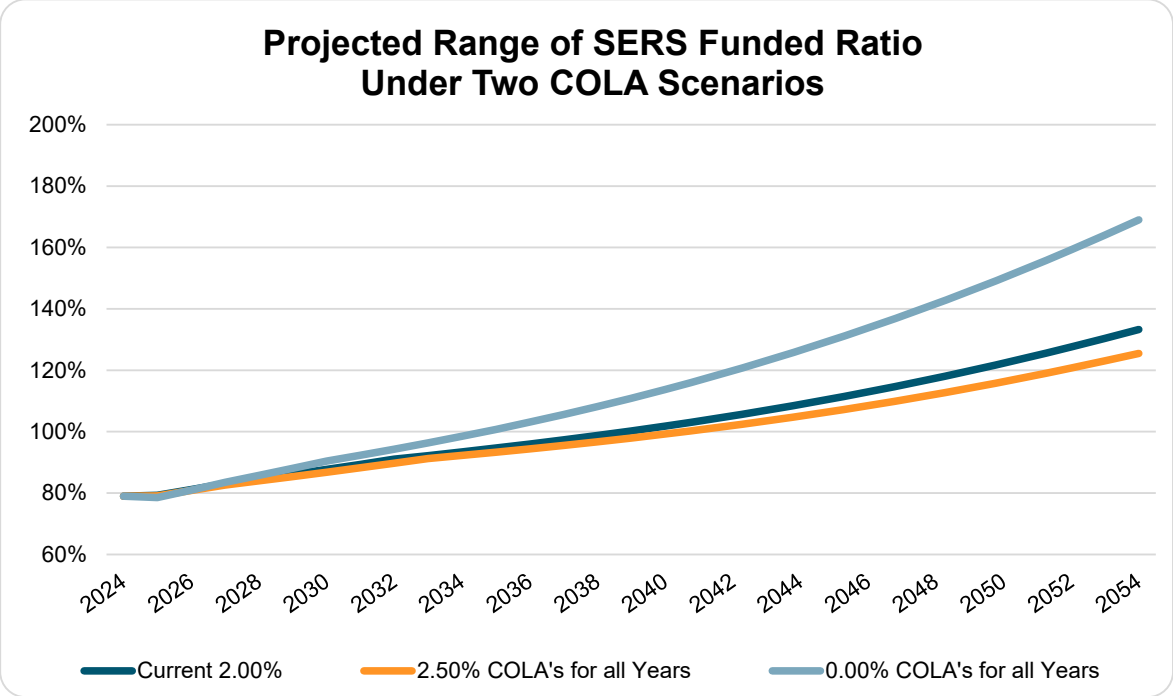
(4) Cost of Living Adjustments

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 where 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 126% to 169%. If future COLA's are equal to the assumed rate of 2.00%, the funded ratio is projected to be 133%.


Projected Range of SERS Funded Ratio
Under Two COLA Scenarios
200%
180%
160%
140%
120%
100%
80%
60%
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042
2044
2046
2048
2050
2052
2054
Current 2.00%
2.50% COLA's for all Years
0.00% COLA's for all Years

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.

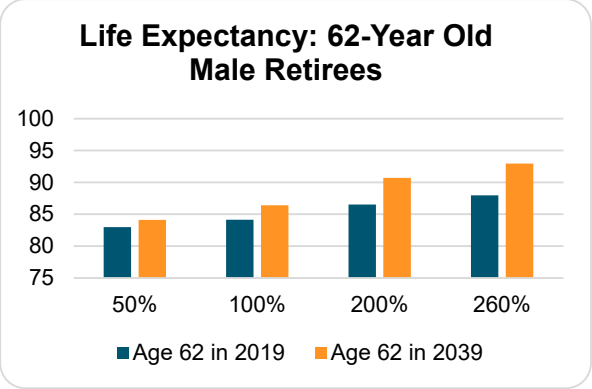
Demographic Risks

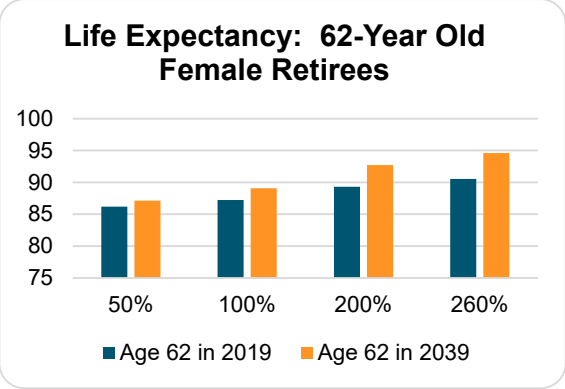
Demographic risks are those arising from the actual behavior of members differing from that expected based on the actuarial assumptions. These changes may arise when a significant portion of members is influenced to take some particular action due to employer or governmental actions, when there are improvements 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 also 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.



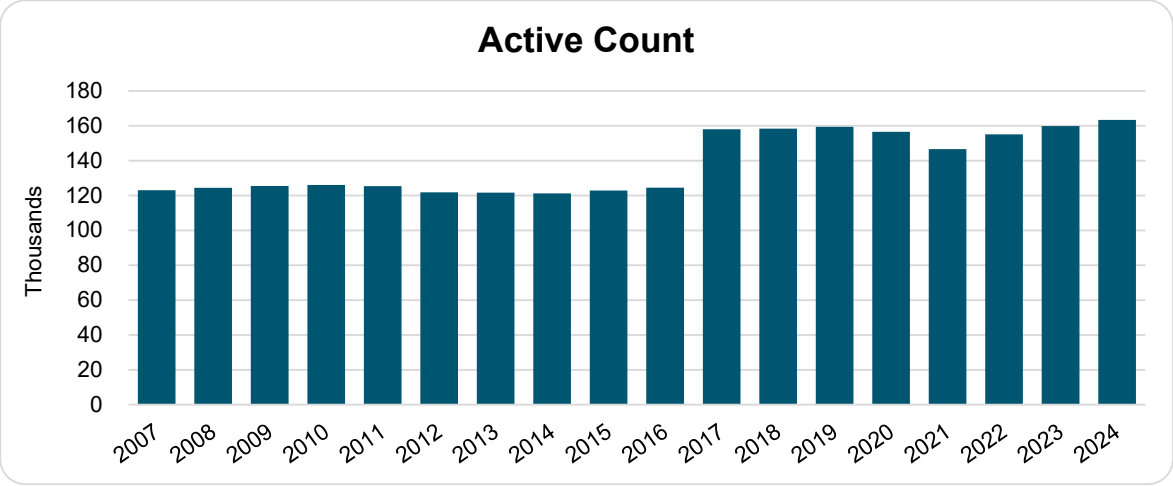


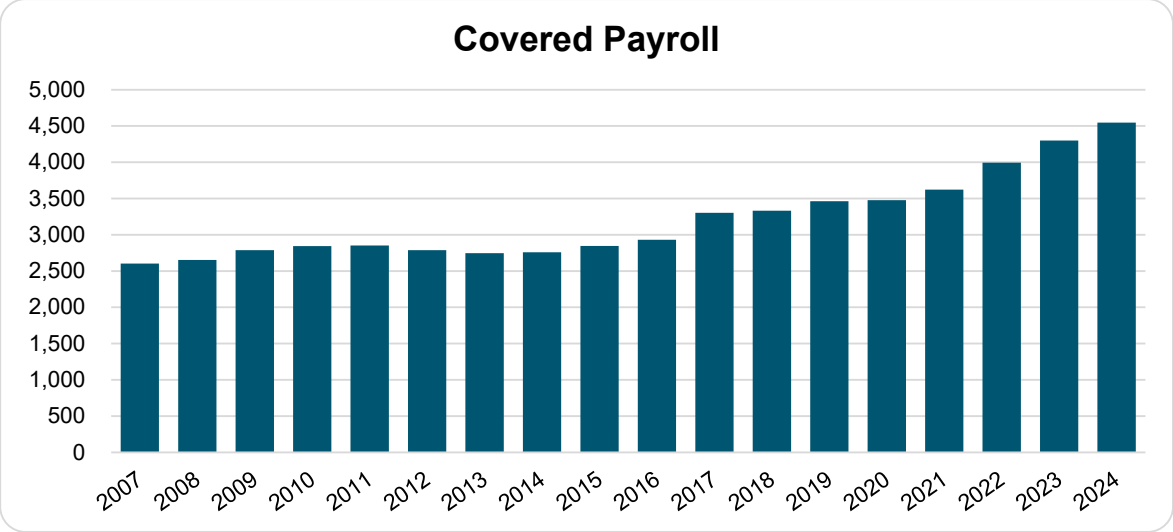
In performing valuations, we do not directly use life expectancy values, but rather apply the mortality rates at each age directly. For 2025, if the mortality improvement scale were cut in half (to a 0.5% per year improvement), the liabilities would decrease by about 1% at age 62, while if the mortality 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.

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:



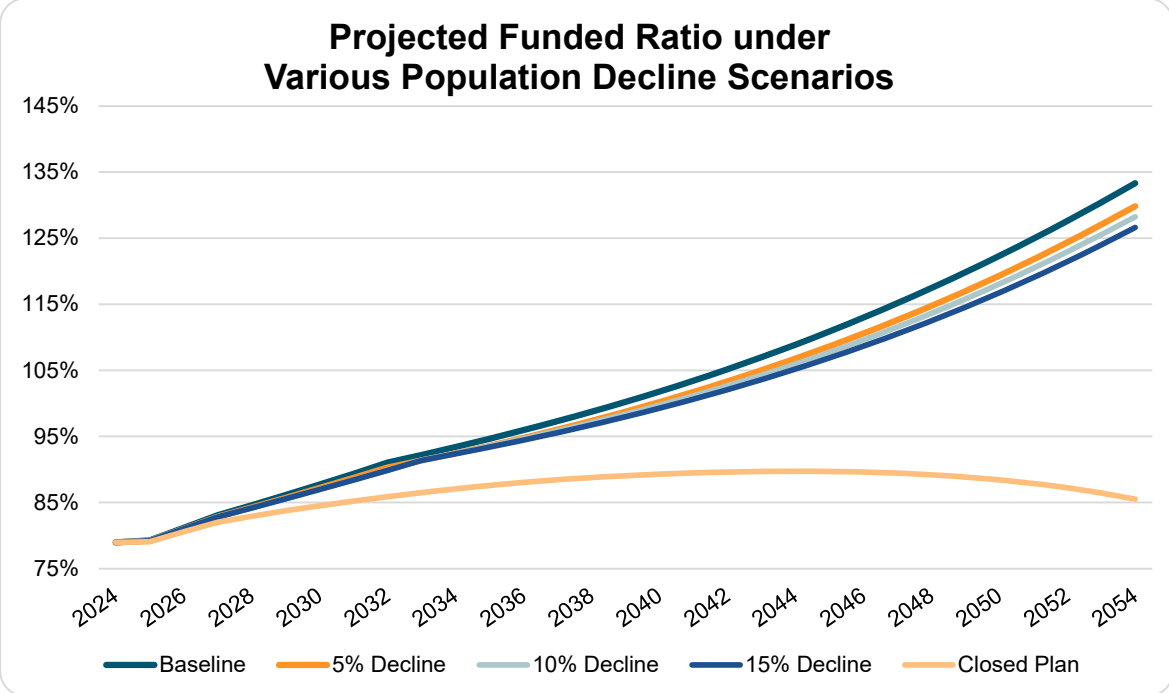


A decline in SERS' active membership could occur for a number of reasons. If the local school systems experience severe and prolonged fiscal challenges, the number of school employees might be reduced. Alternatively, if there is a decline in the student population, it could reduce the need to maintain 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.

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, closing the SERS to new entrants represents a significant risk. If these population scenarios were combined with investment returns that are less than the assumed rate of return of 7.00% the affects would be magnified.



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.

Investment Return Risk

Investment risk volatility is the greatest risk facing SERS, as well as most public retirement systems today. In 2024 the average yield on the 10-year treasury was 4.21%. Compared to the current assumed rate of return of 7.00%, the risk premium is 2.79%. 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.

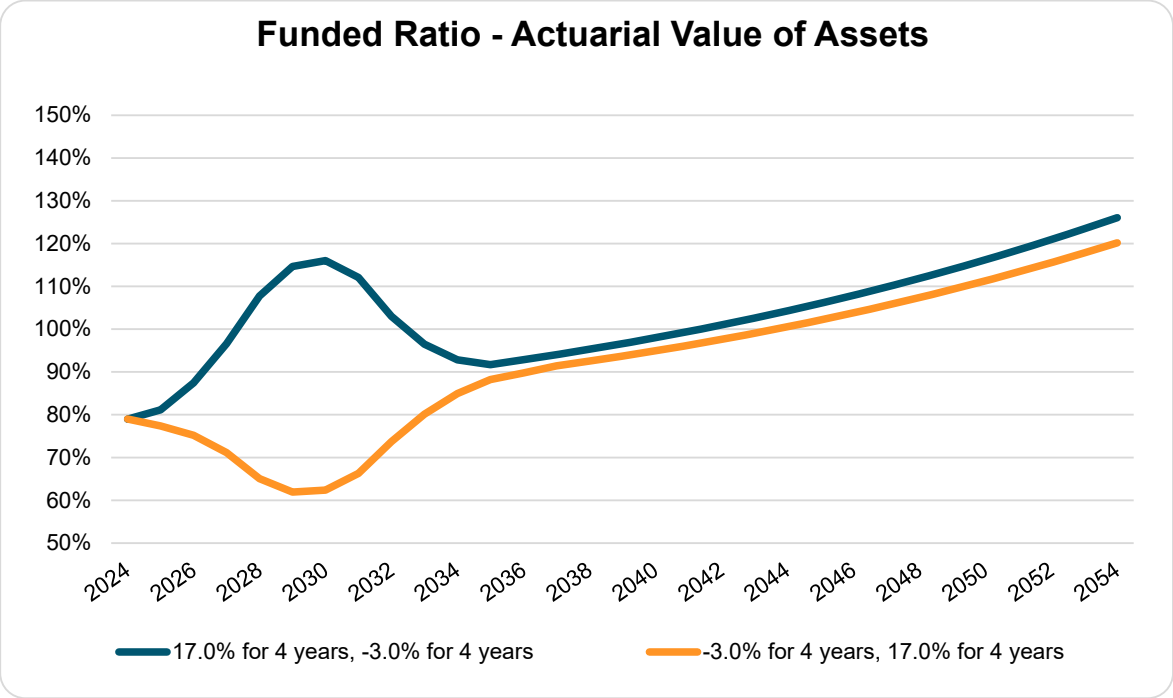
In order to understand the impact of investment volatility, we present a sequence of projections, based on the model prepared for SERS as part of the valuation each year. These "deterministic" projections use one or more selected scenarios to help illustrate certain key concepts. Following these projections, 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 final 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.

The following graph shows the results:

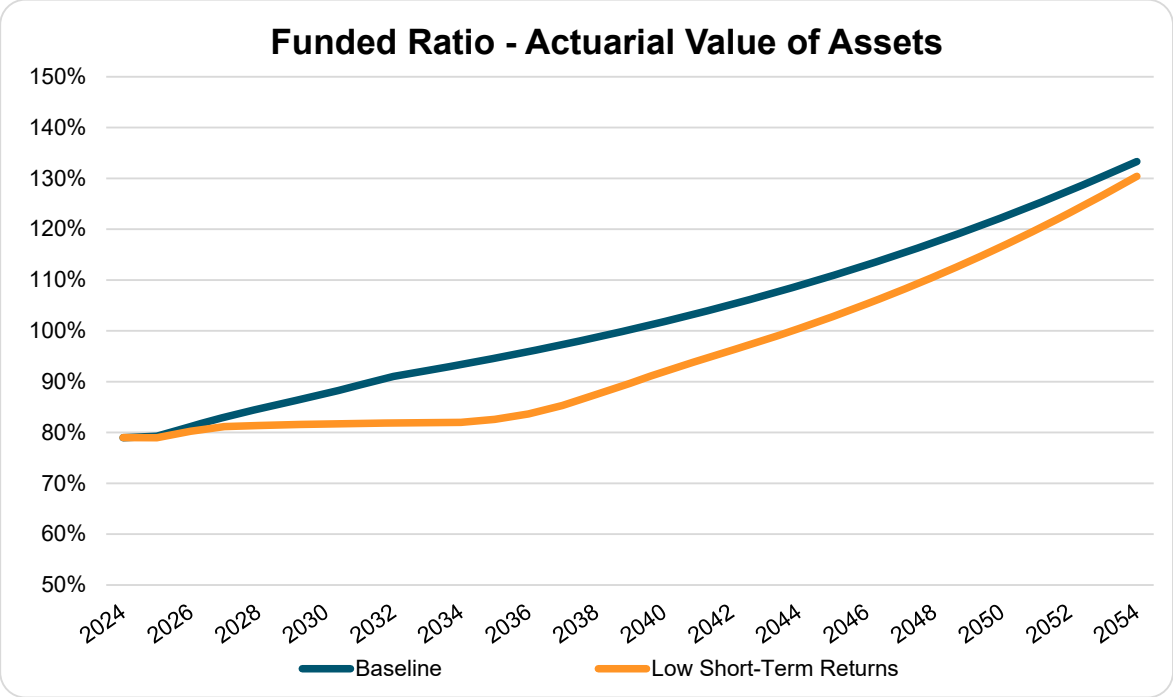


At the end of the projection, the high return followed by low return scenario has a funded ratio of 126%, while the low return followed by a high return is 120% funded. The order of the returns leads to a $2.6 billion dollar difference in market value ($55.8 billion vs. $53.2 billion). While the scenarios displayed here are artificial, they do illustrate that the return order matters.

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. In particular, we want to examine the scenario, that returns will be 5.5% for the next 10 years, and 7.75% thereafter. It should be noted that such an assumption is not inconsistent with the 7.0% long-term rate of return currently used for the SERS valuation. The difference is really a variant of the prior discussion on order of returns: How does a scenario that has lower returns followed by higher returns compare with a scenario that has the (approximately) average returns for all years?

The following graphs shows the impact of low returns on the funded ratio SERS. In each case, the scenario (5.5% for 10 years, 7.75% thereafter) is compared with the baseline scenario of 7.0% for all years.



In this scenario, the low returns for the next 10 years cause the funded ratio to remain constant until 2034, after which the funded ratio begins to improve. In 2036, the gap between the two projections is greatest, reaching a 12.3% difference (83.7% funded vs. 96.0% funded, reflecting a UAAL difference of $3.8 billion). Ultimately, this difference is reduced as the higher investment returns, result in improved funded ratio.

While this scenario above will not happen exactly as modeled, if the average returns over the next 10 years are around 5.5% and then the average returns increase to around 7.6%, similar patterns as these will emerge. It should be stressed, however, that this is only one plausible scenario and there is not universal consensus on return expectations. Please note, this represents a slight improvement from the previous study.

Risk of Shock in a Single Year

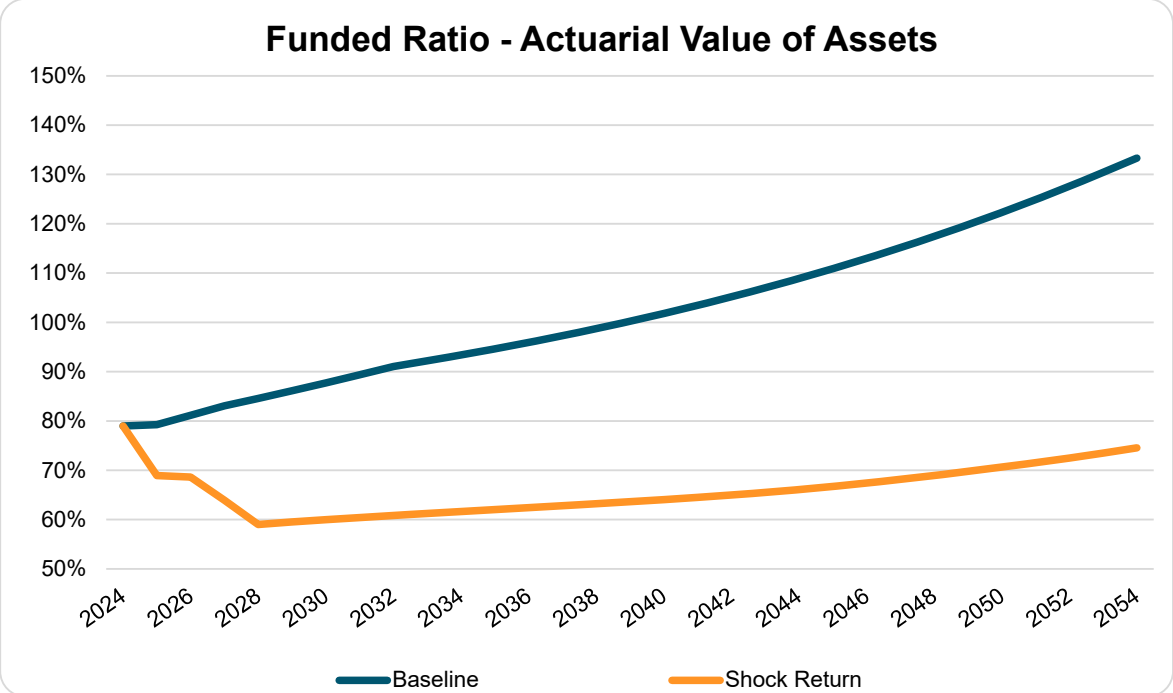
From late 2007 through early 2009, the financial markets crashed both in the U.S. and abroad resulting in the most impactful loss due to investment return ever experienced by SERS. The return on the market value of assets for FY 2009 was -22.9% and this single year dropped the funded status on a market 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 2024, 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.

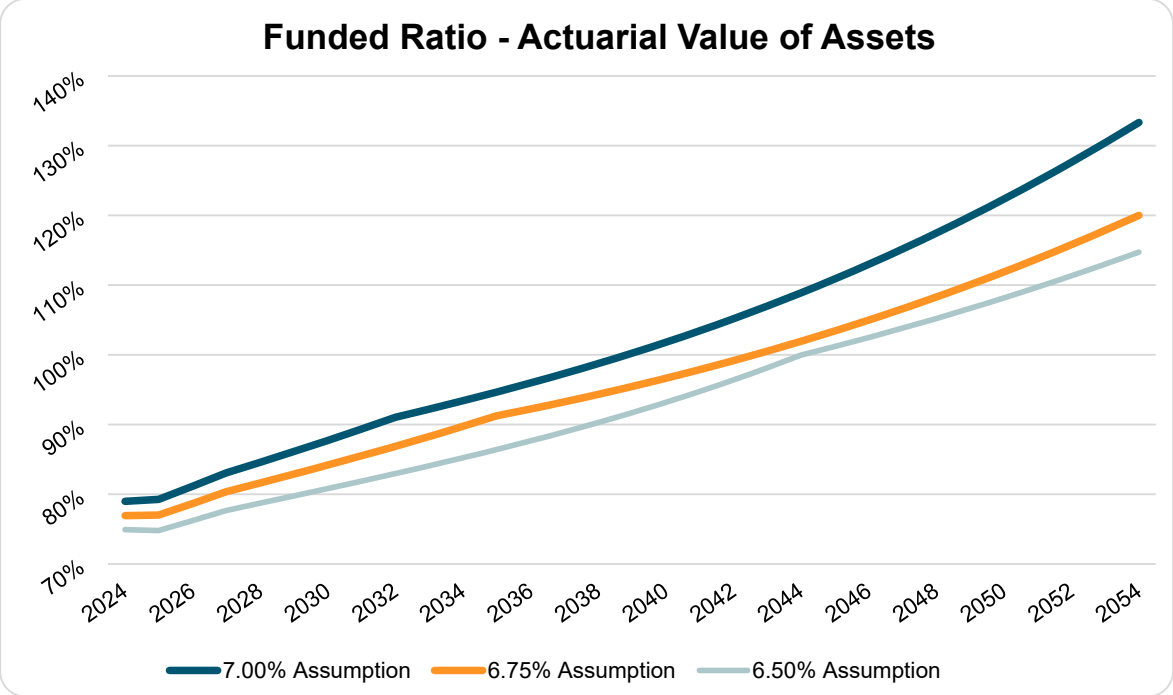
Please note, the graph below is a slight improvement from the previous study when the shock return led to an ultimate funded ratio of 61% compared to 75% in this study.



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 initially, but remains constant throughout the projection period and then begins to improve at the end of the projection period.

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, 2024 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.

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, in reality, 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										
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
5.00%	79%	79%	80%	81%	80%	80%	80%	79%	79%	79%	78%
5.25%	79%	79%	80%	81%	81%	81%	81%	81%	80%	80%	80%
5.50%	79%	79%	80%	81%	81%	82%	82%	82%	82%	82%	82%
5.75%	79%	79%	80%	81%	82%	82%	83%	83%	83%	84%	84%
6.00%	79%	79%	81%	82%	82%	83%	84%	84%	85%	85%	86%
6.25%	79%	79%	81%	82%	83%	84%	85%	86%	86%	87%	88%
6.50%	79%	79%	81%	82%	83%	85%	86%	87%	88%	89%	90%
6.75%	79%	79%	81%	83%	84%	85%	87%	88%	89%	91%	92%
7.00%	79%	79%	81%	83%	85%	86%	88%	89%	91%	92%	93%
7.25%	79%	79%	81%	83%	85%	87%	89%	91%	92%	93%	95%
7.50%	79%	79%	81%	84%	86%	88%	90%	92%	94%	95%	97%
7.75%	79%	79%	82%	84%	86%	88%	91%	93%	95%	97%	99%
8.00%	79%	79%	82%	84%	87%	89%	92%	94%	96%	99%	101%

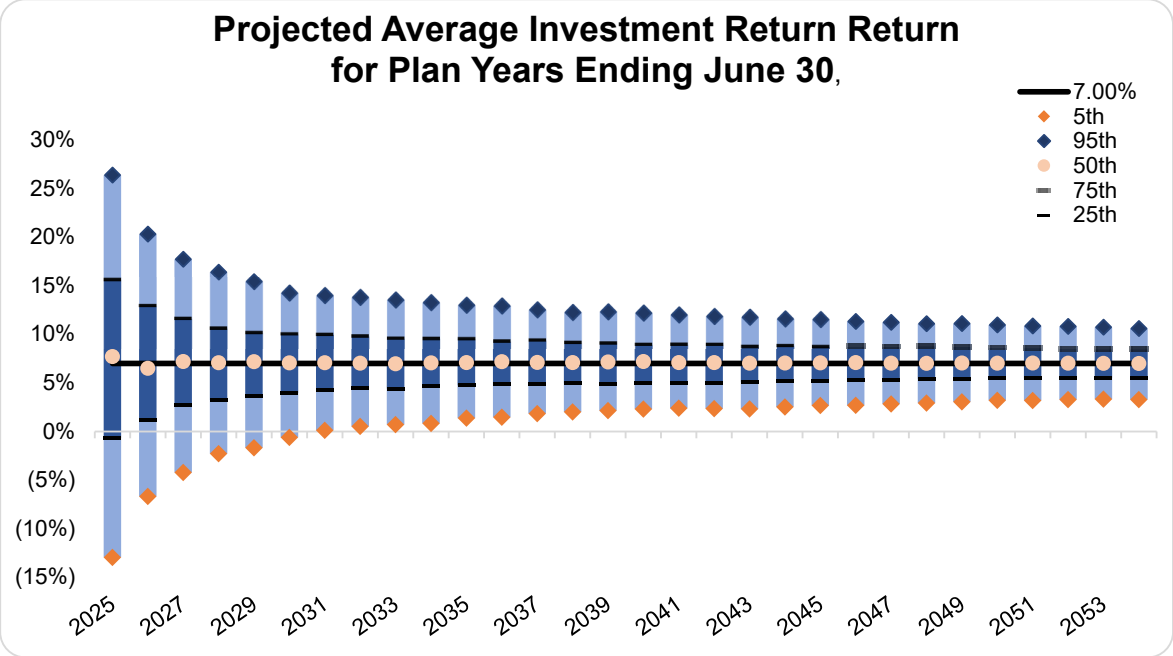
The yellow that predominates the left side of the charts indicates that the system is starting from a position that is comparatively in the middle of the outcomes. Higher returns lead to higher funded ratios, indicated by the green color in the lower right, while lower returns lead to lower funded ratios,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

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 50th percentile compound average investment return over the next 30 years is 7.00%.



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.

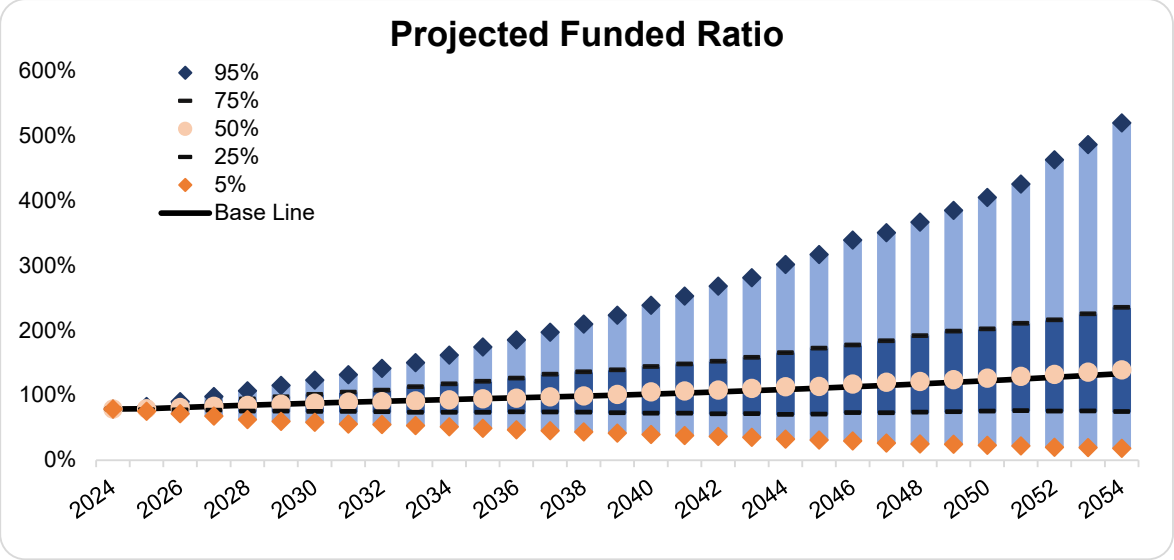
	Ratio <40%	Ratio <50%	Ratio <60%	Ratio <70%	Ratio <80%
2024 – 2029	0%	0%	2%	7%	52%
2024 – 2034	0%	2%	5%	12%	43%
2024 – 2039	1%	3%	7%	15%	39%

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 7% chance that the funded ratio will decline below 60% over the next 15 years, and about a 15% 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.

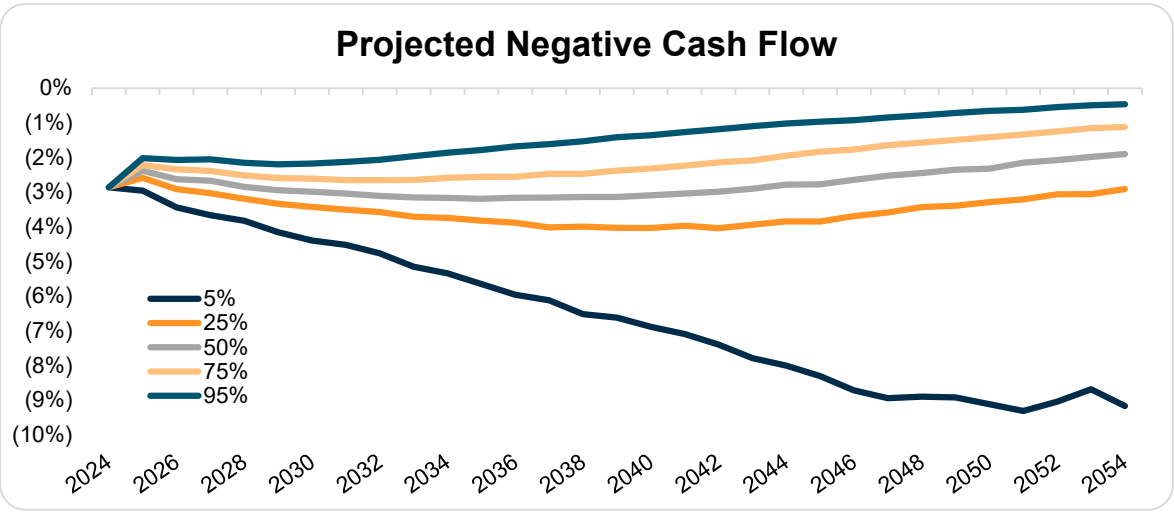
Distributions of Outcomes

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 25th and 75th percentiles, or the middle 50% of results. A black line in the middle of the blue portion indicates the median (50th percentile) result. The lighter blue portion of the bars extend to show the 5th and 95th percentile ranges.



This graph indicates that in 10 years, the middle 75% of possible outcomes are between 74% and 118% funded. There is a 5% chance of being more than 162% funded, and a 5% chance of being less than 52% funded. Of course, should these less likely events occur, changes would mostly 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, however, excessive negative cash flow can disrupt the optimal investment strategy, reducing long-term growth potential.



The median negative cash flow tends to -3.19%, while the 25th percentile tends to -4.00% over the next 11 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.

School Employees Retirement System of Ohio
Risk Assessment as of June 30, 2024

Todd Green, ASA, EA, FCA, MAAA

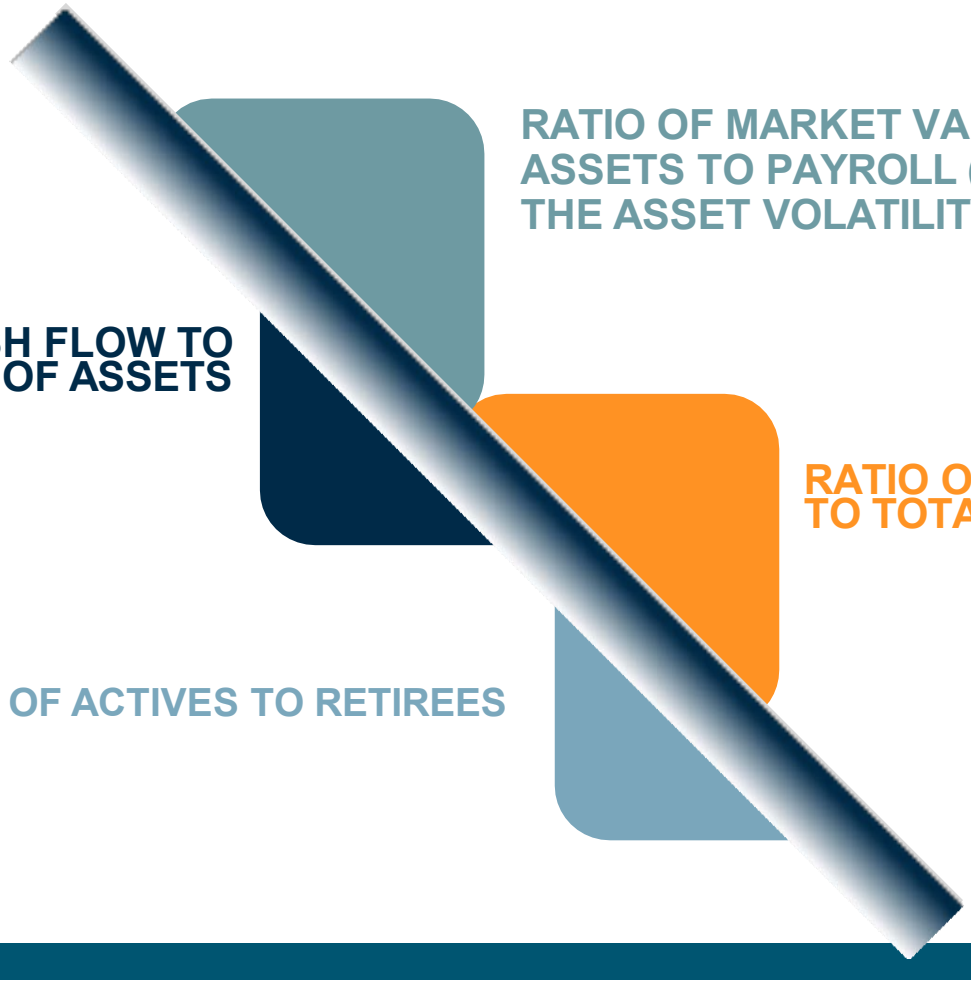
CavMac
Actuarial Consulting Services

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	• Potential that mortality 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



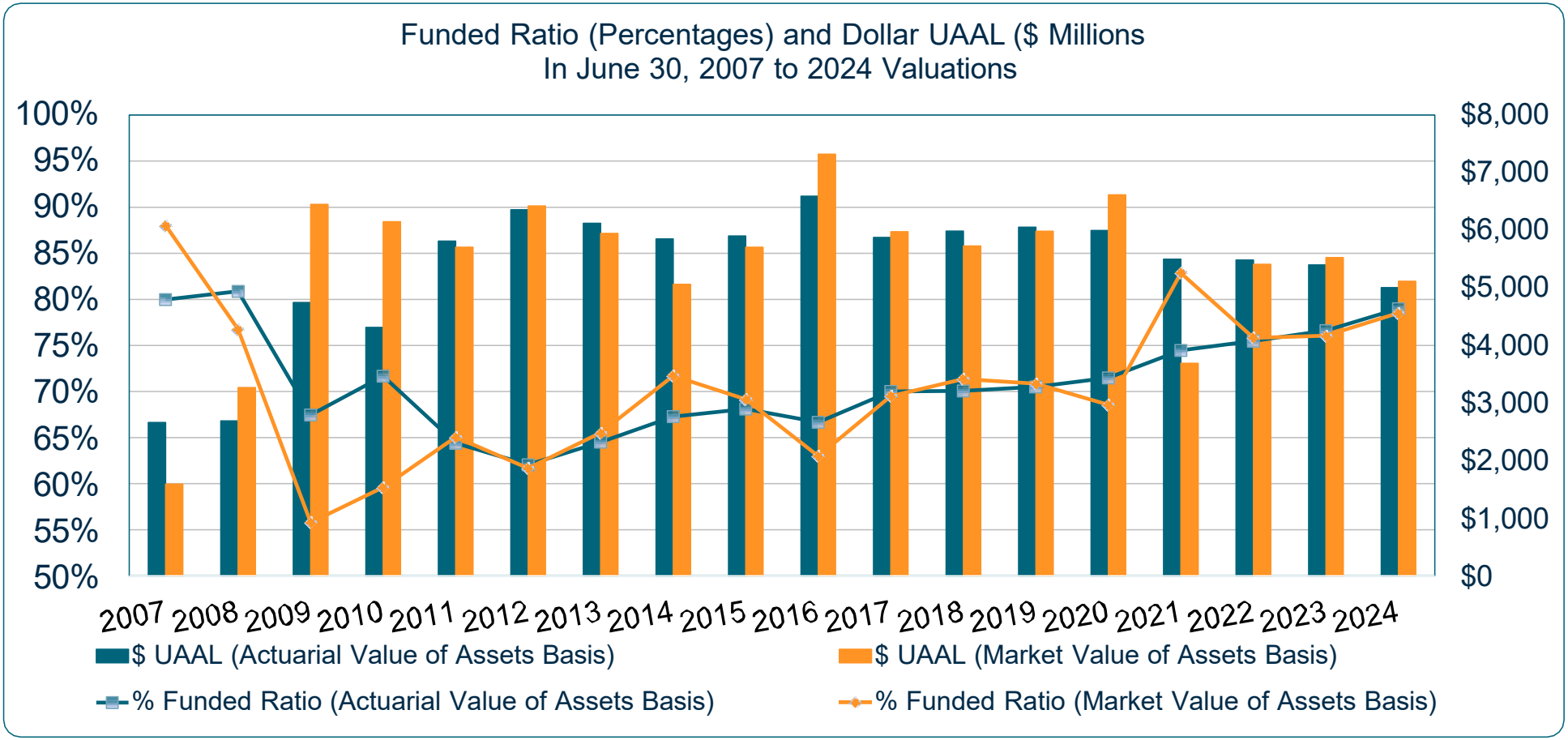
RATIO OF MARKET VALUE OF ASSETS TO PAYROLL (CALLED THE ASSET VOLATILITY RATIO)

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

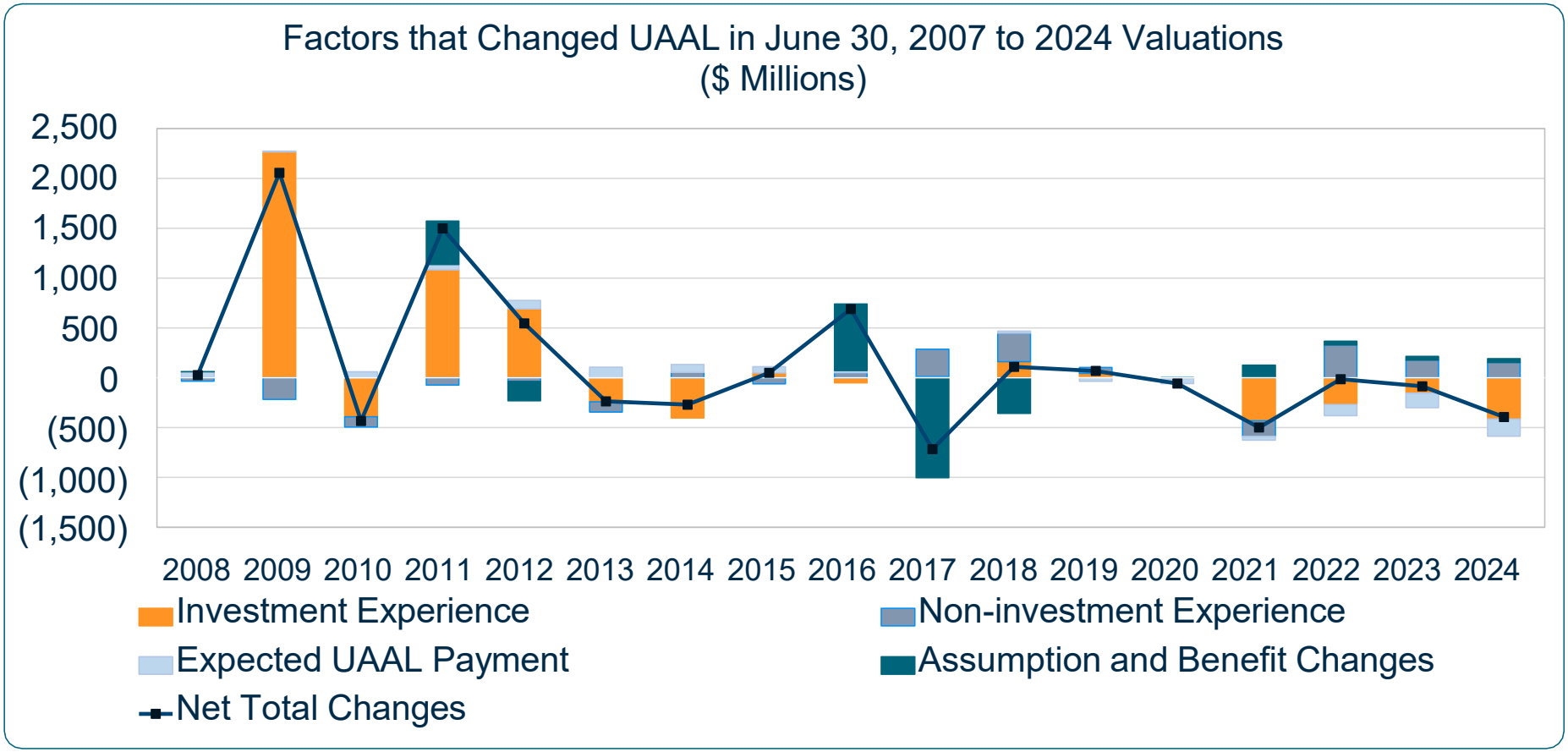
RATIO OF RETIRED LIABILITY TO TOTAL LIABILITY

RATIO OF ACTIVES TO RETIREES

Experience Look-Back



Experience Look-Back



Qualitative Assessment

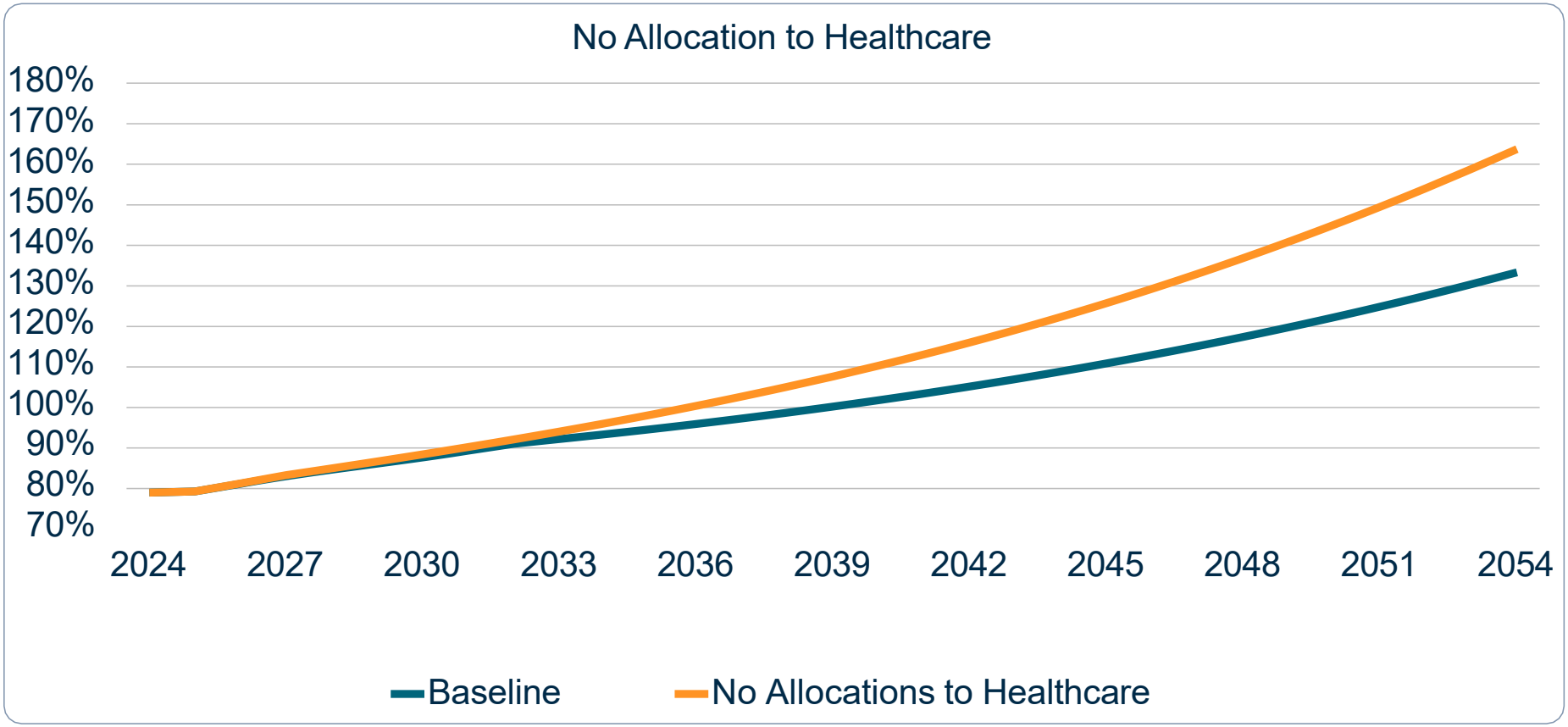
- Funding Policy
- Amortization Policy
- Size of active membership and growth in total covered payroll

Qualitative Assessment

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

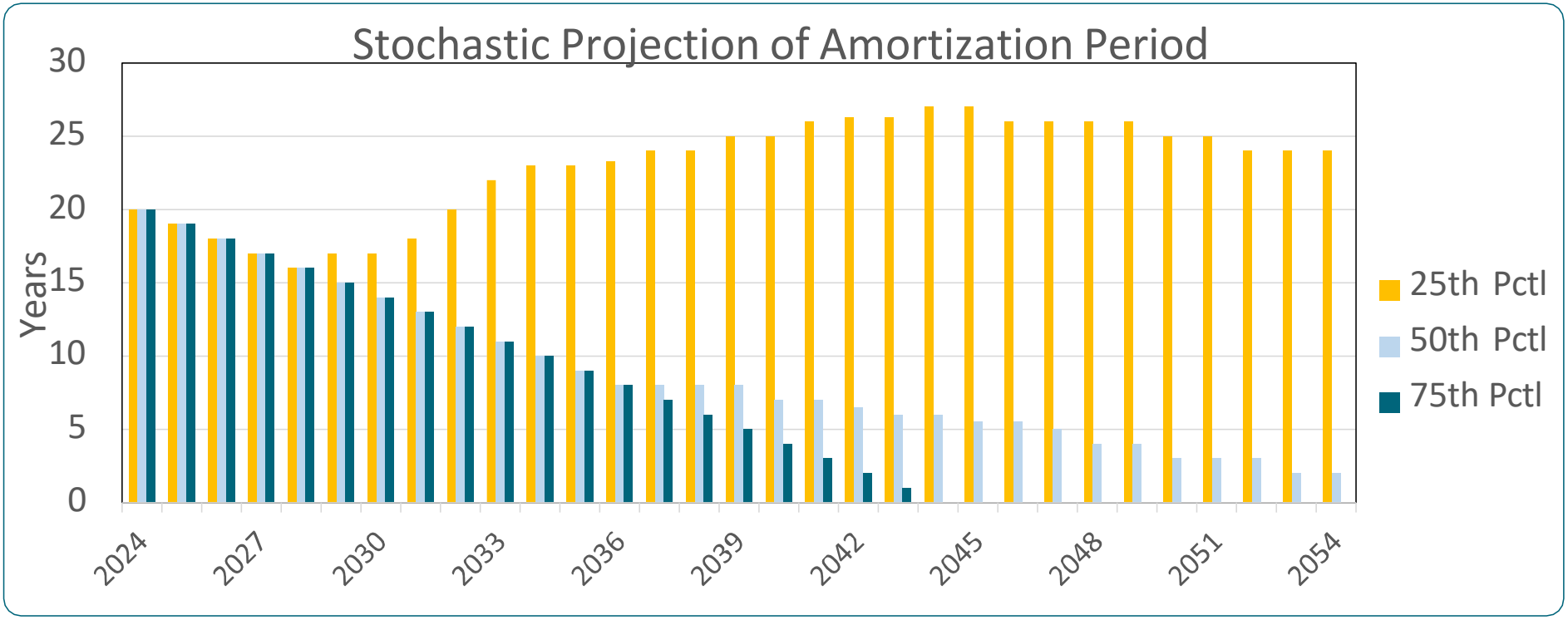


Qualitative Assessment

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.

Qualitative Assessment



Based on current funding constraints, under the 25th percentile, the maximum amortization period is 27 years. Satisfies section 3309.21 of the Revised Code

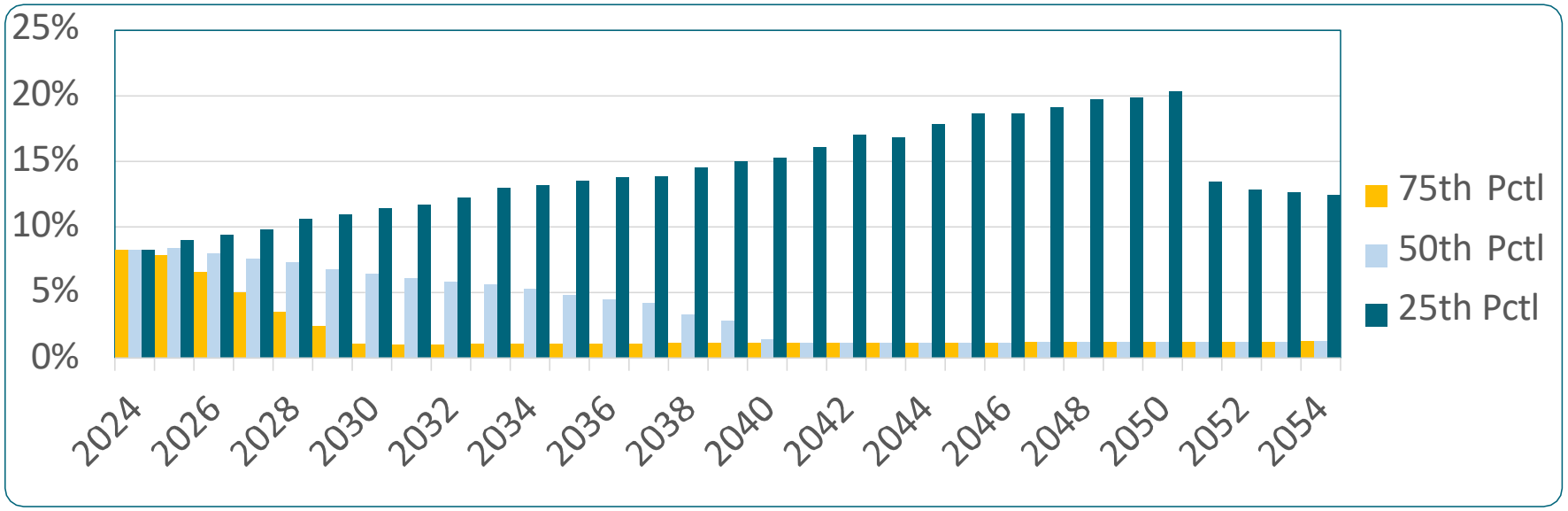
Qualitative Assessment

Layered Amortization

- Establishes a series of “layered” amortization bases
- The first layer is the System’s initial UAL established on June 30, 2024
- 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

Qualitative Assessment

Stochastic Projection of Actuarially Determined Employer Contribution (ADEC) under 27-Year Layered Amortization



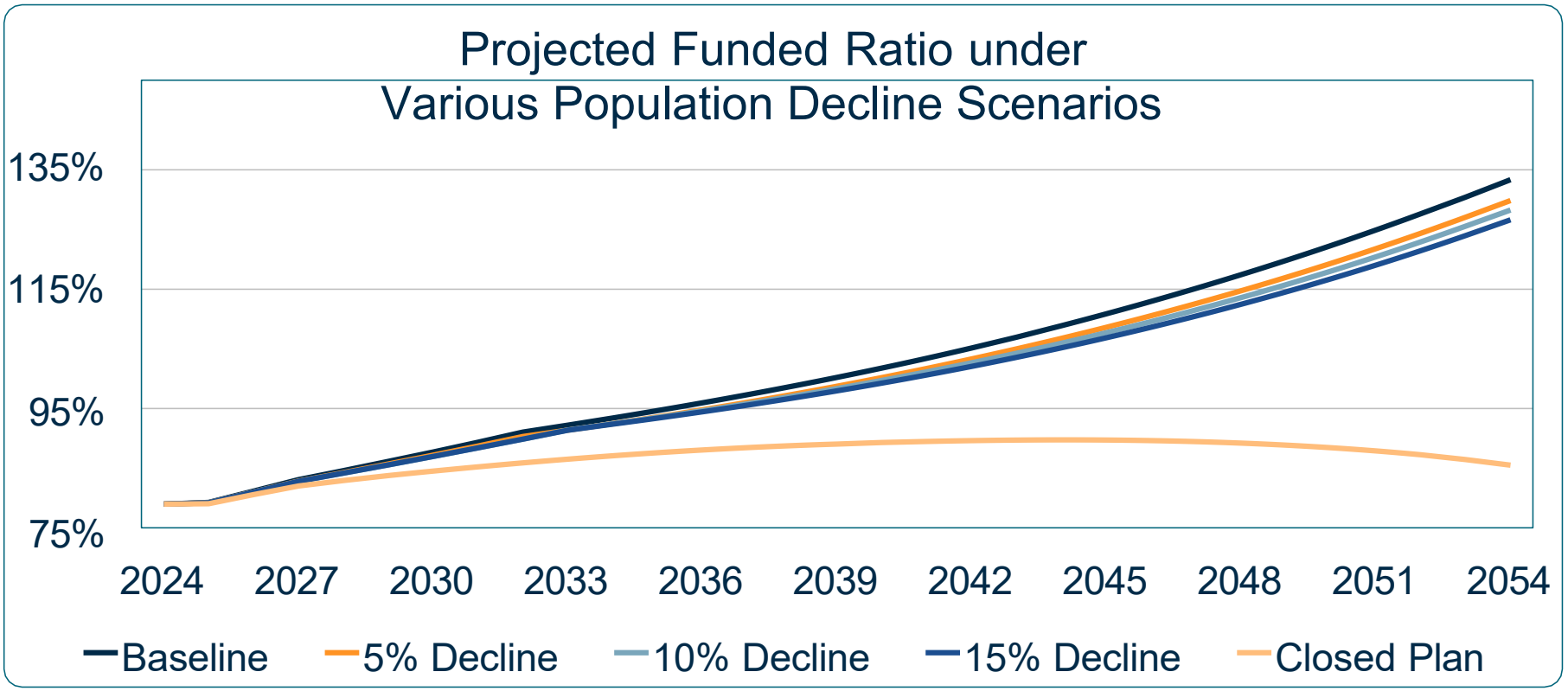
Under the 25th percentile, the ADEC exceeds 14%, therefore the layered amortization policy would need to change to accommodate the 14% employer contribution restriction, to satisfy section 3309.21 of the Revised Code

Qualitative Assessment

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 increased active membership

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

Quantitative Assessment

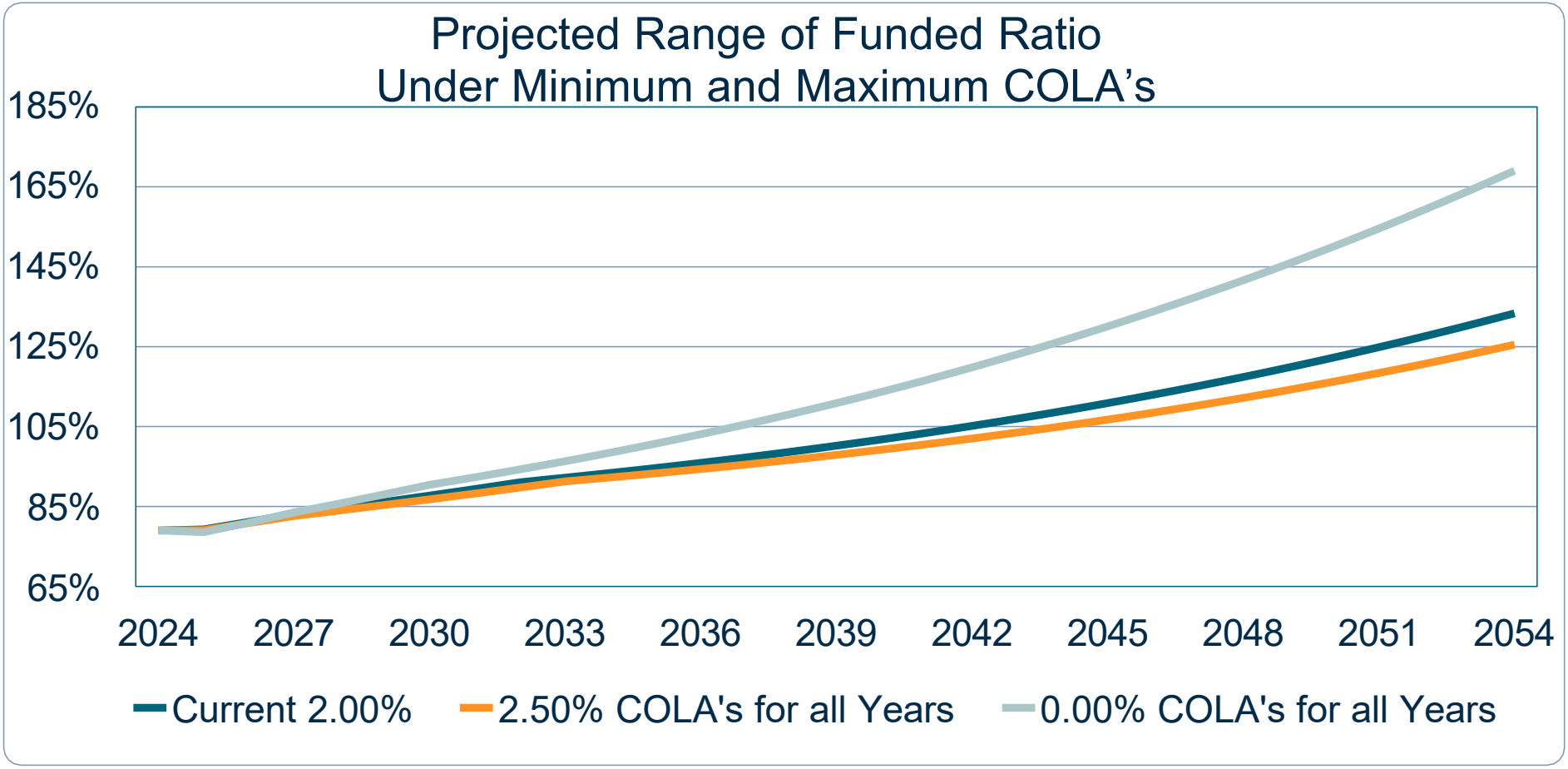
- **MORTALITY RISK: CHANGES IN LONGEVITY**
  - Valuation assumption anticipates small, continuous improvements in mortality each year in the future (generational mortality)
  - This assumption is reviewed and evaluated in each experience study
  - Risk is the possibility of a sudden shift and longer life expectancy

Qualitative Assessment

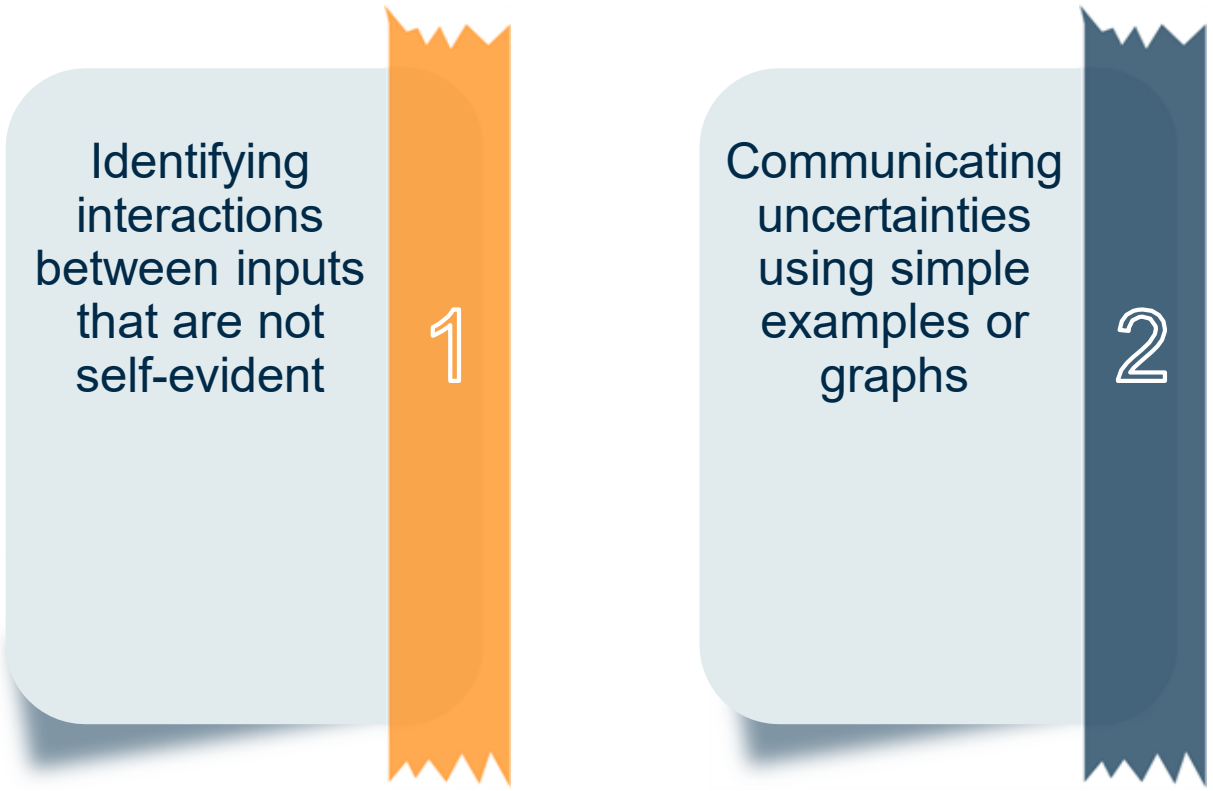
Cost of Living Adjustments

- 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



Usefulness of Models In Risk Assessment



"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

3. Answering "what if" or comparative questions

4. Identifying sensitivities of outputs to compared to inputs, providing guidance on areas that require additional analysis

5. Revealing inconsistencies, discrepancies, or limitations

Limitations of Modeling

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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

1. Vary the rate of return incrementally over specified period
2. Compare results under better/worse than expected scenarios, e.g., current investment return assumption plus scenarios of +1% and -1% returns
3. Compare results under different sets of assumptions

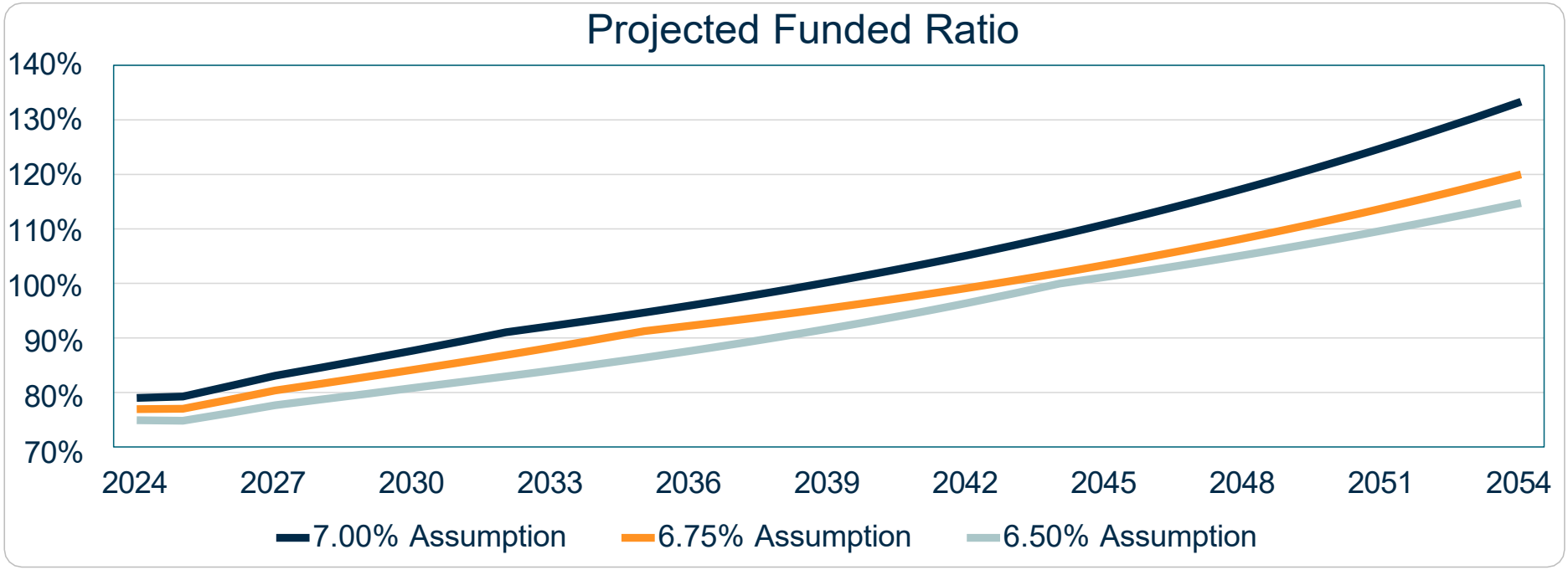
Sensitivity Analysis

Note: investment return assumption is not changed. Actual returns are assumed to be the rate shown over the 10-year period.

	Funded Ratio at June 30, Valuation										
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
5.00%	79%	79%	80%	81%	80%	80%	80%	79%	79%	79%	78%
5.25%	79%	79%	80%	81%	81%	81%	81%	81%	80%	80%	80%
5.50%	79%	79%	80%	81%	81%	82%	82%	82%	82%	82%	82%
5.75%	79%	79%	80%	81%	82%	82%	83%	83%	83%	84%	84%
6.00%	79%	79%	81%	82%	82%	83%	84%	84%	85%	85%	86%
6.25%	79%	79%	81%	82%	83%	84%	85%	86%	86%	87%	88%
6.50%	79%	79%	81%	82%	83%	85%	86%	87%	88%	89%	90%
6.75%	79%	79%	81%	83%	84%	85%	87%	88%	89%	91%	92%
7.00%	79%	79%	81%	83%	85%	86%	88%	89%	91%	92%	93%
7.25%	79%	79%	81%	83%	85%	87%	89%	91%	92%	93%	95%
7.50%	79%	79%	81%	84%	86%	88%	90%	92%	94%	95%	97%
7.75%	79%	79%	82%	84%	86%	88%	91%	93%	95%	97%	99%
8.00%	79%	79%	82%	84%	87%	89%	92%	94%	96%	99%	101%

Assumed Rate of Return (ARR): Sensitivity Analysis

The 7.0% 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 2043 respectively compared to 2039 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)

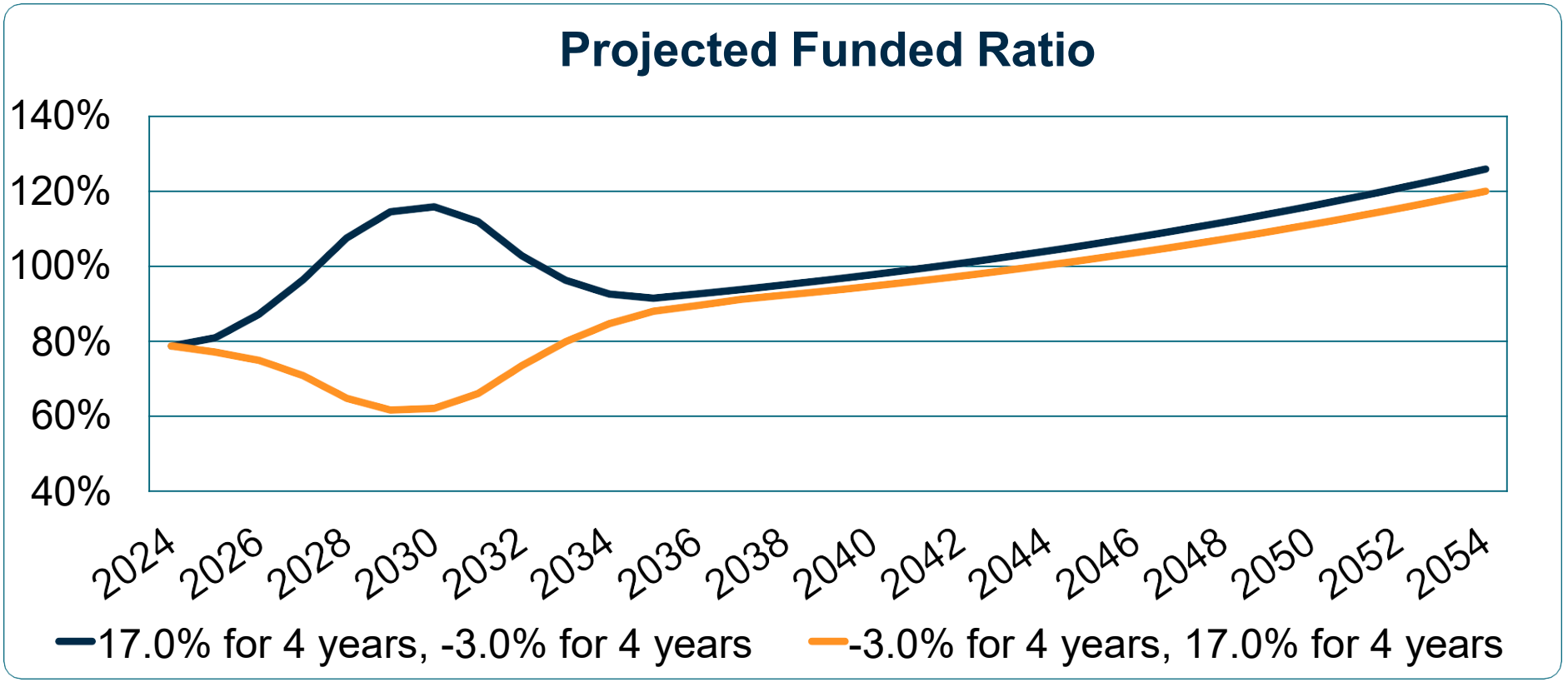
IMPROVE

Sustainability and educate stakeholders of potential risks

Typical Procedure for Stress Test

1. Project historical crisis data into the future and simulate what would happen to system's funding
2. Deterministic projections using one set of assumed returns
3. Take several sets of economic scenarios and project and compare key actuarial metrics

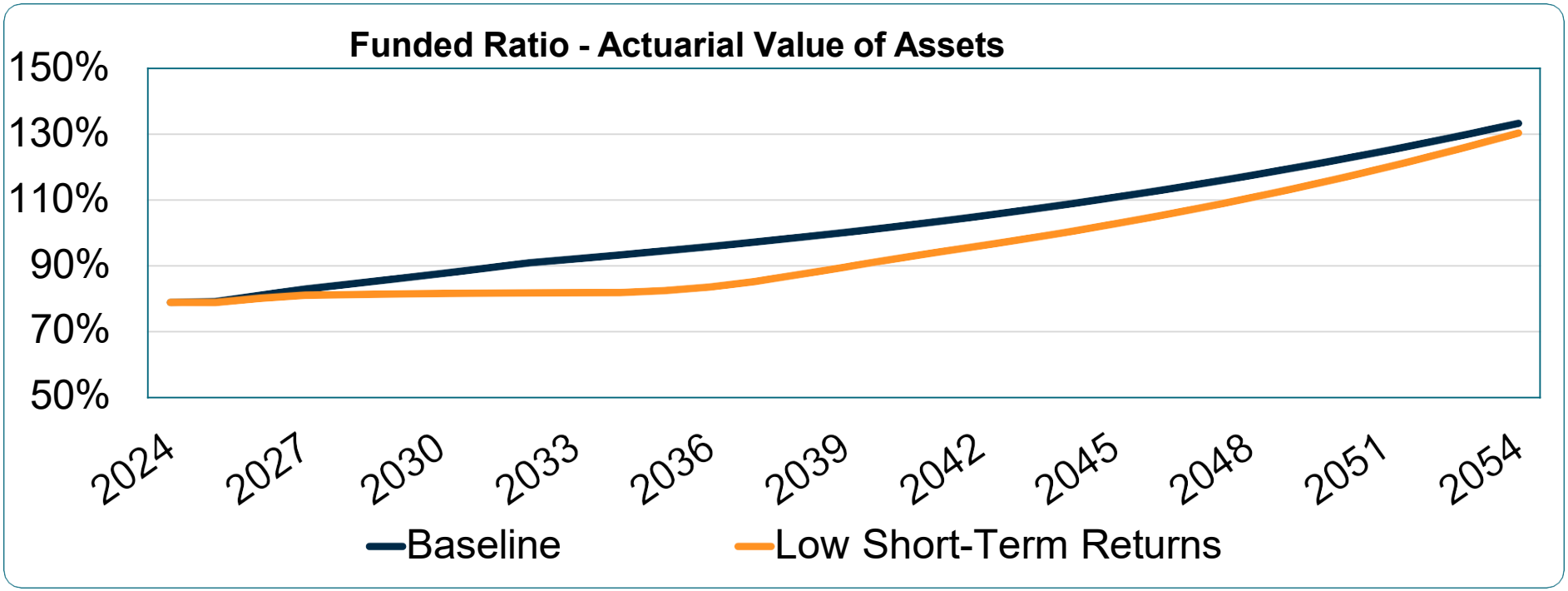
Stress Testing: Order of Returns



The same geometric return occurs over this period, but when low returns occur first, it results in a difference of $2.6 billion in asset value.

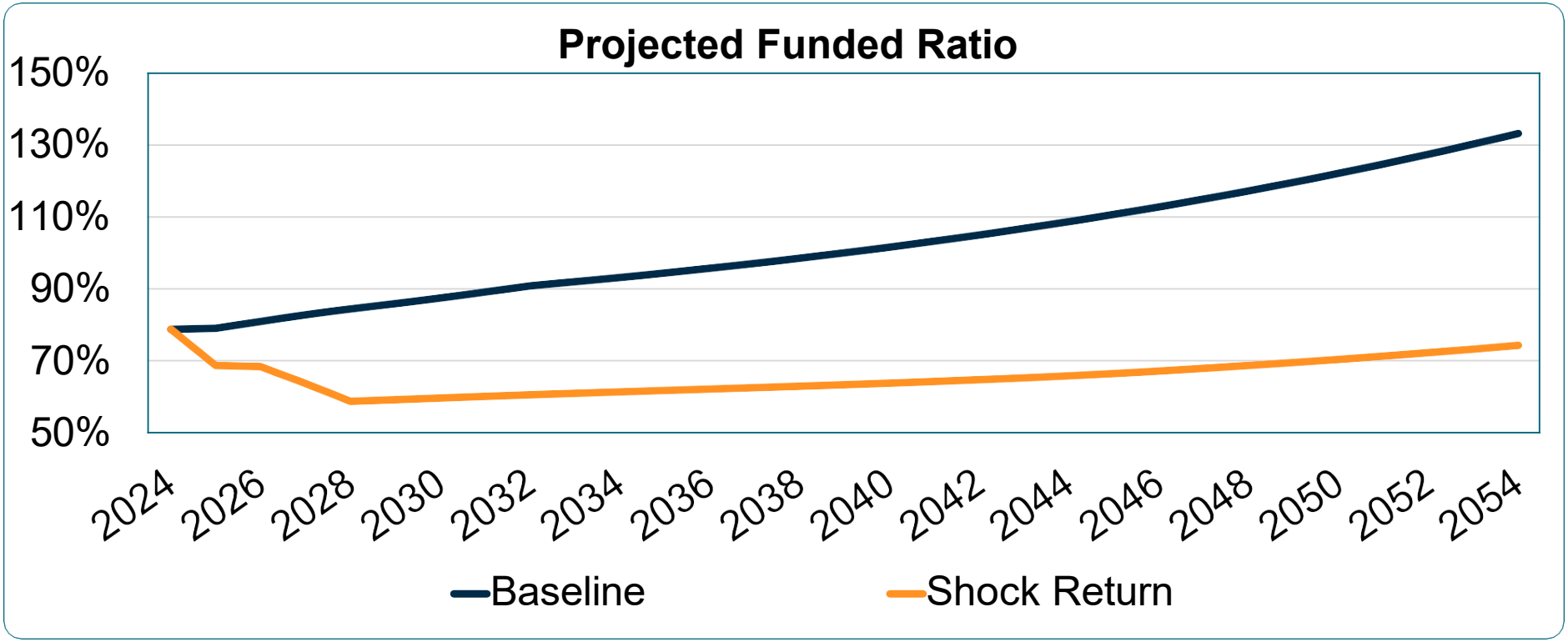
Stress Testing: Low Returns for Sustained Period

Low returns over the next 10 years cause the funded ratio to remain constant until 2034, after which the funded ratio begins to improve. Ultimately, the difference is reduced as the higher investment returns result in a higher funded ratio at the end of the period. The gap is the greatest in 2036 reaching a 12.3% difference in the funded ratios



Stress Testing: Shock Return

Under this scenario the plan suffers a -22.9% return in 2025 without a subsequent market recovery, the funded ratio stabilizes at 59% and begins to improve over projection period. The shock return leads to an ultimate funded ratio of 75%, compared to 61% in the prior study.



Stochastic Analysis

- 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.

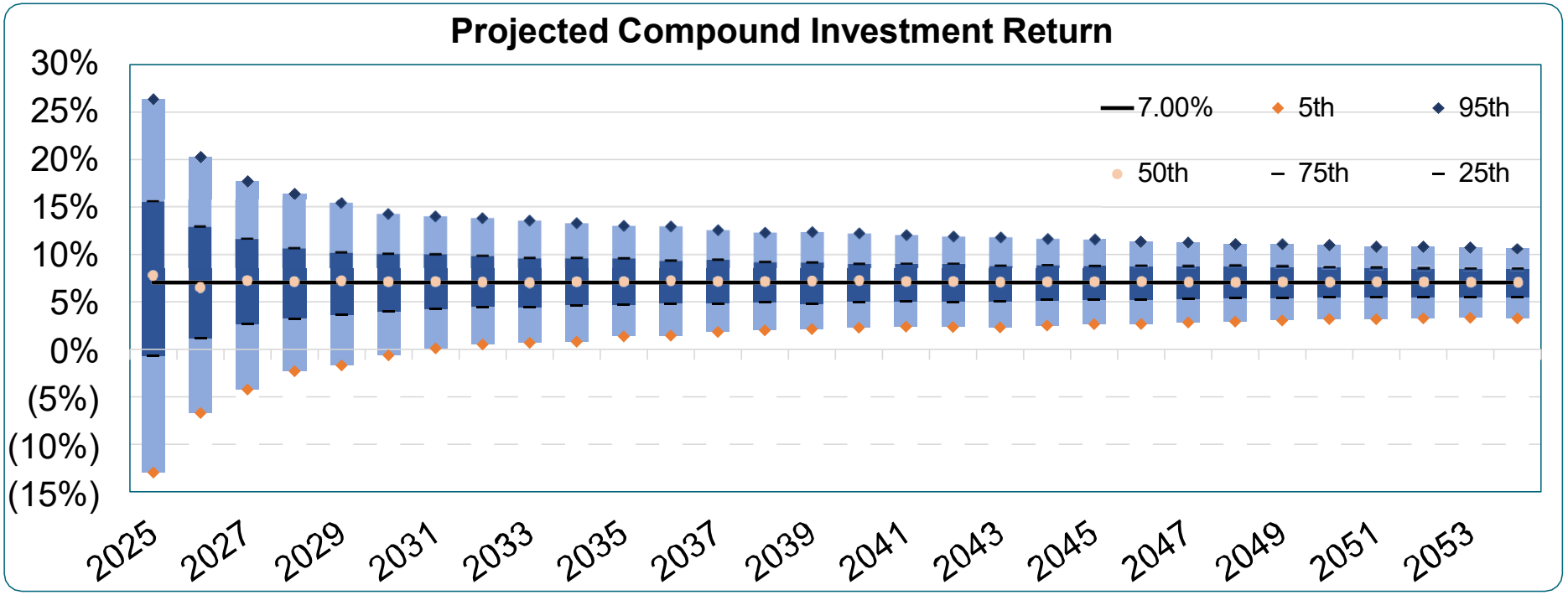
Stochastic Analysis

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%
2024 – 2029	0%	0%	2%	7%	52%
2024 – 2034	0%	2%	5%	12%	43%
2024 – 2039	1%	3%	7%	15%	39%

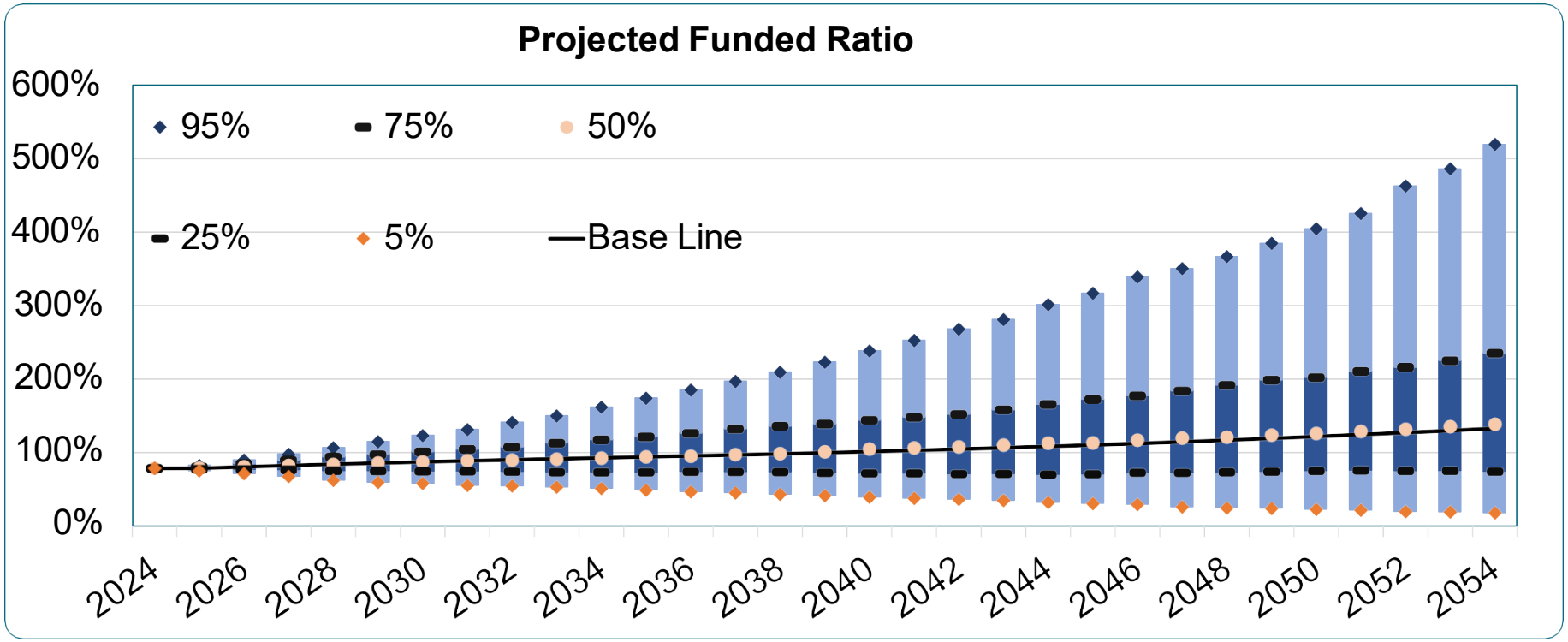
Stochastic Analysis: Compound Return

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%



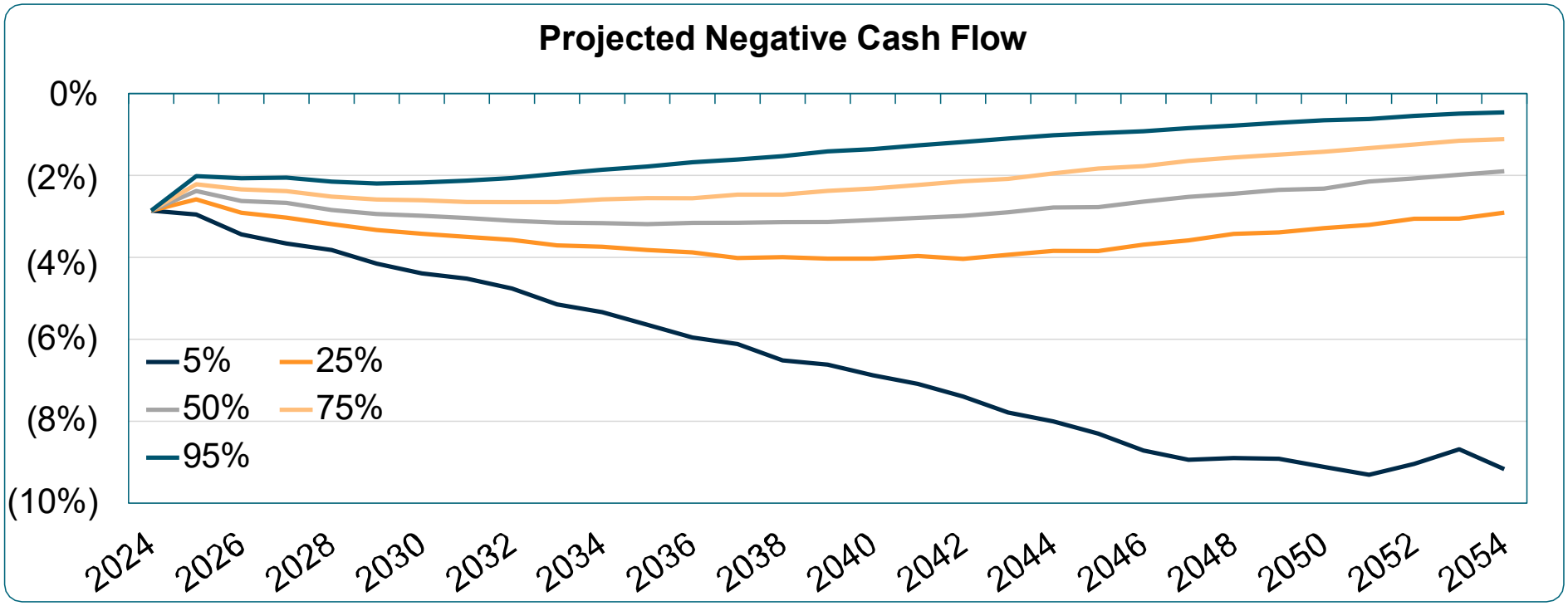
Stochastic Analysis: Funded Ratio

This graph indicates that in 10 years, the middle 50% of possible outcomes are between 74% and 118% funded. There is a 5% chance of being more than 162% funded, and a 5% chance of being less than 52% funded.



Stochastic Analysis: Negative Cash Flow

The median negative cash flow tends to -3.2% over the next 10 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, 2023 Assessment due to:
  - Investment performance since June 30, 2023 has increased the market value of assets by $1.146 billion.
  - Since 2015, the Board's funding policy has accelerated the funding of Basic Benefits by $922 million
  - Since June 30, 2023, covered payroll grew by 5.8% compared to the assumed rate of 1.75%
- Sustained higher than anticipated COLA's do have a long-term impact to expected funding levels.
- SERS can sustain a single "shock" return like the one experienced in fiscal year ended 2009 but would likely require Board action to maintain sustainability of SERS.
- Funding Policy and the authority granted to SERS regarding cost-of-living adjustments are two significant tools to assist the Board in mitigating risk.
- SERS needs to continue monitor risks.


THANK
YOU

SERS Asset Allocation Update

February 2025

Farouki Majeed, Chief Investment Officer

SERS Asset Allocation

Changes since 2010 have added value:

- Hedge Funds reduced from 15% in 2012 to 0% in 2020
- Real Assets increased from 10% in 2012 to 20% in 2023
- Infrastructure included within Real Assets in 2024, has target of 7%
- Private Credit increased from 0% to 5% in 2020
- Global Equities changed from 50/50 US/Non-US to Global (ACWI) benchmark

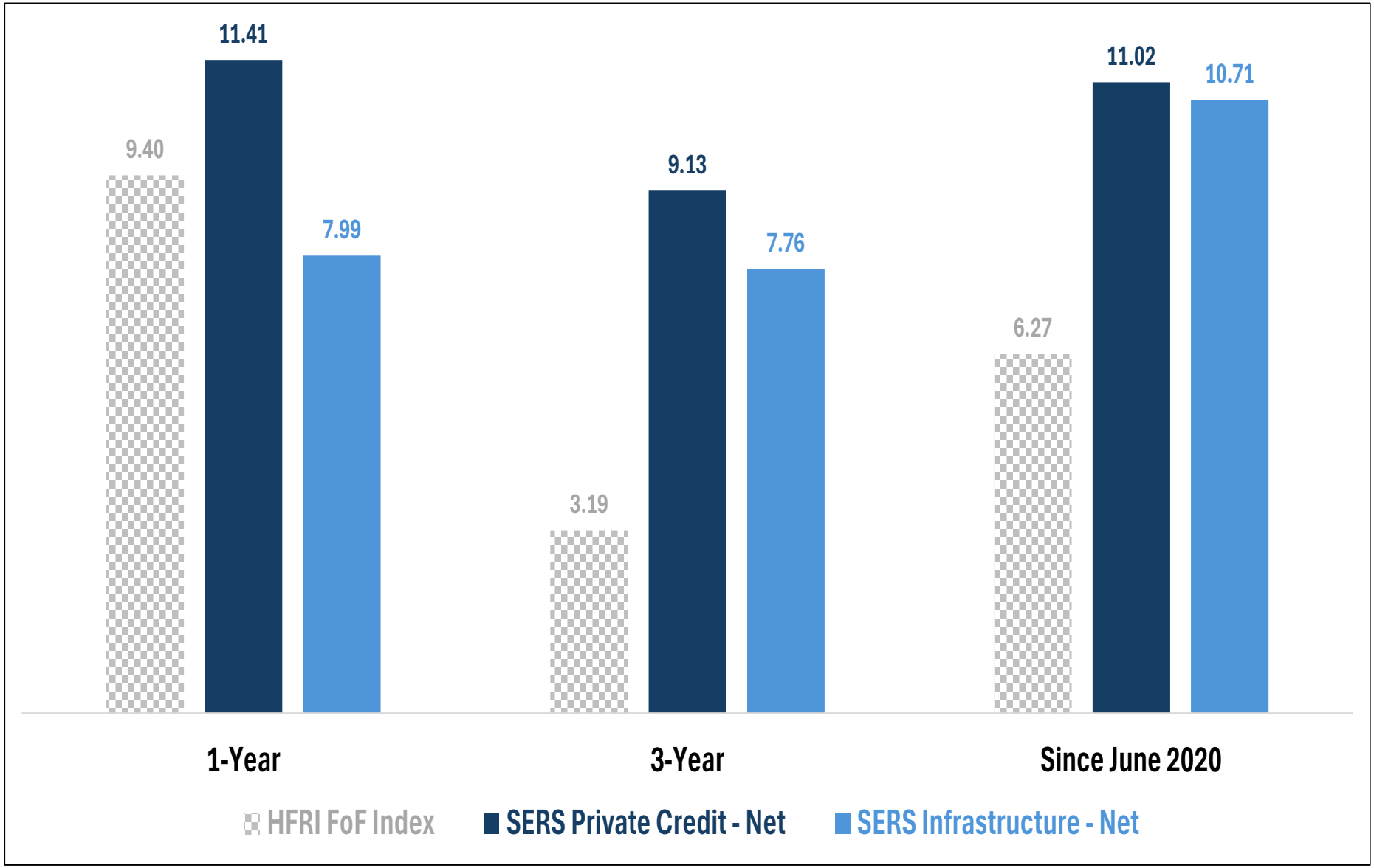
Comparison with 60/40 Equity/Bond index portfolio:

- SERS has lower risk and higher return over 10 yrs.
- SERS portfolio has much smaller drawdown during downturns
- SERS portfolio has better diversification across inflation, interest rates, growth factors

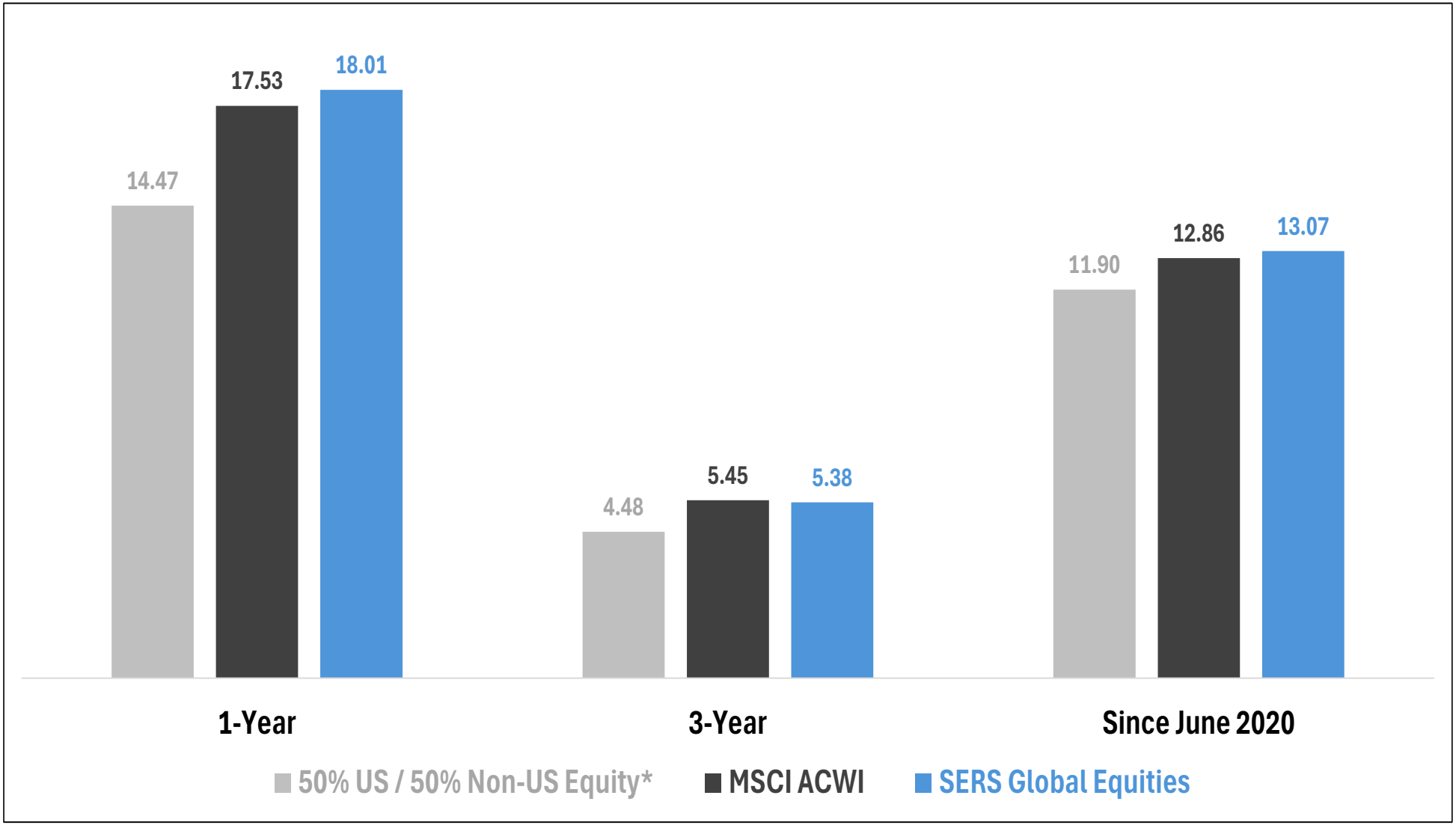
SERS Historical Strategic Asset Allocation

Asset Class	2010	2013	2016	2020	2023	Jan-25
U.S. Equities	22.5%	22.5%	22.5%	n/a	n/a	n/a
Non-U.S. Equities	22.5%	22.5%	22.5%	n/a	n/a	n/a
Global Equities	45.0%	45.0%	45.0%	45.0%	40.0%	40.0%
Private Equity	10.0%	10.0%	10.0%	12.0%	14.0%	14.0%
Fixed-Income	19.0%	19.0%	19.0%	19.0%	18.0%	18.0%
Real Estate/ Real Assets	10.0%	12.0%	15.0%	17.0%	20.0%	13.0%
Infrastructure	n/a	n/a	n/a	n/a	n/a	7.0%
Global Hedge Funds/MAS	15.0%	13.0%	10.0%	n/a	n/a	n/a
Private Credit	n/a	n/a	n/a	5.0%	5.0%	5.0%
Cash	1.0%	1.0%	1.0%	2.0%	3.0%	3.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Value Add from Asset Allocation Changes as of 12/31/24

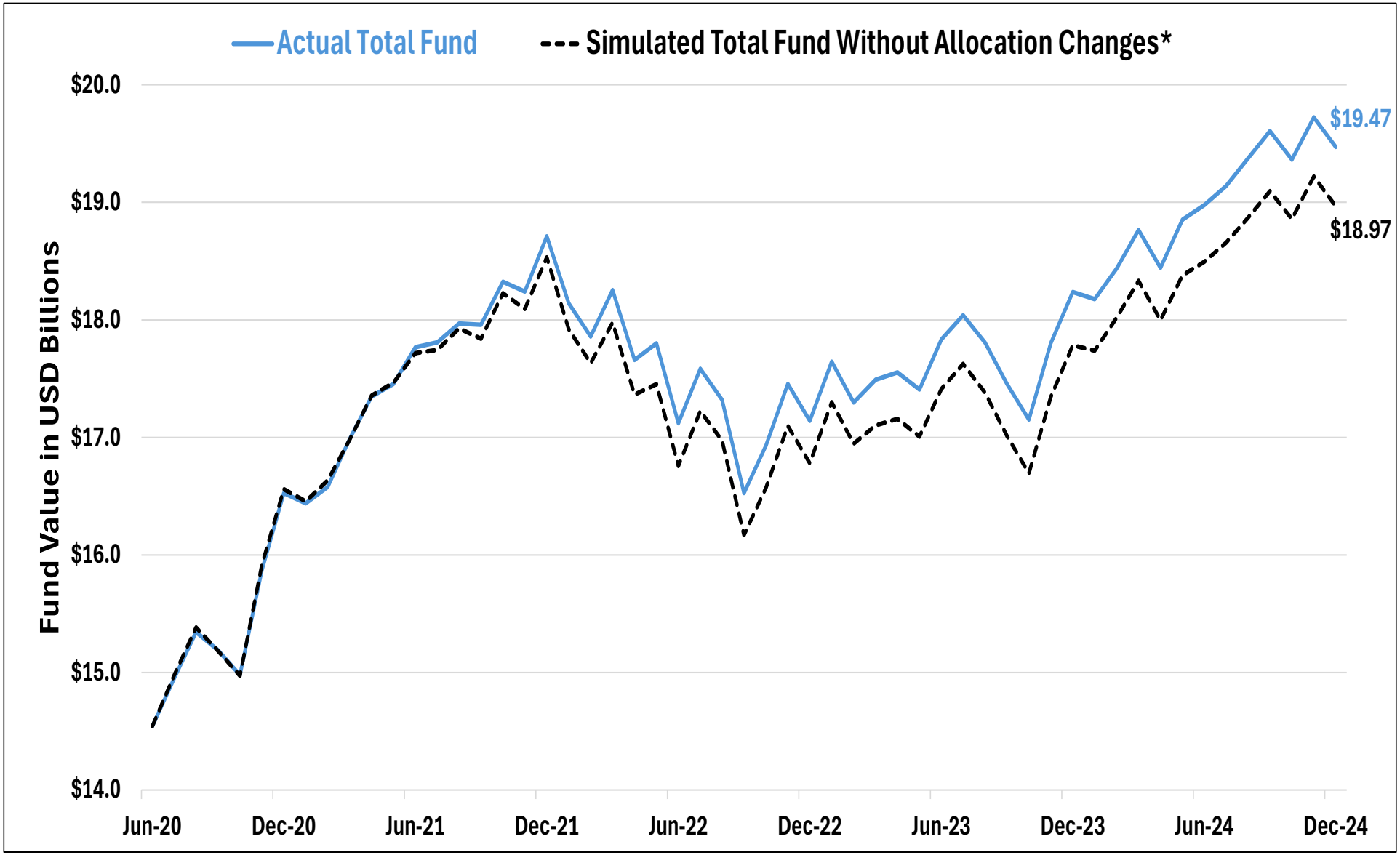


Value Add from Global Equity Benchmark Change as of 12/31/2024



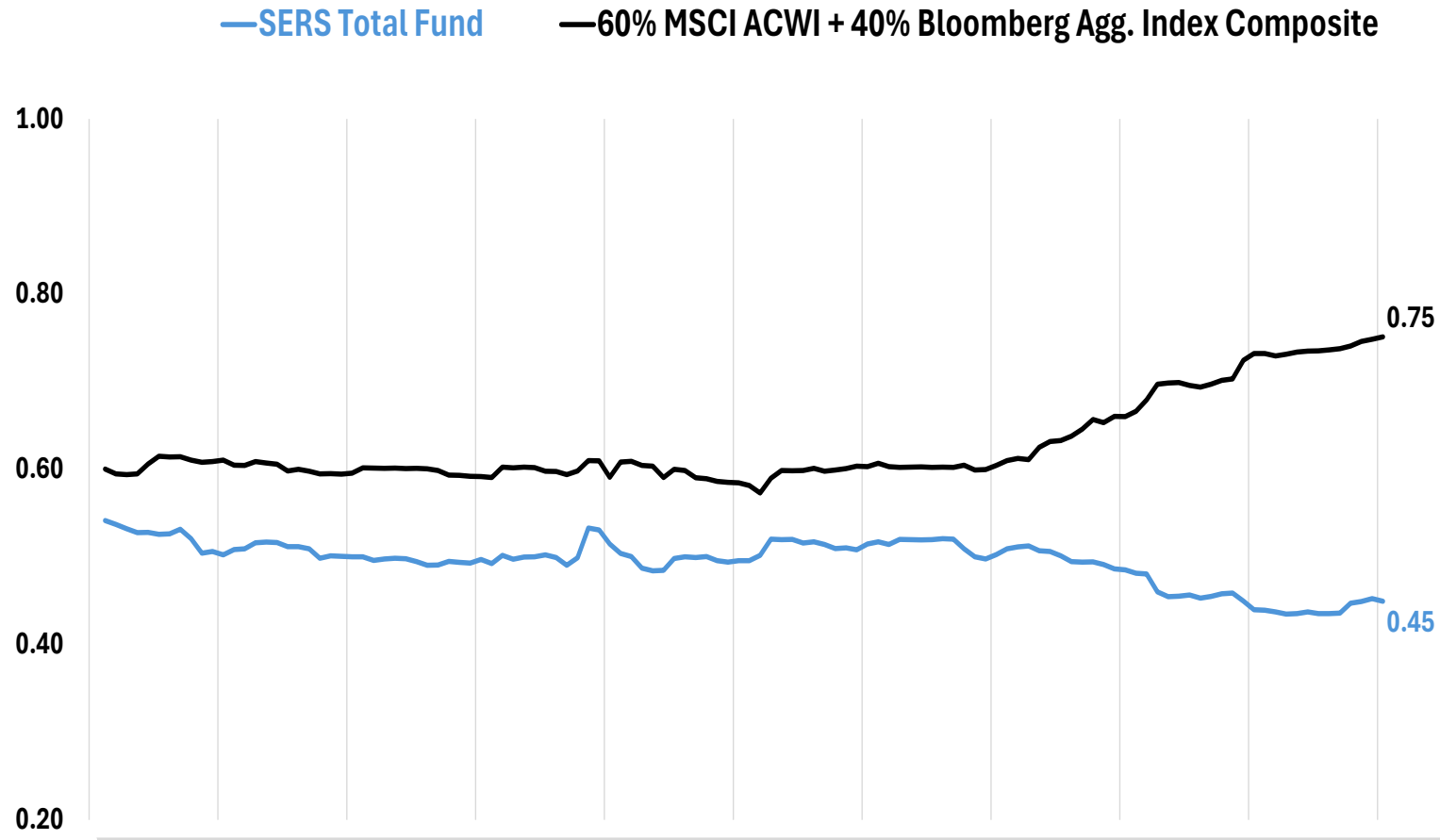
*Prior to July 2020 the Global Equities benchmark was 50% Russell 3000 Index and 50% MSCI All Country World ex-USA Index.
Since 7/1/2020, the change in the Global Equities benchmark added 96 basis points in annualized return and approximately $333 million in value.

Value Add in $ from Asset Allocation Changes since June 2020



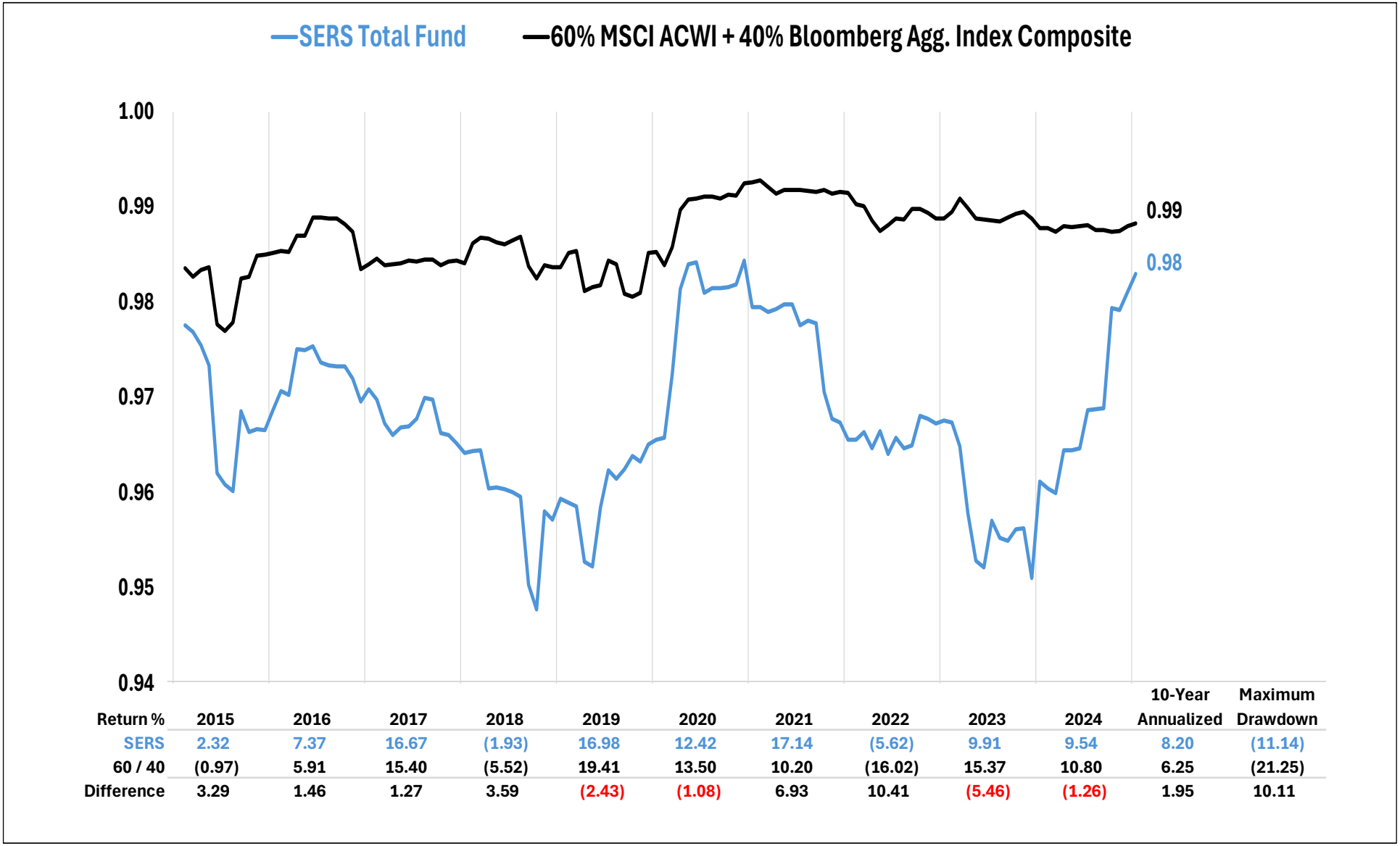
*Calculated as the hypothetical Total Fund value with MAS allocation of 10%, using the HFRI Fund of Funds Index as a proxy for MAS

SERS Asset Allocation Has Lower Equity Beta Than 60/40



Return %	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	10-Year Annualized	Maximum Drawdown
SERS	2.32	7.37	16.67	(1.93)	16.98	12.42	17.14	(5.62)	9.91	9.54	8.20	(11.14)
60 / 40	(0.97)	5.91	15.40	(5.52)	19.41	13.50	10.20	(16.02)	15.37	10.80	6.25	(21.25)
Difference	3.29	1.46	1.27	3.59	(2.43)	(1.08)	6.93	10.41	(5.46)	(1.26)	1.95	10.11

SERS Asset Allocation Has Lower Correlation to Equities than 60/40



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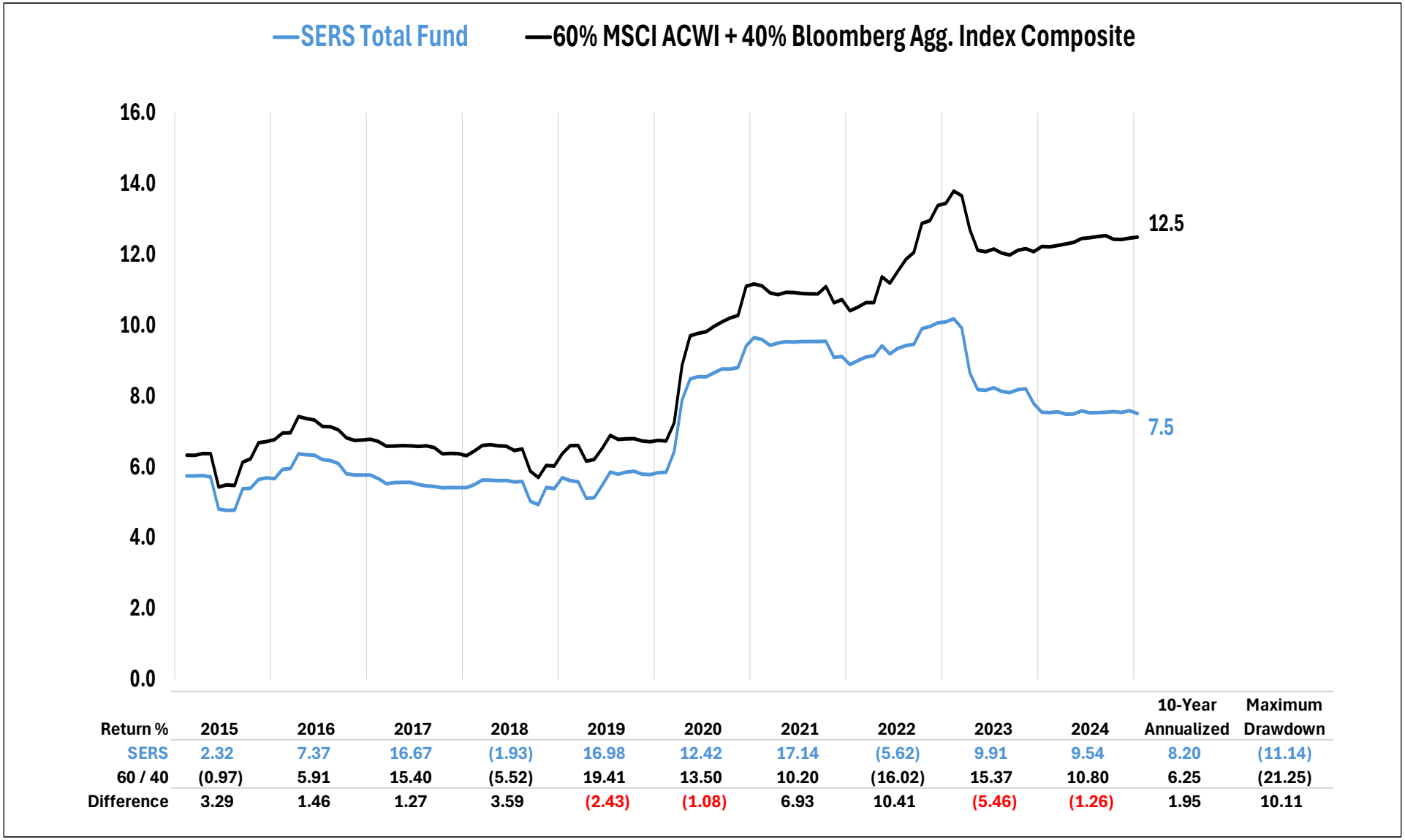
SERS Asset Allocation Has Lower Realized Risk Than 60/40



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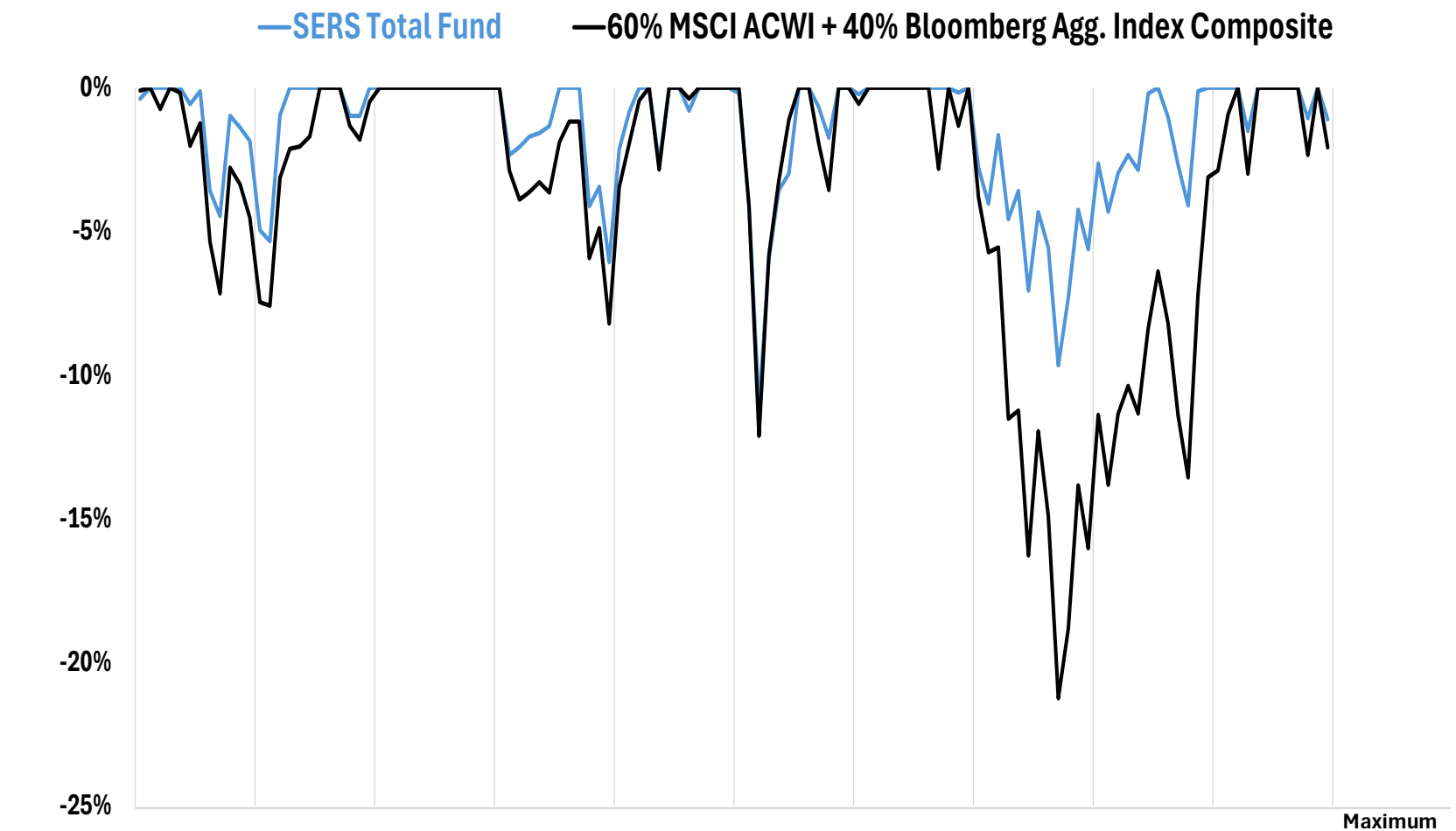
Difference	3.29	1.46	1.27	3.59	(2.43)	(1.08)	6.93	10.41	(5.46)	(1.26)	1.95	10.11

SERS Asset Allocation Has Lower Drawdown Than 60/40



Drawdown %	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Maximum Drawdown
SERS	(4.47)	(5.34)	0.00	(6.07)	(2.61)	(11.14)	(0.23)	(9.66)	(4.32)	(1.51)	(11.14)
60 / 40	(7.16)	(7.58)	0.00	(8.20)	(3.46)	(12.12)	(2.82)	(21.25)	(13.82)	(2.99)	(21.25)
Difference	2.69	2.24	0.00	2.14	0.85	0.98	2.59	11.59	9.50	1.48	10.11

Wilshire

Prepared for

School Employees Retirement System of Ohio

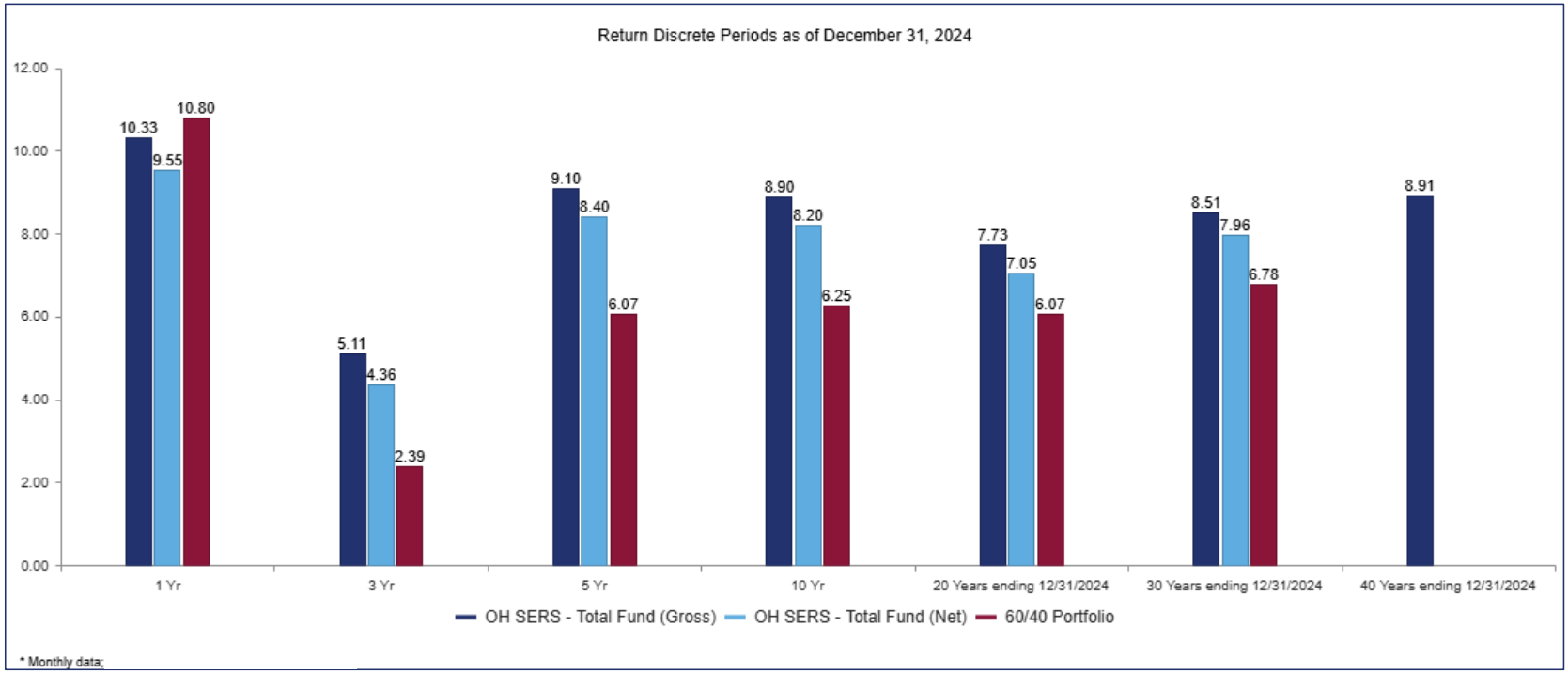
60% Equities/40% Fixed Income vs. A Diversified Portfolio

As of 12-31-2024

Agenda

- Historical Returns: OH SERS vs a 60/40 Portfolio (60% MSCI ACWI and 40% Bloomberg US Aggregate Index)
  - Discrete Periods
  - Rolling Returns over Shorter Periods
- Correlations
  - Equities vs Bonds
  - Assets vs Inflation → Diversity introduces the opportunity for inflation protection
- Volatility
- Forward Looking Returns
  - The highest forecasted return opportunities are outside of 60/40 based on Wilshire's capital market assumptions
- Efficient Frontier Analysis

Historical Returns: 60/40 vs OH SERS Target Asset Allocation as of 12/31/2024



- Long-term returns favor the diversified portfolio adopted by OH SERS over the 60/40 portfolio. Outperformance by the diversified portfolio ranges from 100-300 bps EXCEPT for the 1-year period ended December 31, 2024.

Asset Class Performance: Rotation but with Recent U.S. Equity Dominance

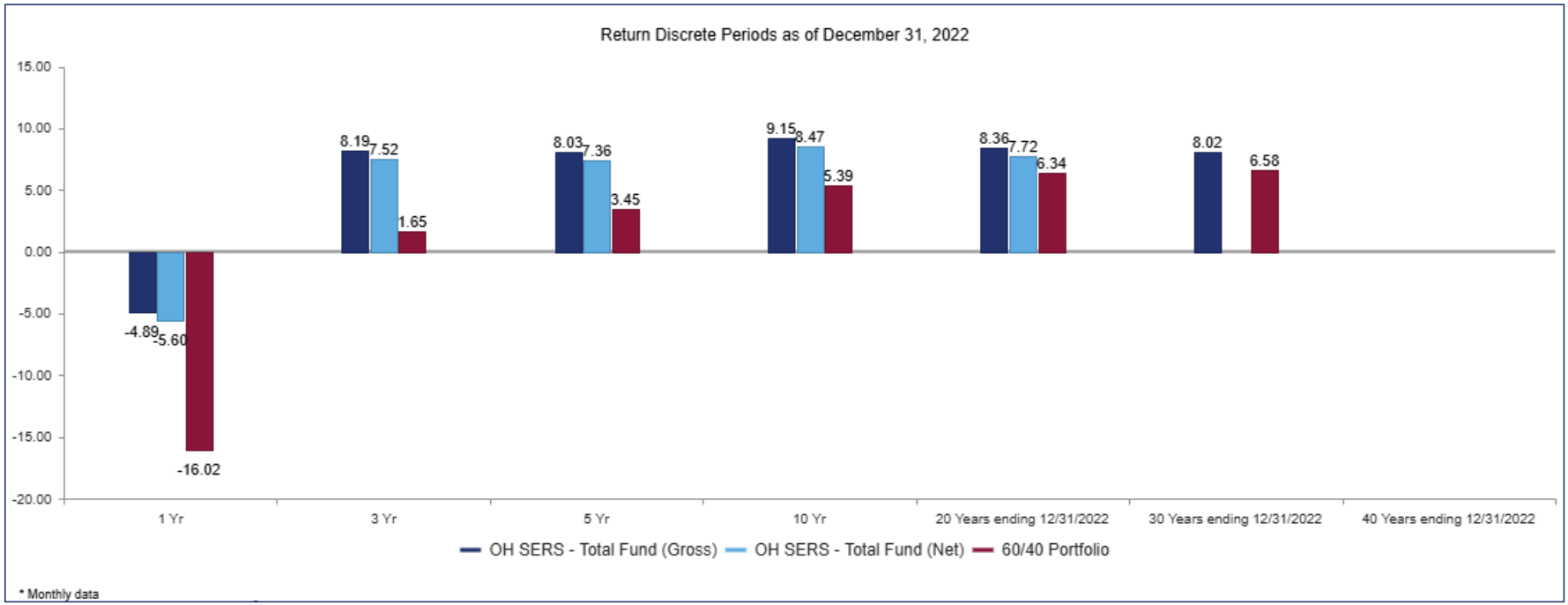
Asset Class Returns - Best to Worst

2019	2020	2021	2022	2023	2024 YTD	Annualized 5-Year as of 12/24
U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 26.1%	U.S. Equity 23.8%	U.S. Equity 14.1%
REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 18.9%	REITs 9.1%	Commodities 6.8%
Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	REITs 16.1%	High Yield 8.2%	Developed 5.2%
Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	High Yield 13.4%	Emrg Mrkts 8.1%	REITs 4.5%
High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 10.3%	Commodities 5.4%	High Yield 4.2%
Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	Core Bond 5.5%	T-Bills 5.3%	T-Bills 2.5%
U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	T-Bills 5.1%	Developed 4.3%	Emrg Mrkts 2.1%
Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	U.S. TIPS 3.9%	U.S. TIPS 1.8%	U.S. TIPS 1.9%
T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -1.3%	Core Bond 1.3%	Core Bond -0.3%

- As equity markets continue to lead asset class performance, it comes as no surprise that portfolios with higher equity exposure (like a 60/40 portfolio) perform better in recent periods.
- However, the best performing asset classes tend to rotate over time.

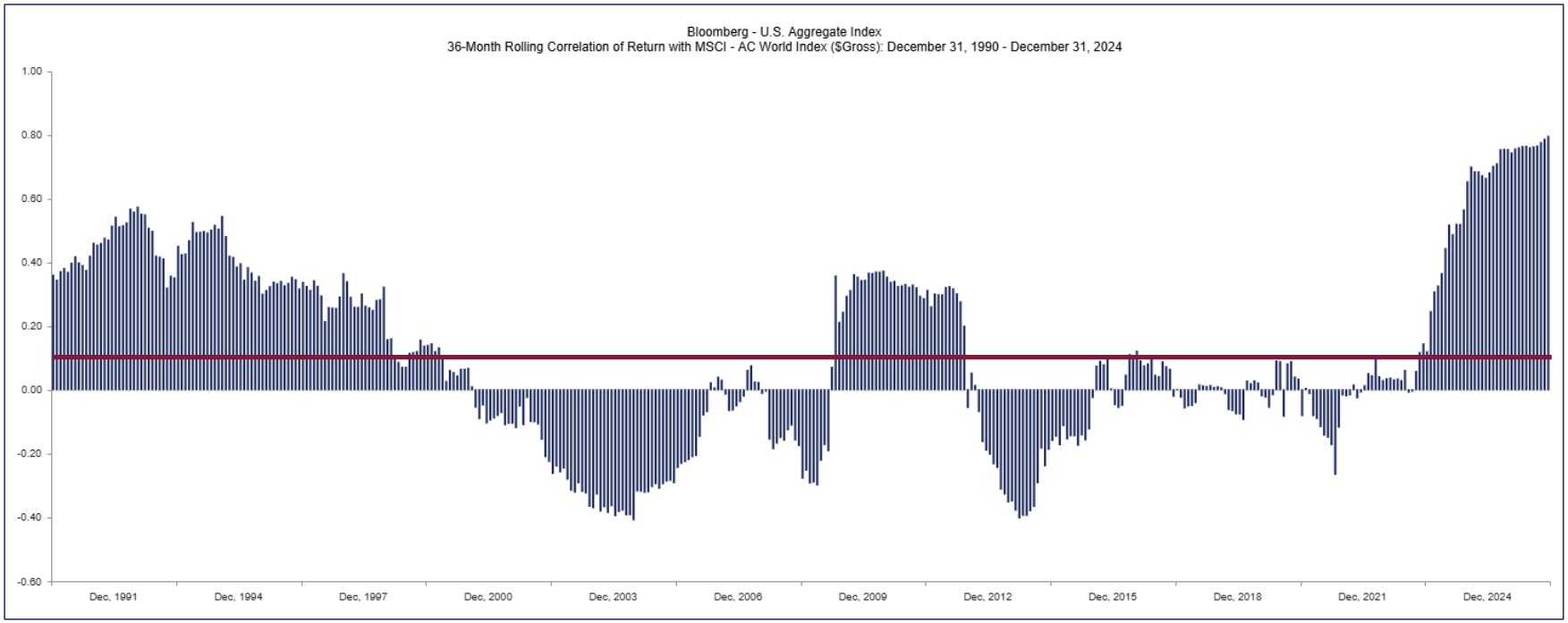
Data Sources: Bloomberg, 12-31-2024
Note: Developed asset class is developed equity markets ex-U.S., ex-Canada

Historical Returns: 60/40 vs OH SERS Target Asset Allocation as of 12/31/2022



- Historical return analysis is time-period specific. A different measurement date, may show a very different analysis.
- When we change the measurement date from 2024 to 2022, the performance of OH SERS' diversified portfolio is materially better than the 60/40 portfolio across all time periods. Outperformance by the diversified portfolio ranges from approximately 150 bps to over 1,000 bps!

Correlation: Equities vs Bonds (Avg = 0.11)



- On average, correlation between stocks and bonds of 0.11 demonstrates strong diversification properties.
- However, when correlations rise, the 60/40 portfolio may become vulnerable as stocks and bonds move in the same direction. Recently high correlations – with both asset classes posting negative returns in 2022 – demonstrates the vulnerability of a two-asset class portfolio.

Wilshire's Inflation Beliefs

Regardless of inflation level, the risk is ever present. Inflation erodes the purchasing power of a currency unit, as a well as future cash flows of capital assets.

Inflation catalysts are many and often in conflict. Investors should be prepared for unexpected inflation with an allocation to inflation sensitive assets, especially if they have inflation sensitive future liabilities.

Real assets play a strategic role within institutional portfolios

- Focus on asset classes with positive correlation to prices over multiple holding periods

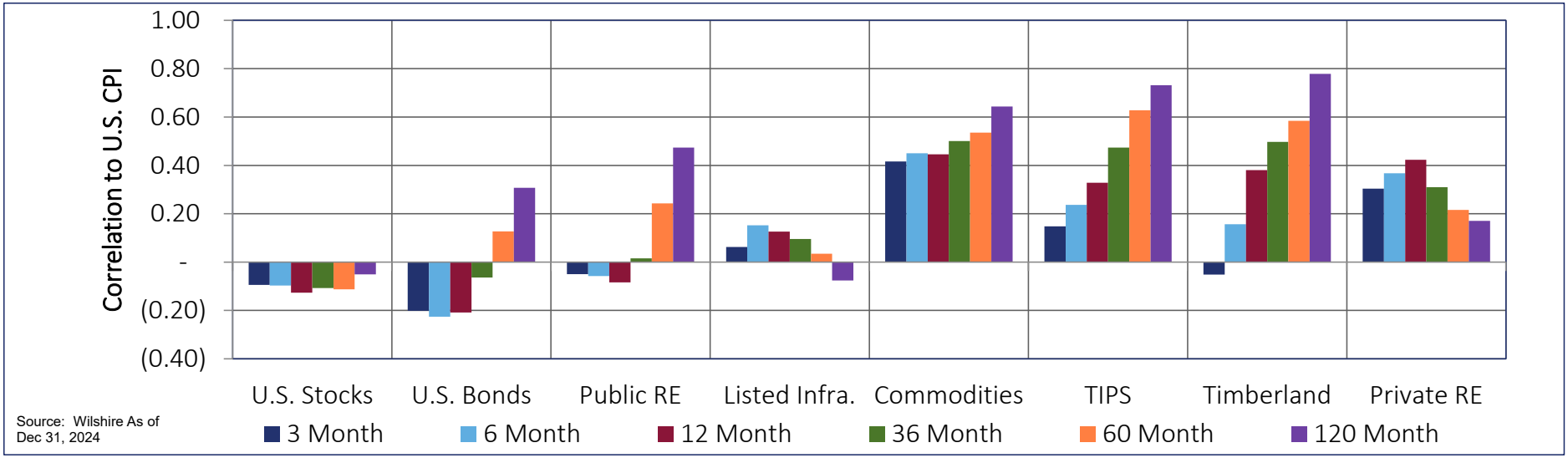
Real assets are effective in pursuing various objectives

- Real return
- Income
- Diversification
- Potential alpha opportunity

In 2022, real assets offered diversification when the traditional pillars of fixed income and equities were highly correlated to the downside.

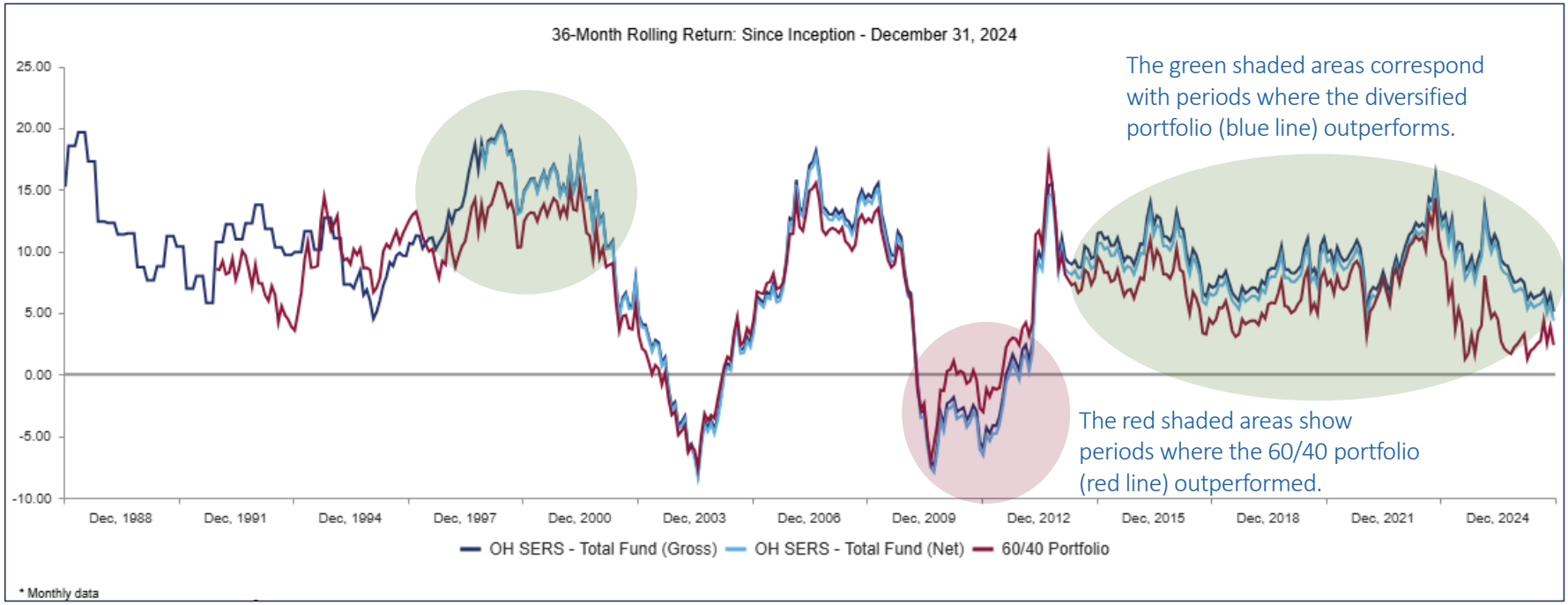
Index	1-Year Return 12/31/2022
MSCI ACWI	-18.36%
Bloomberg US Agg	-13.0%
Bloomberg Commodity	16.1%
Bloomberg Gold	-0.7%
Wilshire Global RESI (Public RE)	-24.9%
NCREIF ODCE Fund (Private RE)	7.5%
NCREIF Timberland	12.9%
FTSE Global Core Infra 50/50	-4.1%
Alerian Midstream Energy	21.5%

Correlation to Inflation



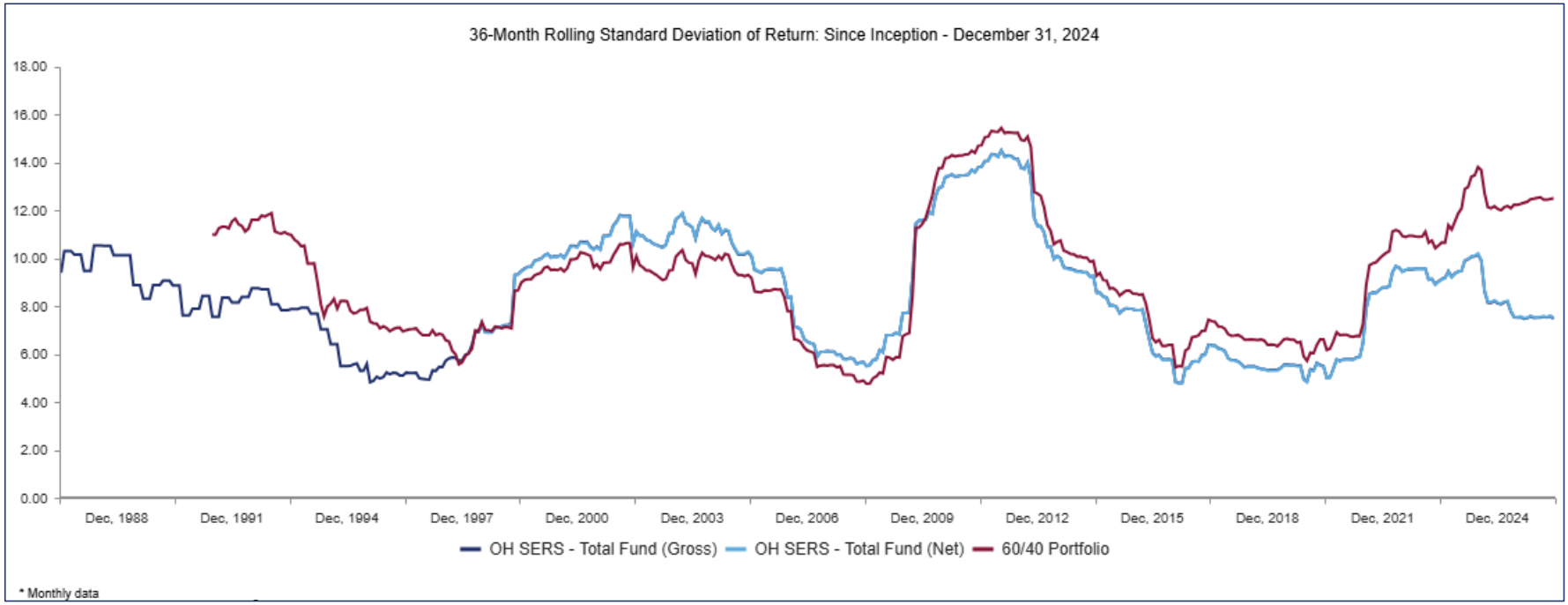
- US Equities and Bonds are negatively correlated to inflation, meaning that as inflation increases, the returns of the 60% Equities/40% Bonds portfolio decline.
- A diversified portfolio that includes inflation-sensitive assets (exhibiting positive correlation with inflation) can blunt the harmful effects of inflation shocks more so than a 60/40 portfolio.

Historical Returns: 60/40 vs OH SERS Target Asset Allocation



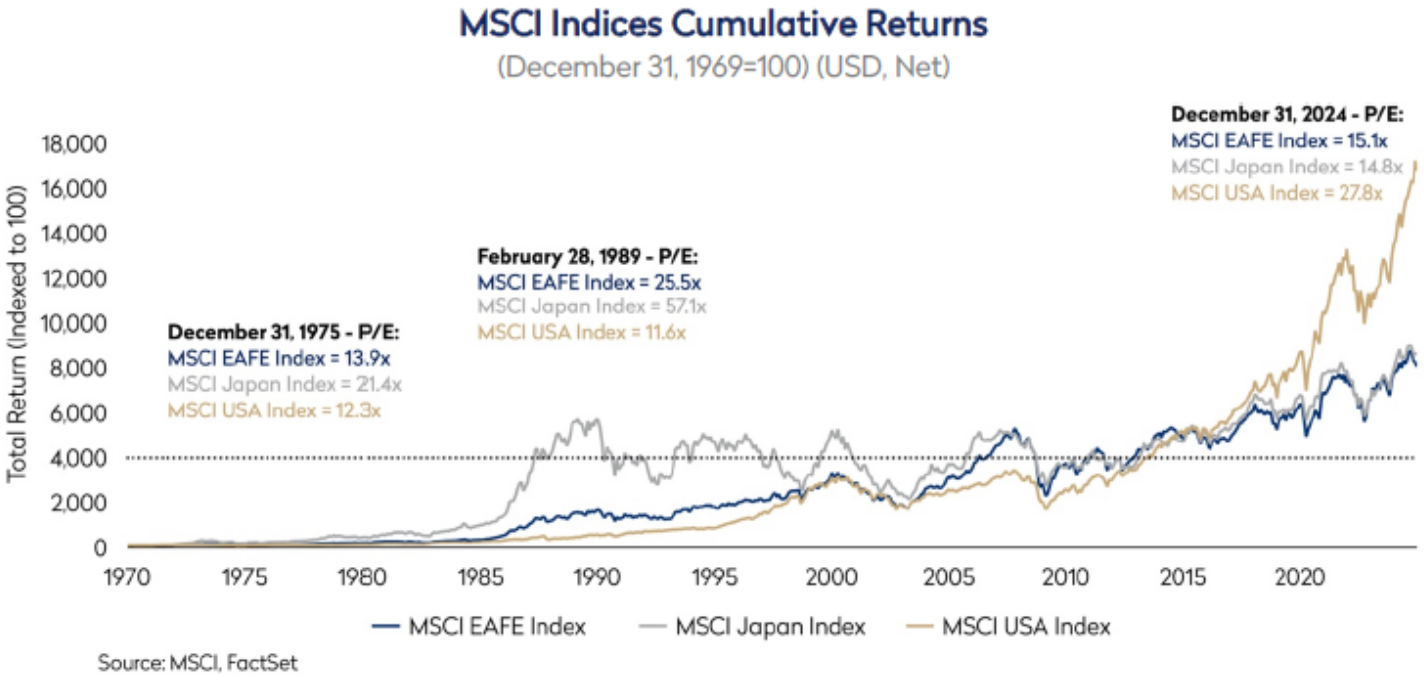
- There are periods of time when both types of portfolios outperform, interspersed with long periods of de-minimis differences between the two portfolio types.
- The most recent 10 years have predominantly seen the diversified portfolio provide superior returns.
- The 60/40 portfolio saw relative success over the diversified portfolio coming out of the GFC given strongly rebounding equity markets.

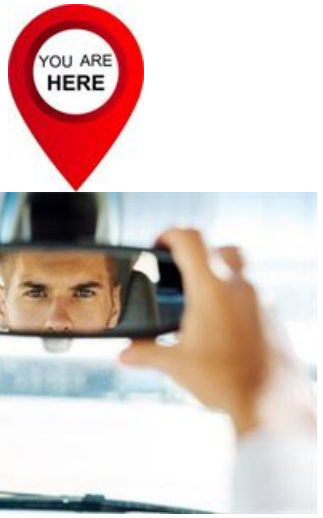
Volatility: 60/40 vs OH SERS Target Asset Allocation



There are significant periods of time when the diversified portfolio (blue lines) exhibits lower volatility than the 60/40 portfolio. The path to achieving returns may be smoother with a diversified portfolio than with the 60/40 portfolio. A lower volatility experience decreases the likelihood of contributions, selling risk assets at depressed prices or other extraordinary measures required to shore-up the portfolio during a significant downturn that could materialize with a higher volatility portfolio.

Historical Results vs Expected Results





"Past performance is no guarantee of future results."

-Every Compliance Department

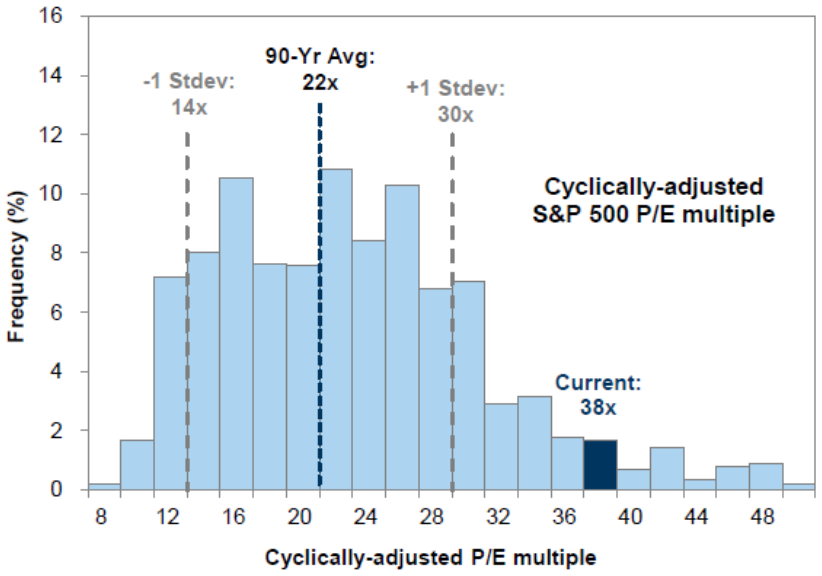
December 2024 Asset Class Assumptions

	Equity						Fixed Income							Real Assets					
															Real Estate				
	U.S. Stock	Dev ex-U.S. Stock	Emg Stock	Global ex-U.S. Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit	Dev ex-U.S. Bond (Hdg)	U.S. RES	Global RES	Private RE	Cmdty	Real Assets	U.S. CPI
Compound Return (%)	4.35	5.35	5.60	5.70	4.90	6.25	3.60	5.20	5.35	4.70	6.35	7.75	3.00	5.70	5.85	6.40	4.85	6.85	2.35
Arithmetic Return (%)	5.70	6.85	8.60	7.35	6.25	10.00	3.60	5.30	5.80	4.85	6.80	8.50	3.10	7.10	7.10	7.30	6.05	7.60	2.35
Risk (%)	17.00	18.00	26.00	19.05	17.00	29.65	0.75	4.75	9.90	6.00	10.00	12.75	4.00	17.50	16.55	13.95	16.00	12.60	1.75
Yield (%)	1.25	3.00	2.50	2.85	1.80	0.00	3.60	5.65	5.70	5.05	9.80	4.85	4.25	3.95	3.95	2.85	3.60	3.70	0.00
Growth Factor 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	0.70	0.00
Inflation Factor 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	4.60	1.00
Correlations																			
U.S. Stock	1.00																		
Dev ex-U.S. Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-U.S. 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-U.S. 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						
U.S. 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

- *"Goldman forecasts just a 3% S&P 500 annual return the next 10 years, down from 13% the last decade."*
  https://www.cnbc.com/2024/10/21/goldman-forecasts-just-a-3percent-sp-500-annual-return-the-next-10-years.html

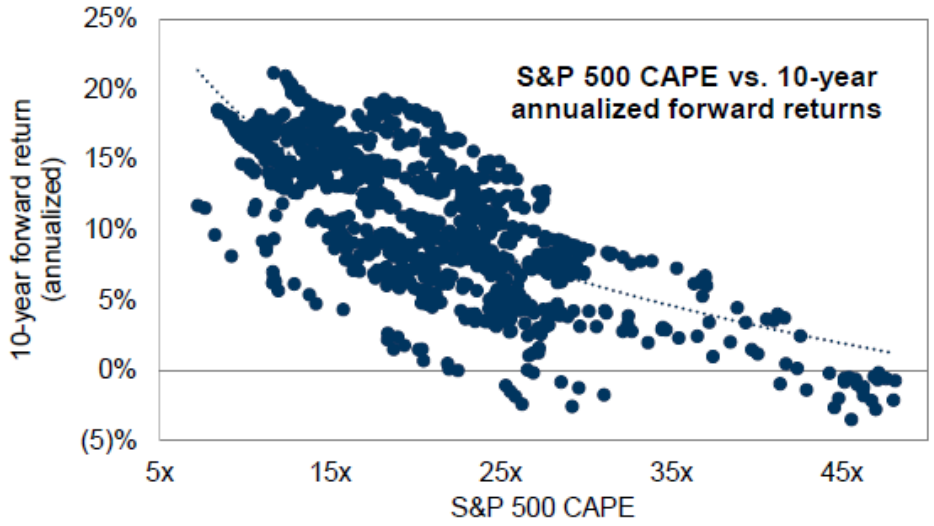
Why Such Low Return Expectations for Equities?
Valuations

Historical Distribution of S&P 500 CAPE Multiples



Source: Robert Shiller, Goldman Sachs Global Investment Research

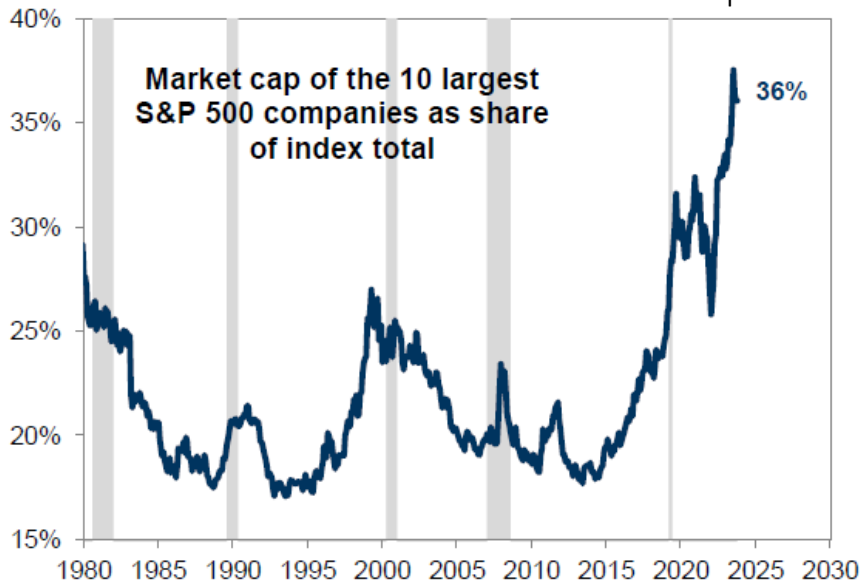
10-Year Annualized S&P 500 Returns Based on Valuation at Initial Investment (Data since 1930)



Source: Robert Shiller, Goldman Sachs Global Investment Research

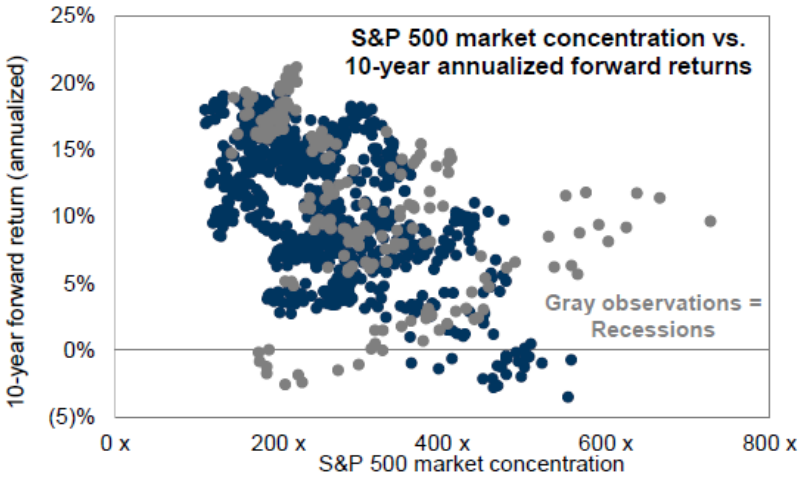
Why Such Low Return Expectations for Equities?
Market Concentration

The 10 Largest Stocks in the S&P 500 Account for More Than a Third of Total Market Cap



Source: FactSet, Compustat, Goldman Sachs Global Investment Research

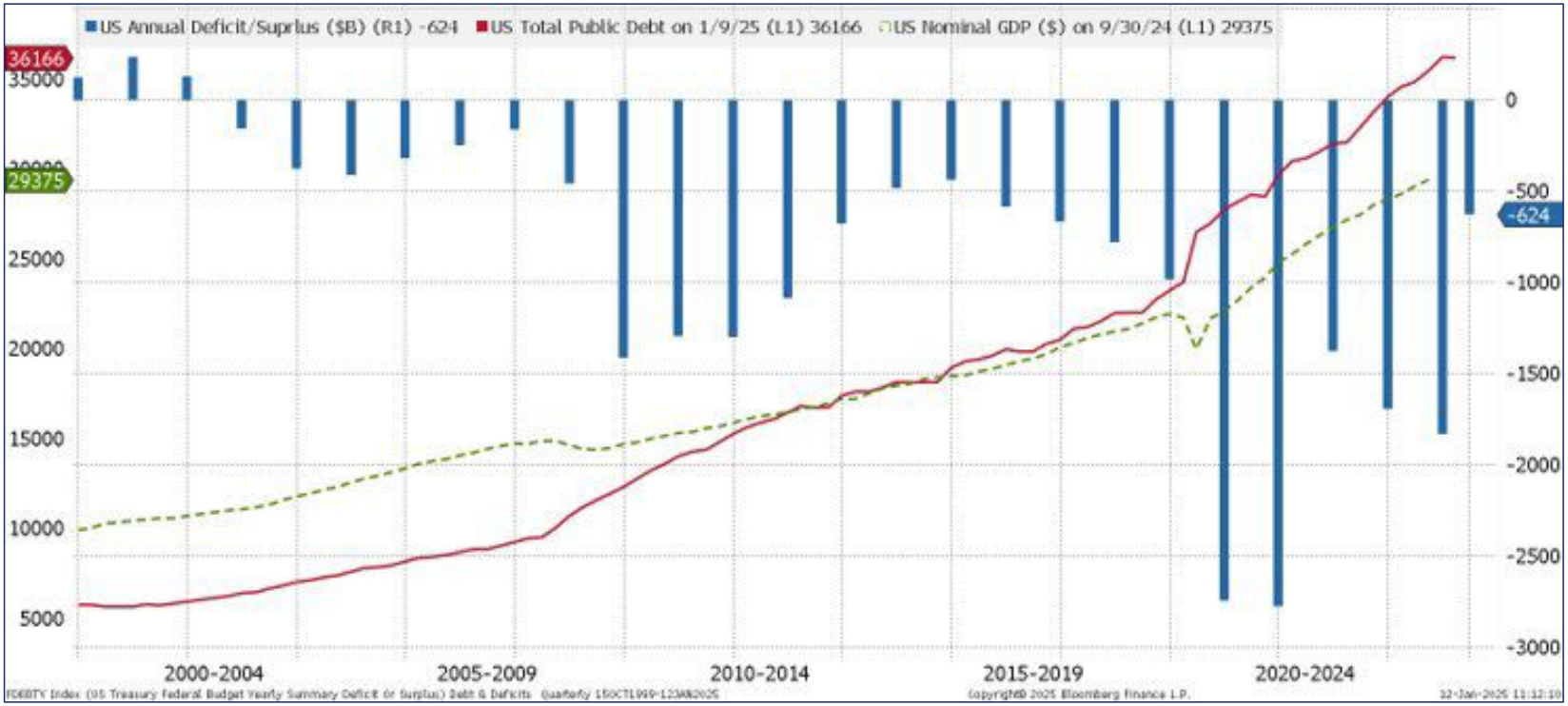
Ex-Recessions, Higher Market Concentration is Associated with Lower Forward Returns



Market concentration defined as the market cap of the largest stock relative to the 75th percentile stock

Source: Goldman Sachs Global Investment Research

Deficits & Debt on an Unsustainable Pace: A Challenge to Fixed Income



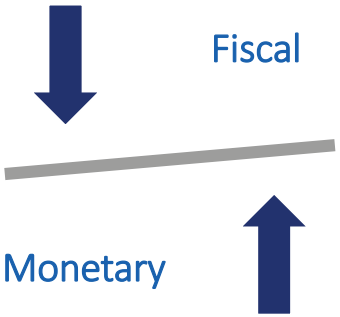
Data Source: Bloomberg

Fiscal Dominance: Complicating Monetary Policy

Fiscal Dominance: when a government's debt is sufficiently high to undermine the central bank's influence on inflation

Long-term Risks/Implications Are Headwinds for Bonds and Other Financial Assets

- **Higher Inflation Rates:** potential for higher future inflation rates (as unstainable debt levels leads to money printing)
- **Higher Interest Rates:** should central bankers be required to battle sustained inflation rates
- **Currency Depreciation**: as investors lose faith in a government's ability to control inflation
- **Budgeting Conflicts/Tradeoffs:** as interest payments required to meet rising debt levels crowds out other spending/investing priorities



Forward Looking Returns: 60/40 vs OH SERS Target Asset Allocation

Asset Class	Portfolio Allocation (%)	Portfolio Allocation (%)
Global Equities	*60.00*	*40.00*
US Fixed Income	40.00	
Global Private Equity		14.00
Global Fixed Income		18.00
Global Private Credit		5.00
Global Real Assets		20.00
Cash		3.00
Total	*100.00*	*100.00*
10-Year Expected Return	*5.32*	*6.19*
Risk (Standard Deviation)	*10.76*	*12.80*
Return Per Unit of Risk	*0.49*	*0.48*
Change in 10-Year Expected Return		*+0.87*
Change in Risk (Standard Deviation)		*+2.04*
Change in Return Per Unit of Risk		*-0.01*

- The diversified portfolio increases expected return by 87 bp.
- The diversified portfolio is expected to have higher standard deviation, but the return per unit of risk is almost identical.

Explanatory Footnotes:

- Global Fixed Income is reflective of the Bloomberg US Universal Index. Approximate composition as of 12-31-2024: 85% Agg, 10% HY, 5% EMD.
- Global Real Assets is a custom basket for SERS that includes 13% Real Estate and 7% Infrastructure.
- Real Estate assumption is a mix of 75% Core Real Estate, 25% Value-Add and Opportunistic Real Estate
- Infrastructure is 75% Private Infrastructure, 25% Timber (inclusive of Agriculture).

Forward Looking Returns: 60/40 vs OH SERS Target Asset Allocation

	Diversified Portfolio	60/40 Portfolio	Change
Expansionary (above trend growth)	9.99	8.08	1.91
Baseline	6.02	5.32	0.69
Slow Growth (below trend)	4.18	4.12	0.06
Recession (negative growth)	-1.26	0.45	-1.72
Severe Recession / Crisis	-25.65	-18.32	-7.32
Inflation Shock	-4.22	-4.40	0.18

Forward Looking Returns: Efficient Frontier Analysis

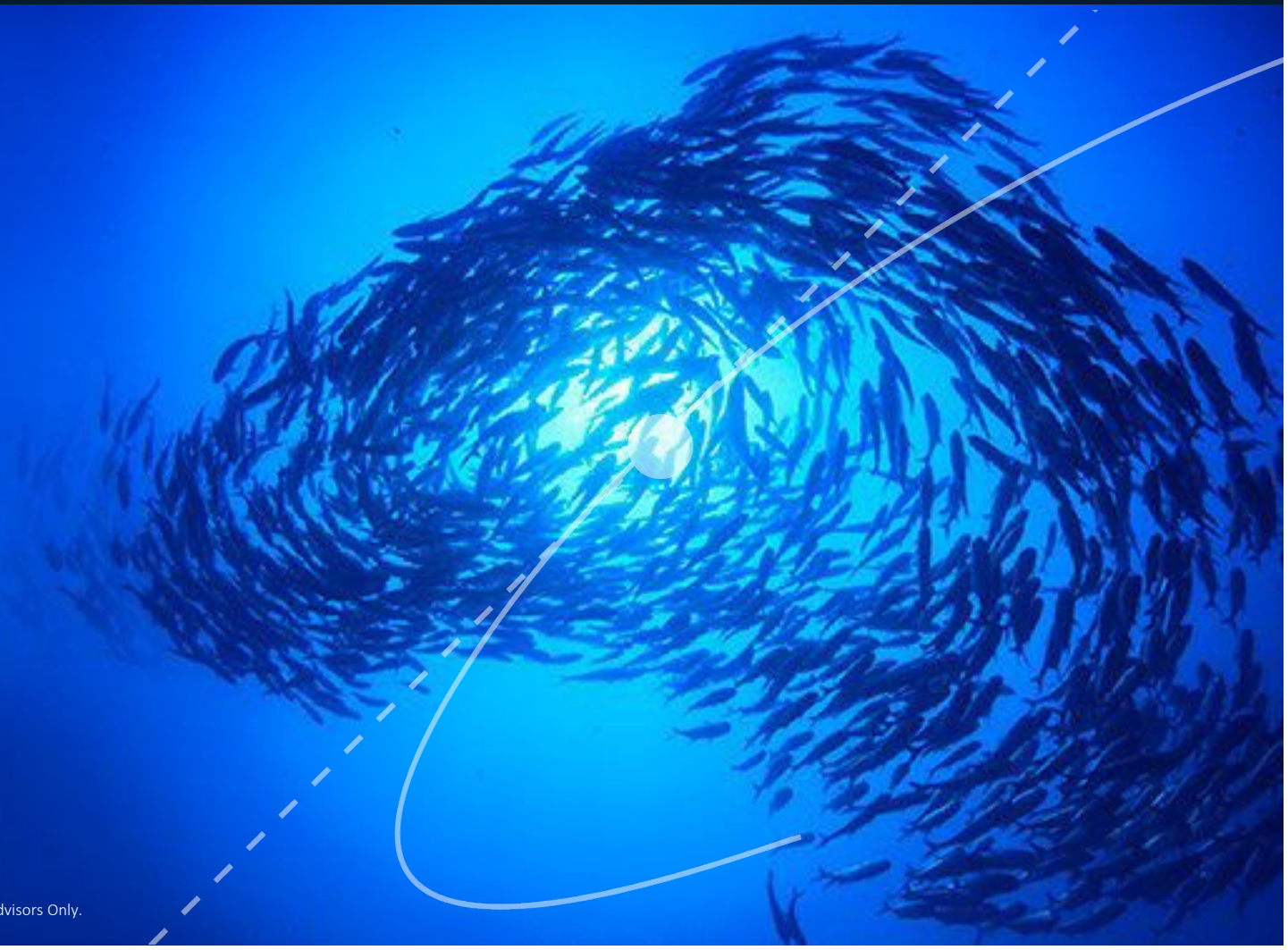
Looking ahead, using Wilshire's 10-year capital market assumptions, a diversified portfolio (light blue line) is expected to offer higher returns at every risk level versus the 60/40 portfolio (dark blue line).

Scenario 1 is an optimization of a two-asset portfolio: equities and bonds at various weights. Scenario 2 uses OH SERS existing asset classes and constraints from the 2023 Asset-Liability Study.

Conclusions

- While returns for a diversified portfolio have generally been superior vs. the 60/40 portfolio, a diversified portfolio also:
  - Protects against time periods where the correlations between equities and fixed income are elevated
  - May offer superior inflation protection
  - May have lower risk/standard deviation over time versus the 60/40 portfolio. The path to achieving returns is likely smoother with a diversified portfolio than with the 60/40 portfolio. A lower volatility experience decreases the likelihood of contributions, selling risk assets at depressed prices or other extraordinary measures required to shore-up the portfolio during a significant downturn that could materialize with a higher volatility portfolio.
  - Expands the efficient frontier, offering portfolios with higher return at every given risk level
- The last few decades have been an extraordinary time for investors with asset prices fueled by central bank intervention, stimulus, low inflation, and ever declining interest rates.
- Going forward, circumstances are likely to change. The years since 2022 have ushered in a potential new regime:
  - Higher inflation and interest rates will be a headwind to asset class returns.
  - High valuations in a concentrated equity market - where only a handful of companies have driven returns - are especially foreboding for future equity returns.
  - High US Debt levels are a headwind for bonds specifically but may be a drag on a broad array of asset classes.
  - Higher returns are forecasted for asset classes that are not included in the 60/40 portfolio.

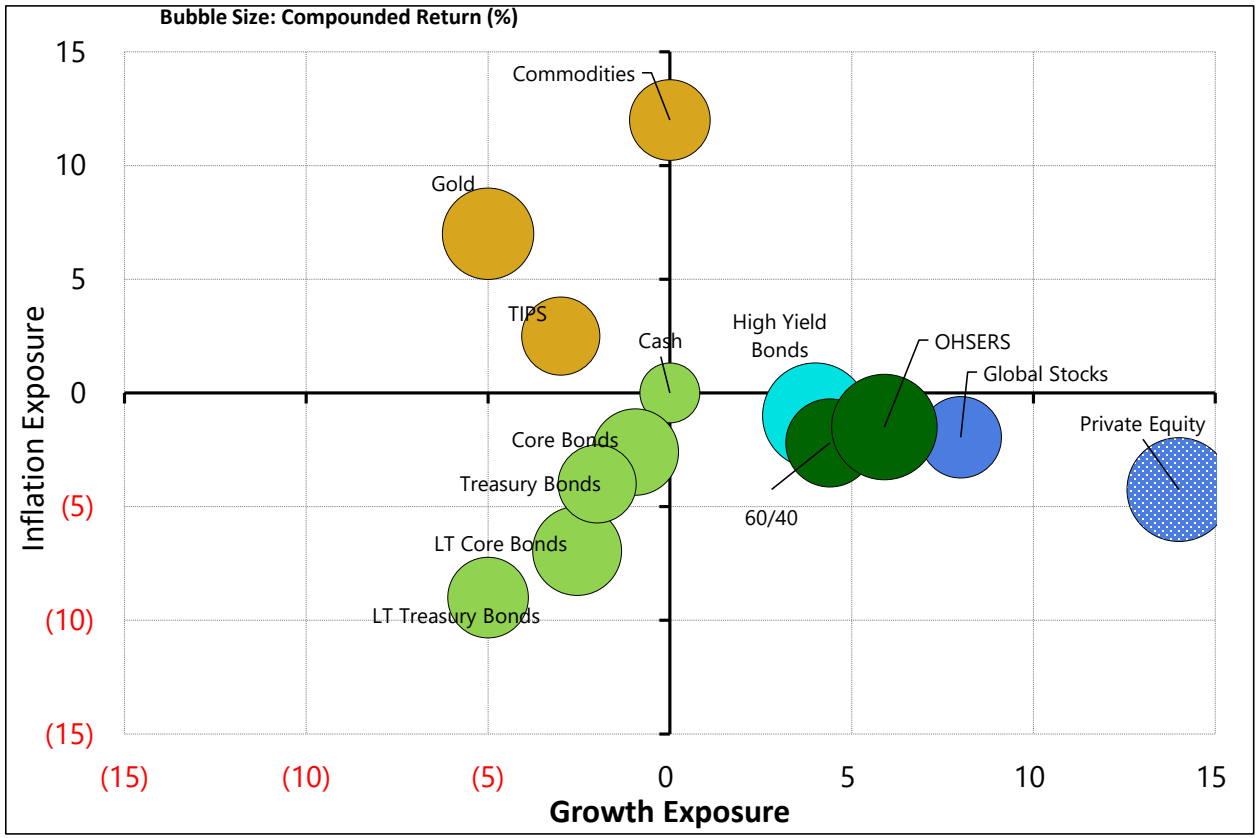
Appendix



Economic Factors

The OH SERS diversified portfolio minimizes the negative effects of inflation exposure relative to the 60/40 portfolio.

The OH SERS portfolio has slightly higher exposure to the growth factor than the 60/40 portfolio. As such, the diversified portfolio may exhibit higher beta to economic growth. Given that the US economy is in growth mode more than 85% of the time[1], the overall effect is expected to be positive for the diversified portfolio.



[1] Source: Capital Group https://www.capitalgroup.com/advisor/insights/articles/guide-to-recessions.html#:~:text=Recessions%20have%20been%20relatively%20small,but%20can%20bounce%20back%20quickly

Wilshire's Bucketing Approach to Asset Allocation

Growth	Defensive-growth	Interest Rate Sensitive	Inflation-sensitive
U.S. Equity	Defensive Equity	Cash	Infrastructure
Non-U.S. Equity	Public Credit	Treasuries	Real Estate
Private Equity	Private Credit	Core Fixed Income	Natural Resources
	Bank Loan		

Asset allocation is subject to change at any time and does not guarantee a profit or protection from losses in a declining market. Investments, when sold, may be worth more or less than the original purchase price.

Important Information

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School Employees Retirement System

Memo

To: Retirement Board

From Richard Stensrud

cc: Karen Roggenkamp, Chris Collins

Date: February 17, 2025

Re: **Nossaman Health Care Legislation Presentation**

In their presentation to the Board, staff from our Federal liaison, Nossaman, will provide their perspective on what we know about the new administration and congressional plans to act on health care related issues.

SERS is grateful to be able to benefit from Nossaman's expertise in this area. Their history of working with lawmakers, regulators and the executive branch is the result of strong relationships coupled with in-depth, substantive knowledge in key industries. They have a record of accomplishment advocating on behalf of clients in front of both the state and federal legislatures and administrative agencies.

Our speakers are Chris Carney and Fred Dombo.

Before joining Nossaman, Chris Carney represented Pennsylvania's 10th Congressional District for two terms and was a tenured professor of political science specializing in international relations at Penn State University. A 'Blue Dog Democrat' while in Congress, where he served from 2007-2011, Chris was assigned to the Transportation & Infrastructure and Homeland Security Committees.

Fred Dombo serves as chair of Nossaman's Government Relations & Regulation Group. He combines experience as an aide to Members of the U.S. House of Representatives Committees on Appropriations and Energy & Commerce with 25 years of private practice to provide advice on the legal and political implications of government relations activities.

We anticipate some of the Pharmacy Benefit Management (PBM) reforms that were discussed in lame duck at the end of last year are likely to be part of a budget reconciliation package being pieced together in Congress right now. Some of those provisions included changes to pharmacy networks contracting requirements, requiring additional transparency, and restriction on utilization management, among other PBM reform proposals that could have both positive and negative impacts on the SERS retiree health care program.

Chris and Fred will discuss what the process might look like and what the timetable might be for action on these issues.

They should also be able to provide insight on related topics such as: Will Republicans pick up where the Democrats at the Federal Trade Commission left off on PBMs? And whether the enhanced ACA subsidies scheduled to expire at the end of the year will be extended by Congress?

Frederick T. Dombo III, Nossaman LLP
Partner | Washington, DC

Fred Dombo serves as chair of Nossaman's Government Relations & Regulation Group. He combines experience as an aide to Members of the U.S. House of Representatives Committees on Appropriations and Energy & Commerce with 25 years of private practice to provide clients with cost effective advice on the legal and political implications of their government relations activities.

Fred advises clients on local, state and federal pay to play, campaign and lobby laws, gift rules, ethics compliance and investigations. His practice includes counsel to nonprofit advocacy organizations with respect to their general operations, as well as their compliance requirements with Internal Revenue Service regulations and the Foreign Corrupt Practices Act. Fred also serves as a lobbyist for private and public sector clients on authorization and appropriations issues. He speaks widely on ethics and election law reform issues.

Fred's practice includes creation and implementation of strategic communication plans regarding the public policy aspects of clients' advocacy campaigns or government/legal dilemmas. He has been active in many presidential nominating conventions and political campaigns and has supported candidates for state and national offices. He speaks widely on ethics, lobbying and campaign finance at the local, state and federal levels.

Fred serves on Nossaman's Diversity, Equity & Inclusion Committee and chairs the Nossaman LLP Political Action Committee.

Hon. Chris Carney
Senior Policy Advisor | Washington, DC

Chris Carney has found success through public service. He represented Pennsylvania's 10th Congressional District for two terms and was a tenured professor of political science specializing in international relations at Penn State University. Prior to running for Congress, Chris worked at the Pentagon for four years on strategic analysis of the global terrorist threat. He ran the Department of Defense's Policy Counterterrorism Evaluation Group (PCTEG) and was the "Special Projects" intelligence officer for two tours during Operation Southern Watch.

A Blue Dog Democrat while in Congress, where he served from 2007-2011, Chris was assigned to the Transportation & Infrastructure and Homeland Security Committees. With his significant experience on both issues, he was appointed Chairman of the Management, Investigations, and Oversight Subcommittee as a freshman member. As a member of the Subcommittee on Intelligence, Information Sharing, and Terrorism Risk Assessment, Chris had the opportunity to work with the Department of Homeland Security (DHS) and the National Counterterrorism Center (NCTC) to develop policies pertaining to international as well as domestic terrorism.

Chris leverages his deep experience in national defense, homeland security, intelligence, cybersecurity, transportation, and veterans' affairs to help clients achieve optimal results. Drawing upon his time as a Naval Officer, and as a former Presidentially-appointed Commissioner on the Military Compensation and Retirement Modernization Commission (MCRMC), Chris credits his fluency in "military" speak as one of the reasons he has been able to represent security-focused clients. At MCRMC, he worked for a bipartisan body whose sole goal was to improve the personnel and budgetary issues for U.S. military and veterans.

Commissioned as an Ensign in 1995, Chris has served as an intelligence officer for more than 15 years. As a former Commander, he is a combat Mission Operation Commander (MOC) for the MQ-1 Predator, the MQ-9 Reaper, and RQ-4 Global Hawk ISR platforms. Chris has earned many personal awards including the Defense Meritorious Service Medal.

OH SERS Board Annual Workshop on Federal Healthcare Legislative Priorities

February 19, 2025

Presented by: Hon. Chris Carney and Fred Dombo

NOSSAMAN LLP

Today’s Presenters

Hon. Chris Carney

Senior Policy Advisor,
Federal Advocacy

ccarney@nossaman.com

Fred Dombo

Partner, Government
Relations & Regulations

fdombo@nossaman.com

Who we are

Nossaman LLP is a national law firm with attorneys and policy advisors located in 11 offices throughout the United States. We focus on distinct areas of law and policy, as well as in specific industries, ranging from government relations & regulation, pensions, benefits & investments, transportation, healthcare, financial services, infrastructure, real estate development, water and employment.

Nossaman's Government Relations & Regulations Practice

Nossaman's Government Relations and Regulation Practice has a legacy that is well-regarded by the United States Congress and the Administration, including federal agency personnel. Our in-depth understanding of the political, policy and funding issues confronting public entities is based on our 80 years of experience representing public agencies at the federal, state and local levels. We have decades of experience advising more than 200 public agencies on their legislative and regulatory priorities. Our team has complementary skills and a history of working together to achieve funding and policy success. Our services provided by our Government Relations and Regulation team will be informed by members of Nossaman's Pensions, Benefits & Investments (PB&I) Practice Group.

Nossaman’s Pensions, Benefits & Investments Practice

Nossaman is one of the select few law firms in the nation with an established full-service practice dedicated to the pensions industry. The unrivaled team of professionals in our PB&I Group collectively have more than 100 years of experience in the pensions sector and have dedicated their legal careers to representing pension plans across the nation. Nossaman’s attorneys provide thoughtful, nuanced, and independent advice on legal and governance issues affecting pension systems, including fiduciary compliance, tax-compliance, ethics, investments, real estate, employee benefits, cyber security, insurance and regulatory-related matters, as well as representing pension systems in litigation in these areas.

Nossaman's OH SERS Team

Hon. Chris Carney

Senior Policy Advisor, Co-Lead Federal Advocacy

ccarney@nossaman.com

Chris has found success through public service. He represented Pennsylvania's 10th Congressional District, was a Member of the T&I Committee, and is steeped in transit and infrastructure experience. At Nossaman, Chris provides federal legislative advocacy for public entities, including LACMTA and the Port of Los Angeles (POLA). While in Congress, Chris was able to kick start the nine-year, $865M Central Susquehanna Valley Thruway Project in Pennsylvania, scheduled for completion in 2024. Chris is a long-time proponent of multi-modal development projects as drivers of economic vitality and understands the importance of "connected" modes of transportation. Having earned the reputation as a truly bipartisan Member while in Congress, Chris maintains close relationships among both parties, and with Senate colleagues as well. Chris has been interviewed and quoted in numerous *The Hills* articles in 2024.

Chris' relevant experience includes:

- Worked with Fred and Shant to secure nearly $30 million in USDOT grant funding over three years, including for the TIGER/BUILD and Port Infrastructure programs.
- Assigned to the T&I and Homeland Security committees in Congress.
- Invited by the White House to attend President Biden's exclusive infrastructure event in Scranton, PA on October 20, 2021.

Fred Dombo

Partner, Co-Lead Government Relations & Regulations

fdombo@nossaman.com

Nossaman's OH SERS Team

Chair of Nossaman's Government Relations & Regulation Group and Chair of federal Nossaman LLP Political Action Committee, combines his experience as an aide to Members of the U.S. House of Representatives committees on Appropriations and Energy & Commerce. Fred has over 25 years of experience inside and outside the legislative branch of the federal government. Since leaving Congress, Fred has served as a lobbyist for more than 50 public and private sector clients on authorization and appropriations issues. His practice includes the creation and implementation of strategic communication plans regarding the public policy aspects of clients' advocacy campaigns or government/legal dilemmas.

Fred's relevant experience includes:

- Devised and implemented strategy for town government in New York to retain an oceanfront parcel of land threatened with reversion by the federal government.
- Protected contract American furniture company holds with the United States Government.
- Represented the U.S. Park Police Fraternal Order of Police on retirement and criminal justice matters; as well as Congressional inquiries regarding force operations and equipment.
- Defended Fortune 50 financial services company during Congressional committee investigations and investigations conducted by the Office of Congressional Ethics.

Michelle McCarthy

Partner
Pensions, Benefits & Investments

mmccarthy@nossaman.com

Nossaman's OH SERS Team

With more than 20 years of legal experience specializing in federal tax and benefits matters, Michelle advises clients of all types – from exempt organizations and governmental plans to some of the largest and most well-known Fortune 100 companies and multiemployer pension, health and welfare plans in the nation.

Michelle advises on litigation matters related to pension and benefits administration and has represented numerous of her clients in matters before the IRS and other governmental agencies on audit and exam. Michelle also has a great deal of experience representing assists her clients before the IRS in obtaining determination letters, private letter rulings, closing agreements and compliance statements with respect to corrective filings under the Employee Plans Compliance Resolution System (EPCRS).

Michelle serves as Assistant Vice Chair of the Exempt Organization and Governmental Plan Subcommittee of the ABA and is an active member and the former Chair of the Employee Benefits and Executive Compensation Subcommittee of the California State Bar and the Taxation Section of LACBA. In addition to also being an active member of NAPPA's Tax Section and the IFEBP, Michelle frequently speaks on federal legal and regulatory compliance issues relevant to governmental plans at conferences hosted by NAPPA, IFEBP, SACRS, CALAPRS, LACBA, the Beverly Hills Bar Association, and the California Society of CPAs.

Focus On Pharmacy Benefit Management (PBM) Reforms

- Budget Reconciliation
  - Potential changes to pharmacy networks
  - Requiring additional transparency
  - Restriction on utilization management
- Federal Trade Commission
  - PBMs in the transition from Democrat to Republican control.

Thank you

Hon. Chris Carney

Senior Policy Advisor,
Federal Advocacy

ccarney@nossaman.com

Fred Dombo

Partner, Government
Relations & Regulations

fdombo@nossaman.com

ADJOURNMENT(R)

_____ moved that the SERS Retirement board adjourn to meet on Thursday, February 20, 2025, for the next regularly scheduled meeting.

The meeting adjourned at _____ a.m./p.m.

_____
Matthew King – Chair

_____
Richard Stensrud, Secretary