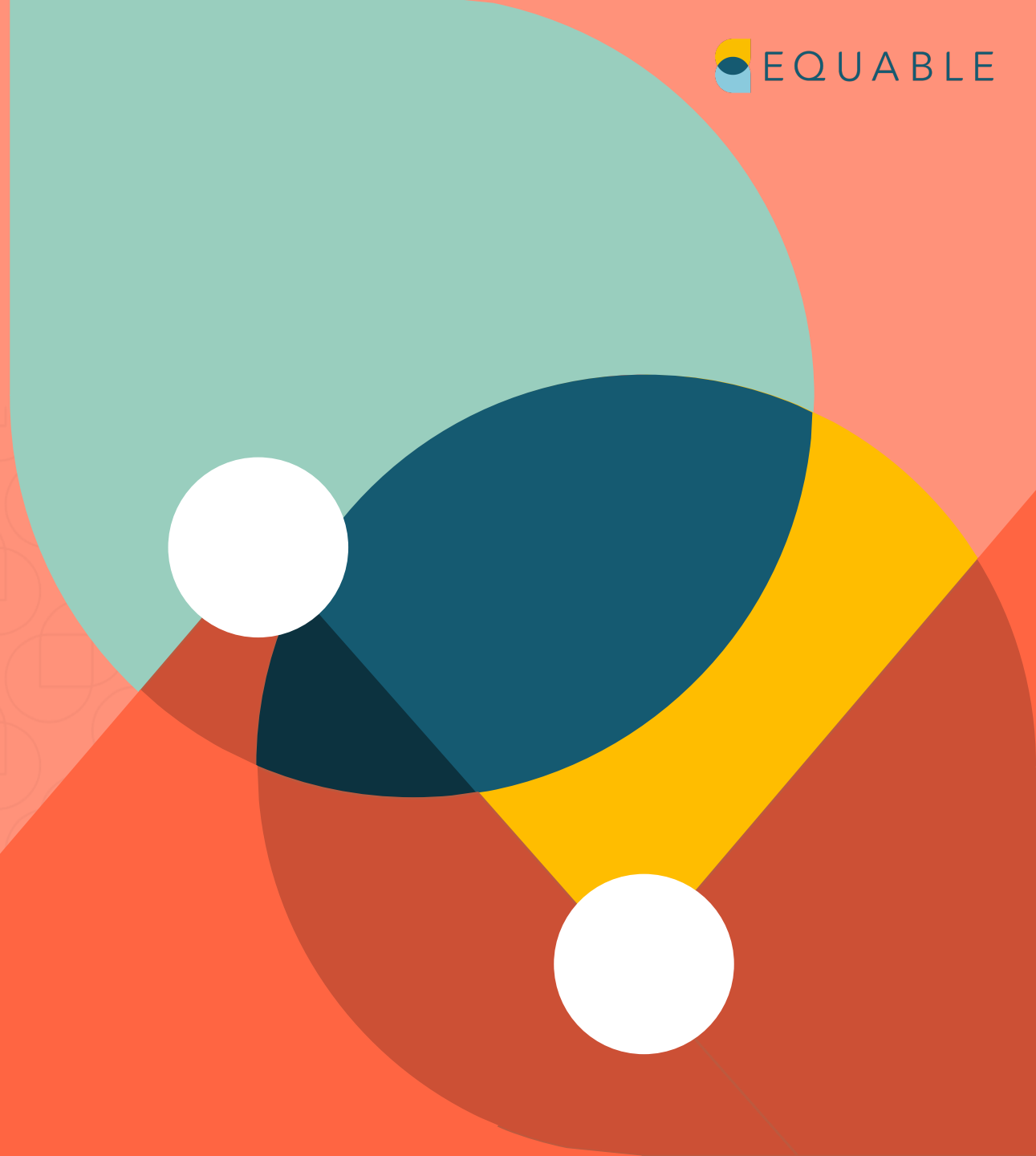
EQUABLE

State of Pensions 2024

Equable Institute's Annual Report | 5th Edition

The Hidden Cost of Pension Debt Paralysis



THE STATE OF PENSIONS IN 2024

- *Takeaways from the 2024 Report*

  Read this if you don't have time for the whole report.

- *National Trends for State & Local Pension Plans*

  We estimate the 2024 funded ratio for state and local plans will increase to *80.6%* as of June 30, 2024, up from *75.8%*, based on reported market valued assets. Benchmark estimates suggest an average 2024 investment return of *7.42%* will overperform average assumed rates of return. Employer contributions in 2024 exceeded *30%* of payroll on average for a third straight year.

- *Examining Pension Debt: The Major Causes of Unfunded Liabilities*

  Around 90% of unfunded liabilities have been caused by improving actuarial assumptions, underperforming investments, and interest on liabilities growing faster than contributions paid. Factors like mortality rates or benefit enhancements were not major reasons for unfunded liability growth between 2000–2022.

- *Valuation Risk: An Update to Our Asset Allocation Analysis*

  The share of public pension portfolios exposed to the risk of being overpriced by non-transparent accounting methods — e.g., valuation risk — has grown to 28% of investments.

- *State of Inflation Protection & COLAs*

  Actual cost-of-living adjustments paid in 2023 averaged *2.02%* compared to the national inflation average of *3.00%*.

- *Within the Trends: 2023 Funded Status*

  There is a wide range of funded ratio variance from state to state.

- *Within the Trends: Investment Assumptions*

  The *6.88%* average assumed rate of return (as of June 2024) remains higher than both a *6.46%* target based on historic interest rate tends, or a *5.9%* target based on the leading national plans.

- *Within the Trends: Contribution Policy*

  A handful of states began adopting policies over the past decade to improve their odds of fully funding pensions.

- *Within the Trends: Cash Flows & Maturing Plans*

  It is hard (or impossible) for pension funds to invest their way back to fiscal health, in part because of negative cash flow trends.

- *Methodology, Glossary, and Appendices*

  Appendix 1: Glossary
  Appendix 2: Additional Charts and Data Trends
  Appendix 3: Methodological Notes
  Appendix 4: Statewide & Municipal Retirement Systems in Our Dataset

Technical Note: As of this publication, some states had not yet released all FYE 2023 numbers. For these few plans, we've rolled forward 2022 figures to 2023 using actuarial modeling and asset allocation data. As new data are released, we will update our figures online. See methodology section in Appendix 3 for more details.

ABOUT
EQUABLE INSTITUTE

Equable is a bipartisan nonprofit that works with public retirement system stakeholders to solve complex pension funding challenges with data-driven solutions.

Read more about the State of Pensions report here.

For an interactive version of the report, visit here.

Some states have not released their final data points for 2023. We will be updating our digital graphics and figures throughout the year as more states release information.

About the Authors:

Anthony Randazzo (Executive Director) is a national expert on public sector pension policy and has provided technical assistance to more than a dozen states and cities on ways to improve retirement plan sustainability.

Jonathan Moody, PhD (Research VP) has developed a wide range of academic and policy research on municipal finance subjects, including state budgeting and reserve funds, state credit ratings, state fiscal management, and public retirement benefits.

The 2024 State of Public Pensions in the United States Remains Fragile

State and local governments paid a record amount into their public retirement systems last year — 31.3% of payroll on average, or $180.7 billion (Page 14). In one way this reflects a positive trend, as more money needs to get contributed to public plans since pension debt won't be eliminated through investment returns on their own. However, it is a problem that nearly two decades on from the Global Financial Crisis this level of money has not been enough: America's pension plans still have $1.34 trillion in unfunded liabilities as of 2024, with a funded ratio of just 80.6% (Page 7).

The news this year is not all bad: After a decade of insufficient funding, state agencies on average are now consistently paying 100% of their actuarially determined contribution rates (Page 67). State legislatures have used surplus revenue over the past few years to make supplemental contributions to state pension funds. And this past year, the average public pension fund's 7.4% investment return beat their average 6.9% assumed return (Page 10).

But some bad news is that the record contributions paid into pension funds have been insufficient to prevent interest from continuing to accumulate. In fact, "interest on the pension debt" is the fastest growing contributor to unfunded liabilities (Page 25).

The result is that public retirement systems are mired in pension debt paralysis.

The simple reality is that states and cities are not doing enough to eliminate unfunded liabilities, and the result is steadily rising contribution rates that will lead to more costs in the long run than if legislatures took this problem seriously. Government complacency is harming taxpayers with lower quality public services and harming public employees who are experiencing reduced benefit values and insufficient inflation protection — problems which are not likely to change even with good investment returns.

Click here for a more detailed assessment on the causes of pension debt paralysis.

Takeaways from the 2024 Report

- Preliminary 2024 investment returns are 7.4% on average for state and local plans (Page 10). Public equity and fixed income performance have been strong, helping plans to beat their 6.9% average assumed rate of return—which is the main target to hit each year in order to prevent further growth of unfunded liabilities.

- We project the average funded ratio for state and local plans will increase from 75.8% to 80.6% (Page 7). And we estimate unfunded liabilities will decline to $1.34 trillion, down from $1.61 trillion in 2023 (Page 8). This is a welcome improvement, but it will require additional years of similar performance to break public plans out of their pension debt paralysis. ***The funded status of public pension plans remains Fragile***.

- Funded ratios for public pension plans vary (Pages 18, 19), but most plans have a Fragile or Distressed funded status (Page 45).

- Unfunded liability costs continue to drive up employer contribution rates, currently over 30% of payroll on average (Page 14). A sign that states had adopted responsible funding policies would be a one-or-two year spike in required contribution rates followed by a steady decline in employer costs over time.

- The Global Financial Crisis, increased lifespans, and enhanced pension benefits are often blamed for unfunded liabilities. However, a new analysis finds 90% of unfunded liabilities as of 2022 were caused by improving actuarial assumptions, underperforming investments, and interest costs growing faster than contributions paid (Page 24).

- Pension fund allocations to private capital increased again to a historic high of 13.7% — a reported value of $694 billion as of 2023 (Page 12). This has driven up the share of pension fund investments exposed to valuation risk to 27.9% (Page 29). Investments in all alternatives continue to be more than one-third (33.8%) of pension fund assets.

- Cost-of-living adjustment policies are insufficient to ensure public pension benefits keep pace with inflation (Pages 37, 38). The average COLA paid in 2023 was 2.02%, below actual national inflation at 3%. Plus, 31.3% of benefit tiers offered no inflation adjustment at all.

- Negative cash flows (benefit payments being larger than income) keep expanding (Page 16) even as contribution rates from members and employers keep growing (Pages 13, 14).

Looking to the Future

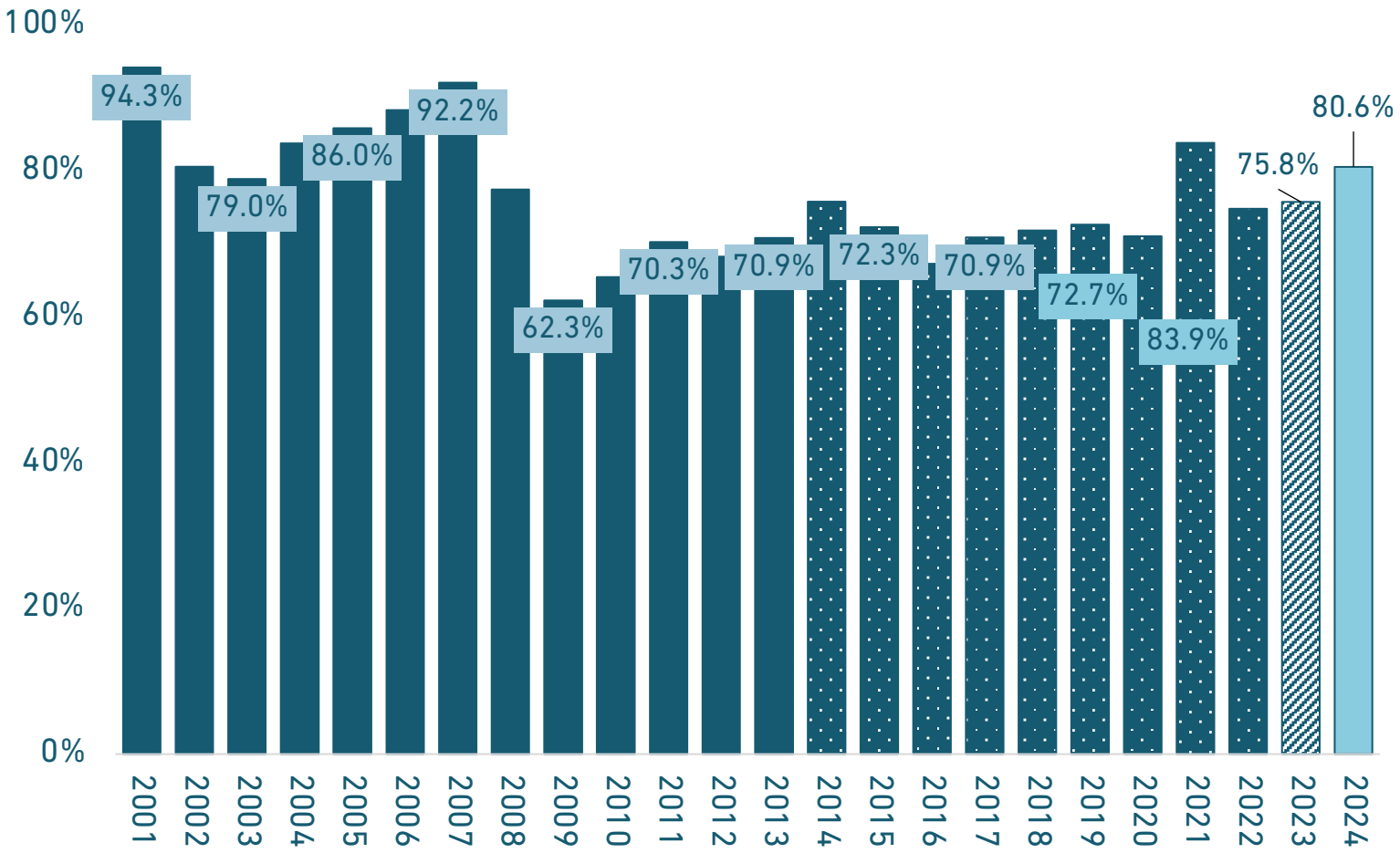
1. Pension debt paralysis has caused average employer contributions to increase from 17.3% to 31.3% of payroll between 2008 and 2024, all while:
   - Unfunded liabilities have risen to levels persistently above $1 trillion.
   - Funded ratios have not rebounded to pre-Global Financial Crisis levels.
   - The higher contributions paid are not even enough to prevent interest from continuing to accrue on unfunded liabilities — which is the fastest growing contributor to pension debt for the country as a whole.
2. Meanwhile, there is a less than a 50% chance, on average, that a U.S. public pension plan can earn a 6.9% return over the next 10 years, which is the average rate of return those plans are expecting to earn.
3. In addition, necessary changes to actuarial assumptions and expected demographic turnover patterns are likely to continue to put downward pressure on public pension plan funded ratios.

This collectively suggests that ***contribution rates will continue growing in the coming years without meaningfully reducing unfunded liabilities***—unless state leaders appropriately respond with improved accounting and adequate near-term contribution increases that will gradually decline over time.

National Trends for State & Local Pension Plans

FUNDED RATIO AVERAGE

FOR STATE & LOCAL PENSION PLANS | 2001–2023 + 2024 Estimate



The aggregate funded ratio for statewide and municipal pension plans in 2024 (80.6%) is still below the recent high mark in 2021 (83.9%).

However, the 2023 to 2024 improvement was the second best year over year increase in the last decade.

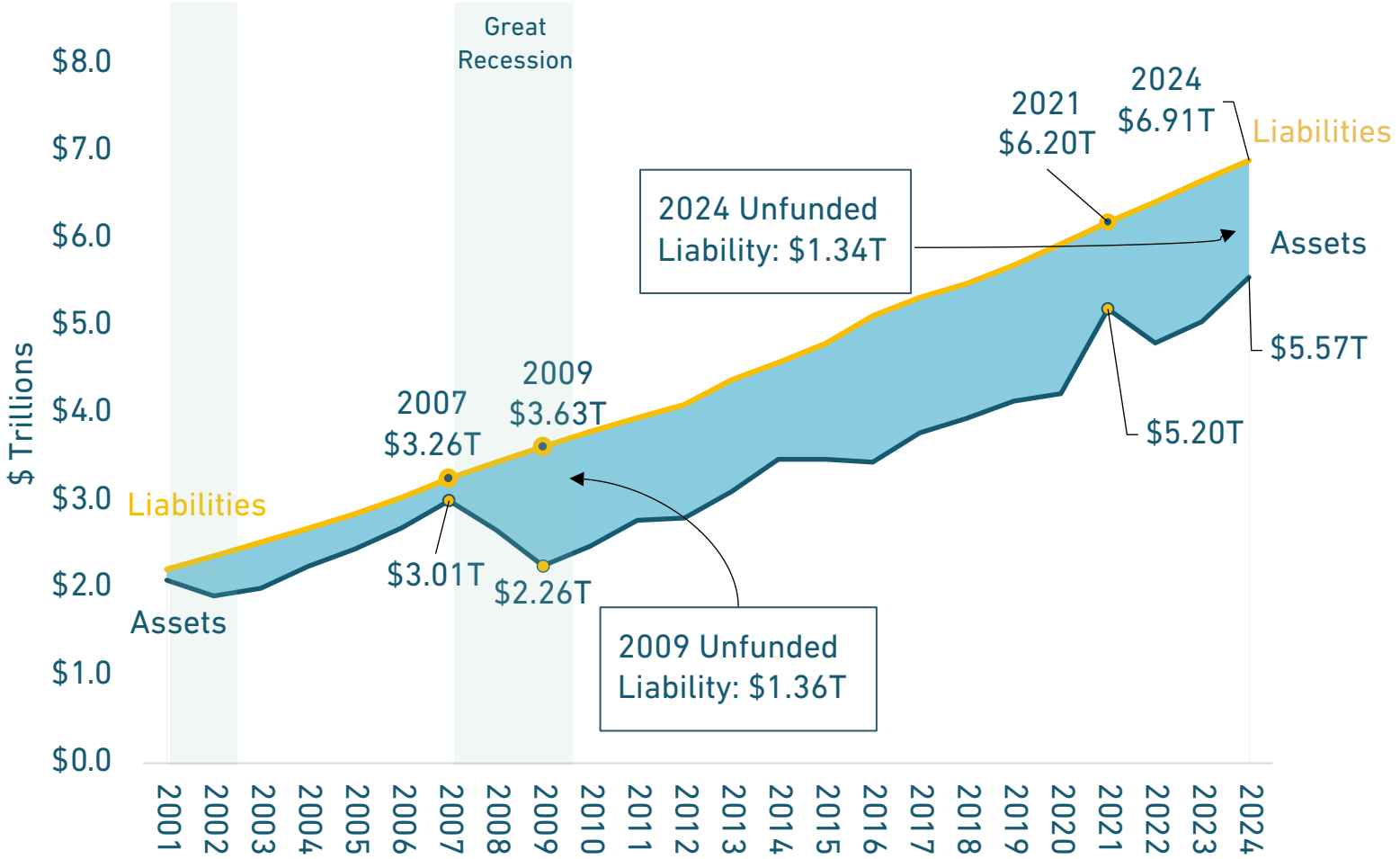
To view funded ratios by state see Page 19.

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2023 Data Availability
- 2024 Estimate Based on June 30 Benchmark Returns

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Data for 2001 to 2013 reflect the "actuarially accrued liabilities" reported by public plans. Data from 2014 onward use the new GASB 67 "total pension liability" measurement. See methodology section for details on 2024 estimate.

TOTAL UNFUNDED LIABILITIES

FOR STATE & LOCAL PENSION PLANS | 2001–2023 + 2024 Estimate



The national shortfall in assets for state and local pension plans shrank from ***$1.61 trillion*** in 2023 to an estimated ***$1.34 trillion*** shortfall in 2024.

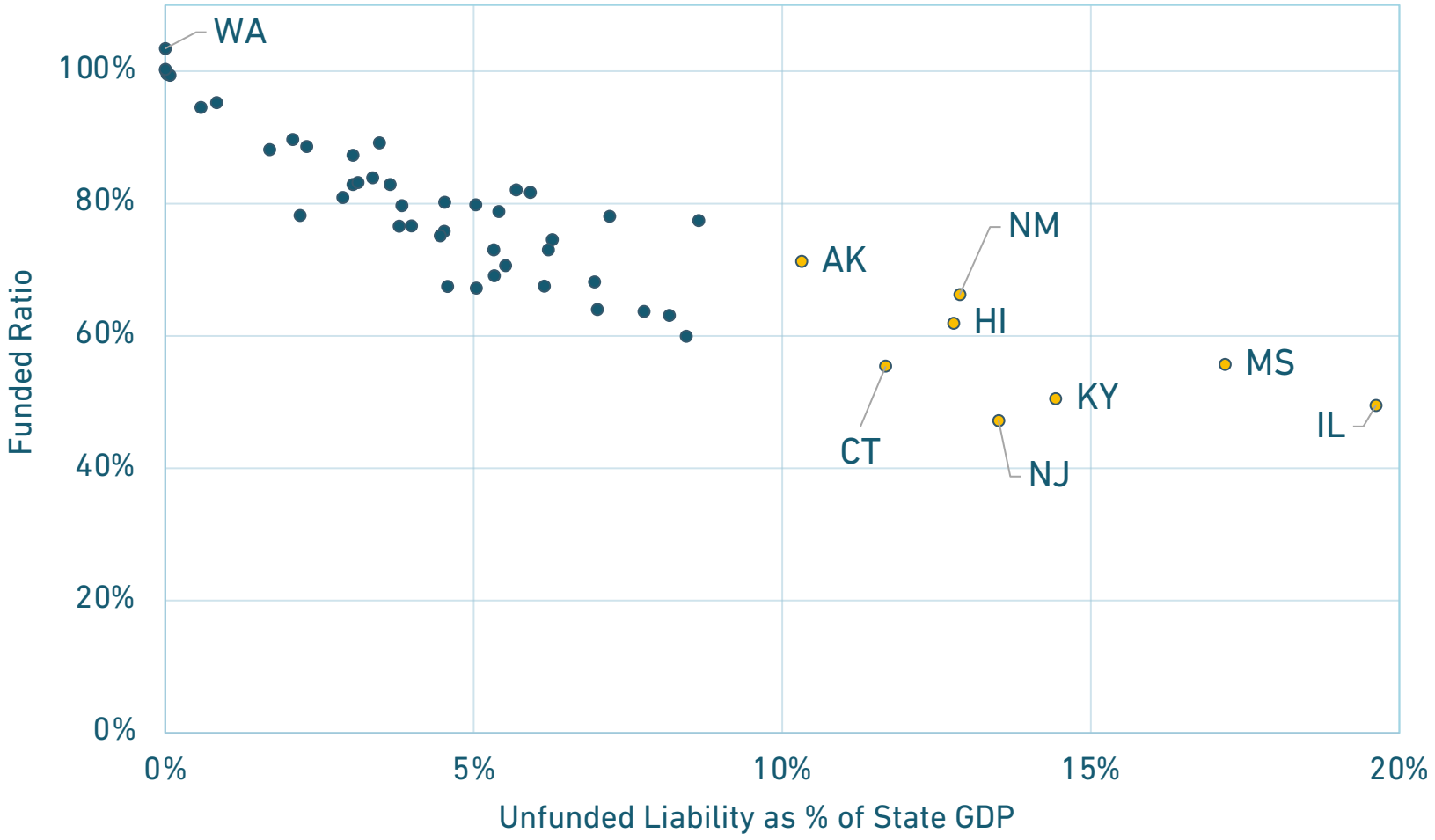
This is nearly the same national unfunded liability level as in 2009 (***$1.36 trillion***).

The volatility of public pension funded status — the average size of the change from year to year — has been notably higher since the pandemic compared to the period after the Global Financial Crisis.

Formally, the "standard deviation" of 5% from 2020–2024 is notably higher than 3.8% for 2009–2019.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Trendline shown is based on market value of assets; using the "actuarial" value of assets shows a similar trend. See methodology section for details on 2024 estimate.

2023 FUNDED RATIO
AS A SHARE OF STATE ECONOMIC OUTPUT



Funded ratio and unfunded liability levels on their own are not perfect indicators of a retirement plan's fiscal health or sustainability.

It is helpful to understand the size of unfunded liabilities relative to the size of a state's economy. This provides a sense of what scale of local tax base resources are needed to improve retirement plan funded status.

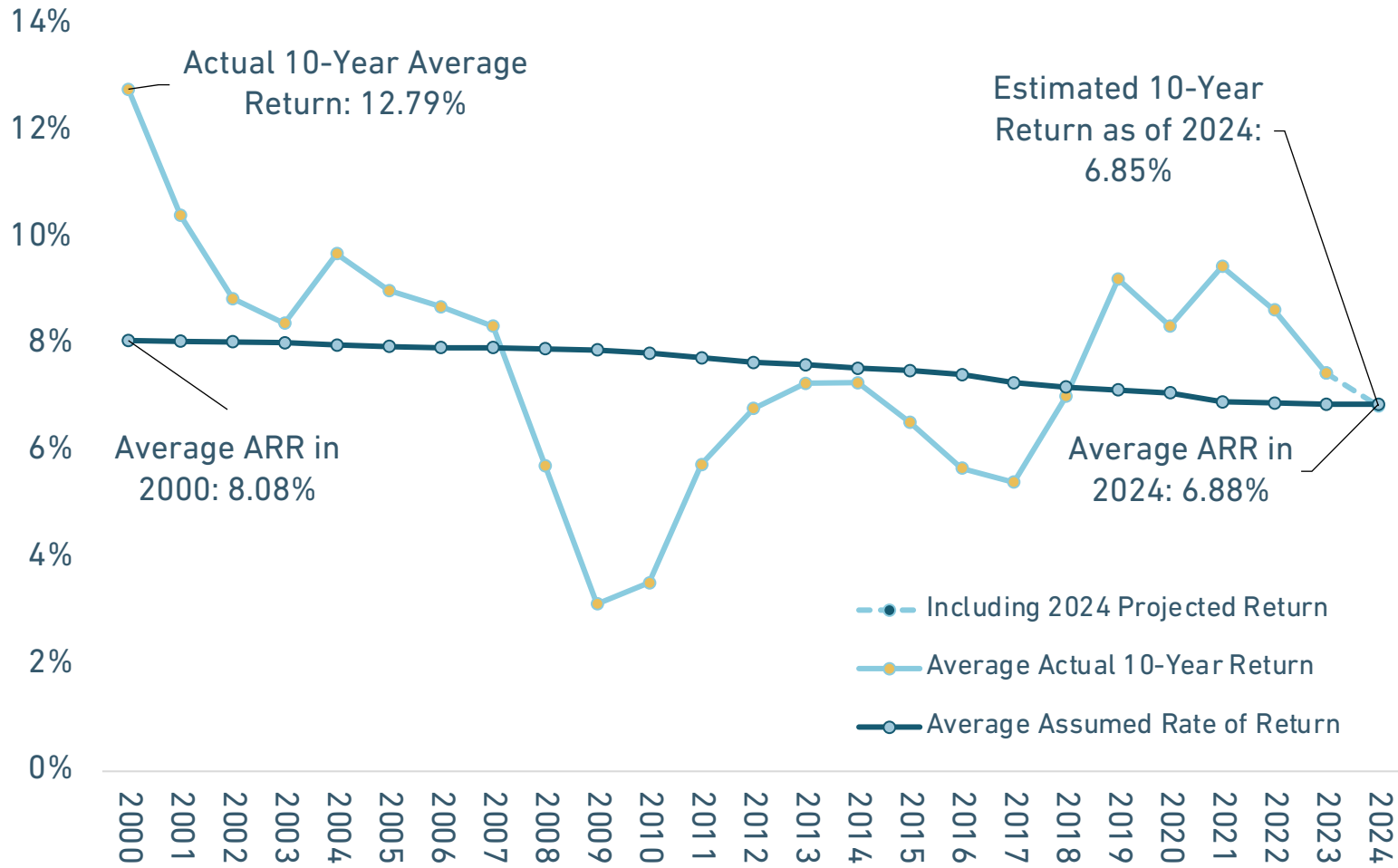
It may also be appropriate for state officials to consider their economic trajectory and demographic patterns to contextualize the funded health of their public pension plans.

Find your state with our interactive chart

Source: Equable Institute analysis of public plan valuation reports and ACFRs; Bureau of Economic Analysis data for state GDP estimate in 2023. Unfunded liability and funded ratio data include statewide retirement plans and municipally-managed retirement plans. Funded ratios reflect a weighted average of assets and liabilities for plans within each state.

INVESTMENT RETURN AVERAGES

COMPARED TO ASSUMED RATES OF RETURN | 2001–2024



We estimate 2024 investment returns will average 7.4% (based on data through June 30).

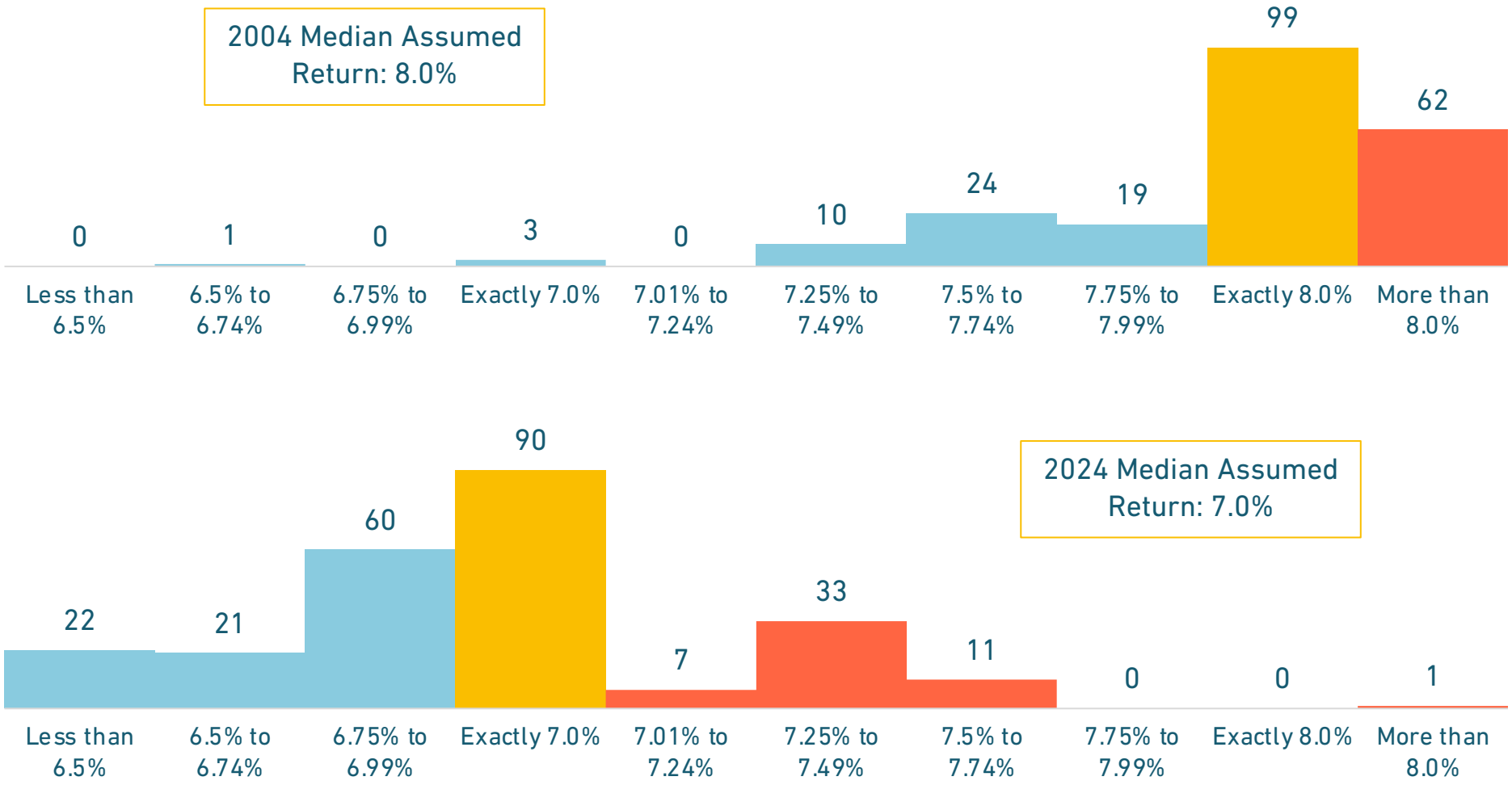
All asset classes had strong performance over the last year, in particular for January-June 2024. If the A.I.-fueled surge in public equities continues then it is likely plans with a fiscal year ending in December will post even stronger returns and move this average return up.

The actual 10-year average return for 2015–2024 is essentially the same level as today's average assumed rate of return.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Average 10-year return for 2023 and 2024 is based on Equable projected investment returns.

DISTRIBUTION OF ASSUMED RATES OF RETURN

BY PENSION PLAN COUNT | AS OF JUNE 2004 & JUNE 2024



There were 214 major public pension plans with assumed rates of return higher than 7% in 2004. That has fallen to just 52 plans today, also down from 60 plans last year.

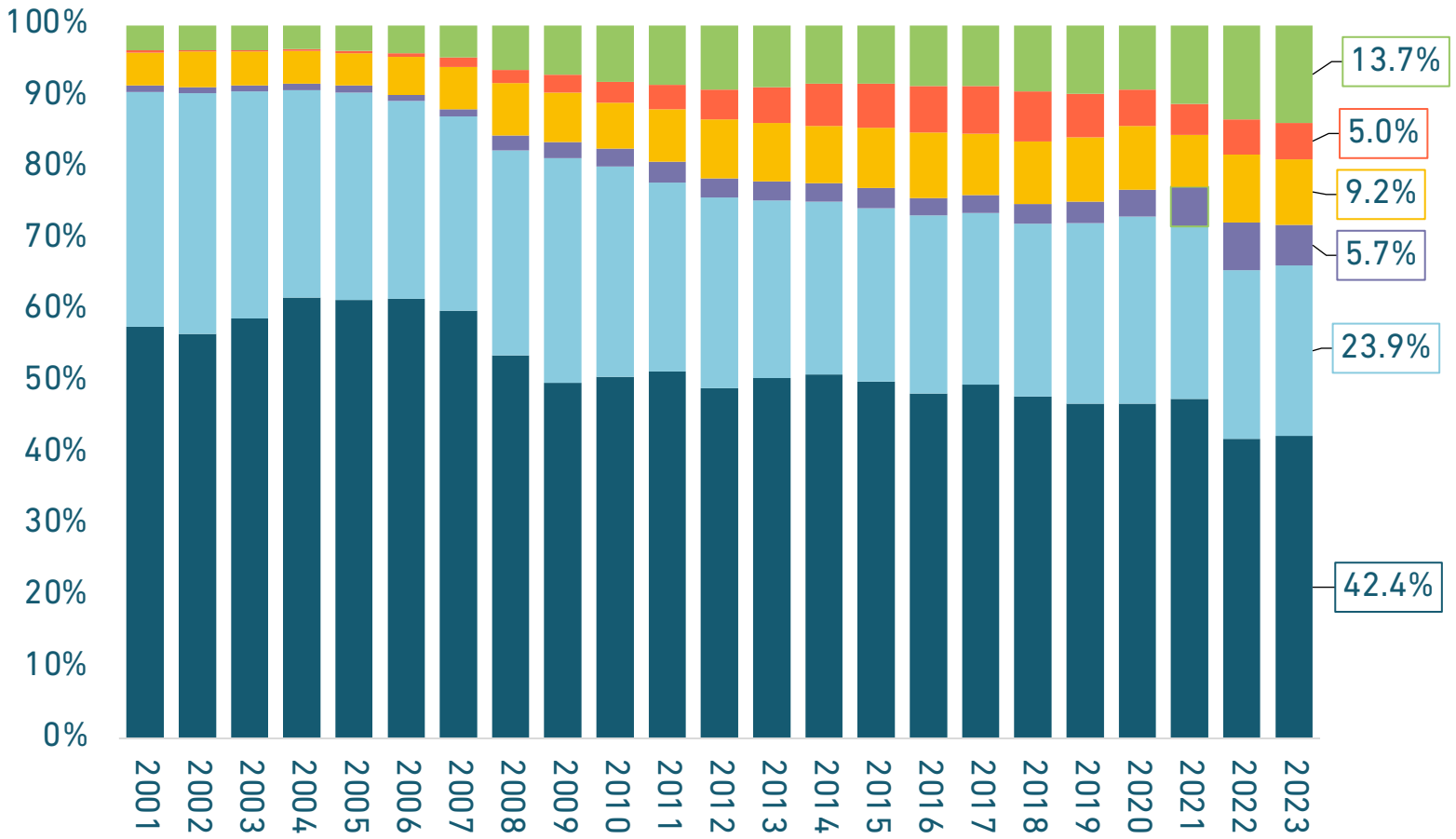
The average assumed return is 6.88%, though the rate of decline has leveled off since 2020.

Still, 41 plans have assumed returns 6.5% or less (up from 39 last year). These plans are leading their peers in adopting more realistic future expectations.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Assumed rates of return for 2024 were cross-checked against published board materials, news reports, and other secondary sources to corroborate any changes in plan assumptions from 2023 to 2024.

ASSET ALLOCATION TREND

OF STATE & LOCAL PENSION FUNDS | 2001–2023



Public pension asset allocations have shifted away from transparent public equities and relatively safe fixed income investments into riskier categories as trustees search for stronger investment returns.

"Alternatives" are a third of pension fund investments (33.7%), driven by private capital investments (13.7%).

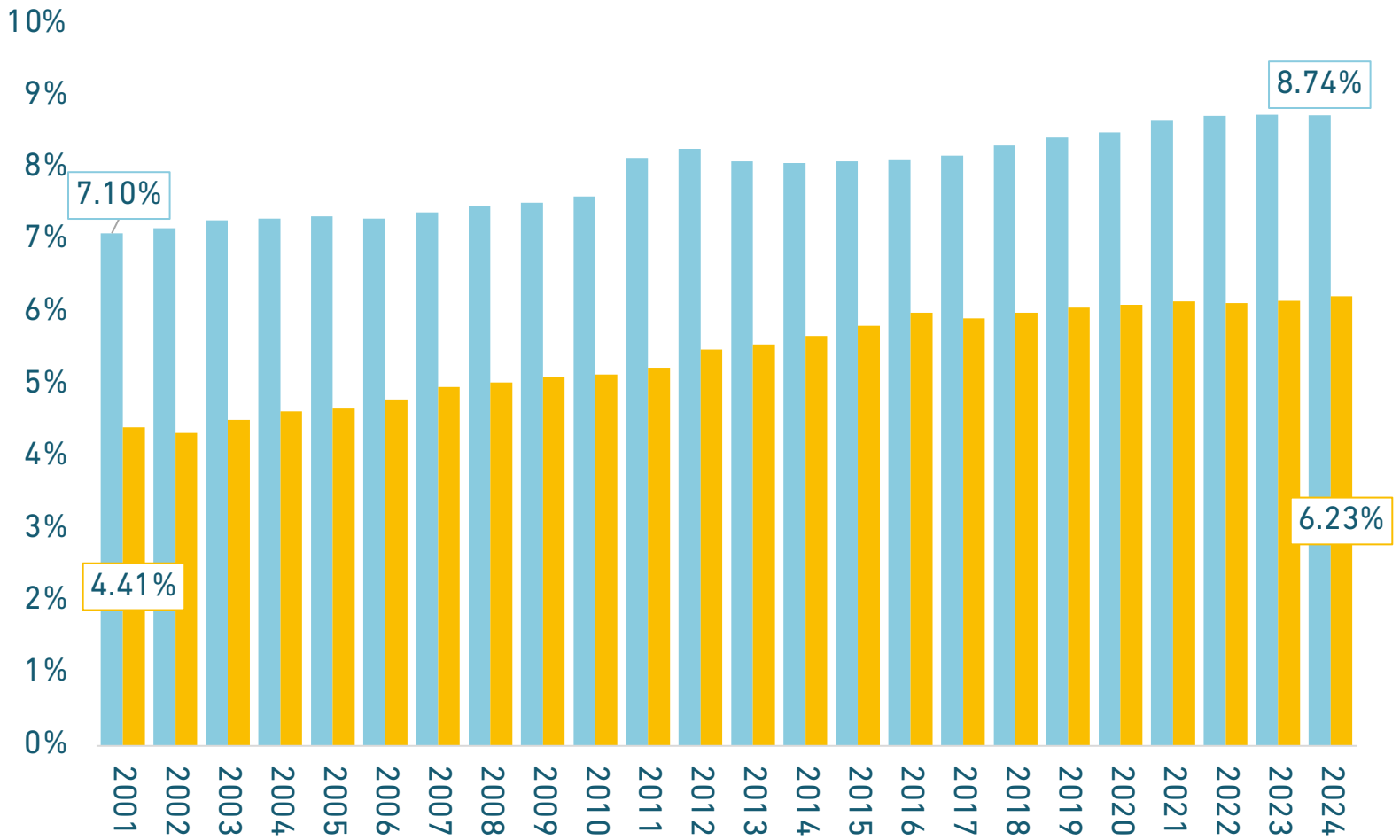
See Page 90 for asset class dollar values.

- Private Capital Investments (Equity & Debt)
- Hedge Fund Strategies
- Real Estate (Real Property, Infrastructure, and REITs)
- Commodities & Miscellaneous Alternatives
- Fixed Income & Cash Holdings
- Public Equities (U.S. & Global)

Source: Equable Institute analysis of public plan valuation reports and ACFRs. *Note:* "Misc. Alternative" investments include opportunistic funds, absolute return pools, tactical asset allocations, alpha strategies, etc. We have classified investments as each fund reports; ex. "private debt" may be allocated with "private equity" or "fixed income' depending on the fund.

AVERAGE MEMBER PAYROLL CONTRIBUTIONS

BASED ON SOCIAL SECURITY PARTICIPATION | 2001–2024



Steady increases in contributions public employees make to their own retirement plans have leveled off over the last three years. However, rates are still notably higher today than prior to the Global Financial Crisis.

In 2024, public sector workers who are enrolled in Social Security paid ***120 basis points more*** than they did during the 2008 fiscal year, ***a 23.8% increase***.

Public workers whose employers do not participate in Social Security paid ***16.7% more this year*** than in 2008, but have paid effectively the same rate since 2022.

Note: Public employees are not uniformly covered by Social Security. Some states never opted into Social Security and, therefore, typically have higher valued benefits and relatively higher contribution rates than for statewide systems where members also have access to Social Security benefits.

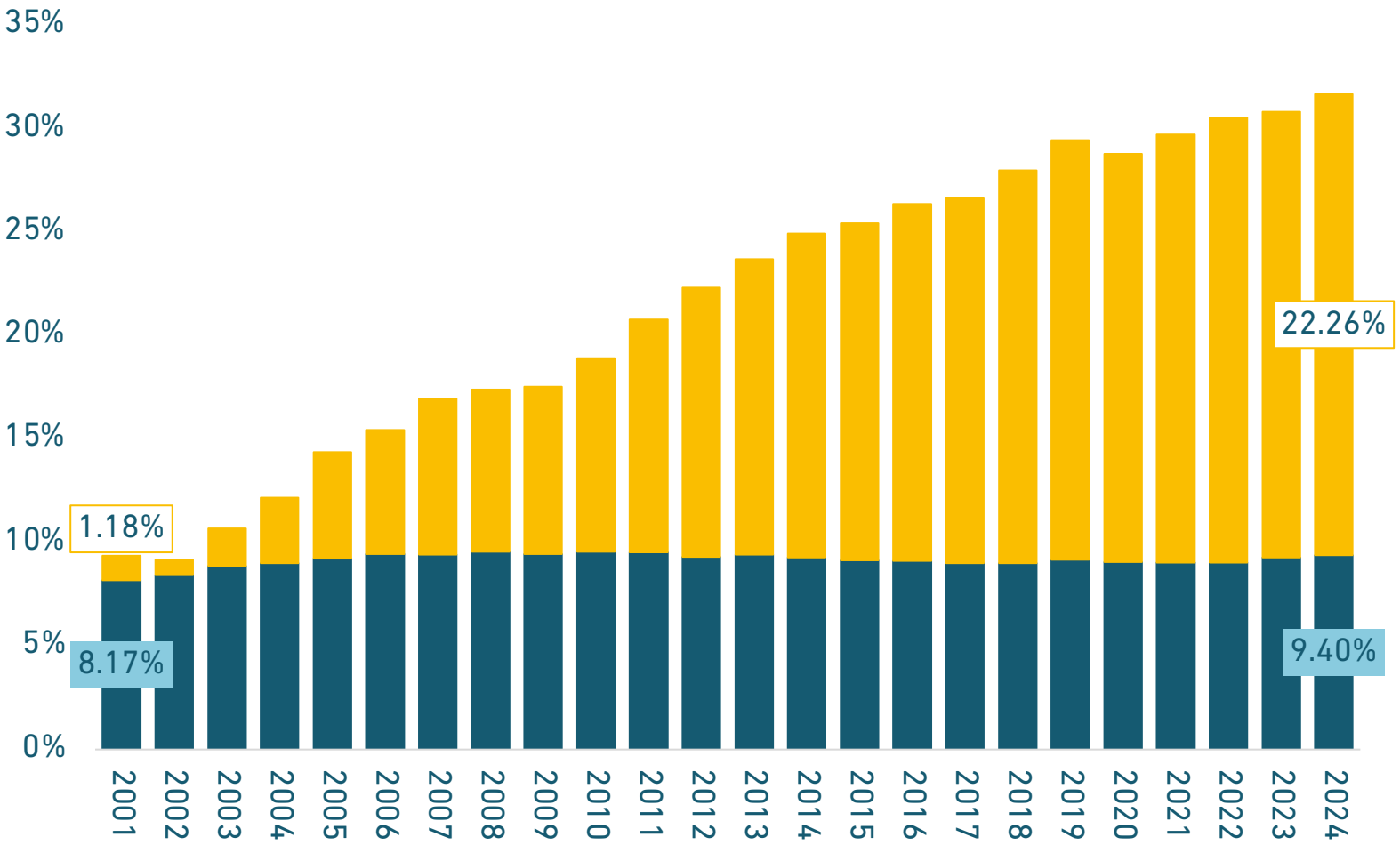
For Plans Not Participating in Social Security or with Mixed Levels of Participation

For Plans Participating in Social Security

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Contribution rates show for the year actually paid. ***Notes:*** (1) Increased contributions do not increase the value of a pension, which is based on years of service and final average salary. (2) Contribution rates are required and set by the sponsoring government.

AVERAGE EMPLOYER CONTRIBUTION RATES

AS A PERCENTAGE OF PAYROLL | 2001–2024 Fiscal Year



Government employer contributions have steadily increased over the past two decades, mostly because of increased payments to cover pension funding shortfalls (e.g., unfunded liability amortization payments).

Combined state and local employer contributions in 2001 were *9.30%* of payroll. During the fiscal year ending 2024, employer contributions are *31.27%* of payroll.

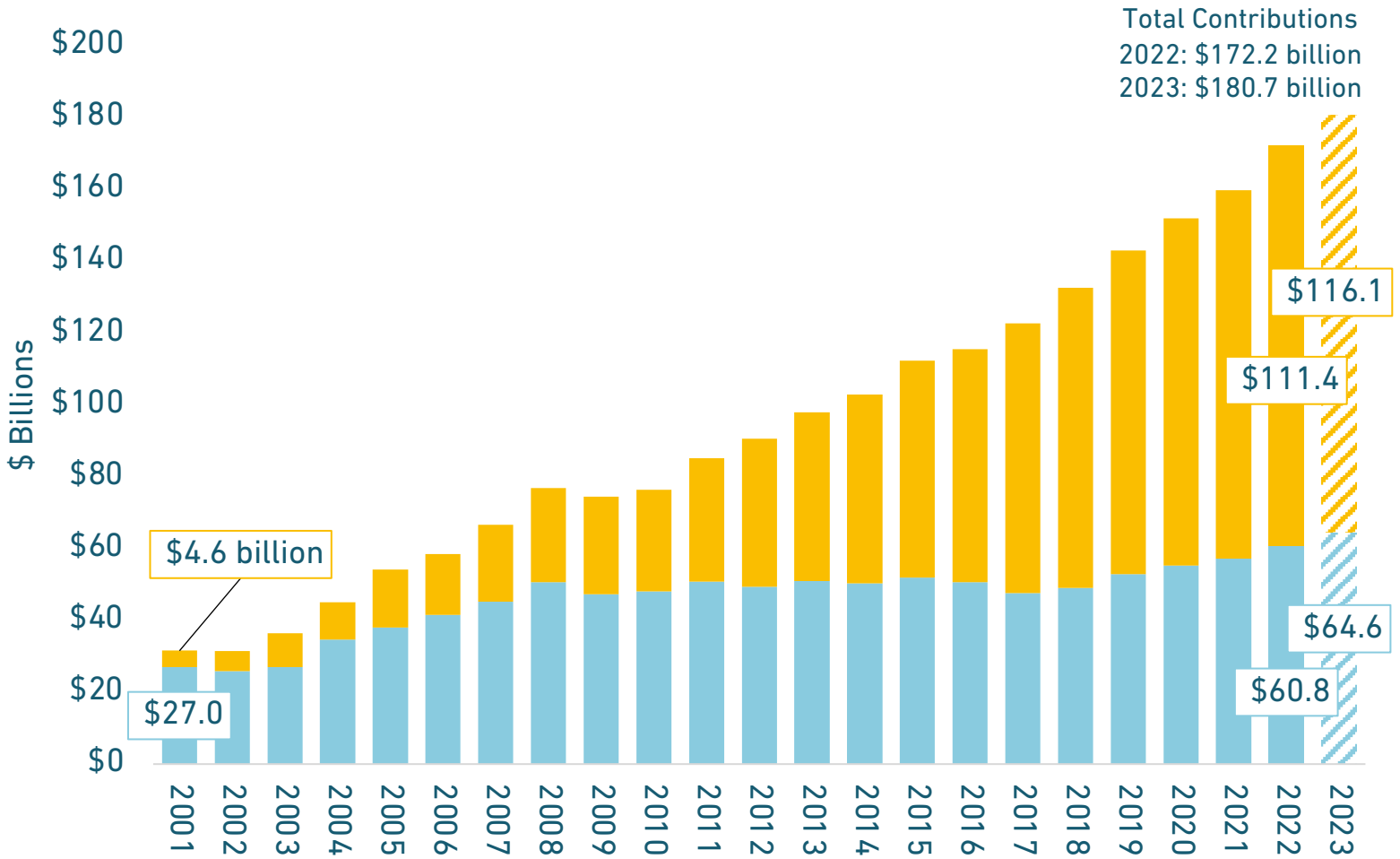
Unfunded Liability Amortization Payments

Normal Cost

Note: Normal cost is the contribution necessary to fund pension benefits earned each year, assuming some future investment income. The normal cost contributions pay in advance for pension benefits promised. Unfunded liability amortization payments are contributions made to close a pension plan's funding shortfall over time.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Contribution rates show for the year actually paid.
Note: For a look at this trendline broken out by Social Security participation see Appendix 2.

EMPLOYERS CONTRIBUTION SHARES TOWARD NORMAL COST V. PENSION DEBT | 2001–2022 + 2023*



Normal cost payments, in dollars, more than doubled — *up 139%* — between 2001 and 2023. However, unfunded liability payments have risen *2,450%* during the same period.

Adjusted for inflation (see Page 69), between 2001 and 2023 normal cost payments grew *40%*, while unfunded liability payments jumped *1,388%.*

Unfunded Liability Amortization Payments

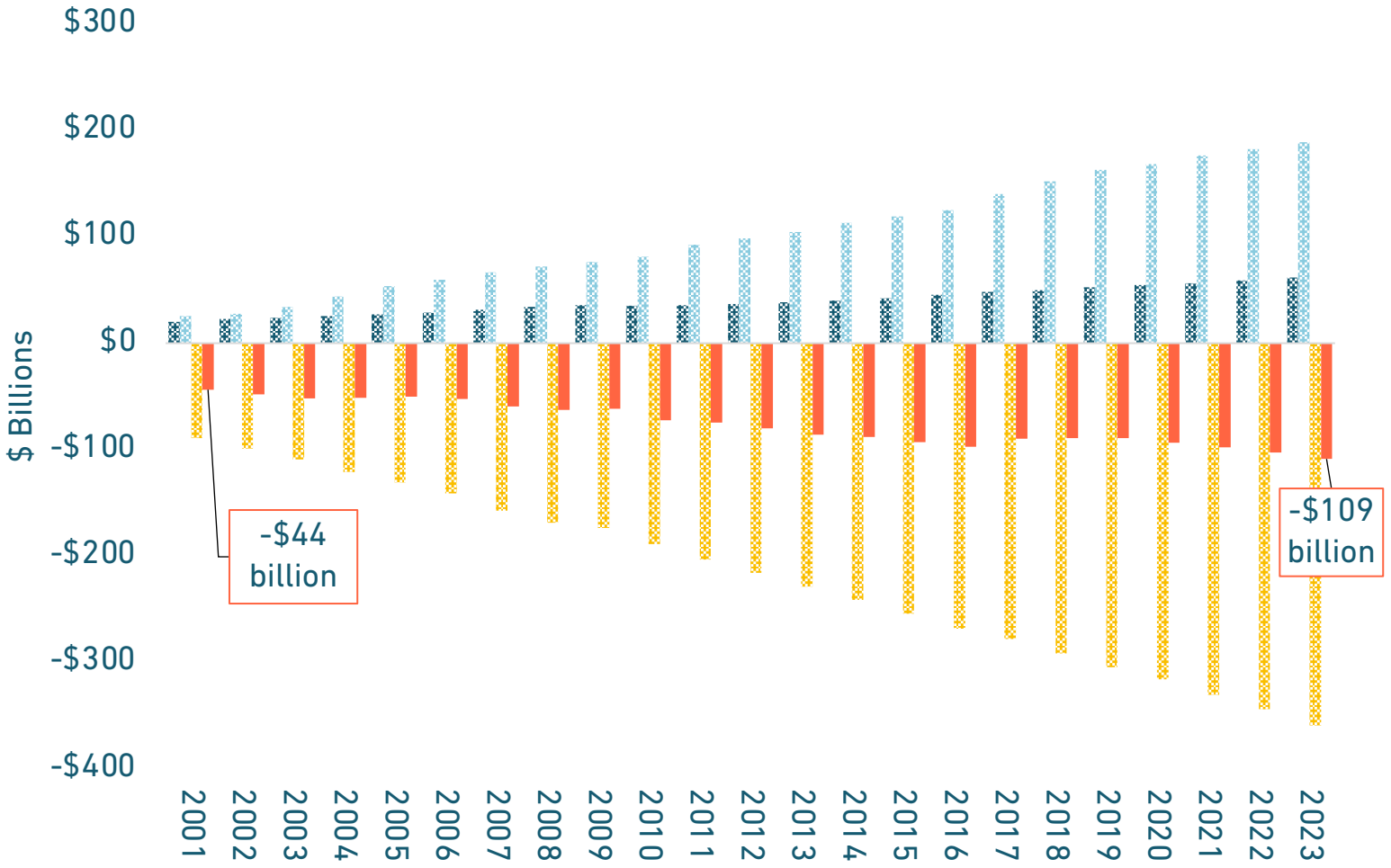
Normal Cost

Note: Contribution data for fiscal year 2023 do not include CalPERS, which will not likely be available until the fall of 2024. For all plans that have yet to release complete 2023 data, we've estimated their contributions paid using actual or rolled forward payroll and the formally published contribution rate for the year. As additional data are released, we will update this chart.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Contribution rates show for the year actually paid.

NON-INVESTMENT CASH FLOW

FOR STATE & LOCAL PENSION PLANS | 2001–2023



See our interactive version for all values

Negative net cash flows from contributions and benefit payments have steadily increased over the past two decades, reflecting more "mature" pension plans.

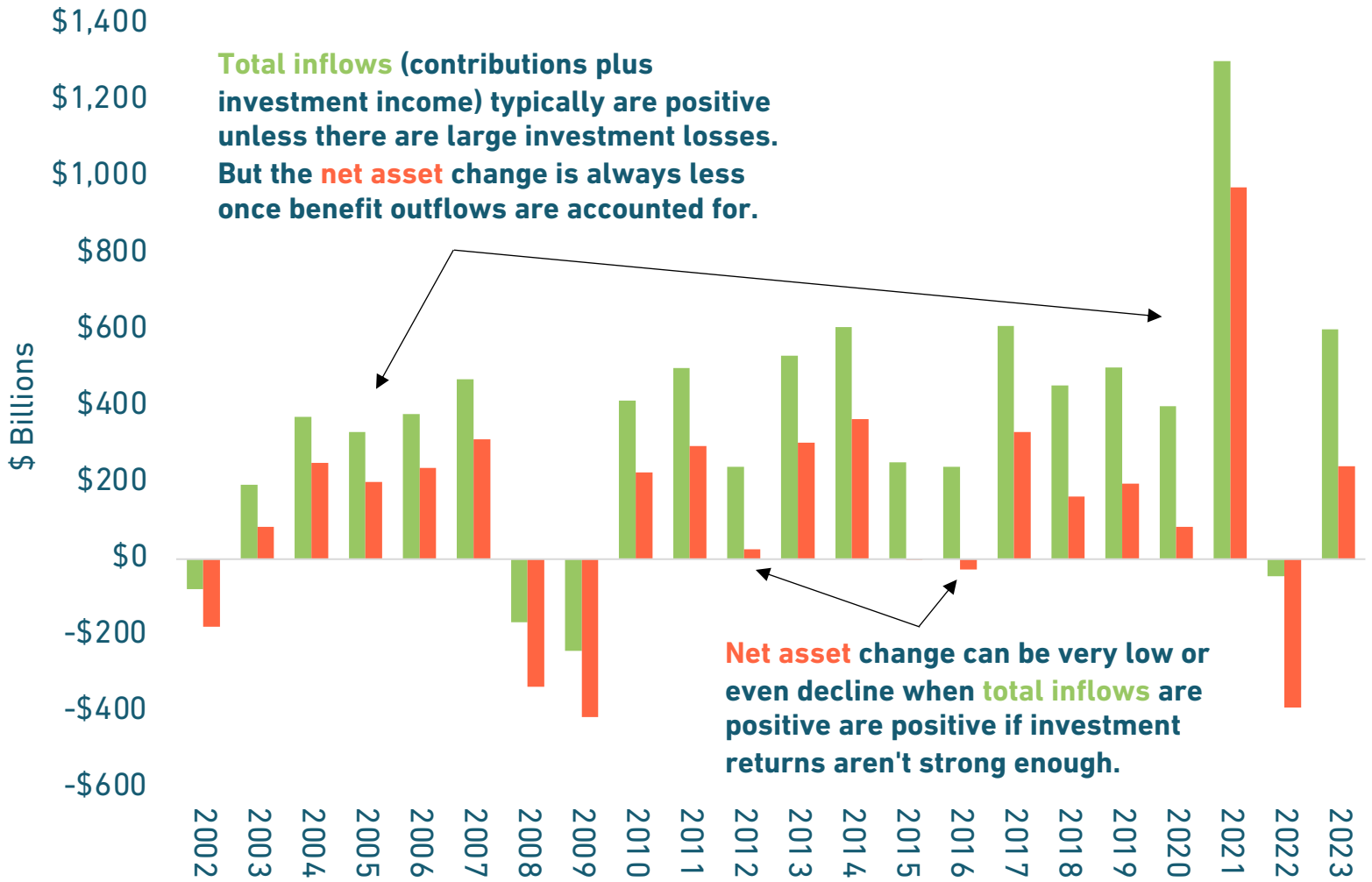
Larger negative cash flows put increased pressure on investment return income each year to make up the difference.

- Net Cash Flow
- Benefit Payments
- Employer Contributions
- Member Contributions

Source: Equable Institute analysis of public plan valuation reports and ACFRs.
Note: Contribution data for 2023 do not yet include retirement plans that haven't published final data, including CalPERS.

AGGREGATE CASH FLOW

FOR STATE & LOCAL PENSION PLANS | 2002–2023



Negative cash flows (e.g., benefit payments being greater than inflows of contributions) are not inherently a problem as long as investment returns are generating expected investment gains that are equal to or greater than benefit payments.

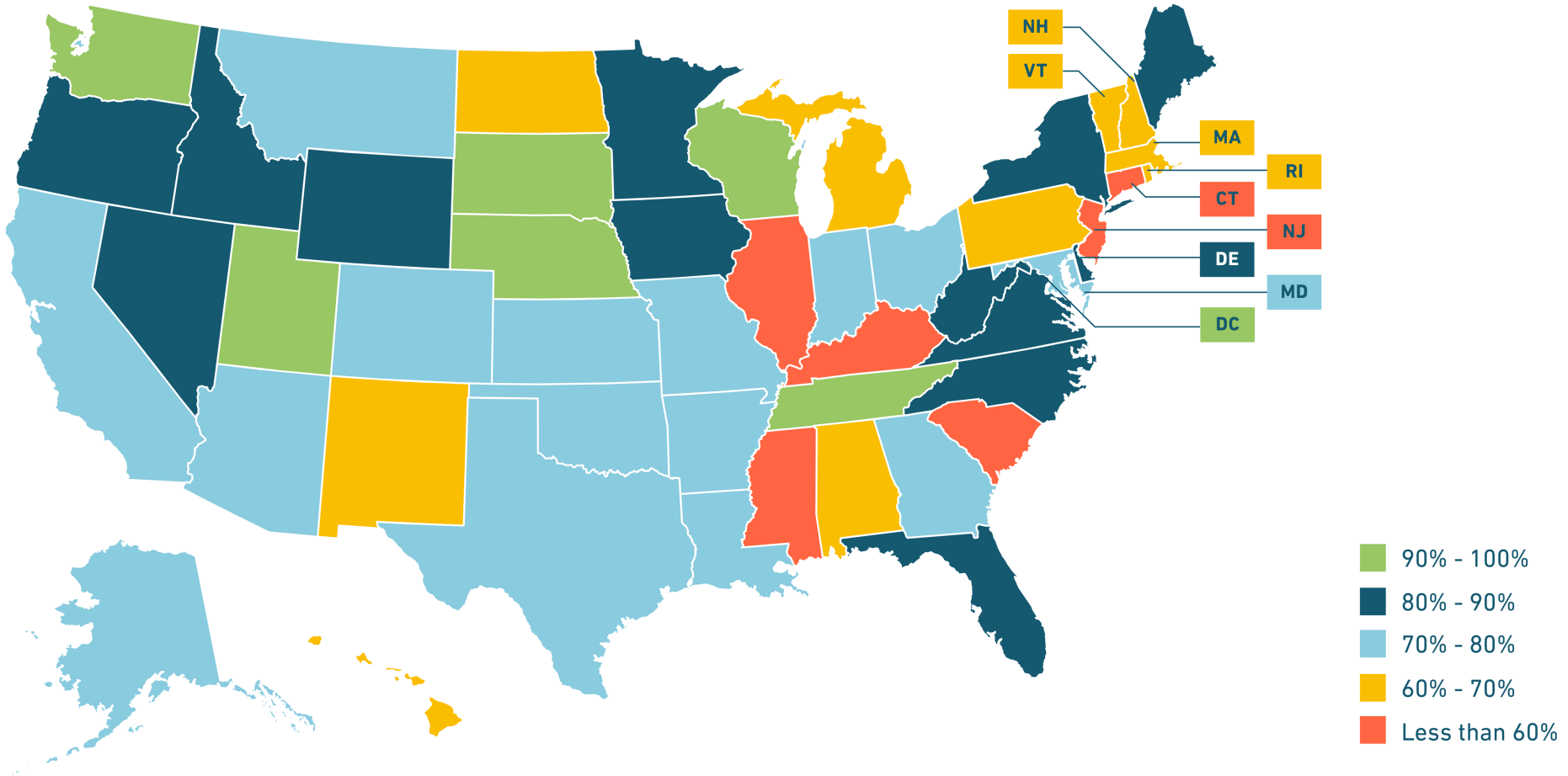
However, sometimes investment returns are less than expected. In these cases, even if investments are positive (meaning total inflows are above $0), it is possible that the ***total change in assets*** might still decline after accounting for benefit outflows.

Total Inflows (e.g., Investment Gains plus Member and Employer Contributions)

Total Change in Assets (e.g., Total Inflows minus Benefit Outflows)

2023 FUNDED RATIOS BY STATE

BASED ON MARKET VALUED ASSETS REPORTED BY STATE & LOCAL PLANS



Statewide average funded ratios ranged from:

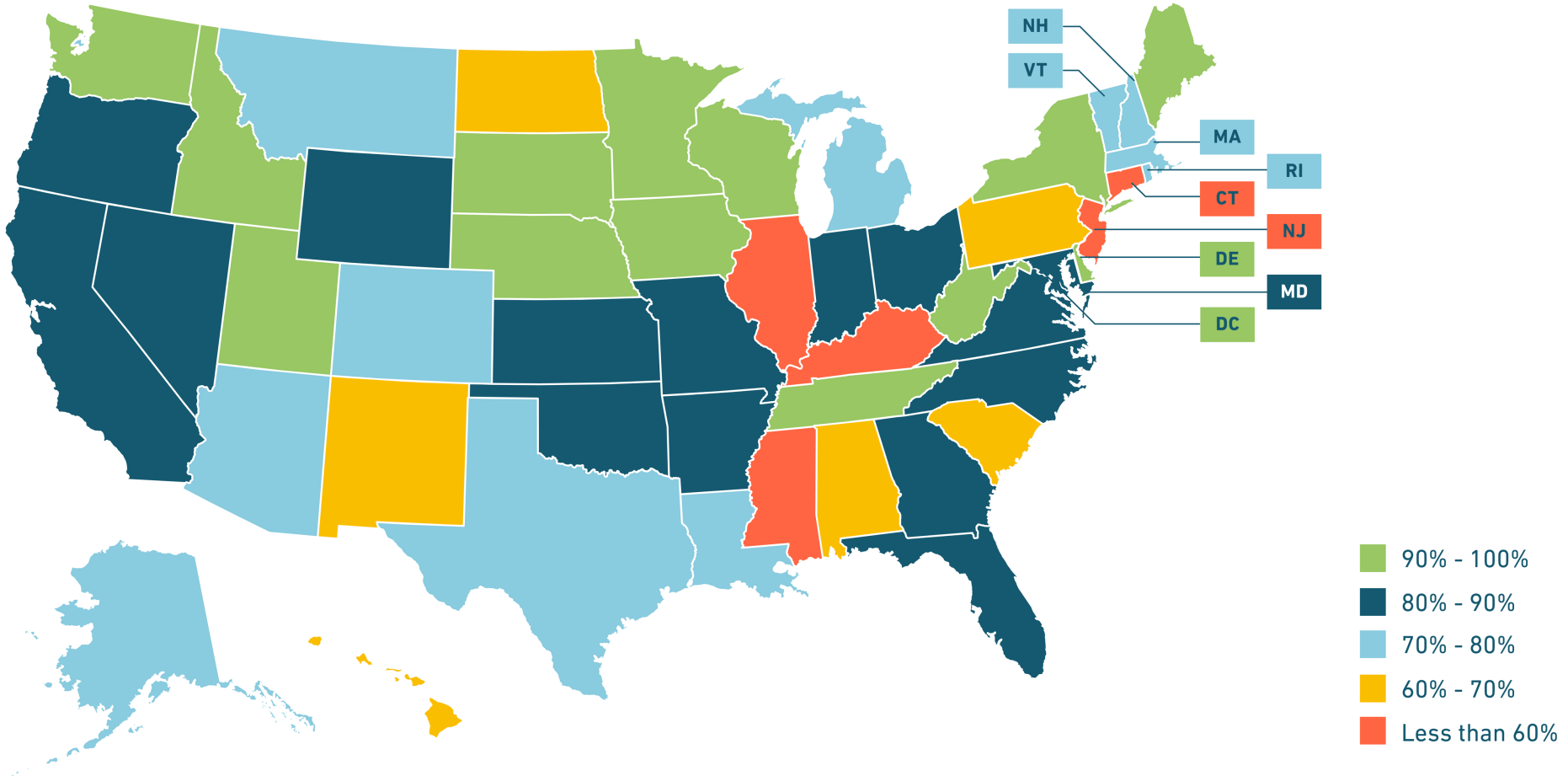
- Washington (103.4%) on the high end, to
- California (77.4%) at the median, to
- Illinois (49.5%) and New Jersey (47.2%) at the bottom of the funded status range.

Note: State averages are asset-weighted across all state and local plans within a given state. A few statewide plans (12.7%) and local plans (27.4%) have yet to release final 2023 financial figures. For these we've used our previous 2023 estimates. CalPERS data reflect preliminary 2023 reported data.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. The funded ratio for each state is the weighted average of all pension plans in that state.

2024 ESTIMATED FUNDED RATIOS BY STATE

BASED ON ESTIMATED ASSETS FOR STATE & LOCAL PENSION PLANS



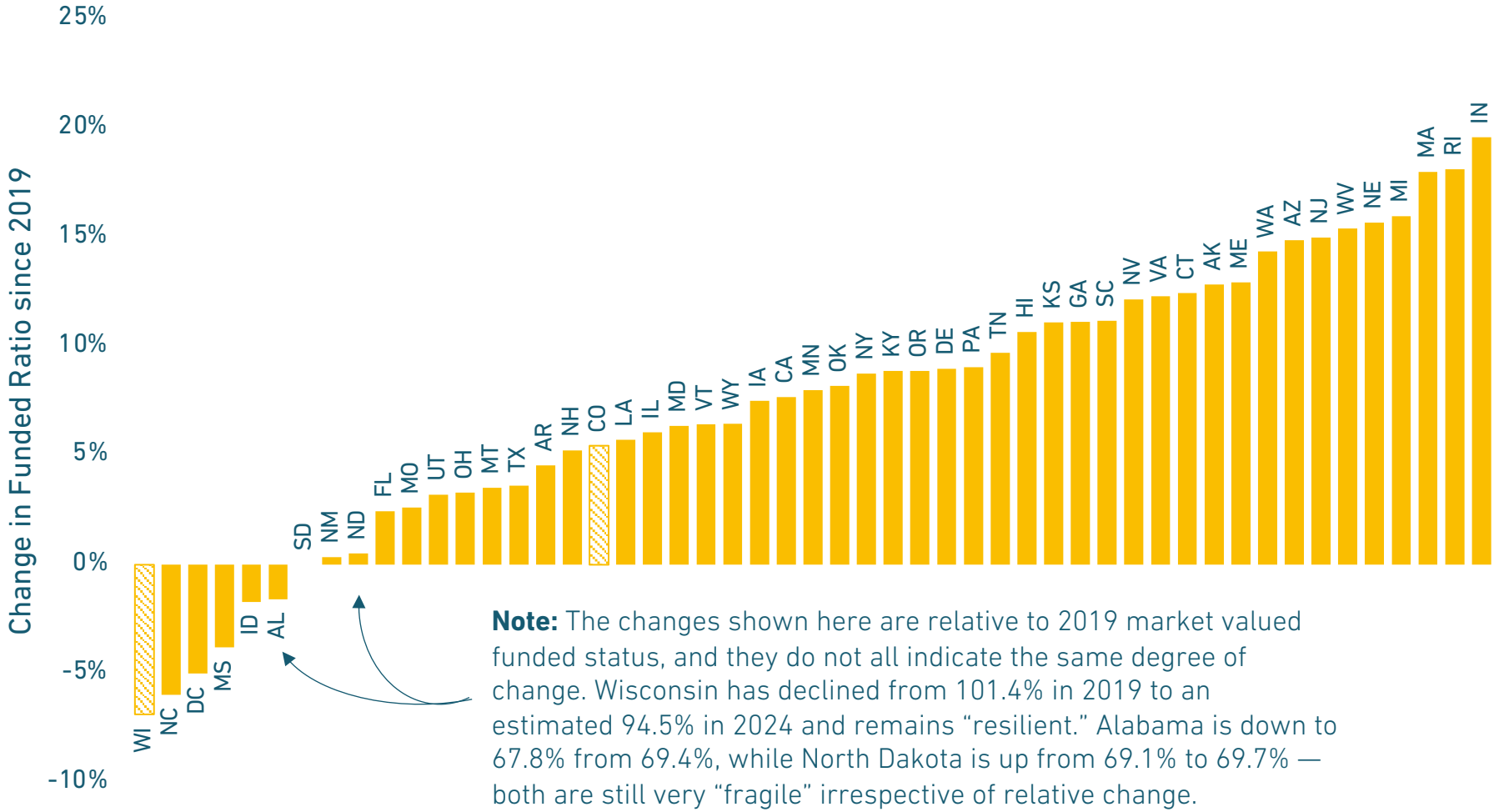
Most states are going to have improved average funded status from 2023 to 2024, including DE, ME, and WV, all of which moved up into the 90% to 100% funded ratio range.

One state moved from the <60% category into the 60% to 70% funded status group: South Carolina. We estimate that they jumped from 59.9% funded in 2023 to a 66.7% funded ratio in 2024.

Source: Equable Institute forecast based on investment returns as of June 30, 2024, and reported asset allocation levels for each plan. For plans with fiscal year end dates after June 2024, the change in funded ratio shown is based only on the part of their fiscal year complete as of the measurement date. See methodology section for complete details.

SOME STATES HAVE MANAGED THROUGH THE POST-PANDEMIC YEARS BETTER THAN OTHERS

ESTIMATED CHANGE IN STATE & LOCAL FUNDED RATIOS | 2019–2024



Note: The changes shown here are relative to 2019 market valued funded status, and they do not all indicate the same degree of change. Wisconsin has declined from 101.4% in 2019 to an estimated 94.5% in 2024 and remains "resilient." Alabama is down to 67.8% from 69.4%, while North Dakota is up from 69.1% to 69.7% — both are still very "fragile" irrespective of relative change.

The change in funded ratio by state since 2019 varies considerably.

Many states with the best improvement benefited from supplemental funding and paying required contributions.

Some states with less improvement over the last five years struggled with interest on the debt or had to adopt more responsible actuarial assumptions.

Denotes states with variable benefits that may be used to offset declines in actuarial funding levels (CO, SD, & WI). These funded ratios use market values for plan assets and liabilities.

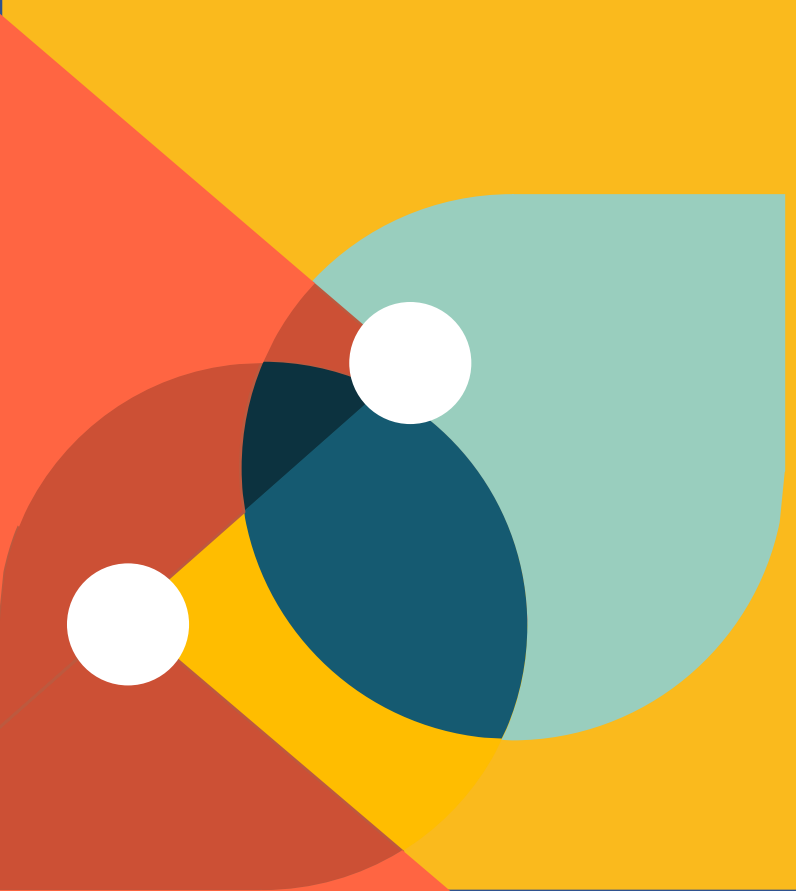
Source: Equable Institute forecast based on investment returns as of June 30, 2024, and reported asset allocation levels for each plan. For plans with fiscal year end dates after June 2024, the change in funded ratio shown is based only on the part of their fiscal year complete as of the measurement date. See methodology section for complete details.

Analysis: What We See in the National Trends

We estimate that unfunded liabilities declined between 2023 and 2024, from $1.61 trillion down to $1.34 trillion (Page 8). Similarly, our 2024 funded ratio forecast for state and local pension plans is improvement from 75.8% to 80.6% (Page 7). This reflects two years of better funded status. However, collectively U.S. public pension plans are still stuck in pension debt paralysis. That's why pension fund investment managers continue shifting assets toward high-risk, high-reward bets (Page 12) even as contribution rates continue to set historic highs (Page 14).

- The decline in assumed rates of return has slowed down over the last three years, with a multi-year average of 6.9% (Page 10). However, the general trend is still downward with a dozen more pension funds dropping assumptions higher than 7.5% and two more funds adopting assumptions of 6.5% or less (Page 11).
- Investment returns as of June 30, 2024, average 7.4%, which is notably better than the 6.9% average assumed rate of return for public plans (Page 10).
- Member contribution rates for public employers that do not participate in Social Security remained steady for a third straight year at 8.7% of payroll, while public employees with Social Security access saw a slight increase from 6.16% to 6.23% of payroll, on average (Page 13).
- Increased employer contributions (Page 14) have not been sufficient to balance the steady increase in benefit payments (outflows) over the past two decades. As a result, pension plans collectively face consistent negative cash flow (Page 16). This puts pressure on investment returns to make up the difference between inflows/outflows, which has only happened in six of the years since the Global Financial Crisis (Page 17).

Looking to the future: There is a theoretical limit to the contribution rates that state leaders will want to have drawing from their general funds, school district funding, or city budgets. The larger a state's unfunded liability relative to GDP, the harder it will be for that state's tax base to pay down the pension funding shortfall.



Examining Pension Debt: The Major Causes of Unfunded Liabilities

WHAT ARE THE SPECIFIC CAUSES OF UNFUNDED LIABILITIES TODAY?

Managing pension plans requires a wide range of assumptions about future events: investment returns, mortality rates, workforce turnover, salary growth, inflation, government contributions, and more. There are lots of places where actual experience may not line up with actuarial expectations — leading to unfunded liabilities or improved funding.

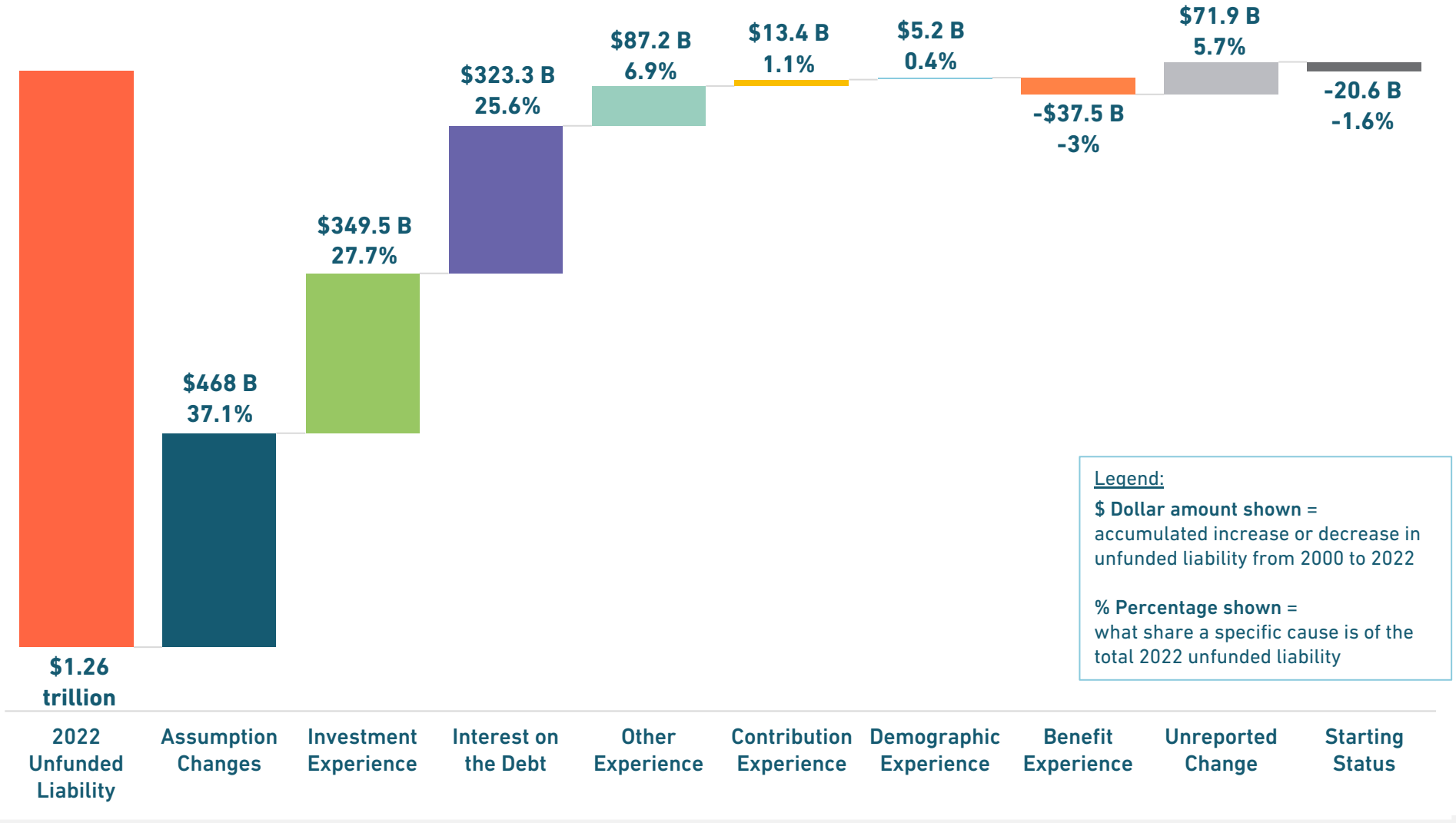
Pension funds compare actuarial and assumed experience every year, along with other factors that can change the value of liabilities.*

We can use the data to look at the internal structure of public pension plans and measure exactly which categories are causing the country's collective unfunded liabilities.

Assumption Changes	Changes to liabilities due to adopting new assumptions
Interest on the Debt	Expected contributions are greater or less than interest growth on liabilities
Investment Experience	Changes to assets due to investment returns higher/lower than assumed
Demographic Experience	Experience in retirement, payroll, mortality, etc. different than assumed
Benefit Experience	Changes to benefit values, COLA experience, different than assumed
Contribution Experience	Contributions paid are greater, the same, or less than expected
Other Experience	Changes to liabilities that are reported in a generic "other" category
Unreported Change	Changes to liabilities that are not documented in pension plan reporting
Starting Status	Funded status at the start of a plan's actuarial gain/loss data reporting

Note: This is typically called actuarial gain/loss data, or some equivalent. States vary in their degree of transparency on these data. For complete methodology see source paper.

THE SPECIFIC CAUSES OF UNFUNDED LIABILITIES THAT ACCUMULATED BETWEEN 2000–2022



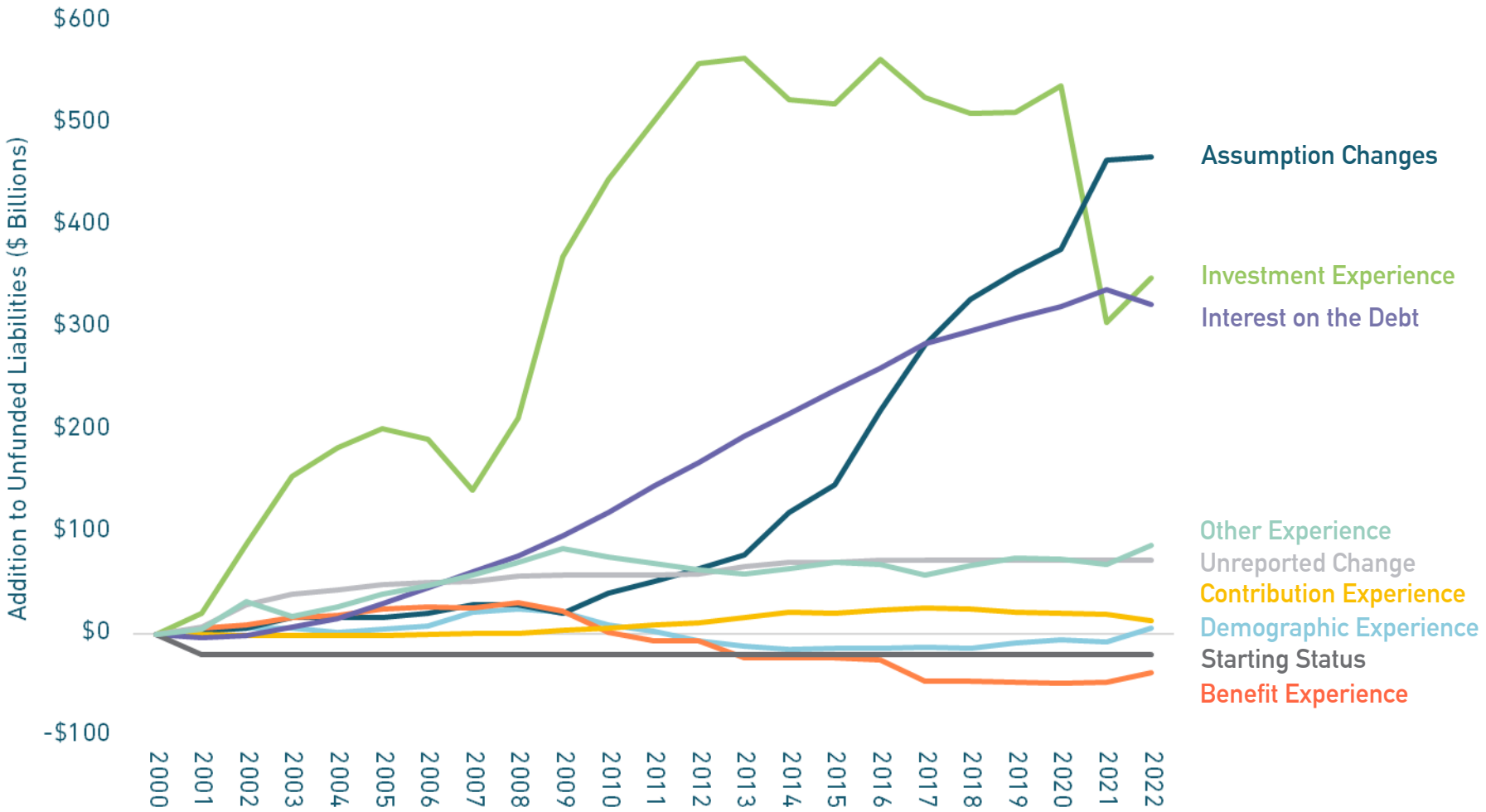
The largest contributor to the $1.2 trillion in unfunded liabilities as of 2022 was necessary improvements to actuarial assumptions: $468 billion accumulated since 2000 (37% of the total accumulated growth).

The next largest factors were underperforming investment returns (28% of the total) and interest growing faster than contributions paid (26%).

Note: State and local pension plans report their unfunded liability change data using "actuarially valued" assets, which vary slightly from market valued data. So the 2022 total unfunded liability figure used here varies slightly from other market valued data in this report.

Source: Fuchsman, Hengerer, Moody, and Randazzo, "The actuarial sources of the rise in unfunded liabilities in America's defined benefit plans in the 21st century," Journal of Pension Economics & Finance, May 10, 2024. ***Note:*** Data in published in JPEF was through 2020; we've updated the data through 2022 for this report.

THE SPECIFIC CAUSES OF UNFUNDED LIABILITIES, CHANGE IN ANNUAL AMOUNT OVER TIME



This figure shows the same categories of change in unfunded liabilities as the previous page, except documenting how they've changed over time.

Underperforming investment experience was the largest contributor to unfunded liabilities, until historically strong 2021 investment returns.

Interest on pension debt has been steadily increasing as a cause of unfunded liabilities for nearly two decades.

Benefit experience has gone from causing unfunded liabilities to reducing pension debt.

Source: Fuchsman, Hengerer, Moody, and Randazzo, "The actuarial sources of the rise in unfunded liabilities in America's defined benefit plans in the 21st century," Journal of Pension Economics & Finance, May 10, 2024. ***Note:*** Data in published in JPEF was through 2020; we've updated the data through 2022 for this report.

ANALYSIS: TODAY'S PENSION DEBT IS NOT PRIMARILY BECAUSE OF INCREASED LIFESPANS, ENHANCED BENEFITS, OR STATES FAILING TO PAY 100% OF REQUIRED CONTRIBUTIONS

Three factors explain 90% of the collective $1.2 trillion in state and local unfunded liabilities as of 2022:

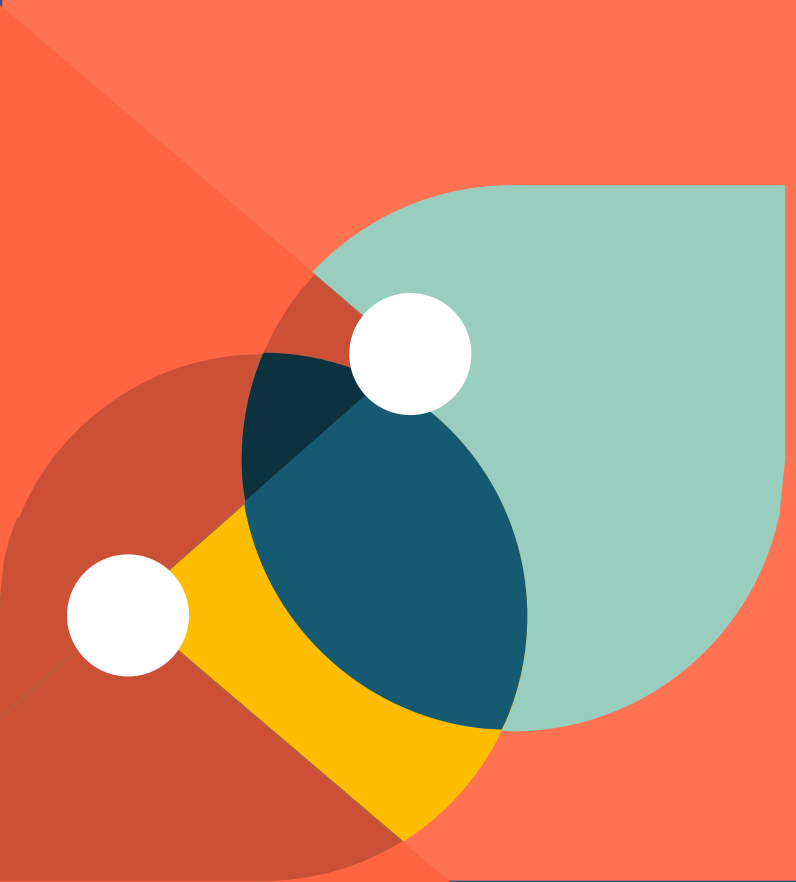
(1) Assumption Changes **e.g., Changes to actuarial assumptions** — These improvements in the quality of expectations about investment returns, payroll forecasts, mortality rates, etc. often mean an increase in the measured value of benefits or a decrease in expected investment returns, which can mean unfunded liabilities increase. While this additional reported funding shortfall does need to be paid down, it is a good thing that public pension plans are improving the accuracy of their accounting.

(2) Investment Experience **e.g., Underperforming investment returns** — While recent years have led to positive overall returns over the last two decades, there are still at least $300 billion in unfunded liabilities that have come from investments earning less than expected.

(3) Interest on the Debt **e.g., Interest growth on liabilities** — When contribution amounts are expected to be greater or less than interest accumulating on liabilities, this leads to an "expected change." Even when actuarially required contributions are fully paid, they may not be sufficient to reduce unfunded liabilities if the funding policy used to calculate those contributions allows for interest to continue adding to unfunded liabilities.

Factors such as increased longevity, benefit enhancements, or states failing to pay 100% of required contributions are all important and, for specific states, they are major contributors to unfunded liabilities. However, nationally they are all small components of the collective pension funding shortfall.

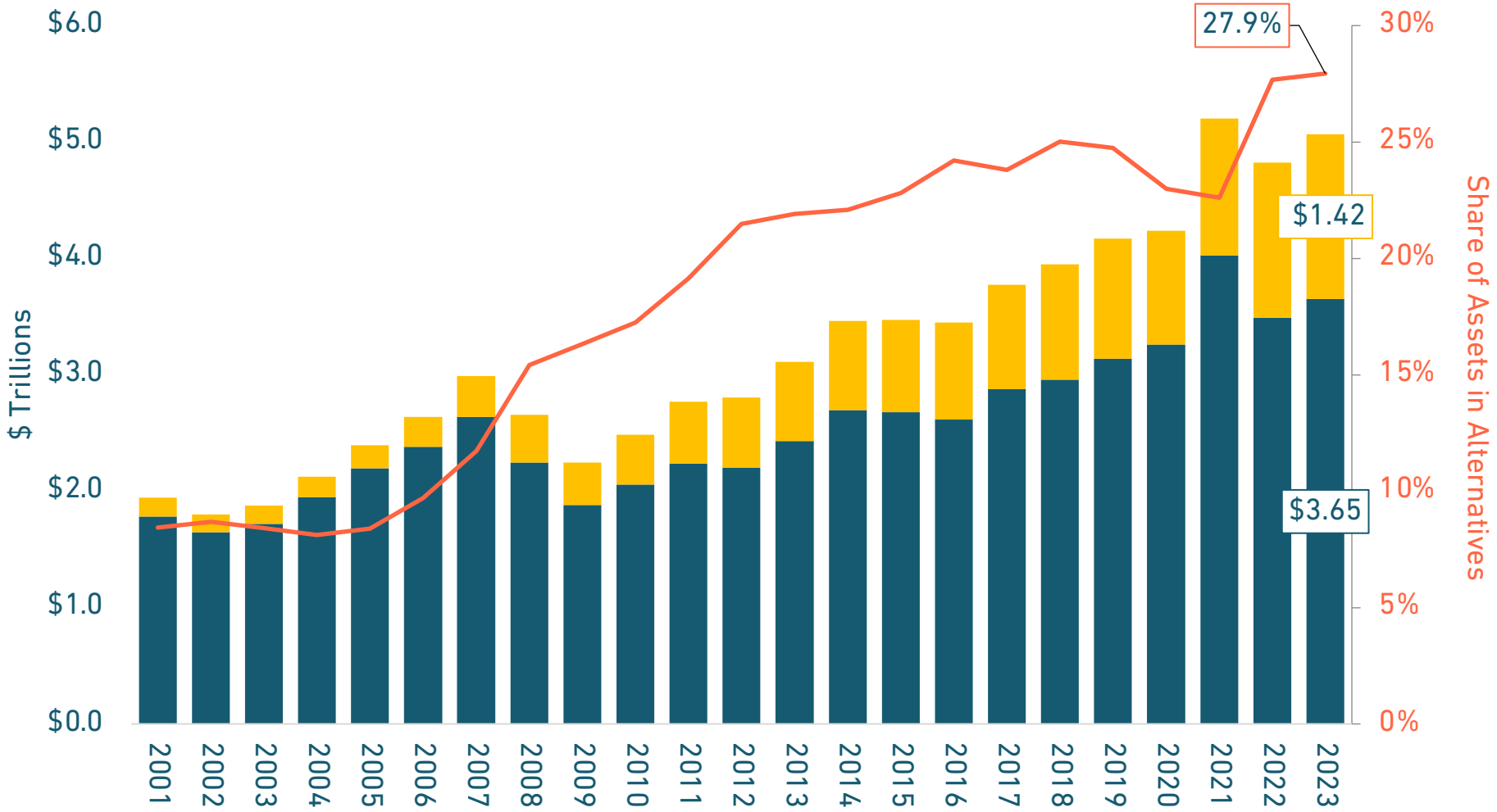
Valuation Risk: An Update to Our Asset Allocation Analysis



UNDERSTANDING "VALUATION RISK"

- **"Valuation Risk"** is the risk to pension funds that the value of their assets as reported to them is inaccurate (e.g., understating or overstating the actual value) because the asset pricing method used is based on valuation models, as opposed to market-based prices.
  - If asset values are overstated today, then that means reported funding levels are overstated. This in turn can lead to lower than appropriate contribution rates, which will mean larger unfunded liabilities in the future than if assets were more accurately priced.
  - Overstated pension asset values can also lead to other policy decisions that could influence future funded status — such as raising the value of benefits or having lower political priority for supplemental funding to pay down unfunded liabilities faster than planned.
- This is in contrast to "opportunity risk" (the risk that a specific use of capital doesn't justify the risk-adjusted returns relative to other opportunities), or "asset risk" (the risk of losing money on an investment), or "management risk" (the risk that trustees will inefficiently allocate capital).

VALUATION RISK: SHARE OF "VALUATION PRICED" ASSETS COMPARED TO "MARKET PRICED" ASSETS



Alternative investments, like private equity and real estate, generally are priced based on valuations, not market-based pricing.

The share of pension fund assets priced based on valuations has grown to 27.9% of assets as of 2023, up from an average of 9% between 2001–2007. This means the share of pension fund assets exposed to "valuation risk" has roughly tripled since the Global Financial Crisis.

Share of Pension Fund Assets Based on Valuation Prices

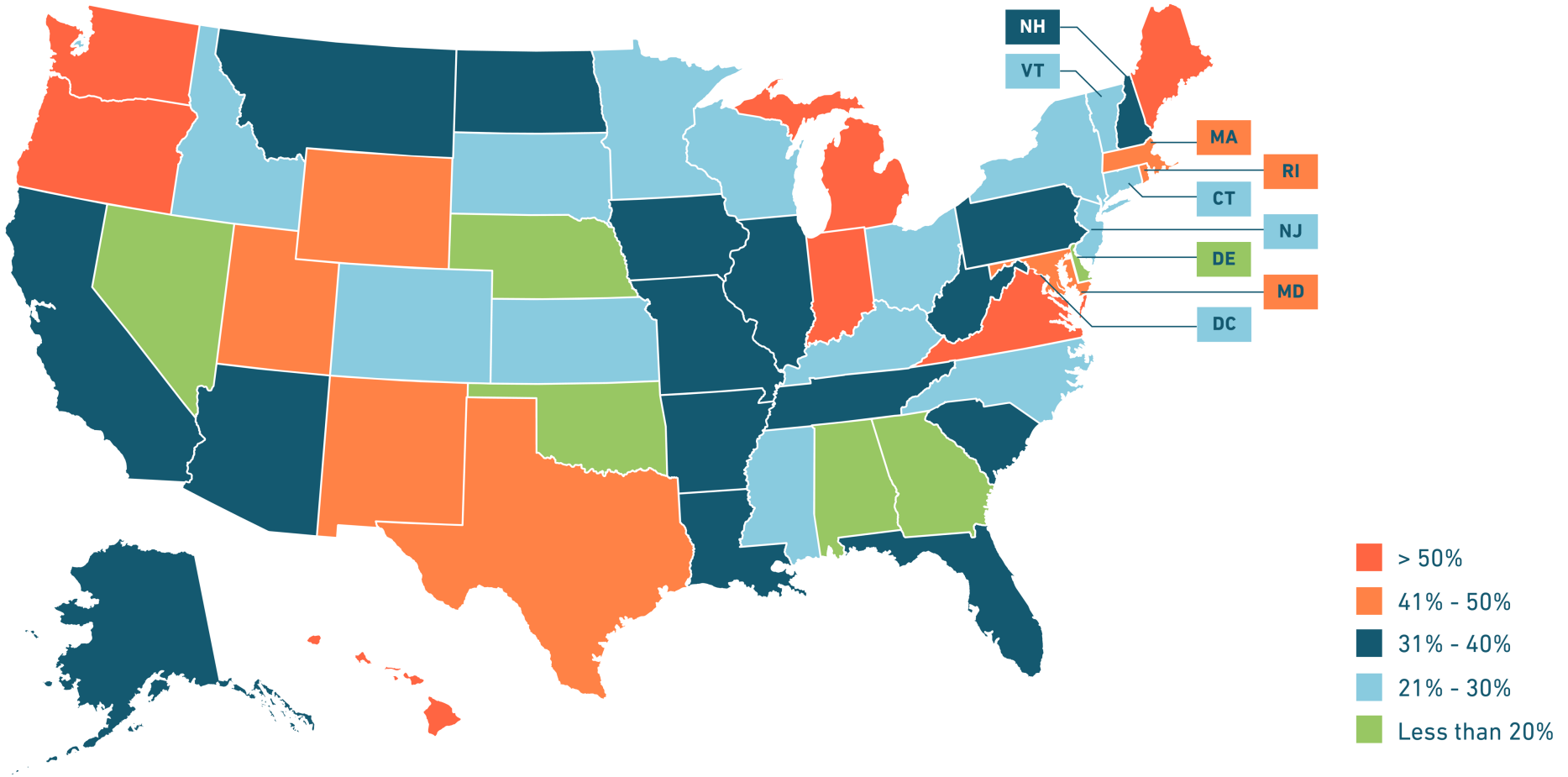
"Valuation Priced" Assets (Private Capital, Real Estate)

"Market Priced" Assets (Public Equities, Fixed Income)

Source: Equable Institute analysis of public plan valuation reports and ACFRs.
Note: "Valuation Priced" investments include assets defined by public plans as private equity, private debt, real estate, or hedge fund.

STATES BY SHARE OF PENSION ASSETS IN ALTERNATIVES

BASED ON 2023 ASSET ALLOCATION DATA AND ASSET VALUES

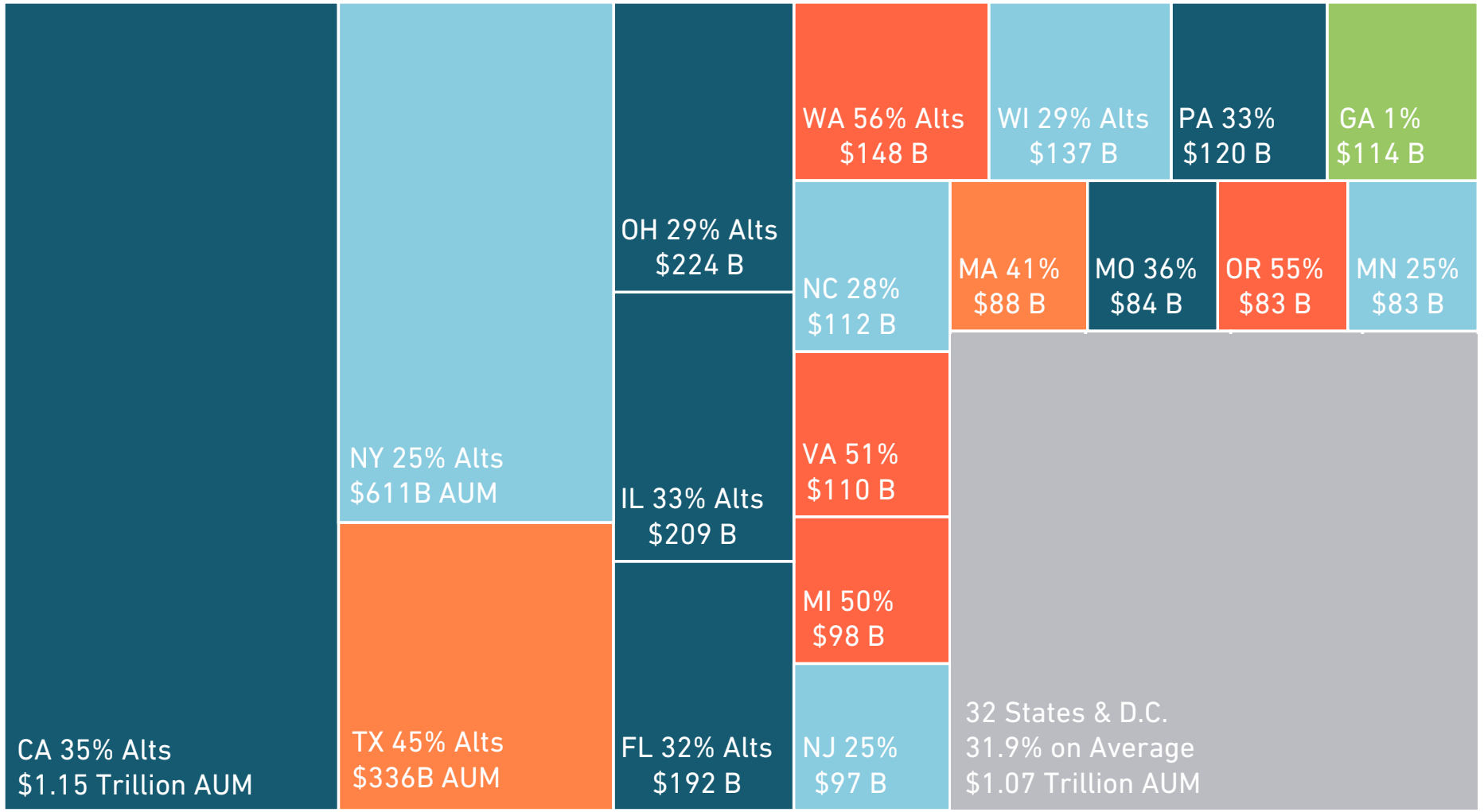


There is a wide variance in how much state and local pension funds have invested in alternatives.

Most states have between 20% and 40% of their collective pension fund investments allocated to alternative asset classes. However, a few outliers are more aggressive — some have over 50% of their pension fund money in alternatives — and a handful are more conservative.

Source: Equable Institute analysis of public plan valuation reports and ACFRs.
Note: "Alternative" investments include private capital, hedge funds, real estate, commodities, and tactical asset allocations.

STATES BY TOTAL ASSETS UNDER MANAGEMENT & SHARE OF INVESTMENTS IN ALTERNATIVES | 2023



This infographic shows states based on their assets under management (AUM) and the percentage of those assets invested in private capital, real estate, hedge funds, & misc. alts.

Five states manage half of all public pension assets in the U.S. (CA, NY, TX, OH, IL, see Page 44). So, the dollar allocations to alternative investments in these states are a major driver of national figures.

But the size of state pension fund assets is not related to their alternative investments. Some smaller states have over 50% of pension assets invested in alternatives.

Source: Equable Institute analysis of public plan valuation reports and ACFRs.
Note: "Alternative" investments include private capital, hedge funds, real estate, commodities, and tactical asset allocations.

TOP 20 PENSION INVESTMENT FUNDS BY SHARE OF ASSETS IN ALTERNATIVES | 2023

Rank	Investment Fund	Alts Share	ARR
#1	Louisiana School Employees' Retirement System	66.4%	6.80%
#2	Washington State Investment Board (Washington Retirement System)	56.8%	7.00%
#3	Oregon Investment Council (Oregon PERS)	55.3%	6.90%
#4	San Francisco City & County Employees' Retirement System	55.0%	7.20%
#5	Employees' Retirement System of the State of Hawaii	54.9%	7.00%
#6	Michigan Department of Treasury (MSERS & MPSERS)	54.5%	6.00%
#7	Indiana Public Employees Retirement System	53.1%	6.25%
#8	Maine Public Employees Retirement System	53.0%	6.50%
#9	Texas Teachers Retirement System	52.9%	7.00%
#10	Virginia Retirement System	52.3%	6.75%

Rank	Investment Fund	Alts Share	ARR
#11	Illinois State Teachers' Retirement System	52.0%	7.00%
#12	Utah Retirement System	47.9%	6.85%
#13	Louisiana Teachers' Retirement System	47.7%	7.25%
#14	Wyoming Retirement System	46.4%	6.80%
#15	Kern County (CA) Employees' Retirement Association	46.0%	7.00%
#16	Arkansas Teacher Retirement System	45.9%	7.25%
#17	Houston Firefighters Relief and Retirement Fund	45.0%	7.00%
#18	New Mexico Public Employees Retirement Association	44.5%	7.25%
#19	Texas Employees Retirement System	44.1%	7.00%
#20	Maryland State Retirement and Pension System	43.5%	6.80%

Some pension funds have committed a particularly large share of their assets to alternative investments.

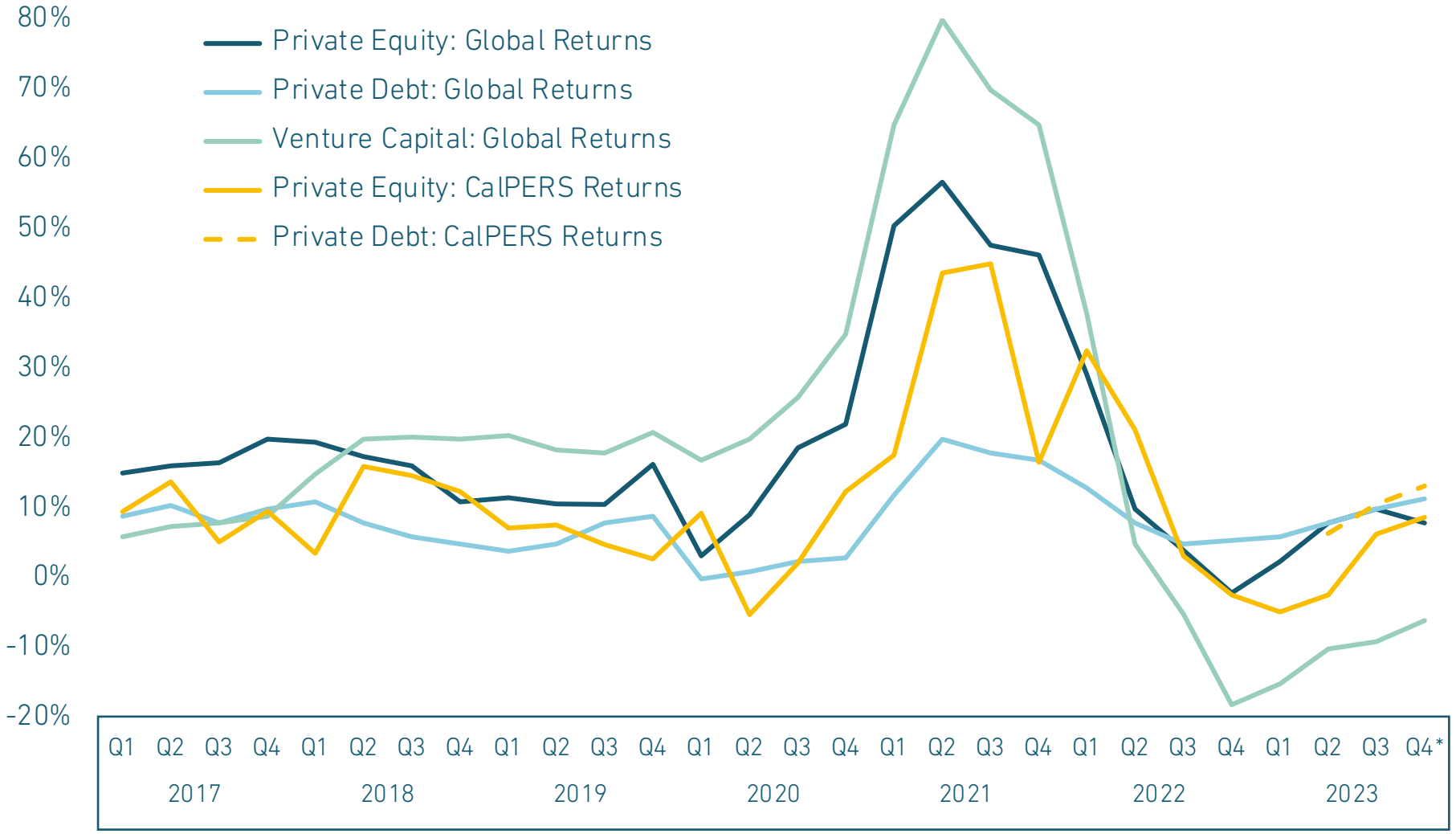
This list shows the 20 state and local pension funds (or investment commissions, if assets of multiple retirement plans are commingled) that have the largest share of assets in alternatives.

Pension funds or state investment commissions with over $50 billion in assets under management are highlighted in blue.

Note: ARR = Assumed rate of return, most recently reported; Alts share is the percentage of the investment fund's assets allocated to alternative asset-classes.

VOLATILITY IN PRIVATE CAPITAL RETURNS

ONE-YEAR ROLLING INTERNAL RATES OF RETURN | 2017–2023



The performance of the largest public pension alternatives portfolio (CalPERS) largely tracks with global returns for varying private capital asset classes.

This chart shows rolling one-year IRRs to account for the lagged reporting cycles that can muddy any given quarter's measurement.

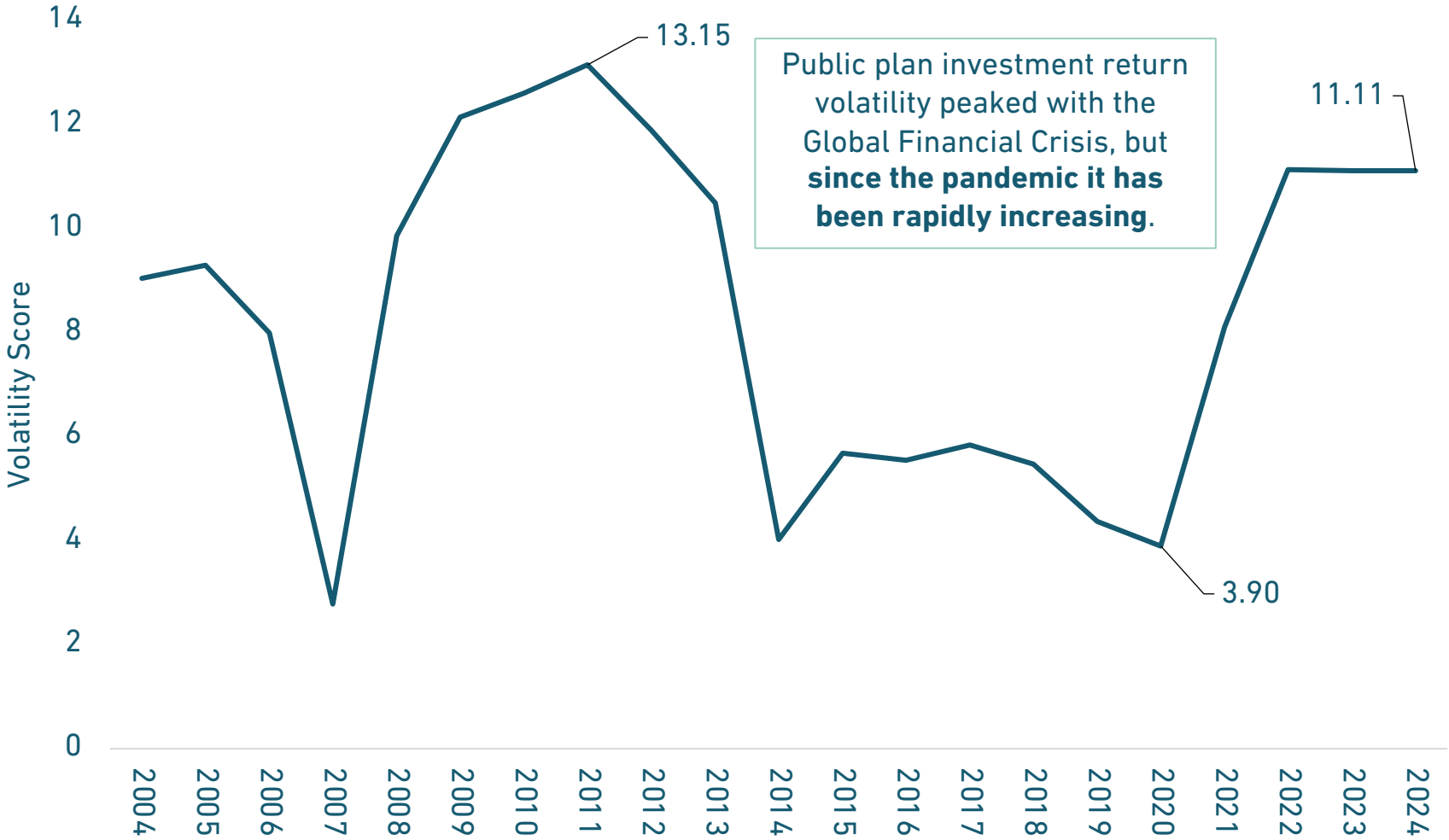
Returns in general show significant volatility, up dramatically in 2021, back down in 2022, and swinging back up in 2023.

*2023 Q4 data is preliminary and subject to change

Sources: Global return data are published by PitchBook in "Global Fund Performance Report as of Q3 2023," May 2024. The CalPERS data come from quarterly performance reports provided to their board of trustees and reflects the published rolling one-year return figure (based on lagged data) as of that quarter.

INCREASING ANNUAL INVESTMENT RETURN VOLATILITY

VOLATILITY IS TRENDING BACK TO GLOBAL FINANCIAL CRISIS ERA LEVELS



In finance, volatility is a measure uncertainty related to asset prices or investment returns.

Savvy investors can use volatility to their advantage, including some pension funds. However, generally pension funds prefer stability because investment returns are important for determining contribution rates and for managing cash flow with regular required benefit payments.

This figure shows a "volatility score" where the higher the number, the more uncertainty there is around investment return patterns and trends.

Note: From a technical perspective, volatility is measured using the standard deviation of the financial instrument being examined. In the case of investments, this can be done by calculating the standard deviation of the year-over-year returns.

WHY GROWING VALUATION RISK IS A PROBLEM

- There is a sharply increasing share of pension fund investments with values based on valuation-methods instead of market prices, which means **an increasing share of pension portfolios are exposed to the risk of being overpriced**.
  - The significant lack of transparency in how pension funds invest in valuation-priced asset classes like private equity and real estate exacerbates concerns about valuation risk.
  - The growing rate of volatility in investment returns also adds to concerns about the scale of pension fund assets that are exposed to valuation risk.
- **Overstated portfolio values for asset classes like private capital and real estate can lead to significant unfunded liability problems in the future**.
  - Example: Consider that general partners managing a private equity fund often value their portfolio companies using the valuation of a recent funding round, which may or may not reflect an overstated price agreed to by a small set of exuberant investors. This potentially overstated pricing approach can lead to an overstated valuation of a pension fund's limited partner share in that private equity fund, which in turn can lead to reporting overvalued assets that translate to lower contribution rates than would be appropriate.

State of Inflation Protection & COLAs

- For pension plans with COLAs, the average rate paid in 2023 was less than actual inflation
- A total of 878 state and local pension benefit classes lack inflation protection

HOW MANY PUBLIC PENSION PLANS HAVE INFLATION PROTECTED BENEFITS? | RULES AS OF 2023

Types of Cost-of-Living Adjustments Provided		*% of Legacy Classes*	*% of Open Classes*
Fixed	Fixed Rate (e.g., 2%)	14.8%	10.1%
CPI	Linked to Inflation, Social Security Rate	1.6%	0.9%
	Linked to Inflation, National CPI	31.2%	23.0%
	Linked to Inflation, Local CPI	17.7%	23.6%
Status	Linked to Investment or Fund Performance	2.6%	2.3%
	Linked to Inflation & Fund Performance	2.4%	4.8%
Ad Hoc	Ad Hoc COLA	12.6%	12.3%
None	No COLA Authorized or Suspended/Frozen* COLA	17.0%	23.0%
Total		*1,987 classes*	*818 classes*

Public pension plans that offer cost-of-living adjustments as protection against inflation use a range of polices.

Most legacy classes used fixed COLA rates, or paid COLAs based on national CPI up to a maximum (e.g., up to 3%).

New classes of benefits often have lower values (as states seek to save money with less valuable benefits), and more are linked to local CPI or funded status.

Pension plans with ad hoc COLAs require legislative authorization. And some plans offer no inflation protection.

EQUABLE

Source: Equable Public Retirement Research Database
**Note:* OK TRS, OH STRS, and all plans in NJ and RI have suspended/frozen COLAs until funded status improves. Legislatures can override this for one-time annual adjustments if wanted.

WHAT COST-OF-LIVING ADJUSTMENTS WERE ACTUALLY PAID OUT IN 2023

Types of Cost-of-Living Adjustments Provided		*Average COLA Paid, 2023*
Fixed	Fixed Rate (e.g., 2%)	1.96%
CPI	Linked to Inflation, Social Security Rate	1.37%
	Linked to Inflation, National CPI	2.94%
	Linked to Inflation, Local CPI	2.71%
Status	Linked to Investment or Fund Performance	2.65%
	Linked to Inflation & Fund Performance	1.86%
Ad Hoc	Ad Hoc COLA	1.18%
None	No COLA Authorized or Suspended/Frozen* COLA	0.00%
Total		*2.02%*

When inflation is mild (below 2%) public pension COLAs are often able to ensure that benefit payments keep up with purchasing power. But public pension COLAs do not always fully adjust for particularly high inflation.

The average national rate of inflation (CPI) over the past two years was 9.1% in 2022 and 3.0% in 2023.

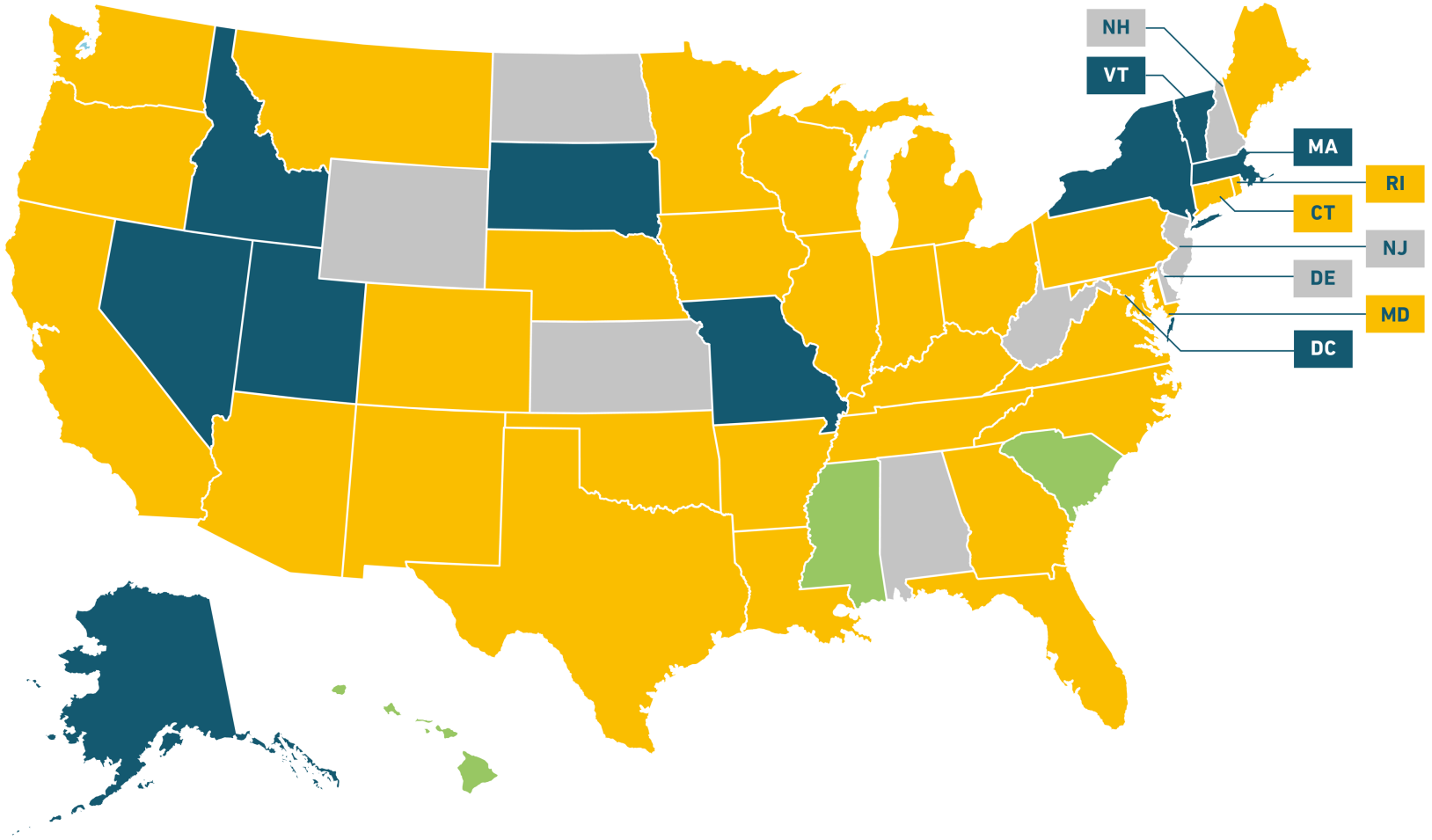
The average actual COLA paid in 2022 and 2023 nationally were 1.83% and 2.02%, respectively.

This table shows how the average COLA paid varies on a plan's COLA provision.

EQUABLE

Source: Equable Public Retirement Research Database
**Note:* OK TRS, OH STRS, and all plans in NJ and RI have suspended/frozen COLAs until funded status improves. Legislatures can override this for one-time annual adjustments if wanted.

DISTRIBUTION OF INFLATION PROTECTION OF PENSION BENEFITS, BY STATE



All Pension Plans with COLA Rules Are Linked to Some Measure of Inflation

All Pension Plans with COLA Rules Have Fixed-Rate COLAs

Mix of Pension Plan COLA Rules with Fixed Rates or Links to Inflation, Investment Performance, or Funding*

Plans Have Ad Hoc COLA Rules, No COLA Provisions, or Suspended COLA Provisions**

**AZ, LA, MI, MT, NE, TX, and WI all have at least one pension plan with COLA rules linked to plan investment or fund performance, but there are other pension plans with different provisions too.*

***Oklahoma TRS, Ohio STRS, and all plans in both Rhode Island and New Jersey have suspended/frozen their COLAs until funded status improves. Legislatures can override suspensions for one-time annual adjustments if wanted (and they have recently). Wyoming RS has a policy of no COLAs until the plan is 100% funded, which is formally a link to performance but in practice means no COLAs for the foreseeable future.*

See this interactive map for details about states with a mix of plan provisions

Note: See previous pages for more details on these categories

STATES HAVE LOTS OF WAYS TO PROVIDE COLAS, BUT THEY DON'T ALWAYS KEEP UP WITH INFLATION

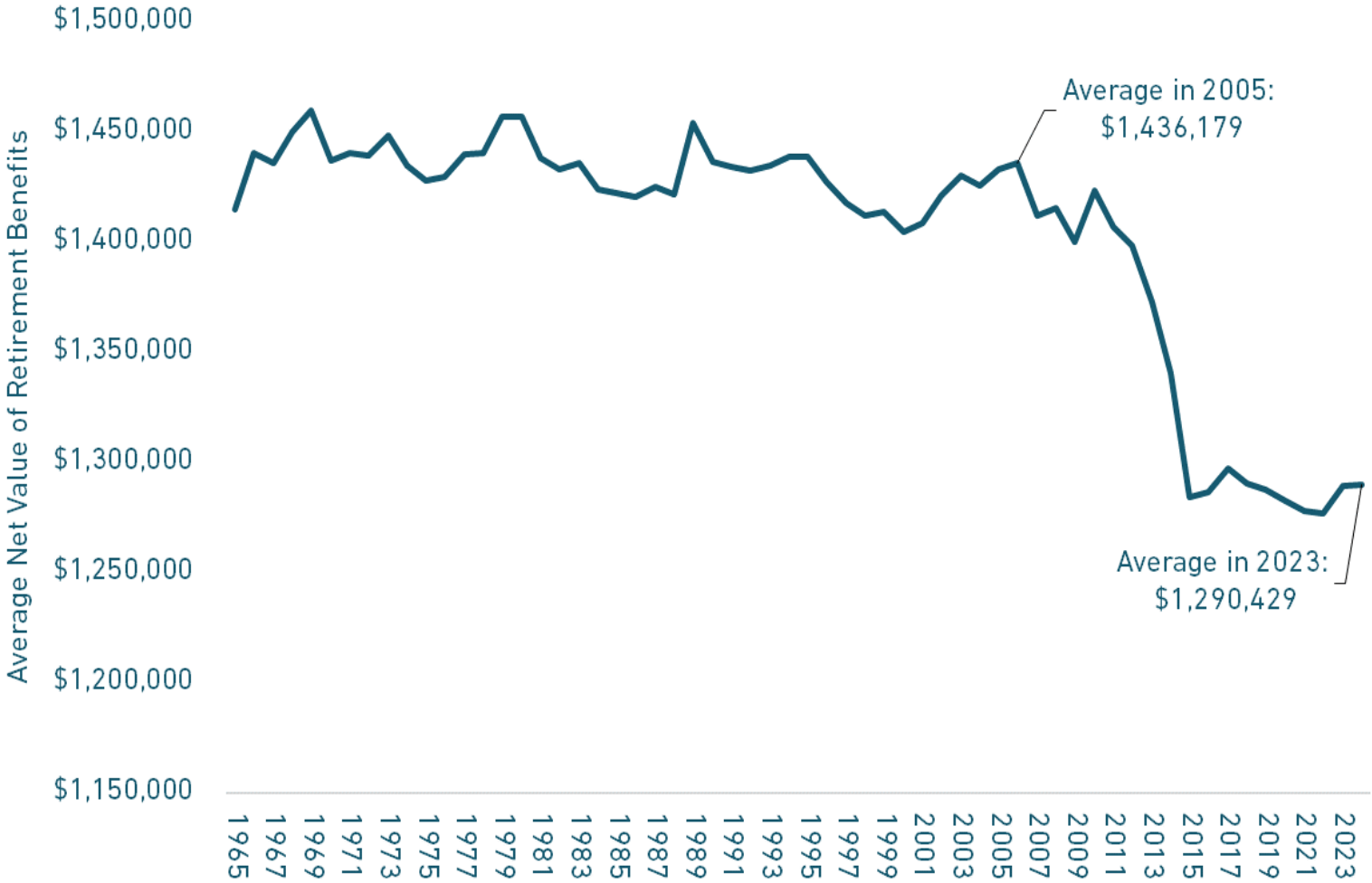
KEY COLA TRENDS:

- States use a wide range of COLA policies to offer protection against inflation, although many tiers of benefits lack inflation projection of benefits.
- States have shifted away from offering benefit tiers with fixed COLA rates and increasingly favor COLAs linked to local CPI. An emerging concept has been to link COLAs to both inflation *and* fund performance such that lower COLAs are paid out when funded ratios are below certain thresholds.
- States with more than one statewide retirement system often do not have consistent COLA rules across all classes of benefits.

COLA POLICY EFFECTS ON PENSION BENEFIT VALUES:

- No matter the provision, the typical COLA does not keep up with inflation when inflation is high. Generally, COLAs are designed to preserve the purchasing power of benefits when inflation is less than 3%.
- New benefit tiers often lower valued COLAs due to a change in provisions from the legacy plan, such as a lower maximum rate, or no longer offering a compounding COLA.
- Lower valued COLAs have been a major contributor to the reduction in the value of public employee pension benefits generally, as shown on the next page.

CHANGE IN AVERAGE LIFETIME VALUE OF BENEFITS FOR PUBLIC EMPLOYEES | 1965–2023



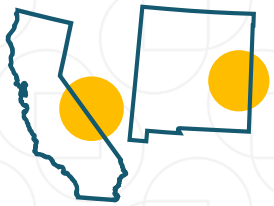
THE VALUE OF PUBLIC EMPLOYEE BENEFITS IN GENERAL HAS BEEN DECLINING SINCE 2005

This chart shows what a 25-year-old new public employee would expect the lifetime value of their pension *will be worth* based on: (1) the benefit rules offered the year they are hired, (2) working until the plan's normal retirement age, and (3) earning the average salary for members of their plan, which increases based on the plan's salary growth assumptions.

The lifetime value of benefits = all future pension checks someone would expect to receive, measured in today's dollars.

A new public employee today would expect to earn a future benefit that is about 10% lower than if they started working in 2005.

EXAMPLES OF STATE APPROACHES TO COST-OF-LIVING ADJUSTMENTS



Single Policy Framework

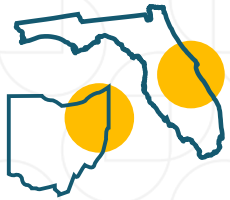
- Fixed Rate: *New Mexico Public Employees Retirement Association has a 2% fixed rate, compounding COLA.*
- Linked to Inflation: *Los Angeles City Employees' Retirement System, Los Angeles Fire and Police, and Los Angeles Water and Power have a range of pension plan tiers of benefits, and they all have a COLA of up to 2% or up to 3% that is based on a local measure of CPI for the Los Angeles–Long Beach–Anaheim Area.*

Dual Policy Framework: Linked to Inflation & Funded Status

- *Arizona Public Safety Personnel Retirement Systems provides a COLA linked to local inflation up to 2%, but if the funded status falls below 90% then the maximum COLA that can be paid is 1.5%, and if the funded status falls below 80% the maximum COLA is 1%.*

Mixed COLA Policies for the Same Retirement System

- *Illinois created a second tier of benefits for statewide retirement plans in an attempt to reduce costs. The Tier 1 COLA provision is a compounding fixed 3% of salary. The Tier 2 COLA provision is one-half of CPI, up to a maximum of 2%.*



Frozen or Eliminated COLA

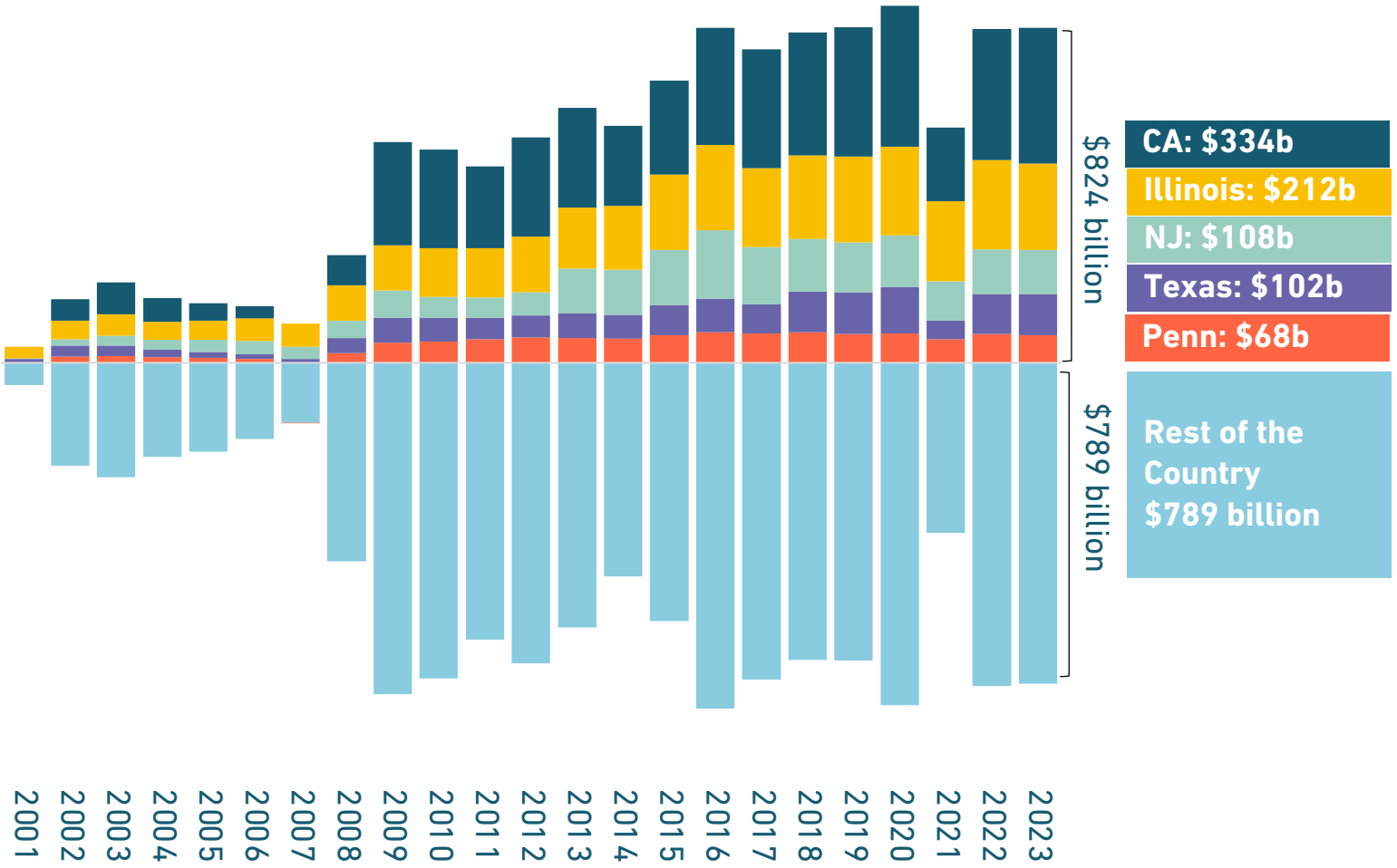
- *Florida Retirement System has a 3% fixed-rate COLA for members hired before July 1, 2011, but it is prorated to only be based on the benefits earned before that date as well. FRS has no COLA provision for members hired after June 2011.*
- *Ohio State Teachers Retirement System has legislative authority to pay up to a 2% COLA so long as it doesn't undermine the solvency of the pension fund. Since 2017, the STRS board has adopted a policy of freezing their COLA until funding meaningfully improves. However, the STRS board did approve a one-time 3% COLA in 2022.*

Within the Trends: 2023 Funded Status

- Funded Ratio
- Unfunded Liabilities

UNFUNDED LIABILITY HISTORY

GROUPED BY STATE | 2001–2023

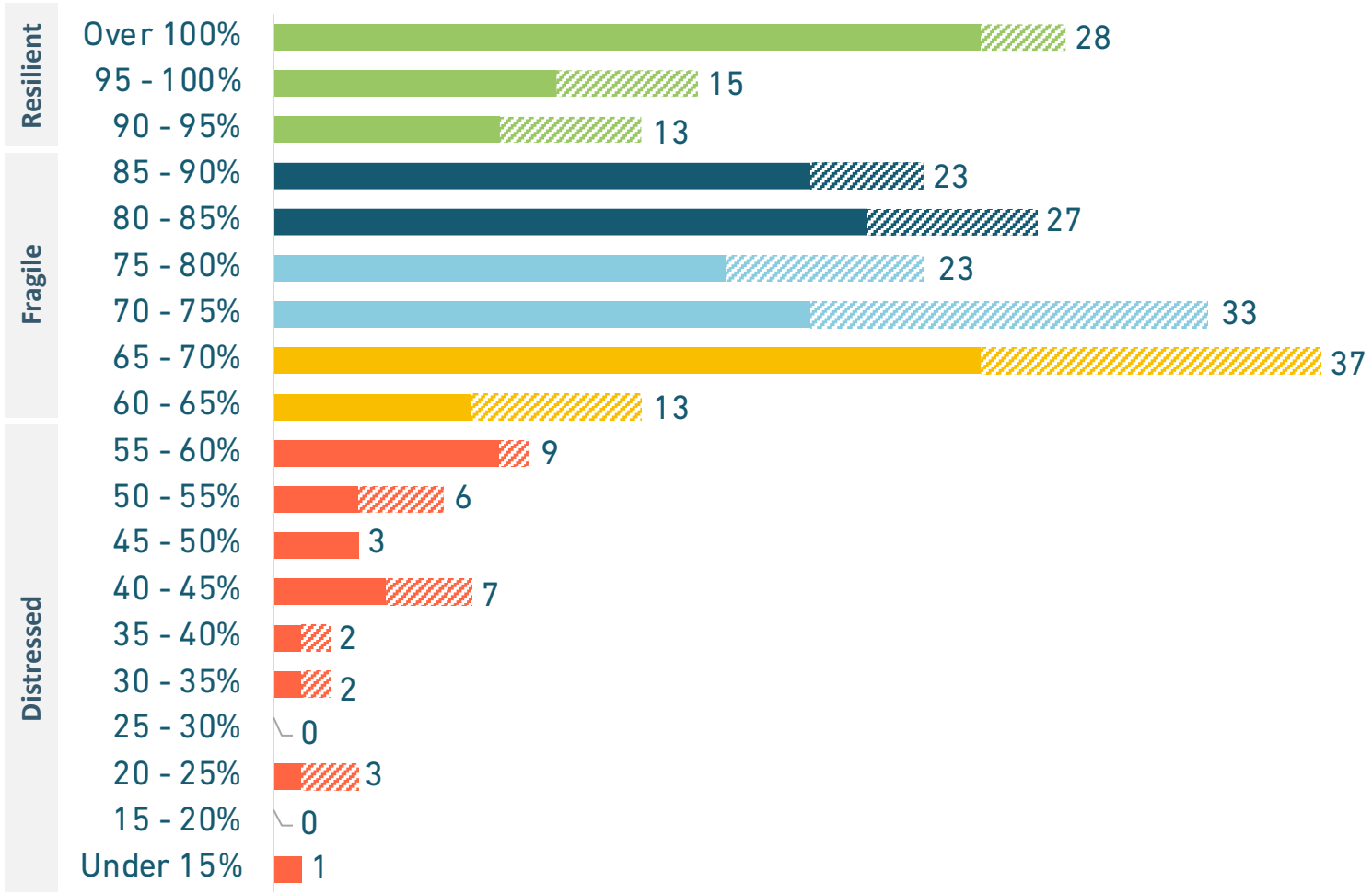


The five largest states by unfunded liabilities have a shortfall *($824.1 billion*) that is notably larger than the rest of the country combined *($789.1 billion*).

More than one-third (33.9%) of national unfunded liabilities are just in California and Illinois combined (*$546.3 billion*).

Source: Equable Institute analysis of public plan valuation reports and ACFRs.

STATE & LOCAL PENSION PLANS
2023 FUNDED RATIO



The funded ratio is a quick first look at the health of a pension plan but it is not the only factor to measure. Actuarial assumptions, funding policies, and governance also matter.

A pension plan's funded ratio might have dipped because the pension board adopted more realistic actuarial assumptions.

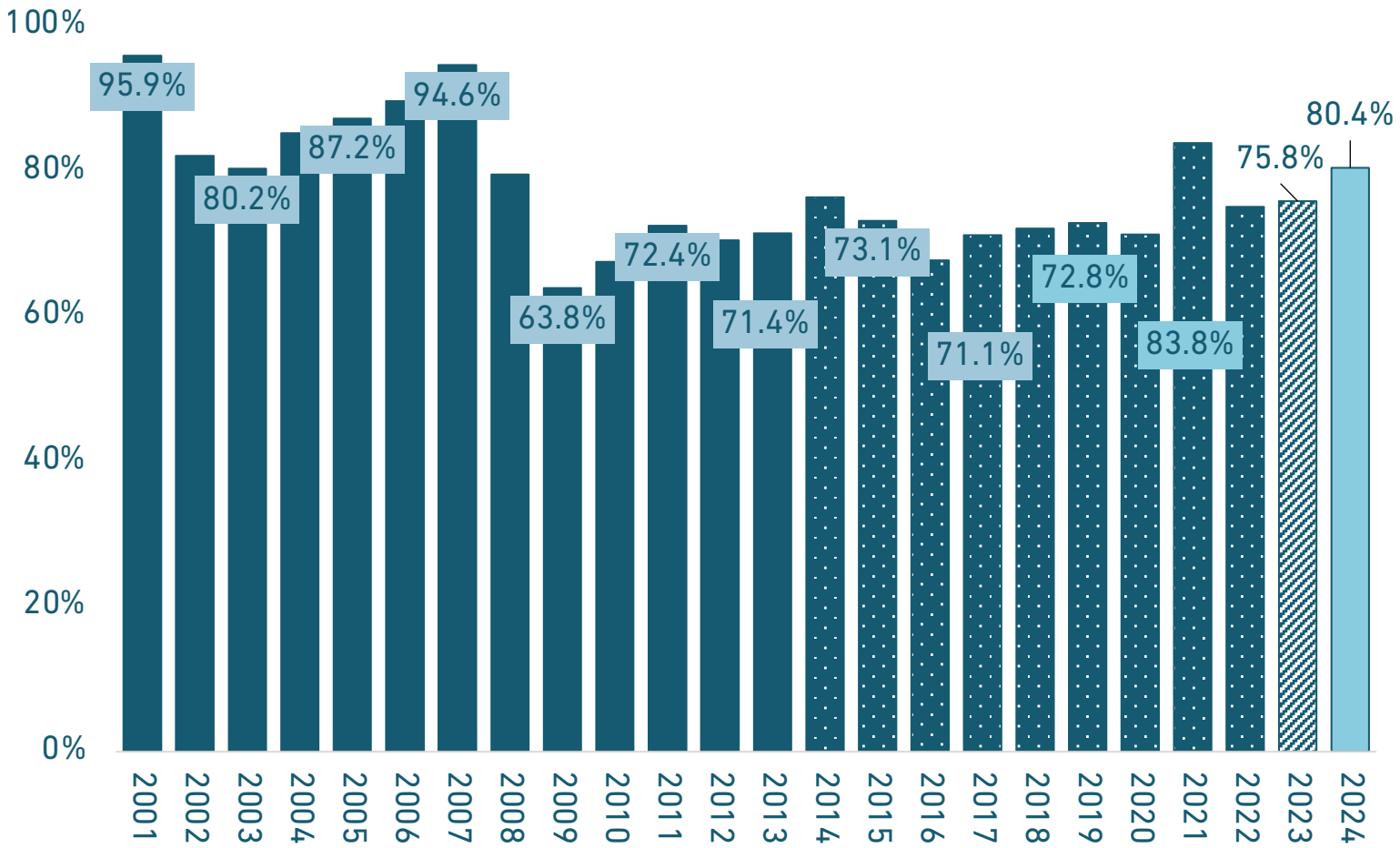
Solid Coloring Indicates Statewide Plans

Textured Patterning Indicates Local Plans

Source: Equable Institute analysis of public plan valuation reports and ACFRs. See notes for a list of plans that have fiscal years ending in December and have not yet reported complete 2023 data; for these plans the figure above is based on estimates of their assets using actual reported investment returns as of June 30, 2024.

FUNDED RATIO AVERAGE

FOR STATEWIDE PENSION PLANS ONLY | 2001–2023 + 2024 Estimate



The aggregate funded ratio for statewide plans collectively is only slightly better than in 2008. However, the trend from 2019 to 2024 does show general improvement.

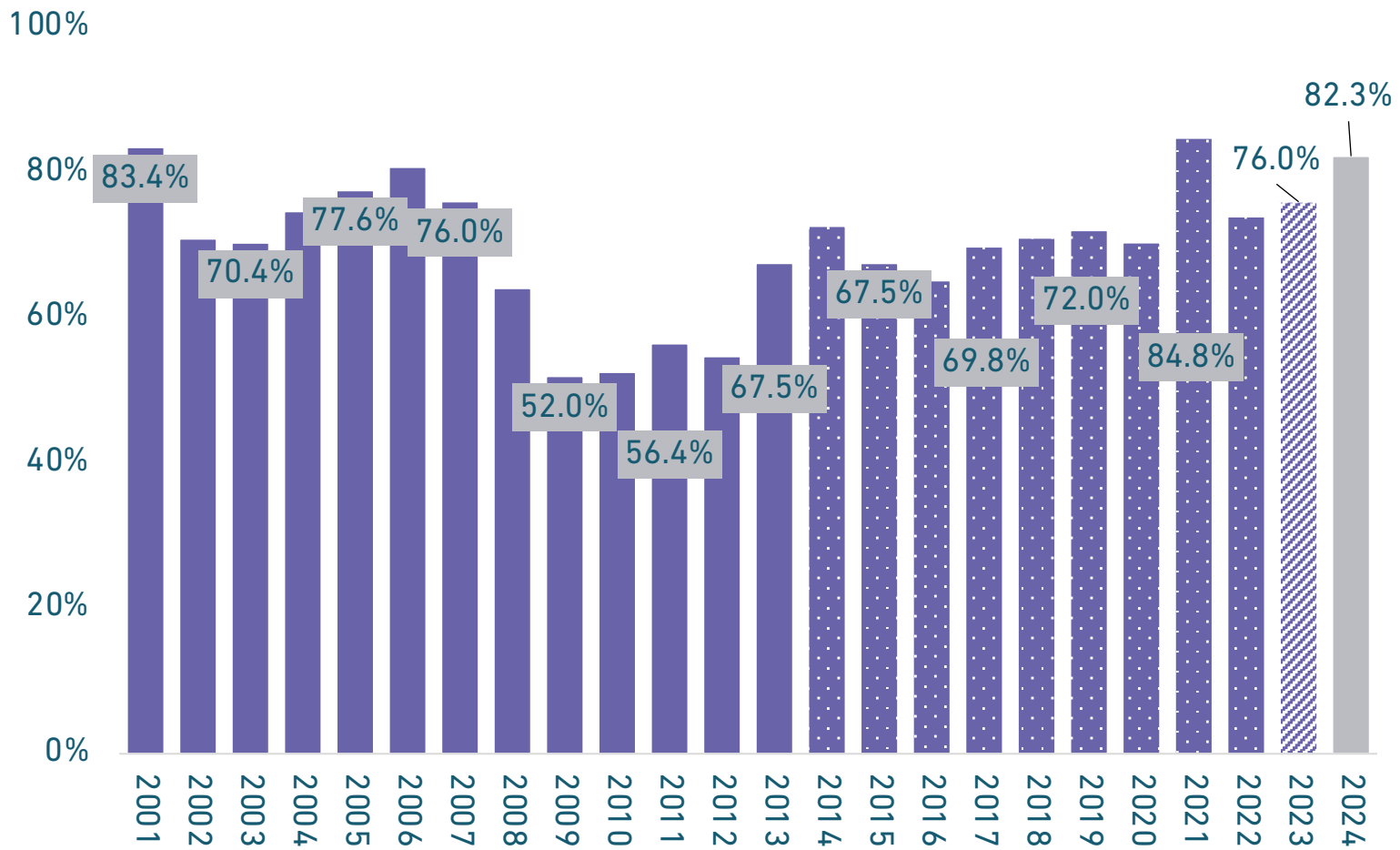
To view funded ratios by state, click here.

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2023 Data Availability
- 2024 Estimate Based on June 30 Returns

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Data for 2001 to 2013 reflect the "actuarially accrued liabilities" reported by public plans. Data from 2014 onward use the new GASB 67 "total pension liability" measurement. See methodology section for details on 2024 estimate.

FUNDED RATIO AVERAGE

FOR LOCAL PENSION PLANS ONLY | 2001–2023 + 2024 Estimate



The aggregate funded ratio for municipally-managed plans in 2024 is just above 80%. This makes 2024 near the highest point in recent history.

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2023 Data Availability
- 2024 Estimate Based on June 30 Returns

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Data for 2001 to 2013 reflect the "actuarially accrued liabilities" reported by public plans. Data from 2014 onward use the new GASB 67 "total pension liability" measurement. All years use market valued assets (MVA) except 2001–2003 due to poor reporting of MVA assets by plans for those years.

2023: THE TOP 10 AND BOTTOM 10 STATEWIDE PLANS
AMONG STATE PLANS THAT HAVE REPORTED FYE 2023 DATA

Top 10 Statewide Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#1	Michigan Public Schools Pension Plus 2	147.8%
#2	Washington Law Officers Plans 1 & 2*	144.6%
#3	Utah Firefighters	111.9%
#4	Washington Public Safety Plan 2	107.9%
#5	Arizona Public Safety Tier 3	107.0%
#6	Washington PERS Plans 2 & 3	107.0%
#7	Tennessee Teacher Plans*	104.5%
#8	Washington State Patrol Plans 1 & 2	104.2%
#9	Washington D.C. Police & Fire	104.0%
#10	Utah Public Safety Contributory Tier 1	103.5%

Bottom 10 Statewide Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#163	New Jersey PERS State and Local Divisions*	48.4%
#164	New Jersey Police & Fire State Division	48.2%
#165	Illinois State Universities	44.1%
#166	Illinois Teachers	43.9%
#167	Illinois Judges	42.7%
#168	Illinois State Employees	41.4%
#169	Arizona Elected Officials	38.6%
#170	New Jersey Teachers	34.7%
#171	Kentucky State Employees Non-Hazardous	22.3%
#172	California Judges**	1.9%

Source: Equable Institute analysis of public plan valuation reports and ACFRs. | *Notes:* * Indicates two plans administered by the same retirement system that have been averaged to produce this figure. **Indicates a pay-as-you-go plan that does not use traditional pre-funding methods.

2023: THE TOP 10 AND BOTTOM 10 LOCAL PLANS

AMONG LOCAL PLANS THAT HAVE REPORTED FYE 2023 DATA

Top 10 Local Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#1	Detroit General Employees Plan 1	113.7%
#2	Detroit Police & Fire Plan 1	109.1%
#3	Houston Firefighters	98.9%
#4	New York City Board of Education	98.8%
#5	Los Angeles Fire and Police	98.6%
#6	Montgomery County (MD) Employees	97.2%
#7	Los Angeles Water and Power	96.6%
#8	Marin County Employees	91.6%
#9	Atlanta General Employees	91.4%
#10	Houston Police	91.3%

Bottom 10 Local Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#63	Chicago Transit	54.8%
#64	Chicago Water	51.9%
#65	Jacksonville Employees	51.5%
#66	Chicago Teachers	43.4%
#67	Jacksonville Police and Firefighters	43.1%
#68	Dallas Police and Firefighters	40.6%
#69	Chicago Laborers	38.5%
#70	Chicago Police	31.1%
#71	Chicago Municipal	22.2%
#72	Chicago Firefighters	21.6%

Source: Equable Institute analysis of public plan valuation reports and ACFRs.

TYPES OF PENSION FUNDS AND THEIR FUNDED STATUS | 2023

	Plan Count	*Unfunded Liabilities*	*Funded Ratio*
Statewide Systems & Local Plans for Teachers and Public School Employees Only*	*51 Plans*	*$633.2 billion*	*73.1%*
Statewide Systems for Higher Education Only	*California URS + Illinois SURS*	*$49.8 billion*	*69.1%*
Statewide Systems for All Public Employees Doing Any Public Service Job in the State	*10 Plans*	*$111.5 billion*	*83.2%*
Statewide Systems for State Employees Only	*20 Plans*	*$187.7 billion*	*63.3%*
Statewide Systems for Municipal Civilian Employees	*21 Plans*	*$58.1 billion*	*83.7%*
Municipally-Managed Systems for Civilian Employees**	*46 Plans*	*$129.6 billion*	*76.6%*
Statewide Systems for Public Safety Only***	*41 Plans*	*$57.5 billion*	*75.3%*
Municipally-Managed Systems for Public Safety Only***	*20 Plans*	*$43.0 billion*	*75.3%*

Funded ratio and unfunded liability figures vary depending on the kind of employees that the retirement system covers.

Retirement systems for educators are often the largest pension plans in a state, based on the value of promised benefits. The funded status of systems managed solely for public safety or municipalities are also generally better funded than plans for educators.

Notes:

* Includes standalone systems for teachers, standalone systems for public school employees, and plans for teachers or public school employees that are part of broader systems but are valued and reported on separately; does not include teacher benefits that are provided by statewide systems including other kinds of employees and blended without distinction (e.g., Florida or Mississippi).

** Does not include plans that are only for teachers or school staff.

*** Includes police-only systems, firefighter-only systems, general public safety systems, and public safety portion of statewide or local plans that is independently valued and reported.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. | ***Note:*** There are 34 other plans in our data set not represented on this list, including: CalPERS and 25 others that cover different combinations of state, local, public school, and public safety employees but not all of them; 7 for judges; and 1 for elected officials.

COMPARING CHANGES IN UNFUNDED LIABILITY & FUNDED RATIO

STATEWIDE VERSUS LOCAL PLANS

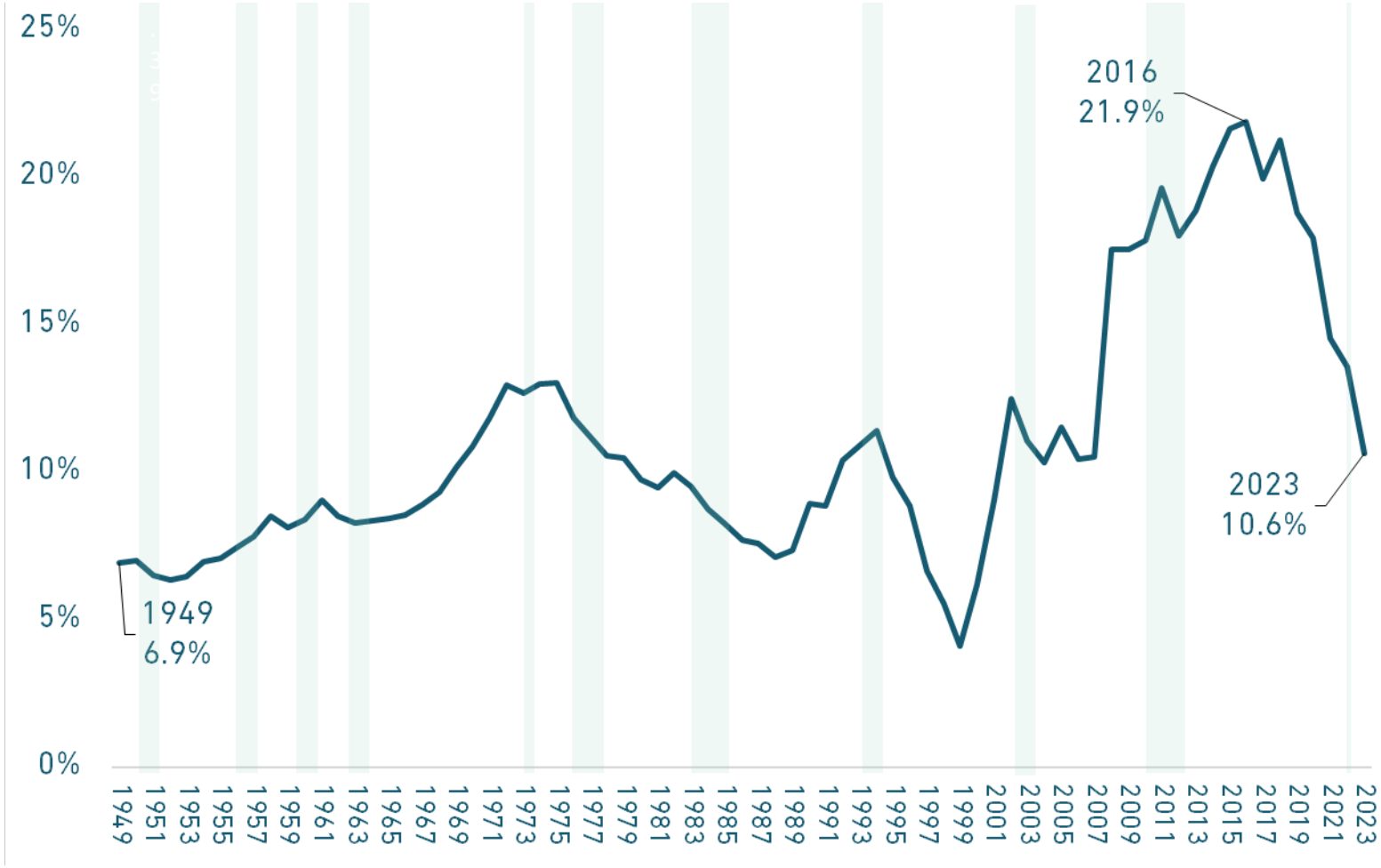
	Statewide Retirement Plan Unfunded Liabilities & Funded Ratio	*Municipally-Managed* Plan Unfunded Liabilities & Funded Ratio	*Combined* Unfunded Liabilities & Funded Ratio
2019	*$1.35 trillion 72.8% funded*	*$206.3 billion 72.0% funded*	*$1.56 trillion 72.7% funded*
2020	*$1.49 trillion 71.2% funded*	*$229.4 billion 70.4% funded*	*$1.72 trillion 71.1% funded*
2021	*$0.88 trillion 83.8% funded*	*$121.7 billion 84.8% funded*	*$1.00 trillion 83.9% funded*
2022	*$1.40 trillion 75.0% funded*	*$215.4 billion 73.9% funded*	*$1.62 trillion 74.9% funded*
2023 (81% Reported)	*$1.41 trillion 75.8% funded*	*$204.6 billion 76.0% funded*	*$1.61 trillion 75.8% funded*
2024 (Estimate)	*$1.18 trillion 80.4% funded*	*$156.3 billion 82.3% funded*	*$1.34 trillion 80.6% funded*

Most public pension unfunded liabilities reside within statewide retirement systems, primarily because they are simply larger, with more members and more promised benefits.

The funded ratios for state and local plans also have tended to move together, as the same dynamics of underperforming investments and changes to actuarial assumptions have influenced overall finances.

UNFUNDED LIABILITY OF PUBLIC PENSIONS

AS A SHARE OF NATIONAL GDP | 1949–2023



The value of the dollar changes over time, so looking at public sector unfunded liabilities as a percentage of the nation's economy is a helpful way to understand just how big the funding shortfall has become.

It is unlikely that state pension funding shortfalls will be solved at a national level. But measuring unfunded liabilities as a share of the national GDP gives a sense of the nation's collective ability – all states combined – to pay down the funding shortfall.

Comparisons:

2023 State & Municipal Debt: 11.7% GDP

2023 Total Student Debt: 6.2% GDP

2023 Consumer Credit Debt: 3.7% GDP

Source: Federal Reserve's measurement of U.S. public pension liabilities, assets, and GDP. See technical notes for more.

DEFINING "RESILIENT" FUNDED STATUS

We think about the sustainability of state-managed pension funds in three groups: Resilient, Fragile, and Distressed. No single data point on its own should be used to measure a pension plan's fiscal health, so we use a multi-factor matrix when thinking about plan sustainability. This includes funded ratio, unfunded liability as a share of GDP, the assumed return, share of required contributions received, and availability of risk-sharing tools. Here is a breakdown of how we think about the first of these factors, the funded ratio:

Resilient: A resilient pension system has a funded ratio of 90% or more for at least three years in a row. These plans are generally in a strong position to recover from financial downturns as funding policy improvements are easier to make when the plan's finances are stable.

Fragile: A fragile pension fund is consistently between 60% and 90% funded. While these plans aren't going insolvent anytime soon, they will be building up unfunded liabilities that will gradually become a strain on budgets and government revenues. A plan that is 85% funded for several years in row is healthier than one 65% funded, but it is still exposed to risk. One or two asset shocks could send the plan into a downward spiral.

Distressed: Pension systems with funding levels below 60% should be looking to make immediate steps toward fixing their problems. While the specific threshold may vary across plans, at a certain point it is much harder for a plan to return to fiscal health.

Analysis: What We See in the Funded Status Trends

Funded ratio and unfunded liability levels vary considerably from state to state.

- **A small group of states have historically Resilient statewide pension systems — including New York, South Dakota, Tennessee, and Wisconsin.** The majority of Washington State plans are consistently over 90% funded as well, and the asset-weighted average funded ratio for Washington is among the top three in the country.
- **Roughly half of national unfunded liabilities are for retirement systems that cover teachers and public school employees** (Page 50).
- After a market rebound in 2023, **only a few plans were above 90% funded: a quarter (25.0%) of major statewide plans and just 17.8% of municipally-managed plans** (Page 45).
- **A plurality of state and local plans (63.7%) is Fragile as of 2023,** with a funded ratio between 60% and 90% (Page 45).
- **More than 13% of all statewide plans and local plans were Distressed as of 2023** (Page 45)**. These plans face a considerable uphill climb to recovery.** The costs of paying down unfunded liabilities for these plans (e.g., Illinois Teachers, Kentucky State) are challenging for state budgets, but the costs of insolvency and shifting to "pay-as-you-go" could be even more expensive.

Looking to the future: States that have Fragile, but not Distressed, pension plans should be looking to make funding policy improvements while the costs of doing so are not prohibitively expensive, as is likely the case for states with some of the worst-funded plans.

FACTORS DRIVING OUR ANALYSIS

Funded status matters because it reflects both the solvency of a pension fund and the underlying costs of providing the benefit.

There is no inherent reason that a pension fund needs to be exactly 100% funded every year. The funded level of a plan will fluctuate over time. However, if a pension fund remains at 70% or 80% funded perpetually, the costs of funding benefits will grow.

A plan that is consistently below 100% funded for more than two to three years will have consistent unfunded liabilities. The costs of carrying unfunded liabilities for a long period of time can grow exponentially.

While a pension fund that is 80% funded for 10 years in a row is at no risk of near-term insolvency, their unfunded liability amortization payments could very well double in that time frame, making the costs of providing the same benefit higher than necessary over the long term.

Reported funded ratio and unfunded liability numbers are only as good as the underlying assumptions.

Funded ratios and unfunded liability numbers depend on accurately measuring the value of promised liabilities and assets. This means the reported funded status is dependent on accurate assumptions like mortality rates used to measure promised benefits and valuation methods used to measure assets.

There is an academic debate about whether pension plans should use the assumed rate of return on assets as the discount rate for liabilities. There is a separate debate about whether the assumed rates of return used by plans (current median is 7%) is too high.

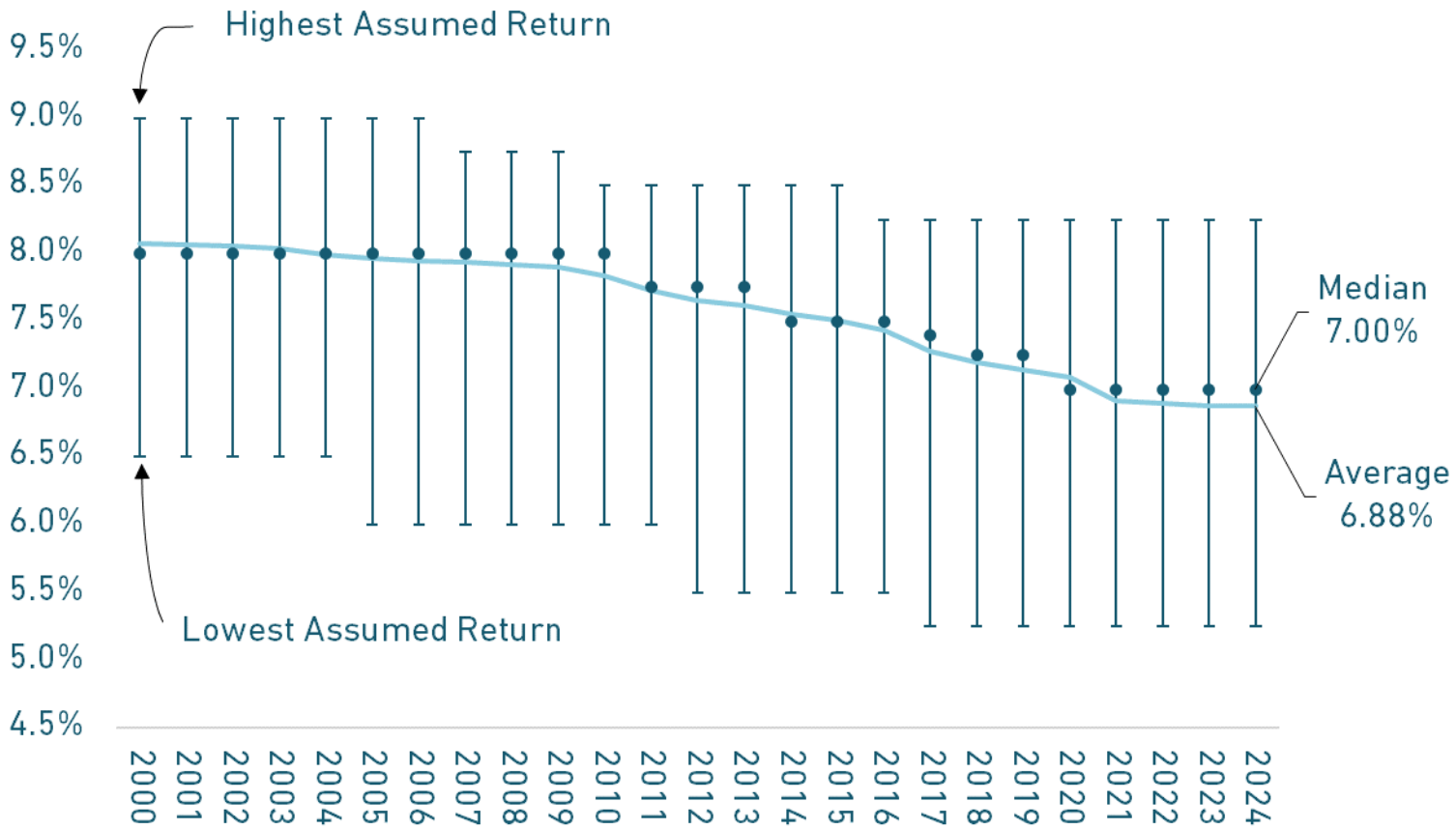
Moody's Analytics uses an alternative process for measuring liabilities from most actuaries and winds up with a discount rate usually 5% or less. Actuarial firm Milliman measures liabilities using an assumed rate of return (6.6%) that is much lower than the national average.

Within the Trends: Investment Assumptions

- Interest Rates
- Assumed Rate of Return

AVERAGE ASSUMED RATE OF RETURN

FOR STATE & LOCAL PLANS | 2001–2024



The average assumed rate of return has gradually declined from *8.07%* in 2001 to *6.88%* in 2024.

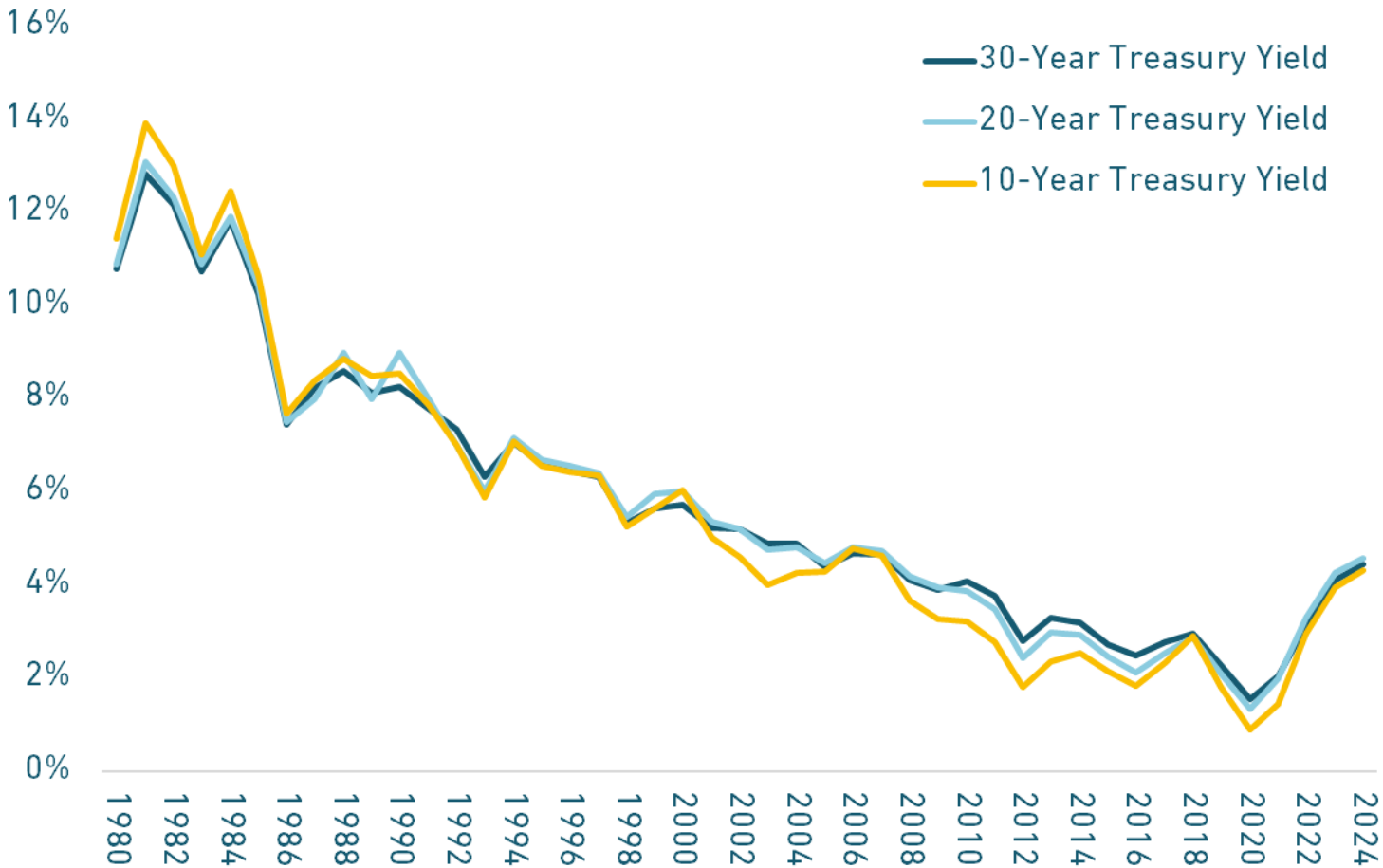
However, there is still a wide range of assumptions adopted by public pension plans.

The lowest rate adopted by any plan is *5.25%.* The highest rate currently used by a statewide plan is *7.50%*, and the highest rate by a local plan is *8.25%*.

Source: Equable Institute analysis of public plan valuation reports, ACFRs, and board of trustees reports.

INTEREST RATE TRENDS

TREASURY YIELDS CHANGE OVER TIME | 1980–2024



One of the most significant events to have influenced public pensions over the past 50 years has been the steady decline in interest rates between 1980 and 2020.

Lower interest rates raised the costs of financial guarantees, like pensions and life insurance.

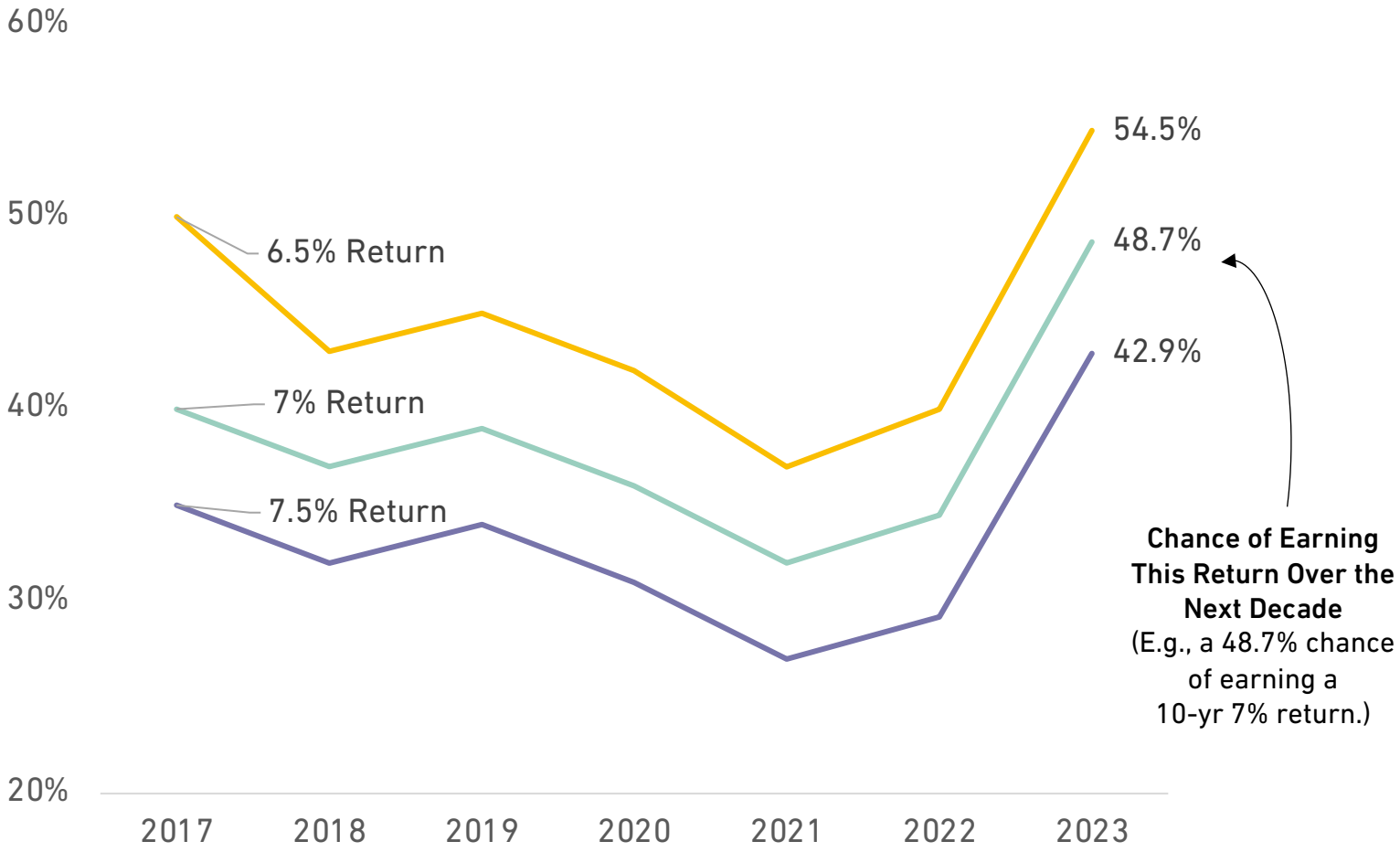
Lower interest rates also changed financial markets with lower yields on fixed income investments and a need to expand portfolio risk to meet assumed rates of return.

Recent increases in interest rates have now created a range of mixed signals for pension funds about investment strategy for both public and private markets.

Source: Federal Reserve, annual average yields. See technical notes for more. | *Notes:* (1) Yields for 2024 are the average as of June 30, 2024; (2) 20-year treasury bonds were not issued until 1993 but the Federal Reserve has imputed values for prior years; no 30-year treasury bonds were issued between February 18, 2002, and February 8, 2006.

PROBABILITY OF A STANDARD PENSION FUND EARNING RETURNS BETWEEN 6% AND 7.5%

10-YEAR CAPITAL MARKET FORECAST AVERAGE



The increase in interest rates has driven up investment return expectations.

Where a 6.5% return assumption had a roughly 40% probability going into 2022, it had an over 50% probability going into 2023 (which public plans exceeded on average).

Notably, despite this improvement in the outlook for investment returns, there is still a less than 50% chance of an average pension fund earning a 7% return, which is the median assumption for state and local pension plans.

6.5% Return over 10 Years

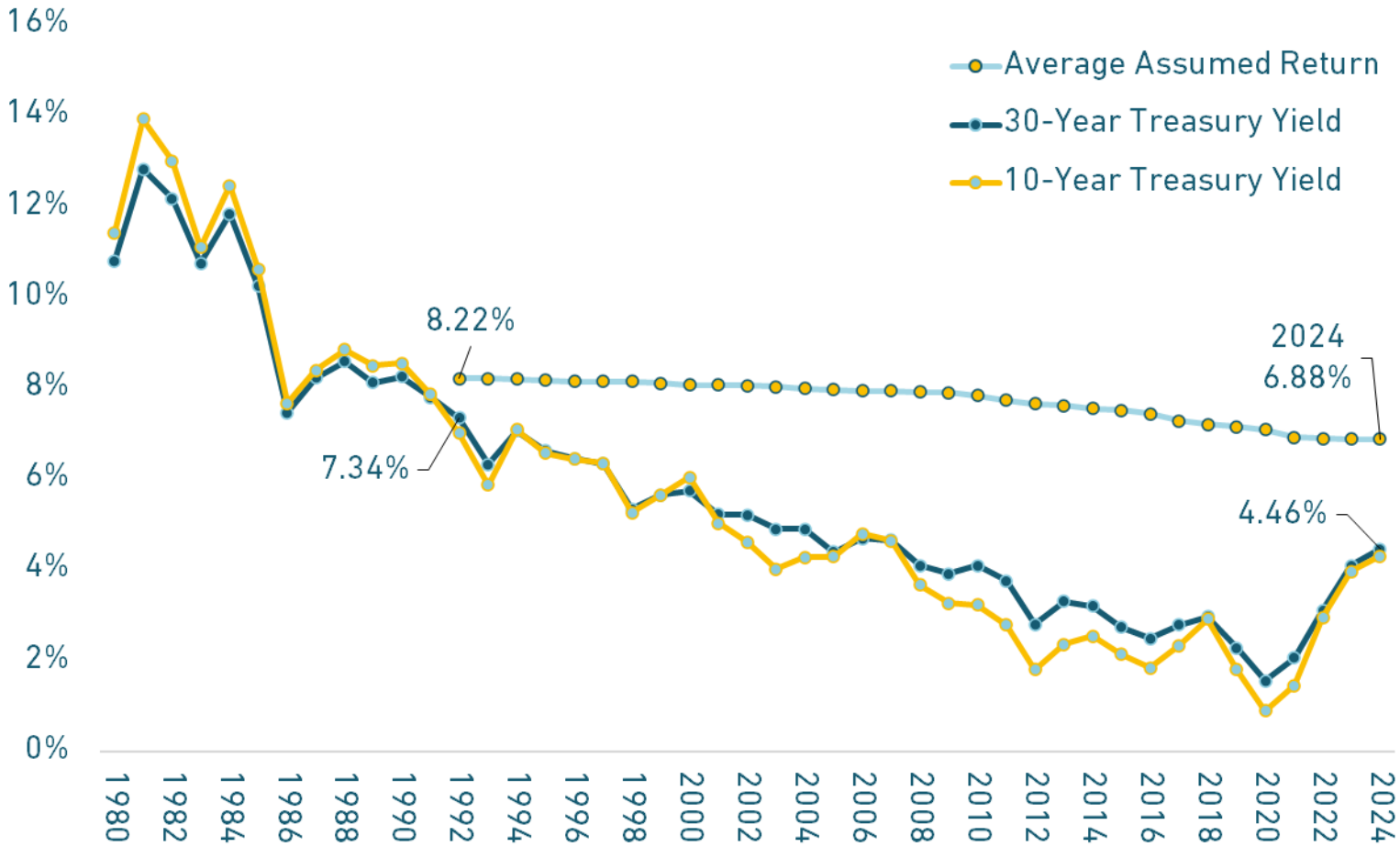
7% Return over 10 Years

7.5% Return over 10 Years

Source: Horizon, "Survey of Capital Market Assumptions: 2023 Edition"
Note: The figures show the average capital market forecast for a typical multi-employer pension plan with an average diversified asset allocation.

THE SLOW CHANGE IN ASSUMED RETURNS

ASSUMED RETURN VERSUS INTEREST RATES | 1980–2024



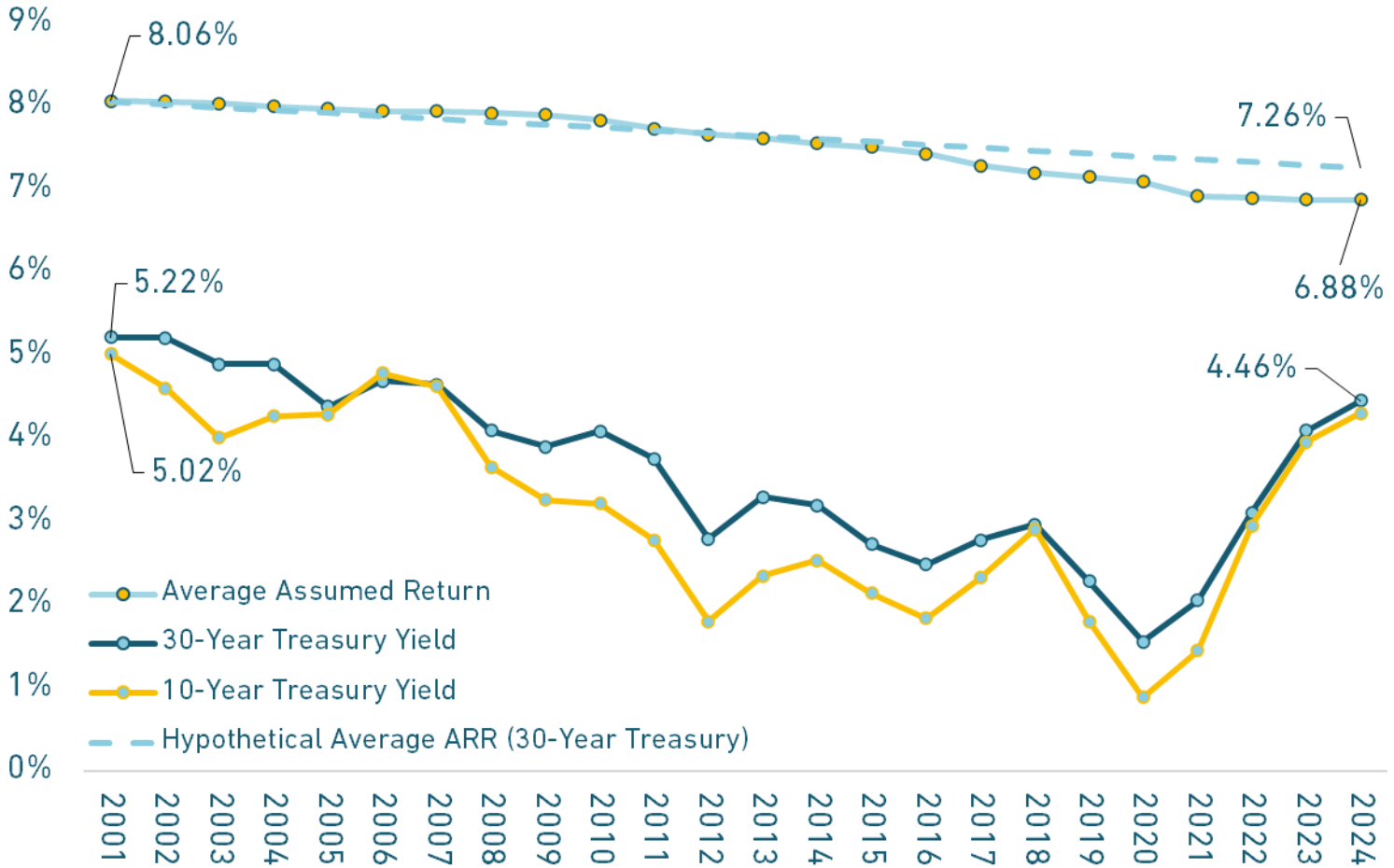
Assumed returns have been falling steadily since 2008, but at a pace slower than the change in interest rates.

Increased investment risk enabled this slow pace in changing assumed rates of return between 2008 and 2020. However, in the last two years, the rapid growth in interest rates — combined with mixed capital market forecast signals — have led to a general pause in the decline of the average assumed rate of return.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. | ***Notes:*** (1) Yields for 2024 are the average as of June 30, 2024; (2) No 30-year treasury bonds were issued between February 18, 2002, and February 8, 2006, but the Federal Reserve has imputed yields for those periods.

COMPARING HYPOTHETICAL & ACTUAL INVESTMENT ASSUMPTION CHANGES

ASSUMED RETURN VERSUS INTEREST RATES | 2001–2024



This chart shows the same picture as on the previous page, except zoomed into starting 2001. The chart also shows what a hypothetical average investment assumption would look like if public plans kept the same relative risk tolerance they had in 2001.

In previous years, the dotted blue line was below the actual average assumed return. This year the hypothetical average is higher due to higher interest rate yields.

Source: Equable Institute analysis of public plan valuation reports and ACFRs. | ***Notes:*** (1) Yields for 2024 are the average as of June 30, 2024; (2) No 30-year treasury bonds were issued between February 18, 2002, and February 8, 2006, but the Federal Reserve has imputed yields for those periods.

PLANS BEING LEFT BEHIND

ASSUMED RETURNS HIGHER THAN 7.25%

AS OF ANNOUNCEMENTS THROUGH JUNE 2024

Plans with Assumed Rates of Return Above 7.25%			
Chicago Transit Authority Employees Retirement Plan	8.25%	Oklahoma Firefighters	7.50%
Oklahoma Police (PPRS)	7.50%	Milwaukee City Employees	7.50%
Arkansas State Highway Employees	7.50%	Alabama Employees	7.45%
Texas County & District (CDRS)	7.50%	Alabama Teachers	7.45%
Omaha Employees	7.50%	Philadelphia Muni Employees	7.35%
Oklahoma Law Enforcement	7.50%	Missouri Public Education (PEERS)	7.30%
Cincinnati Employees	7.50%	Missouri Public Schools (PSRS)	7.30%
Ohio Police & Fire Pension Fund	7.50%	Austin Firefighters	7.30%
Montgomery County (MD) Employees	7.50%	Montana Teachers	7.30%
Iowa Municipal Fire and Police	7.50%	Montana Employees (PERS)	7.30%

Even with relatively higher capital market expectations, there is still a less than 50% chance for the average pension fund to earn 7%. There is an even lower probability of earning rates above this. And yet there are still 20 plans that are assuming future investment returns greater than 7.25%.

The decision-makers of the plans on this list (e.g., pension board trustees, state legislatures) are either taking on high underperformance risk (likely to cause unfunded liabilities), or they are intentionally failing to adopt appropriate investment assumptions to avoid recognizing additional unfunded liabilities today.

Note: Assumed returns shown are reported in each plan's most recently published actuarial valuation. For most plans this is for 2023, but others have not yet published documents for 2023, so their totals are drawn from 2022 valuations.

Source: Equable Institute analysis of public plan valuation reports and ACFRs.

Analysis: What We See in the Investment Trends

In 2020, there were 82 state and local pension plans using an assumed rate of return higher than 7.25% — but as of June 2024, 76% of those have since lowered their assumptions. Today there are only 20 plans using a greater than 7.25% assumed return rate or higher, most of whom were using even higher assumptions in 2020 (Page 62). Among those plans, five are municipally-managed plans with assumptions at or above 7.5%, and seven statewide plans with assumptions at 7.5%.

- It took states more than a decade to move away from unrealistic 8% investment return assumptions. Fortunately, it is taking less time to also move past a similarly optimistic 7.5% assumed rate of return. The new target for public plans to leave behind is a 7% assumed return, which is currently the median assumption (Page 11).
- The longer that states maintain assumptions 7% or higher, the longer they are going to have to take on asset risks (the risks associated with alternative investments that promise high returns, see Page 60) and underperformance risk (the risk that pension funds won't earn their targeted return, which in turn leads to a growth in unfunded liabilities, see Page 24).
- The 6.88% average assumed rate of return (Page 59) is still very optimistic. Depending on whose capital market assumptions are used, the 50th percentile return — e.g., the return that has a 50/50 chance of being earned over the next decade — for a typical pension plan is between 6% and 7%.

Looking to the future: Public plans are likely to continue the trend of lowering their assumed returns in the coming years due to lower probable actual returns. The speed at which this change is made will likely influence how much risk persists within public plans.

FACTORS DRIVING OUR ANALYSIS

The most significant problem for pension fund investments currently is low interest rates.

Interest rates are an important trendline for retirement systems because they reflect the kind of financial market that pension funds are investing in. If interest rates are low, it makes it harder to earn higher returns from relatively safe, fixed income investments like bonds.

Since the Great Recession, low interest rates have caused pension funds to shift their assets into higher risk categories to try and earn high returns.

The most important actuarial assumption for public pension Resilience is the assumed rate of return.

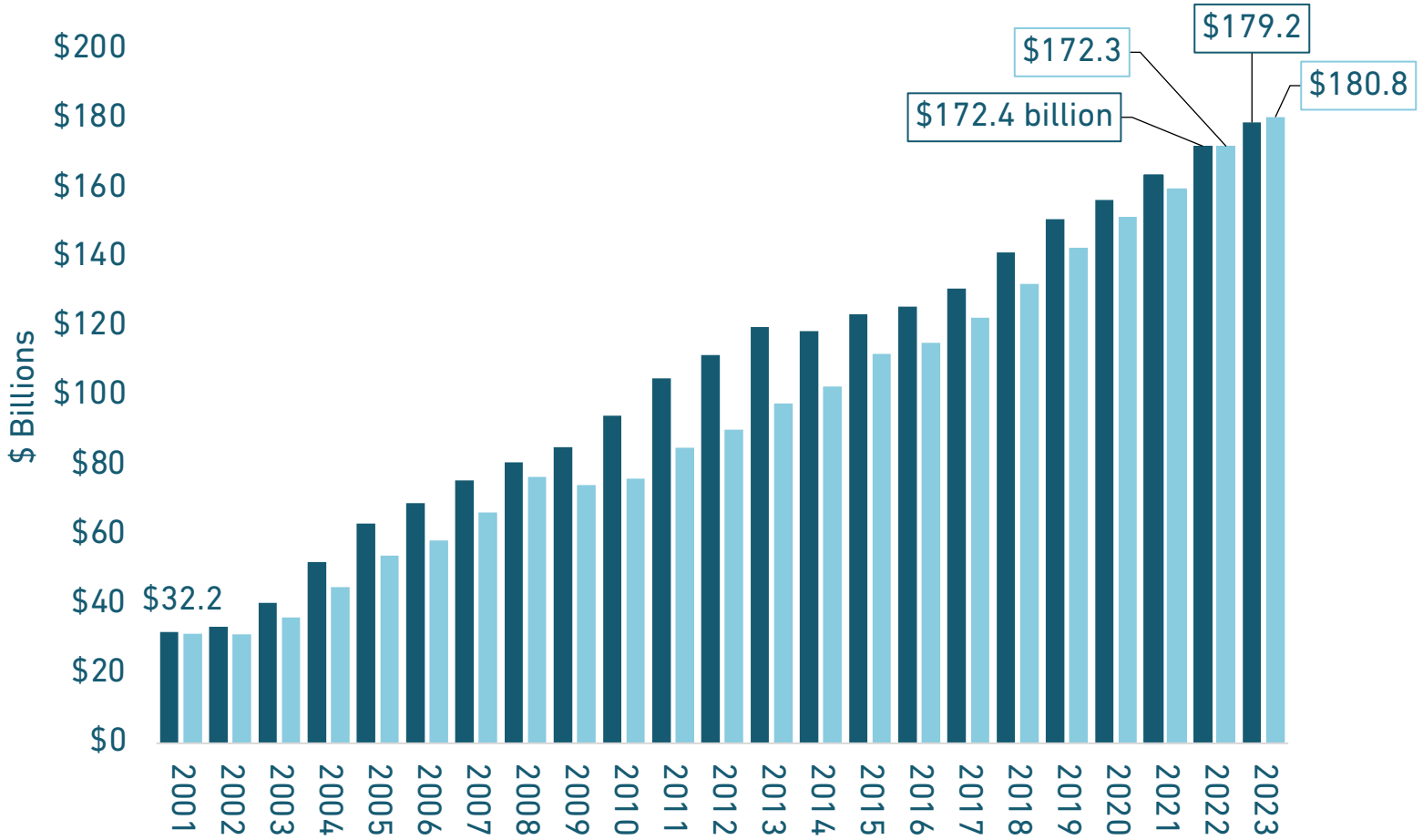
The assumed rate of return is used to help determine what the level of contributions is each year.

The assumed rate of return is the annual target for a pension fund. Just earning a return greater than 0% is not good enough. If a state plan is assuming 7.25%, then anything less than that will add unfunded liabilities.

Within the Trends: Contribution Policy

- Actuarially Determined Employer Contributions
- Funding Policy Trends

EMPLOYER CONTRIBUTIONS
ACTUAL v. REQUIRED | 2001–2023



Actuarially required contributions have grown steadily over the past two decades.

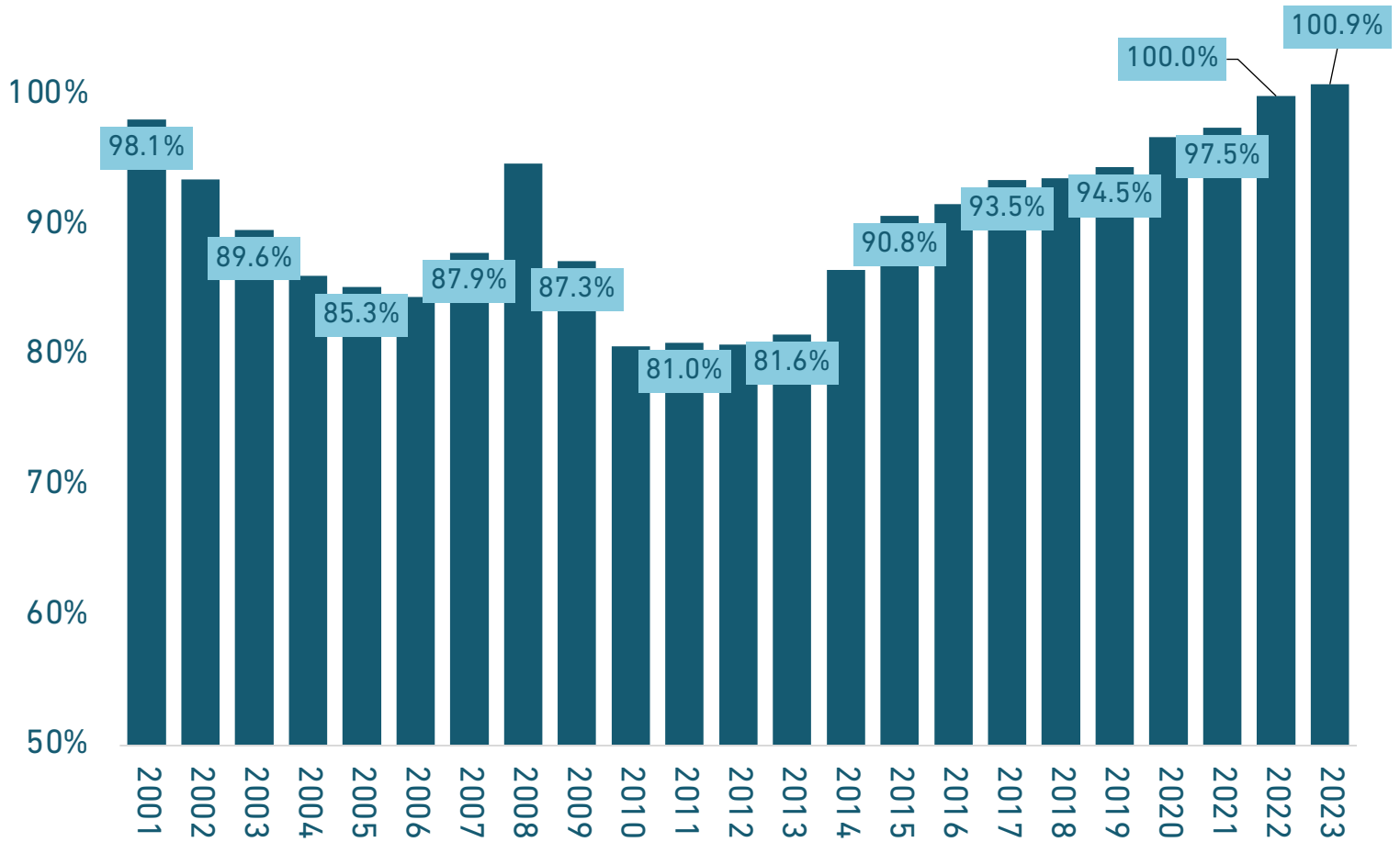
In recent years, states have paid all required contributions on average. In fact, supplemental contributions using budget surpluses in 2022 and 2023 have led to overpayment of required costs in fiscal year 2023.

Actual Contributions (in billions)

Required Contributions (in billions)

Source: Equable Institute analysis of public plan valuation reports and ACFRs. "Required" based on GASB definitions for ARC and ADC. Plans that have not published their 2023 data were estimated based on reported contribution rates as a percentage of payroll and a roll-forward of payroll based on plan assumptions.

SHARE OF REQUIRED CONTRIBUTIONS PAID BY STATEWIDE PLANS | 2001–2023



States have steadily improved their commitment to paying actuarially required contributions over the past several years after reaching a modern low point in 2012, following the Great Recession.

While a few states are still not paying 100% of required contributions, on net the country paid 100% in both 2022 and 2023 (due to supplemental payments in some states).

Source: Equable Institute analysis of public plan valuation reports and ACFRs. "Required" based on GASB definitions for ARC and ADC.

PENSION PLANS THAT RECEIVED 20% OR MORE ABOVE REQUIRED CONTRIBUTIONS IN FYE 2023

Retirement System	% of ADEC Paid	2023 Funded Ratio
Oklahoma Police (PPRS)	267.3%	101.0%
West Virginia Employees	166.1%	100.1%
Nebraska Employees – State Cash Balance Plan	127.0%	99.9%
Nebraska School Employees	210.4%	97.3%
Oklahoma Employees	304.2%	95.9%
Minnesota State Employees (SERF)	267.3%	94.5%
Colorado PERA – Denver Public Schools	156.5%	86.6%
Colorado PERA – Judges	173.5%	86.6%
Minnesota Police and Fire	149.2%	86.5%
Minnesota General Employees (GERF)	167.7%	83.1%

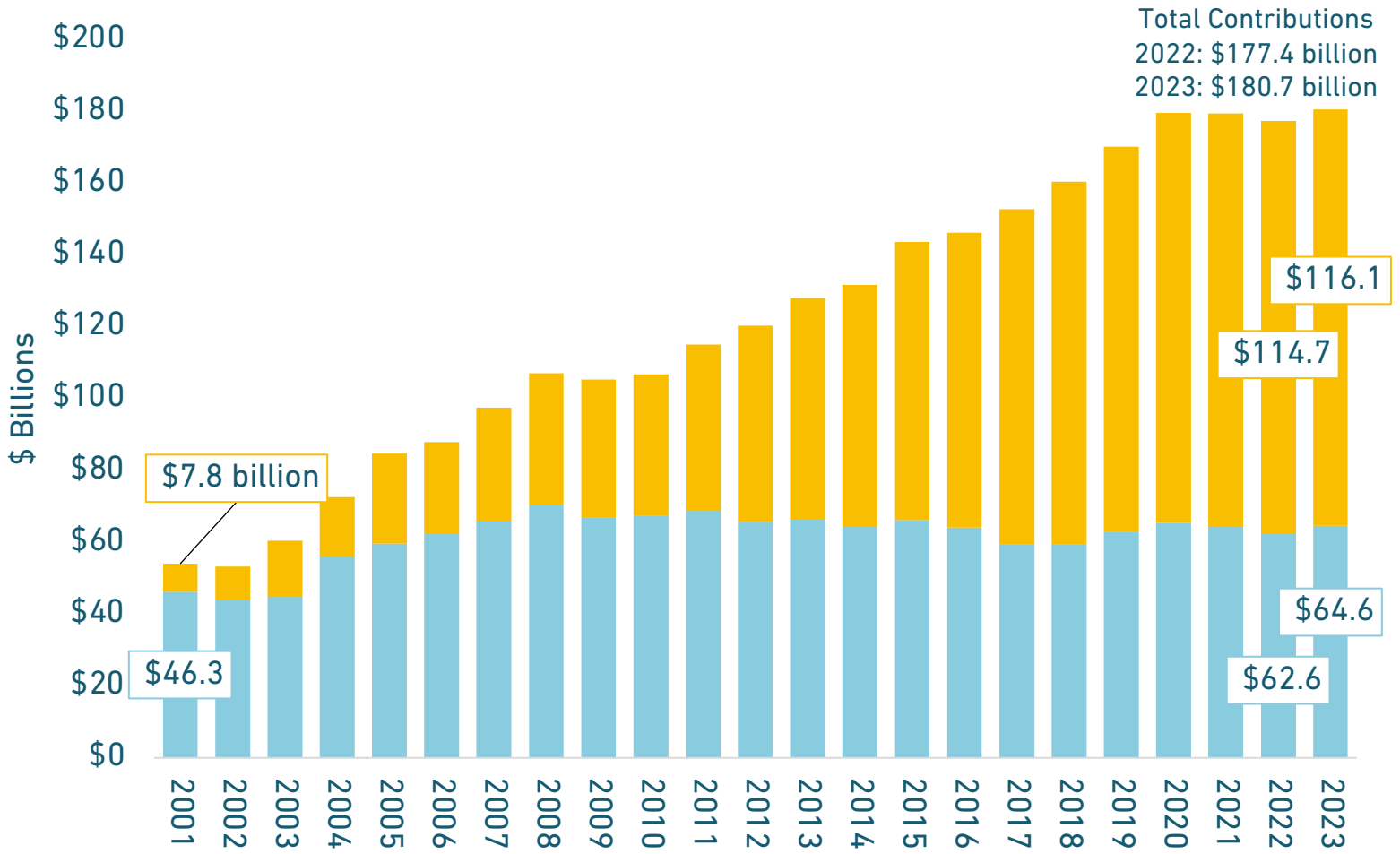
Retirement System	% of ADEC Paid	2023 Funded Ratio
Arizona Corrections Officers	329.5%	82.6%
Milwaukee City Employees	148.7%	82.5%
Indiana Public Employees	145.3%	80.8%
Ohio State Teachers	209.9%	80.0%
Tucson Supplemental Retirement	126.4%	78.9%
Texas Employees	169.0%	70.9%
Michigan State Police	204.3%	68.5%
Michigan Public Schools	145.2%	66.3%
St. Paul Teachers	148.6%	64.3%
Philadelphia Municipal Employees	145.3%	61.7%

Several states have used budget surpluses over the last few years to put supplemental dollars into state retirement systems. And a few states have fixed contribution rates that exceed actuarially determined funding.

Together these factors helped drive pension fund contributions over 100% of required rates for two years in a row, despite some state plans still getting less than actuarially required.

In 2023, 58 plans received 105% or more of their actuarially required employer contribution — and the 20 listed here received 120% or more.

NC v. UAL: ACTUAL EMPLOYER CONTRIBUTIONS, INFLATION-ADJUSTED | 2001–2023



On an inflation-adjusted basis, there has been a slow increase in normal costs (due to lower discount rates), while unfunded liability amortization payments have increased from $7.8 billion in 2001 to $116.1 billion in 2023.

Unfunded Liability Amortization Payments

Normal Cost

Source: Equable Institute analysis of public plan valuation reports and ACFRs. "Required" based on GASB definitions for ARC and ADC.

Analysis: What We See in the Contribution Trends

After decades of states failing to ensure they were paying at least the actuarially determined contribution rates, they now have a five-year stretch of paying at least 95% of their collective required contribution — including an estimated 100% paid in 2022 and 2023, among states that have reported data thus far (Page 67).

- **States have a historically inconsistent record with paying required contributions.** Even though pension funds are supposed to be pre-funded, many states did not get serious about trying to make such contributions until as late as the 1990s.
- **Contributions relative to requirements were particularly low in the years after the Great Recession.** Though the economy recovered, tax revenues took years to bounce back from their decline in 2008. Fortunately for state finances, federal fiscal stimulus in 2020 and early 2021 has helped prevent a similar economic catastrophe that might have led to similar underfunding behavior.
- **The year 2023 was the best on record for paying actuarially determined contributions**, even though there were still instances that did not have every plan paying their full actuarially determined contribution (e.g., Texas has a schedule in place that could result in making full required contributions as of fiscal year 2026).
- Notably, New Jersey made a full required contribution into its state pension funds starting with fiscal year 2022 and has continued the same trend for two more consecutive years.

Looking to the future: States on the cutting edge of pension plan management (e.g., MI, CO, NM) are focused on adopting risk-sharing policies that give pension boards tools to balance the goals of protecting benefits and ensuring a well-funded plan. The best-funded plans historically — South Dakota and Wisconsin — have benefited from risk-sharing tools built into their plans decades ago. More states would benefit from adopting similar policies now.

FACTORS DRIVING OUR ANALYSIS

Ensuring the actuarially determined contribution rate is fully paid each year is the minimum states can do if their goal is to ensure resilient, sustainable retirement systems.

There are reasonable debates to be had over public policy priorities for any given state or municipality, including over-allocation of resources to various policy goals and what tax rates are appropriate or not. Whether states should use resources to pre-fund retirement benefits is often a part of these debates.

While state and local leaders might have acceptable arguments for a choice that trades off fully funding a pension plan, if a state has the goal of maintaining a sustainable retirement system, then the bare minimum requirement each year is paying at least 100% of the ADC.

Actuarially determined contribution rates are only as sound as the underlying assumptions used to calculate them.

Actuarially determined contribution rates are based on numerous actuarial assumptions (i.e., investment returns, mortality, payroll growth, etc.) that factor into measuring liabilities. In addition, pension boards can set amortization policies that target 100% funding over an excessive period of time (more than 25 years), or in some cases target less than full funding in the first place.

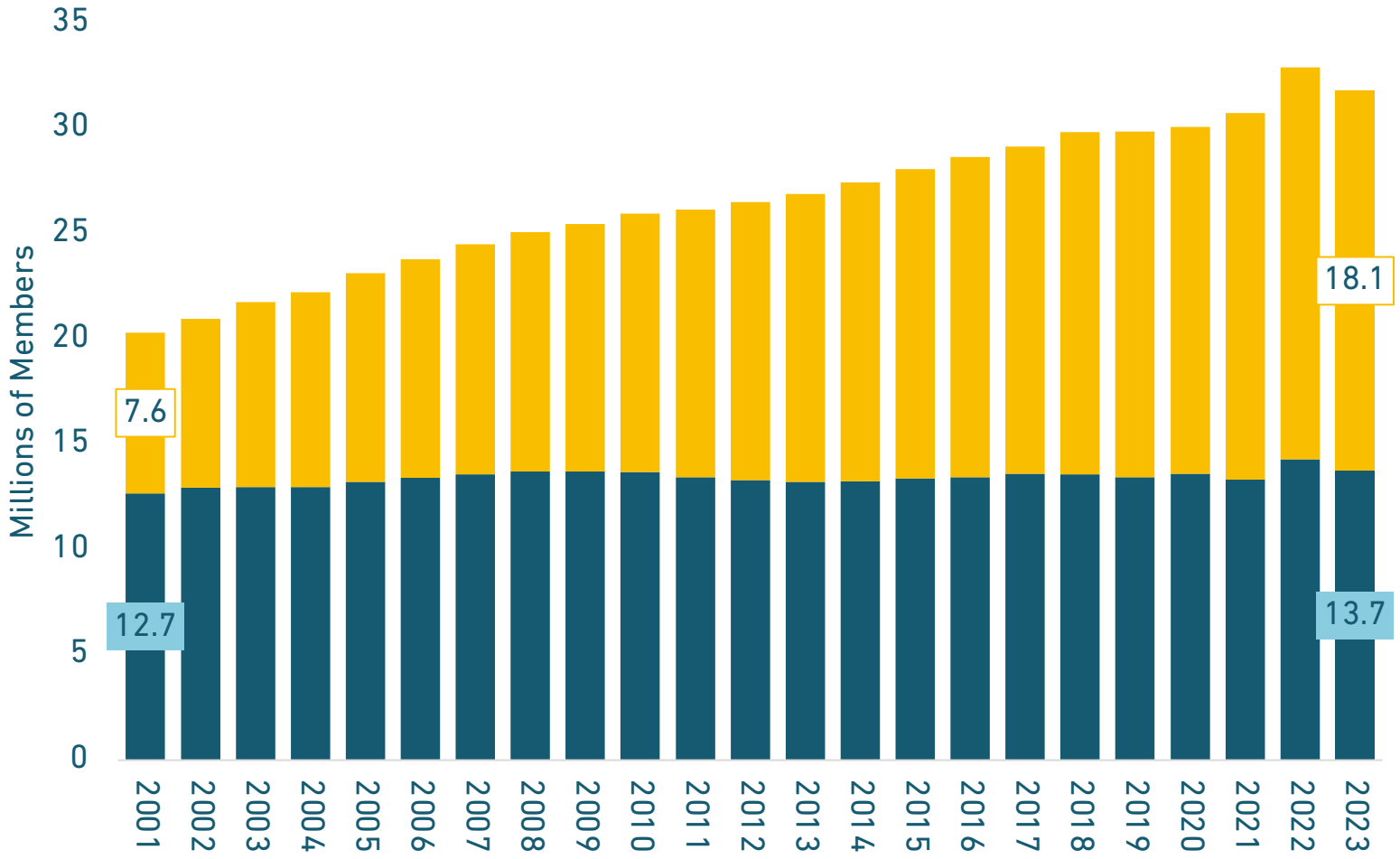
As a result, a number of states pay their full ADC every year but still have mounting unfunded liabilities. Just paying the actuarially required rate each year is not enough on its own to ensure full funding in the long term.

If the assumptions and funding policies are flawed, then the ADC alone cannot put a pension plan on the path to full funding.

Within the Trends: Cash Flows & Maturing Plans

- Active Members-to-Retirees Ratio
- Benefit-to-Asset Ratio

RATIO OF ACTIVE MEMBERS TO RETIREES, A HISTORIC TREND | 2001–2023



The ratio of active workers to retirees provides a signal about cash flows into and out of pension funds.

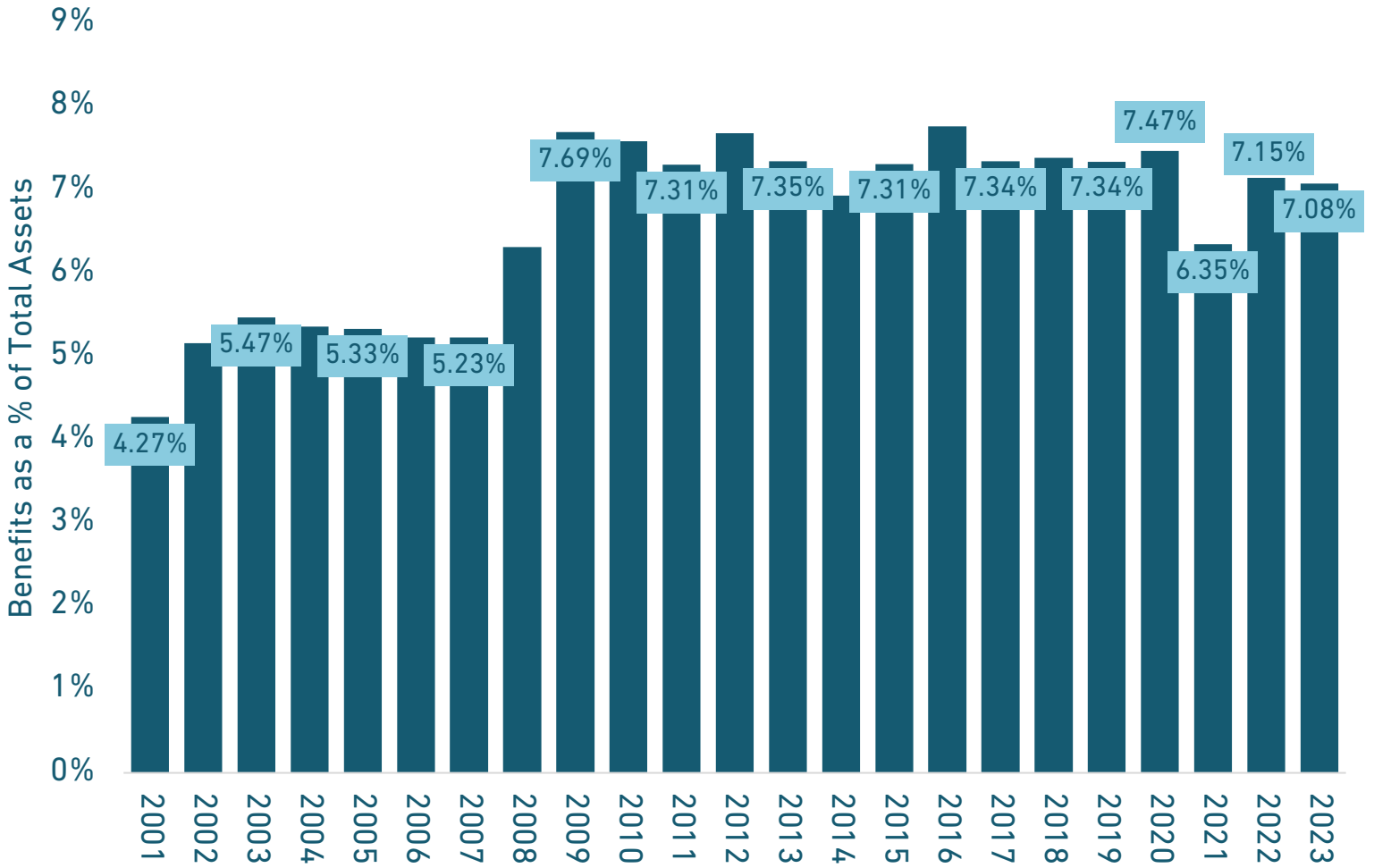
People are living longer and retiring faster (as the Baby Boomer generation phases out of the labor force). Public sector hiring rates slowed down after the Great Recession. The net result is active member counts have been relatively stable for the past few years, while the total number of retirees collecting benefits has grown.

Retired/Inactive

Active

Source: Equable Institute analysis of public plan valuation reports and ACFRs.

BENEFIT PAYMENTS
AS A SHARE OF ASSETS | 2001–2023



The benefit-to-asset ratio is a helpful metric for states and pension boards to monitor whether they are at risk of running into a liquidity crunch. The closer a pension plan is to a 1:1 ratio, the closer they are to running out of cash.

But beyond solvency, there is also an investment concern here: As more of the asset base is being used to pay benefits, there is less money that can be invested in long-term assets to earn returns.

Benefit : Asset Ratio	
1 : 23	*1 : 14.1*
2001	2023

Source: Equable Institute analysis of public plan valuation reports and ACFRs.

Analysis: What We See in the Cash Flow Trends

Public pension plans have increasing negative cash flows from benefit payments growing larger than contributions (Page 16). This is not inherently a problem so long as there is investment income to cover the difference, but that has not been consistent (Page 17). And the available asset base to earn investments from is improving but is still at least a trillion dollars less than it should be (Page 8).

- It has now been 11 years since total retirees became greater than active members (Page 73). The growth in retirees is driving ever-increasing benefit payments. If plans were fully funded this wouldn't be a problem — but they are not.
- Benefit payments relative to assets are slightly below the ratios displayed throughout the 2010s (Page 74).
- Because investment returns have been less than expected in most years during the past two decades (Page 10) and asset values haven't kept up (Page 8), the ratio of benefits to assets has been trending down since 2001 (Page 74). This is a vicious cycle because negative cash flow from contributions puts additional pressure on plan investment returns to meet or exceed expectations.
- As the Benefit-to-Asset measure of liquidity shifts toward 1:1, pension fund managers will find it increasingly harder to make investment decisions. There will simply be fewer assets that can be invested flexibly.

Looking to the future: It will be very difficult (in some cases impossible) for public plans to invest their way back to fiscal health. Contributions are being fully consumed by benefit payments, and pension funds are relying on investment returns to make up the balance (meaning less exponential investment growth). Each year investment returns underperform expectations it perpetuates a vicious cycle.

FACTORS DRIVING OUR ANALYSIS

If public plans were fully funded, the active-to-retiree and benefit-to-asset ratios would not be a concern.

Pensions are supposed to be "pre-funded" with contributions plus investment earnings. The benefits earned each year are supposed to be matched by contributions that will be sufficient to pay those benefits, assuming: (1) the value of the benefits was calculated correctly; and (2) the contributions earn assumed investment earnings.

This means that new members and their contributions should not be necessary to pay retiree benefits.

In practice, there isn't a problem with a pension fund paying out all its assets if there is enough to meet all promises.

If a fully funded pension plan were to stop adding new members, it could be gradually wound down over time without fear of running out of money, because it was appropriately pre-funded. Each passing year the ratio of retirees to active members would grow and the benefit-to-asset ratio would shift toward 1:1 or worse, but that would be expected and not a problem.

Simply hiring more people would improve near-term cash flows, but it would also mean faster growth of promised benefits which is already outpacing assets.

A frequently proposed solution to cash flow problems is hiring more people because this will mean more contributions. However, this also means more promised benefits. The existing challenge for statewide pension plans is that promised benefits are outpacing the growth of assets (Page 8). So, hiring more people could exacerbate the long-term problem.

The additional "contributions" that come from hiring more workers are all coming from government resources in the first place — member contributions are from their paychecks; employer contributions are from taxpayer resources. If there is money available to hire more workers, then those funds, including the amounts for paychecks, in theory could be used to pay down existing funding shortfalls without taking on the additional liabilities that come from hiring more members.

This is not to say governments should not hire more people — there are plenty of public policy reasons why that might or might not be appropriate for any given state at any given time. This is to say that hiring more people is not a solution to the cash flow problem.

APPENDIX 1: GLOSSARY

KEY TERMS TO KNOW

Liabilities

- *Accrued liability (AAL):* Total amount of promised pension benefits, counting up all expected pension checks for active members and retirees, and then reporting those in today's dollars.
- *Total pension liability (TPL):* A technical definition from the Governmental Accounting Standards Board for the value of promised benefits. All retirement systems that want to comply with GASB reporting requirements must measure their pension obligations in a particular way that sometimes can be slightly different from AAL.

Assets

- *Actuarial value of assets (AVA):* A "smoothed" value of assets, typically used for the purposes of determining contribution rates and measuring unfunded liabilities. Actuaries "smooth" any gains and losses of a particular number of years to minimize year-to-year changes in the value of the AVA. For example, actuaries typically smooth investment gains and losses over a five-year period, only recognizing 20% of the market valued return each year for the purposes of determining the AVA.
- *Market value of assets (MVA):* The actual fair market value of the plan's total assets, measured by the price that would be received to sell an asset in an orderly transaction.
- *Fiduciary net position:* A technical definition from the Governmental Accounting Standards Board for the market value of assets. All retirement systems that want to comply with GASB reporting requirements are required to measure the real value of their assets, instead of the actuarial value.

Pension Debt

- *Unfunded liabilities:* The difference between the value of promised benefits and assets available to pay those benefits. This is the shortfall in assets that should be in the pension fund and invested so that all promised benefits can be paid. An easy way to think about unfunded liabilities is as pension debt.
- *Net pension liability (NPL):* A technical definition from the Governmental Accounting Standards Board for pension funding shortfalls. All retirement systems that want to comply with GASB reporting requirements are required to measure their obligations as total pension liabilities, and their assets using a market value called fiduciary net position (FNP). The difference between these two accounting metrics is the net pension liability.
- *Pension debt:* A non-technical way to think about "unfunded liabilities," which is the difference between the value of promised benefits and the assets available to pay those benefits. Pension debt isn't like typical government debt. Money isn't borrowed and put into the pension fund. Instead, it is money the pension fund needs to make up for past contributions that weren't enough to appropriately pre-pay for benefits.

KEY TERMS TO KNOW

Contributions

- ***Actuarially determined contribution (ADC):*** Annual amount actuarially necessary to cover the normal cost and amortization payment (previously known as the "annual required contribution" or ARC payment).
- ***Actuarially determined employer contribution (ADEC):*** The value of the ADC after accounting for any employee contributions.
- ***Amortization payments:*** Contributions necessary to pay down the unfunded liability shortfall over time. These can be stretched over varying periods of time and are based on an equal dollar-per-year basis or calculated as an equal percentage of payroll for each year of the amortization schedule.
- ***Funded ratio:*** The funded ratio measures the ratio of dollars in the pension fund compared to the value of promised lifetime income benefits.

Assumptions

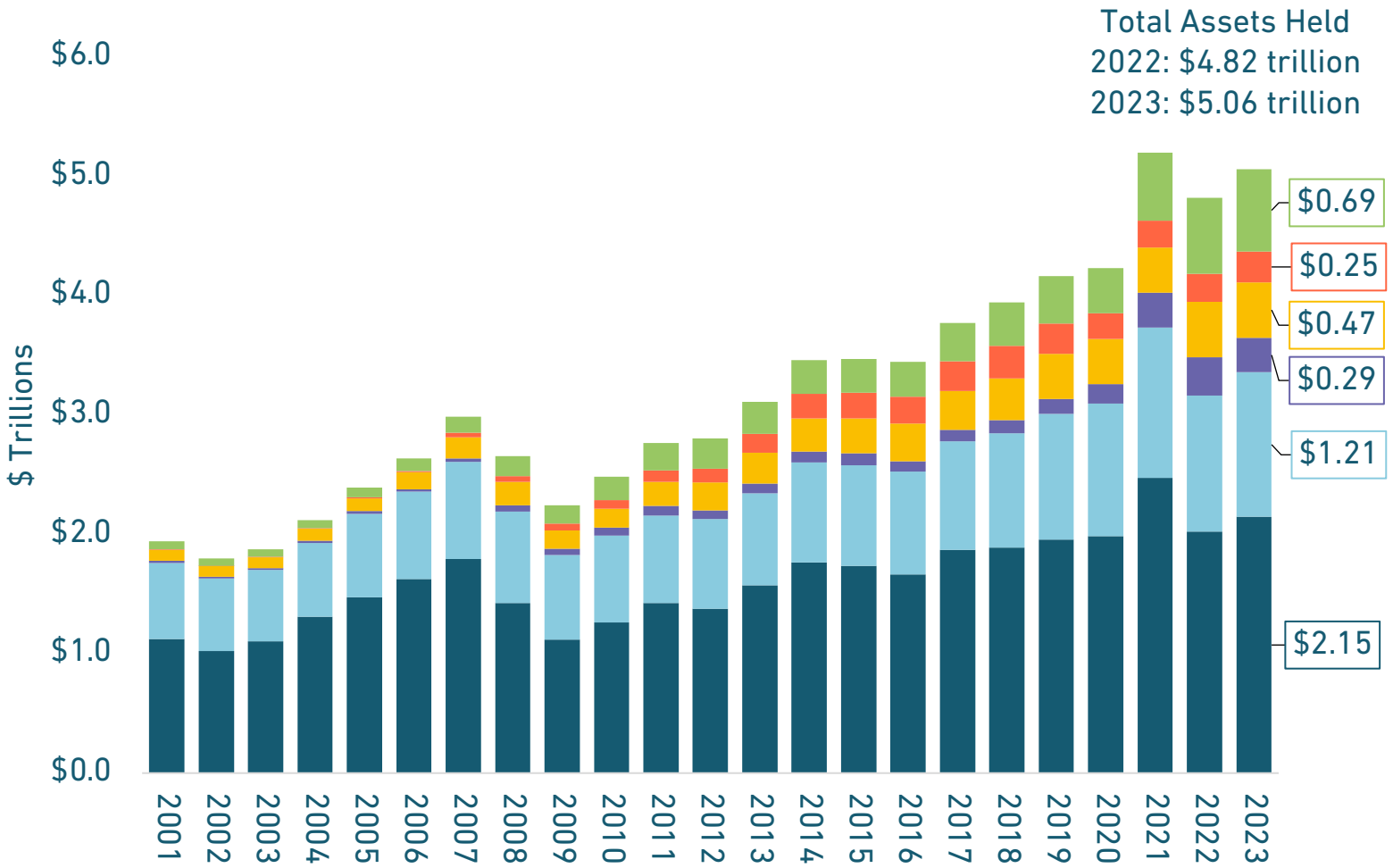
- ***Actuarial assumptions:*** Estimates used to forecast uncertain future events affecting future benefits or costs associated with a pension fund. Examples of these assumptions include investment rate of return, inflation, payroll growth, mortality, retirement patterns, and other demographic data.
- ***Assumed rate of return (ARR):*** The investment return on assets that the pension fund expects to earn over the long-term.
- ***Expected rate of return:*** This term is often used interchangeably with "assumed rate of return." Technically, the expected rate of return refers to the middle of the possible investment returns for a given pension fund's portfolio. Investment advisors forecast what the probability is for different rates of return based on a given portfolio (such as the mix of stocks and bonds). The 50th percentile — or 50% probability — in that forecast is formally known as the expected rate of return. Pension board trustees do not always choose the expected rate of return as the assumed rate of return, but they do use it as a guidepost.
- ***Payroll:*** The total amount paid to employees participating in a retirement system. The costs and contribution rates of a pension plan are often expressed as a percentage of the total plan payroll.

Benefits

- ***Cost-of-living adjustment (COLA):*** An annual change to a pension benefit for retirees, usually pegged to some measure of the rate of inflation.
- ***Defined benefit plan:*** A retirement plan that determines benefits by a formula in advance of retirement. This term is often used to refer to pensions, but technically it can refer to a range of retirement plan designs.
- ***Normal cost:*** The contribution necessary to pay for benefits earned each year. This amount gets invested, and the combined total is intended to pay all promised benefits. The normal cost "pre-funds" or "pays in advance" for promised pension benefits.
- ***Pension plan:*** A guaranteed income plan that provides a fixed, guaranteed monthly income based on two factors: (1) years worked; and (2) average salary during final working years. The years worked are usually multiplied by an accrual rate as a component of the benefit.

APPENDIX 2: ADDITIONAL CHARTS AND DATA TRENDS

DOLLAR DISTRIBUTION OF PENSION FUND INVESTMENTS | BY ASSET CLASS, 2001–2023

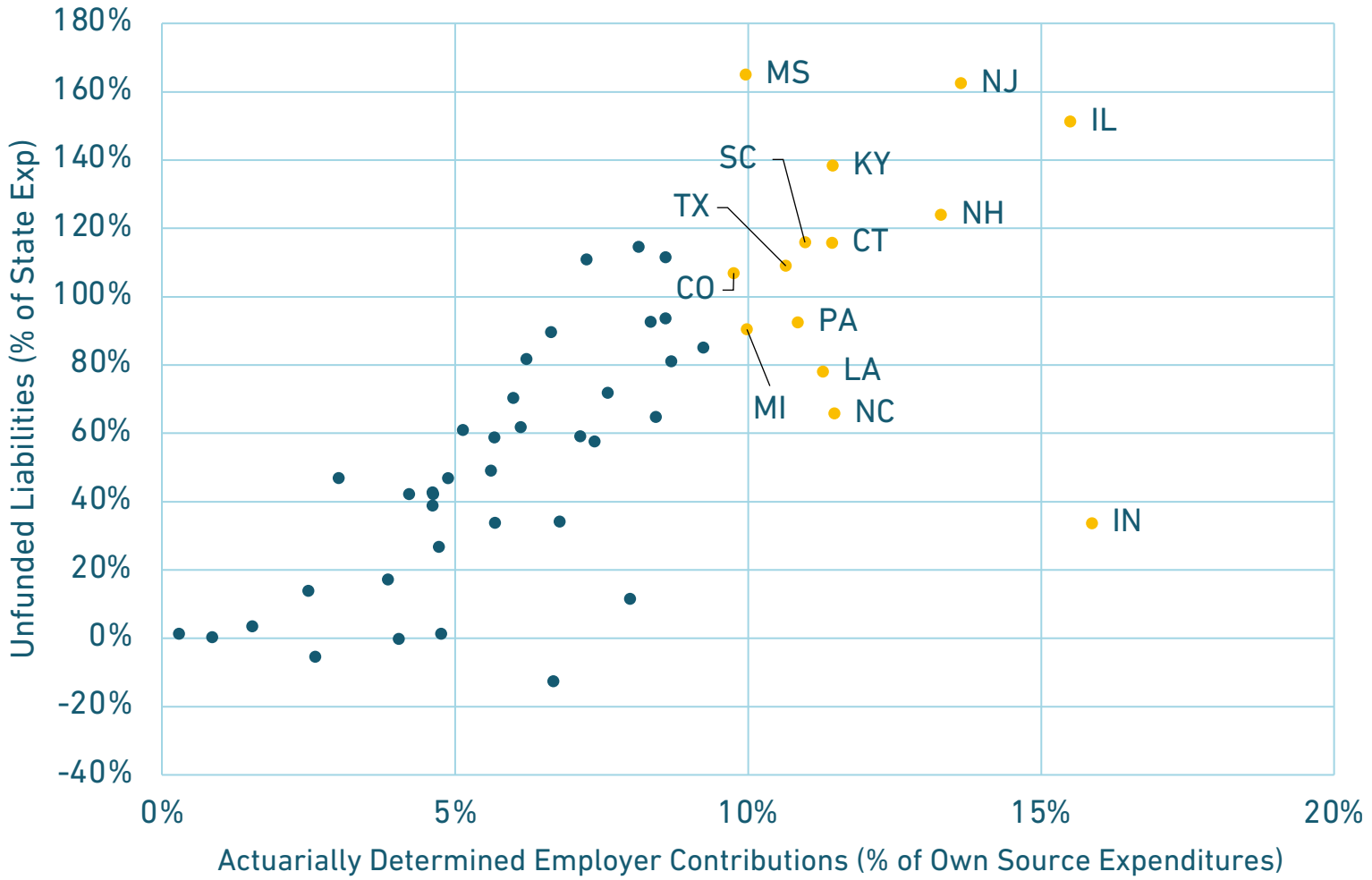


Dollar expansion to alternatives has grown from $418.1 billion in 2009 to $1.7 trillion in 2023. The largest component of that is private capital, now accounting for a reported $694.1 billion of public pension plan assets.

- Private Capital Investments (Equity & Debt)
- Hedge Fund Strategies
- Real Estate (Property & REITs)
- Miscellaneous Alternatives
- Fixed Income & Cash Holdings
- Public Equities (U.S. & Global)

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Data for 2023 are incomplete pending the release of investment data from late-reporting systems.
Note: "Alternative" investments include private capital, hedge funds, real estate, commodities, and tactical asset allocations.

SHARE OF 2023 STATE BUDGETS REQUIRED BY ACTUARIALLY DETERMINED CONTRIBUTIONS

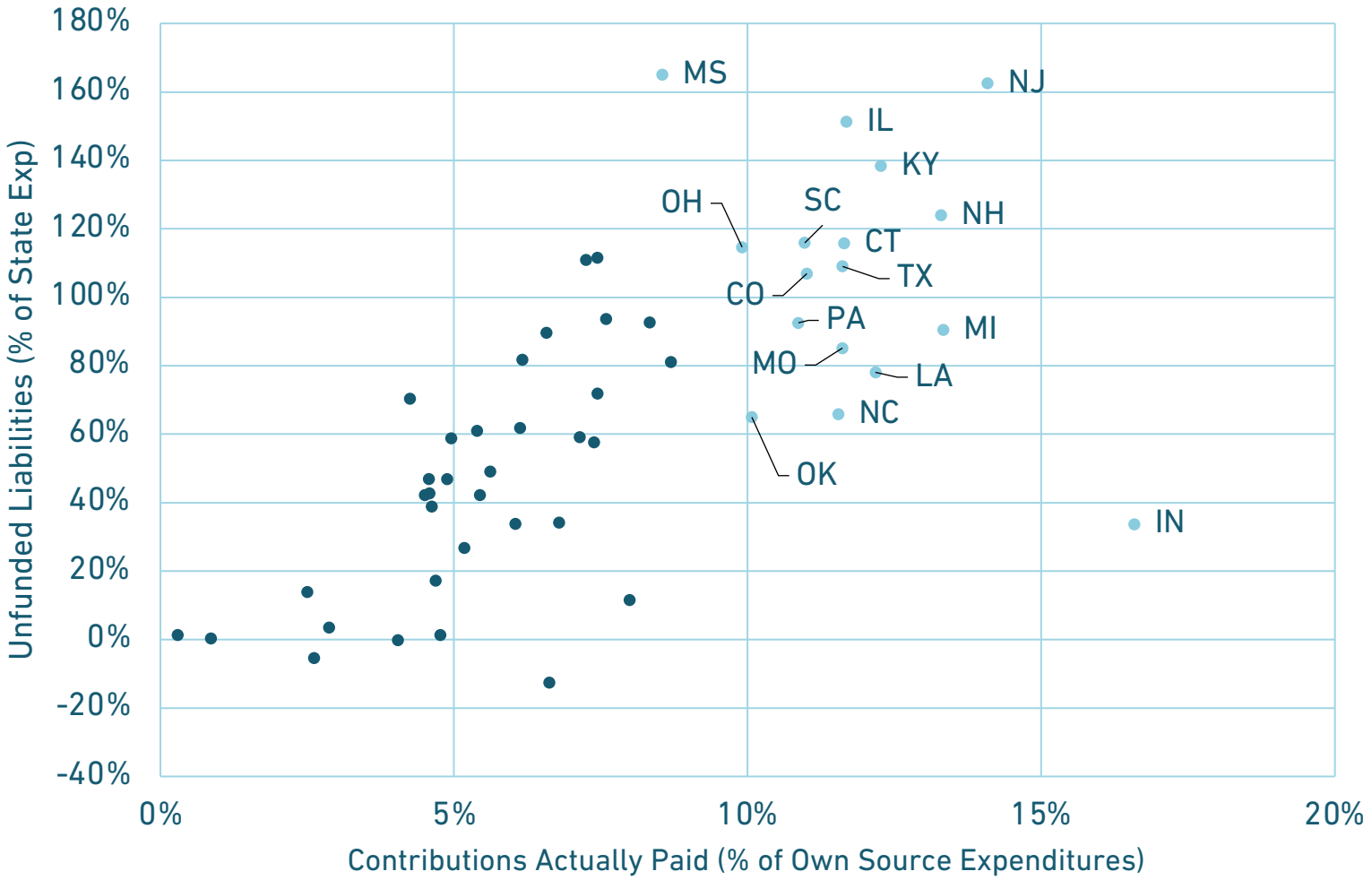


Actuarially Determined Employer Contribution for Statewide Plans as % of the State's General Fund Budget

	2001	*2009*	*2023*
IN	6.5%	7.3%	15.9%
IL	7.0%	10.9%	15.5%
NJ	2.2%	10.1%	13.6%
NH	3.1%	7.9%	13.3%
NC	3.4%	2.3%	11.5%
KY	3.0%	7.3%	11.4%
CT	4.9%	7.6%	11.4%
LA	6.1%	8.3%	11.3%
SC	5.8%	7.0%	11.0%
PA	0.8%	5.8%	10.8%

Source: Equable Institute analysis of public plan valuation reports and ACFRs; NASBO for state expenditure data. | ***Note:*** Some statewide plans are funded with contributions from local employers that draw on local revenues. This matrix reflects the size of required contributions relative to state expenditures as a common cross-state measurement not as a reflection of the actual amount of state expenditures on pension contributions.

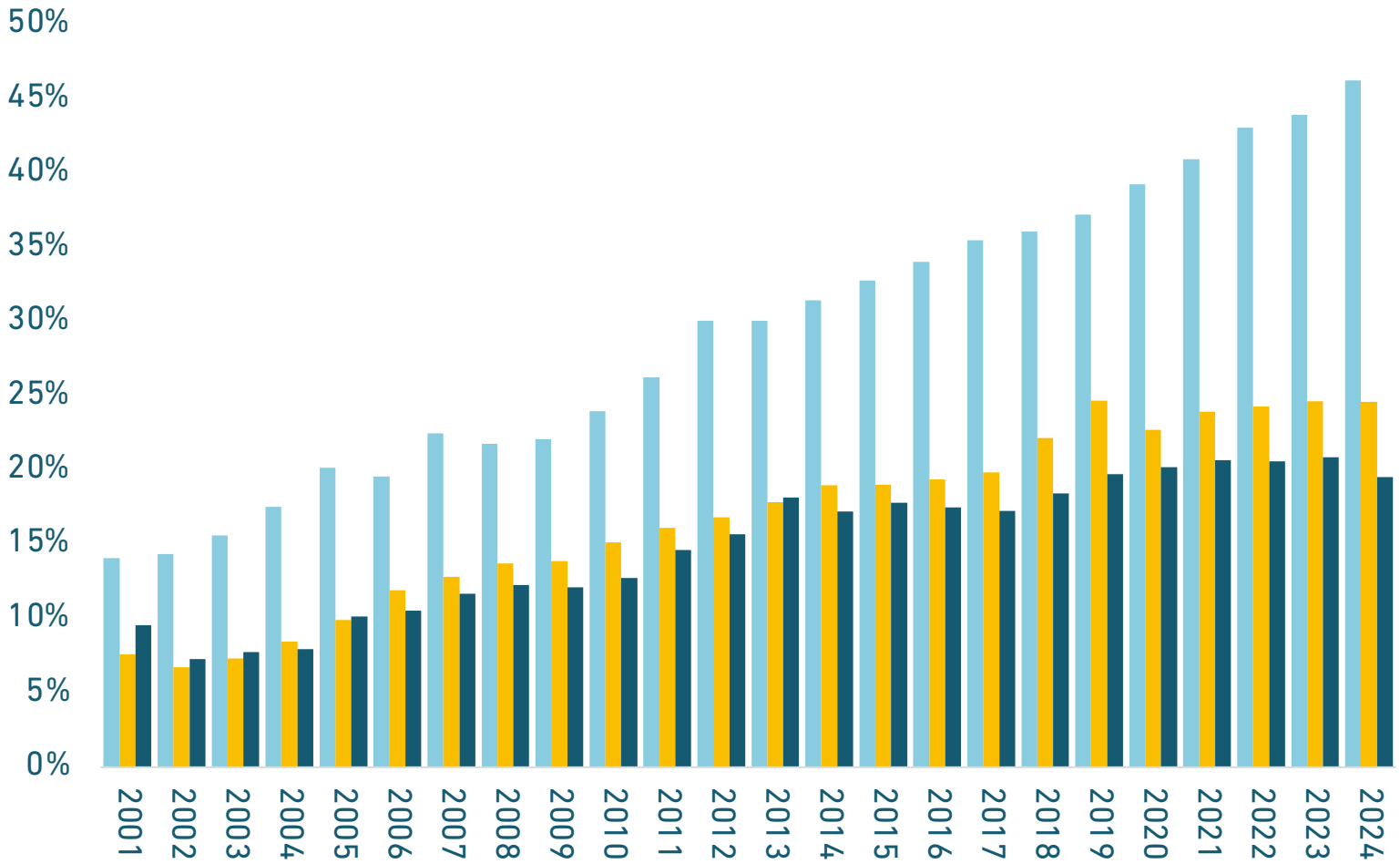
SHARE OF 2023 STATE BUDGETS REQUIRED BY ACTUAL CONTRIBUTIONS PAID



Actual Contributions to Statewide Plans as % of the State's General Fund Budget			
	2001	*2009*	*2022*
IN	7.9%	7.5%	16.6%
NJ	0.4%	3.0%	14.1%
MI	3.1%	5.7%	13.3%
NH	3.1%	7.9%	13.3%
KY	3.2%	5.3%	12.3%
LA	6.7%	8.5%	12.2%
IL	5.8%	8.2%	11.7%
CT	4.7%	7.3%	11.6%
TX	5.9%	6.2%	11.6%
MO	6.8%	7.4%	11.6%

Source: Equable Institute analysis of public plan valuation reports and ACFRs; NASBO for state expenditure data. | ***Note:*** Some statewide plans are funded with contributions from local employers that draw on local revenues. This matrix reflects the size of all employer contributions relative to state expenditures as a common cross-state measurement not as a reflection of the actual amount of state spending on pension contributions.

AVERAGE STATE PLAN EMPLOYER CONTRIBUTIONS
BY SOCIAL SECURITY PARTICIPATION | 2001–2024



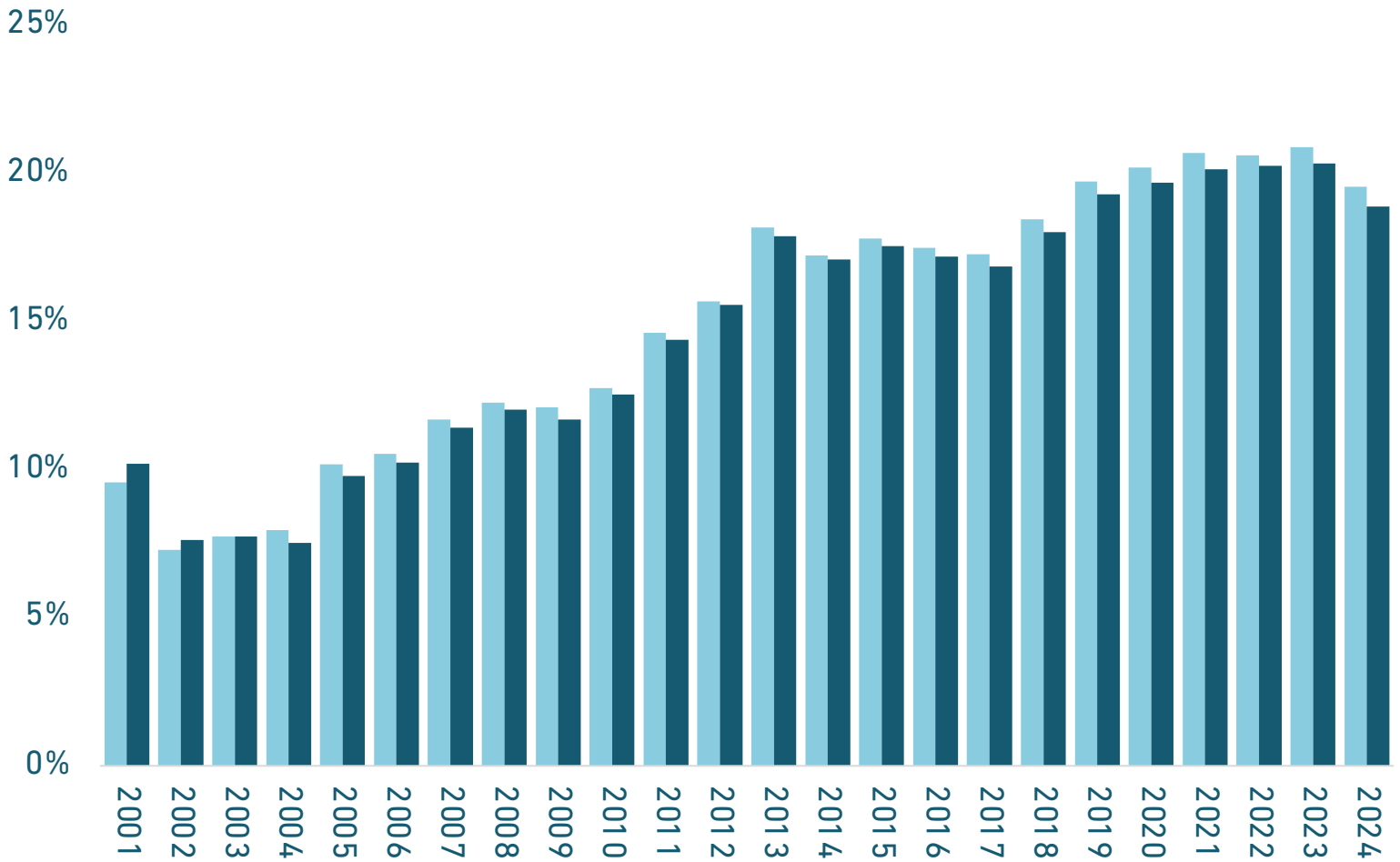
The total employer contribution rates for state and local pension plans vary depending on the degree to which those employers participate in Social Security.

However, the overall trend of increases of employer contributions has been consistent across all three kinds of participation levels.

- For Plans Not Participating in Social Security
- For Plans Participating in Social Security
- For Plans with Mixed Social Security Participation

Source: Equable Institute analysis of public plan valuation reports and ACFRs. Contribution rates show for the year actually paid.

AVERAGE STATE PLAN EMPLOYER CONTRIBUTIONS FOR MIXED SOCIAL SECURITY PARTICIPATION | 2001–2024



Unlike member contribution rates, there is a similar average employer contribution rate trendline for state and local pension plans with mixed participation in Social Security (SSA).

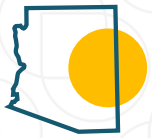
Like member contributions, the absolute average does increase slightly when adding CalPERS costs into the average.

For Plans With Mixed SSA, Including CalPERS

For Plans With Mixed SSA, Without CalPERS

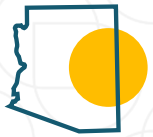
Source: Equable Institute analysis of public plan valuation reports and ACFRs. Contribution rates show for the year actually paid. | ***Note:*** In these cases the pension benefit levels tend to be the same across all plans, so the contributions into the retirement system for members (and employers) are also the same even if Social Security taxes are collected at the same time.

STATES THAT REQUIRE EMPLOYEES TO PAY FOR A PORTION OF UNFUNDED LIABILITY COSTS



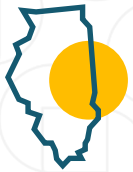
Arizona SRS (State & Local)

Members explicitly pay 50% of unfunded liability payments.



Arizona PSPRS Tier 3 (Police & Fire)

Members explicitly pay 50% of unfunded liability payments.



Illinois TRS (Teachers)

Member contribution rate for Tier 2 (9% of payroll) is larger than the normal cost for the plan (8.06% of payroll), meaning they tacitly cover a portion of unfunded liability costs, too.

Ohio STRS (Teachers)

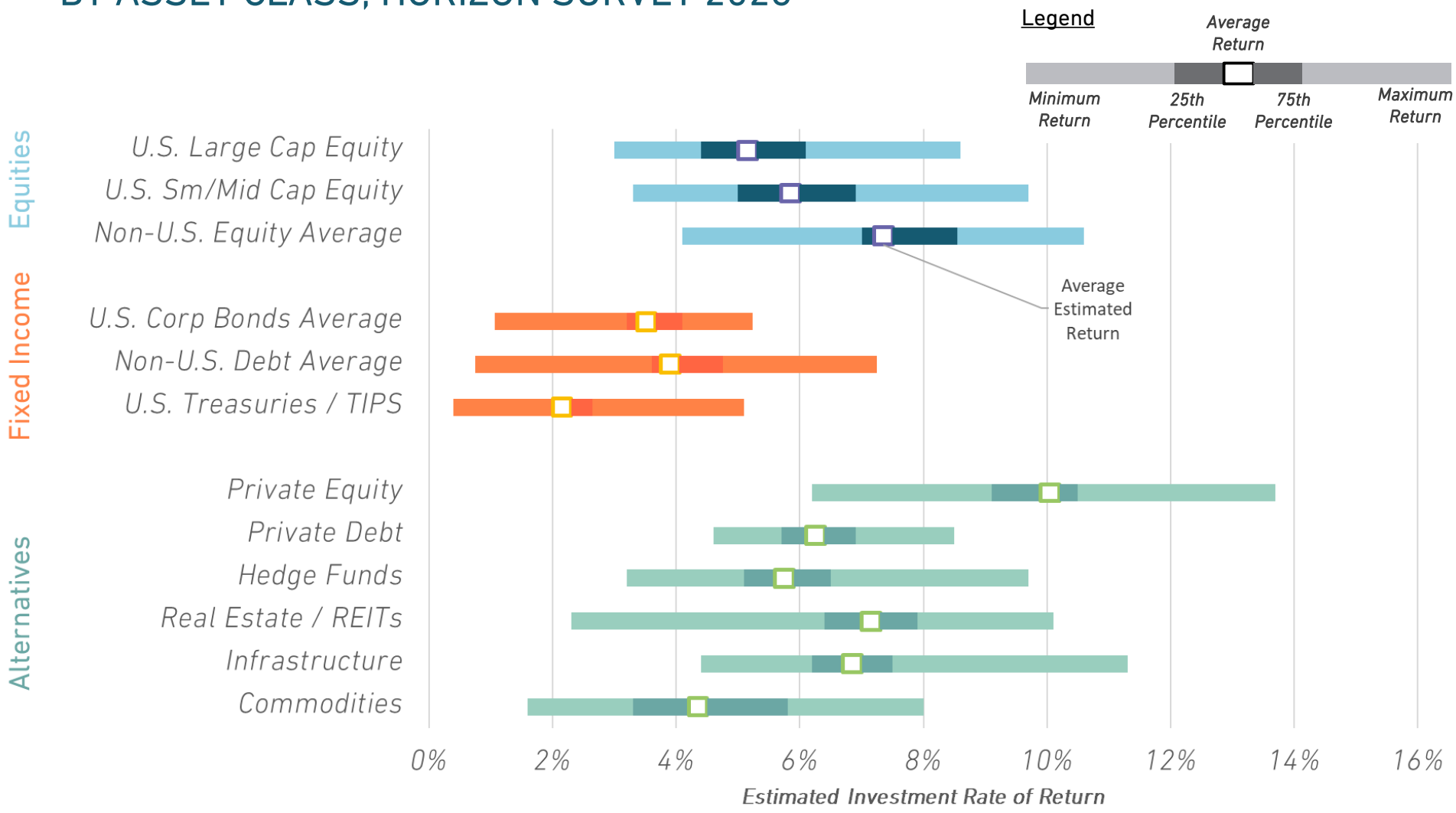
Member contribution rate (14% of payroll) is larger than the normal cost for the plan (10.93% of payroll), meaning they tacitly cover a portion of unfunded liability costs, too.

Nevada PERA (State & Local)

Members of the "Employer-Employee Pay" plan share the costs of paying the required contribution rate 50/50.

RANGE OF 10-YEAR INVESTMENT RETURN ESTIMATES

BY ASSET CLASS, HORIZON SURVEY 2023



This chart shows the range of investment returns expectations that different financial experts have forecasted for varying asset classes. The wider the range of possible returns, the more volatility risk investors face. The narrower a range of expected returns for an asset class is, the more confidence investors can have in what their future returns might be.

The 10-Year Horizon Survey forecast shows minimum expected returns to be higher this year than last (see State of Pensions 2023), especially for fixed income and public equities. And, at least for the past year, that was the right directional shift in expectations. However, almost all categories have wider bands of possible returns in the 2023 forecast compared to the same expert outlooks in 2022, which reflects an expectation of higher levels of volatility.

Source: Horizon, "Survey of Capital Market Assumptions: 2023 Edition"

APPENDIX 3: METHODOLOGICAL NOTES

WHO ARE WE COUNTING?

- For our analyses we focus on statewide and municipally-managed retirement systems and the various defined benefit plans within those systems. Eligible plans hold at least $1 billion in accrued liabilities.
- For certain retirement systems we separate their respective plans (e.g., Colorado PERA is split into four plans) and count each separately as they have independently measured and reported assets, liabilities, contribution rates, and other data.
- Numerous states have hybrid systems (e.g., Michigan, Pennsylvania, and Tennessee) that include both defined benefit and defined contribution portions. For those plans, we include the defined benefit portions in our data and analyses.
- We treat guaranteed return/cash balance plans in the same fashion as hybrid plans. We report defined benefit totals as they are presented in plan actuarial valuations and comprehensive annual financial reports.
- The result of this approach is a population of 172 statewide retirement plans and 73 municipally-managed retirement plans across the 50 states and Washington, D.C. In total, this results in 245 plans that provide benefits for both state and local public employees being included in our analyses. (Our data collection includes additional plans — Miami GESE, Nashville-Davidson ERS, Omaha Police & Fire, San Antonio Police and Fire, Wichita WERS, Wichita Police and Fire, and Providence ERS — however, these have been excluded from this analysis due to extremely limited public data availability for 2023 and 2024 which prevent us from estimating their funded levels and other important information.)
- A full list of included plans is available on Pages 96 to 99.

WHAT YEARS ARE WE MEASURING?

- Our analyses focus on the years 2001 through 2023 (for reported data) and 2024 for our projections.
- We use reported figures for fiscal year ending 2023 for all plans that have published their actuarial valuation reports or annual reports for that year. For all plans that do not yet report those values, we either roll them forward using the reported assumptions of the retirement system (e.g., payroll growth) or simply carry forward their reported values for FYE 2022 when a roll-forward is not possible.
- We will update this report later this year when all FYE 2023 data have been reported.
- We have also published a table online with each plan, the measurement date, the topline funding numbers, assumed returns, and other metrics used in our analyses. That table can be accessed here.

TECHNICAL NOTES ON SELECT CHARTS

- **Page 7:** "Funded Ratio Average for State & Local Pension Plans" measures the aggregate funded ratio for statewide pension plans weighted by total liabilities. The trendline shown here is using the fair market value of assets to measure funded status.

- **Page 37:** "How Many Public Pension Plans Have Inflation Protected Benefits" provides a table with a list of COLA provisions that states use to provide cost-of-living adjustments. There are additional ways that these provisions can be tweaked, such as whether the COLA is simple or compounded. Some states also have a benefit rule that keeps the purchasing power of benefits at a minimum level relative to the year a person retired if the normal COLA doesn't provide that on its own.

- **Page 52:** "Unfunded Liability of Public Pensions as a Share of National GDP" uses the Federal Reserve's asset and liability data, which differ from the rest of the asset and liability data in this report on two points: (1) the total plans covered are larger, meaning the asset base is larger; and (2) the Federal Reserve applies their own methodology for measuring pension liabilities that differs from how some states report their own accrued liabilities, usually resulting in a higher estimation of the value of promised benefits and thus a higher unfunded liability figure. The points of comparison on the slide are formally defined by the Federal Reserve as "state and local government debt securities" (Municipal Debt), "student loans owned and securitized" (Student Debt), and "revolving consumer debt" (Credit Card Debt).

- **Pages 57, 58, & 60:** A common proxy for the trendline of interest rates is the yield on Treasury bonds as they represent a "risk-free" rate of return. We show the 10-year, 20-year, and 30-year returns to demonstrate that at issue is not the specific yield but rather the overall trend.

DATA SOURCES

- Our primary source for state plan data between 2001 and 2023 is the actuarial valuation published by the retirement system.
- For pension finance data not available in the valuation, we also use the system's ACFR and separately published GASB 67 statements.
- State GDP data are compiled from both the Bureau of Economic Analysis and Federal Reserve.
- State budget data are drawn from the National Association of Budget Officers' annual State Expenditure Report.
- Interest rate data and pre-2001 pension finance data are drawn from the Federal Reserve.
- Cost-of-living adjustment data are gathered from a range of sources, including public retirement system websites, public reports (ACFRs, valuation reports, etc.), and members communications (such as newsletters or other published materials).

HOW WE PRODUCED OUR 2024 FUNDED RATIO ESTIMATE

- We collected asset allocation data for each plan using their most recent published report, usually in the ACFR but occasionally via an investment report on the plan's website. We broke these data into the following categories: U.S. Equities, Global Equities, U.S. Fixed Income, Global Fixed Income, Private Capital, Hedge Funds, Real Estate, Commodities, and Cash.

- We collected actual returns for benchmarks for these categories and applied those benchmarks to each plan's allocation to get an approximate estimated return.

- This methodology has some clear disadvantages: It does not account for the actual strategies employed by each fund — for instance, the actual equity allocation may differ significantly from broad market metrics, and it does not account for special leverage or hedges that might aid or harm a fund's overall performance. However, as a tool for approximating a return, our methodology has the advantage of working with many plans. For some we will overestimate and others underestimate.

- We rolled forward each plan's liabilities using their TPL (or AAL if the TPL was not available) as the base. We rolled forward each plan's assets using their FNP (or MVA if the FNP was not available) and the approximate return generated by the above methodology. Back tests of these methodologies were with a reasonable range of actual figures on a one- and two-year roll-forward basis.

- We used these approximate figures for assets and liabilities to estimate 2024 unfunded liability and funded ratio levels.

- For plans with fiscal years ending later than June 2024, we only rolled their assets and liabilities forward as far as June 30, 2024. Their actual asset performance during the rest of their fiscal year may vary considerably based on market trends and could cause the final funded ratio figure for the full fiscal year ending 2024 to vary from our current estimate.

Comparing Equable's 2023 Forecast Against 2023 Actual Experience

Pension funds use assumptions about the future to determine contribution rates and then are reviewed relative to those forecasts and predictions. Equable measures itself on a similar standard. Each year we review the projections we made in previous reports and measure them against actual experience.

- In July 2023, we used projected asset class benchmarks as of June 30 to estimate that the FYE 2023 average investment return for state and local retirement systems would be 5.3%. Using a mix of benchmark projections and preliminary reports, we updated this estimate to a 7.47% average return in a January 2024 update.
  - The actual average return for FYE 2023 reported by state and local plans was 7.37%, using data published as of June 30, 2024.*
- We estimated a 77.4% market valued funded ratio among state and local plans ($1.49 trillion in unfunded liabilities), as of June 30, 2023.
  - The actual FYE 2023 funded ratio is 75.8%, among plans that have reported actual data.
  - Once the small number of plans who have outstanding 2023 actuarial valuations publish their reports, we anticipate the actual FYE 2023 unfunded liability number will be $1.61 trillion.*
- The primary drivers between our 2023 estimates and the actual funded status performance for 2023 was:
  - Stronger investment returns in the second half of the 2023 calendar year, which drove higher fiscal year returns for plans whose fiscal year ended in September through December compared to those whose fiscal year ended in June.
  - Liabilities growing larger than expected, leading to lower funded status than anticipated despite lower than projected assets. Factors that could have contributed to this could include increased retirements relative to actuarial assumptions, COLAs authorized higher than actuarially assumed, or other demographic experience varying from assumptions.

** There are still a handful of retirement systems that have yet to release actual figures for the fiscal year ending 2023. As of this publication, full actual FY 2023 data have been reported for approximately 80.9% of total pension liabilities in our data set. The "actual average return" figure above only includes these plans with reported data. The estimated funded status data points above include our 2023 estimates for plans that have not yet released actual data for 2023.*

APPENDIX 4: STATEWIDE AND MUNICIPAL RETIREMENT SYSTEMS IN OUR DATASET

RETIREMENT SYSTEMS IN OUR DATASET (Alabama ERS – Chicago Municipal)

Retirement System Full Name	Pension Plan Shorthand
Alabama Employees' Retirement System	Alabama ERS
Alabama Teachers' Retirement System	Alabama TRS
Alameda County (CA) Employees' Retirement Association	Alameda County ERS
Alaska Public Employees' Retirement System	Alaska PERS
Alaska Teachers' Retirement System	Alaska TRS
Arizona Corrections Officers Retirement Plan	Arizona CORP
Arizona Corrections Officers Retirement Plan Tier 3	Arizona CORP Tier 3
Arizona Elected Officials Retirement Plan	Arizona EORP
Arizona Public Safety Personnel Retirement System	Arizona PSPRS
Arizona Public Safety Personnel Retirement System Tier 3	Arizona PSPRS Tier 3
Arizona State Retirement System	Arizona SRS
Arkansas Local Police and Fire Retirement System	Arkansas Local P&F
Arkansas Public Employees Retirement System	Arkansas PERS
Arkansas State Highway Employees Retirement System	Arkansas DOT
Arkansas Teacher Retirement System	Arkansas TRS
Atlanta Fireman's Pension Fund	Atlanta Fire
Atlanta General Employees' Pension Fund	Atlanta ERS
Atlanta Police Officers' Pension Fund	Atlanta Police
Austin Firefighters Relief and Retirement Fund	Austin FRS
Austin Police Retirement System	Austin Police
Baltimore Fire and Police Employees' Retirement System	Baltimore Fire and Police
Baton Rouge City Parish Employees' Retirement System	Baton Rouge City Parish RS
Board of Education Retirement System of the City of New York	New York City BERS
Boston Retirement System - Non-Teachers	Boston Employees
Boston Retirement System - Teachers	Boston Teachers
California Judges Retirement Fund	California JRF
California Judges Retirement Fund II	California JRF II
California Public Employees Retirement Fund	CalPERS
California State Teachers' Retirement System	CalSTRS
Chicago Metropolitan Water Reclamation District Retirement Fund	Chicago Water
Chicago Municipal Employees' Annuity Benefit Fund	Chicago Municipal
Chicago Policemen's Annuity Benefit Fund	Chicago Police
Cincinnati Employees' Retirement System	Cincinatti ERS
City of Austin Employees' Retirement System	Austin ERS
City of Kansas City Missouri Firefighters' Pension System	Kansas City Missouri Fire
City of Lincoln Police and Fire Pension Fund	Lincoln P&F
City of Omaha Employees' Retirement System	Omaha Employees
City of San Jose Police and Fire Department Retirement Plan	San Jose P&F
Civilian Employees' Retirement System of the Police Department of Kansas City, Missouri	Kansas City Missouri Civ. Police
Colorado Fire and Police Pension Association	Colorado P&F
Colorado Public Employee Retirement Association - Denver Public Schools Fund	Colorado DPS
Colorado Public Employee Retirement Association - Judges	Colorado Judges
Colorado Public Employee Retirement Association - Local Division Fund	Colorado Local
Colorado Public Employee Retirement Association - Schools Division Fund	Colorado Schools
Colorado Public Employee Retirement Association - State Division Fund	Colorado State
Connecticut Municipal Employees Retirement System	Connecticut MERS
Connecticut State Employees Retirement System	Connecticut SERS
Connecticut State Teachers' Retirement System	Connecticut STRS
Contra Costa County Employees' Retirement Association	Contra Costa County
Cook County (IL) Employees' Annuity Benefit Fund	Cook County ERS
Dallas Police and Firefighters Retirement System	Dallas PFRS
Delaware County and Municipal Employees Pension Plan	Delaware Muni
Delaware County and Municipal Police and Fire Employees Pension Plan	Delaware Muni P&F
Delaware State Employees' Pension Plan	Delaware SEPP
Denver Employees Retirement Plan	Denver ERS
Detroit General Retirement System - Component I	Detroit General RS 1
Detroit General Retirement System - Component II	Detroit General RS 2
Detroit Police and Fire Retirement System - Component I	Detroit PFRS 1
Detroit Police and Fire Retirement System - Component II	Detroit PFRS 2
District of Columbia Police Officers and Fire Fighters' Retirement Fund	D.C. POFRP
District of Columbia Teachers' Retirement Fund	D.C. TRP
Chicago Municipal Employees' Annuity Benefit Fund	Chicago Municipal

RETIREMENT SYSTEMS IN OUR DATASET (Fairfax County Schools – Maryland TCS)

Retirement System Full Name	Pension Plan Shorthand
Educational Employees' Supplementary Retirement System of Fairfax County	Fairfax County Schools
Employees' Retirement Fund of the City of Dallas	Dallas ERS
Employees' Retirement System of Rhode Island - State Employees	Rhode Island ERS-S
Employees' Retirement System of Rhode Island - Teachers	Rhode Island ERS-T
Employees' Retirement System of the State of Hawaii	Hawaii ERS
Fairfax County Employees' Retirement System	Fairfax County ERS
Firefighters Retirement System of Louisiana	Louisiana FRS
Firemen's Annuity and Benefit Fund of Chicago	Chicago Firemen
Florida Retirement System - Defined Benefit Plan	Florida RS
Georgia Employees' Retirement System	Georgia ERS
Georgia Teachers Retirement System	Georgia TRS
Hartford Municipal Employees' Retirement Fund	Hartford MERF
Houston Firefighters Relief and Retirement Fund	Houston PFRS
Houston Municipal Employees Pension System	Houston MEPS
Houston Police Officers' Pension System	Houston Police
Illinois Municipal Retirement Fund	Illinois MRF
Illinois State Employees Retirement System	Illinois SERS
Illinois State Teachers' Retirement System	Illinois TRS
Illinois State University Retirement System	Illinois SURS
Indiana 1977 Police Officers' and Firefighters' Pension and Disability Fund	Indiana 1977 P&F
Indiana Public Employees Retirement Fund	Indiana PERF
Indiana State Teachers Retirement Fund - 1996 Account	Indiana TRF 1996
Indiana State Teachers Retirement Fund - Pre-1996 Account	Indiana TRF Pre-96
Iowa Municipal Fire and Police Retirement System	Iowa MFPRS
Iowa Public Employees' Retirement System	Iowa PERS
Jacksonville General Employees Retirement Plan	Jacksonville ERS
Jacksonville Police and Fire Retirement Plan	Jacksonville P&F
Judges' Retirement System of Illinois	Illinois JRS
Kansas City Missouri Employees' Retirement System	Kansas City Missouri ERS
Kansas City Missouri Public School Retirement System	Kansas City Missouri Schools
Kansas Police and Firefighter's Retirement System	Kansas PF
Kansas Public Employees Retirement System - Local Employees	Kansas PERS-L
Kansas Public Employees Retirement System - School Employees	Kansas PERS-T
Kansas Public Employees Retirement System - State Employees	Kansas PERS-S
Kansas Retirement System for Judges	Kansas JRS
Kentucky County Employees' Retirement System - Hazardous Employees	Kentucky CERS H
Kentucky County Employees' Retirement System - Nonhazardous Employees	Kentucky CERS NH
Kentucky Employees' Retirement System - Hazardous Employees	Kentucky ERS H
Kentucky Employees' Retirement System - Nonhazardous Employees	Kentucky ERS NH
Kentucky State Police Retirement System	Kentucky SPRS
Kentucky Teachers' Retirement System	Kentucky TRS
Kern County (CA) Employees' Retirement Association	Kern County ERS
Laborers' & Retirement Board and Employees' Annuity and Benefit Fund of Chicago	Chicago Laborers
Los Angeles City Employees' Retirement System	Los Angeles ERS
Los Angeles City Fire and Police Pension System	Los Angeles Fire and Police
Los Angeles County Employees Retirement Association	LA County ERS
Los Angeles Water and Power Employees' Retirement Plan	Los Angeles Water and Power
Louisiana Municipal Employees Plan A	Louisiana MERS A
Louisiana Municipal Employees Plan B	Louisiana MERS B
Louisiana Municipal Police Employees Retirement System	Louisiana MPERS
Louisiana School Employees' Retirement System	Louisiana SRS
Louisiana State Employees' Retirement System	Louisiana LASERS
Louisiana State Parochial Employees Retirement System - Plan A	Louisiana SPERS A
Louisiana State Parochial Employees Retirement System - Plan B	Louisiana SPERS B
Louisiana State Police Retirement System	Louisiana SPRS
Louisiana Teachers' Retirement System	Louisiana TRS
Maine Public Employees Retirement System - Consolidated Plan for Participating Local Districts	Maine CPPLD
Maine Public Employees Retirement System - State Employee and Teacher Program	Maine SETP
Marin County (CA) Employees Retirement Association	Marin County ERS
Maryland State Retirement and Pension System - Employees Combined System	Maryland ECS
Maryland State Retirement and Pension System - Teachers' Combined System	Maryland TCS

RETIREMENT SYSTEMS IN OUR DATASET (Massachusetts SERS – Phoenix ERS)

Retirement System Full Name	Pension Plan Shorthand
Massachusetts State Employees' Retirement System	Massachusetts SERS
Massachusetts Teachers' Retirement System	Massachusetts TRS
Miami Firefighters' and Police Officers' Retirement Trust	Miami Fire and Police
Michigan Municipal Employees' Retirement System	Michigan MERS
Michigan Public School Employees' Retirement System	Michigan PSERS
Michigan Public School Employees' Retirement System Pension Plus Plan	Michigan PSERS PPP
Michigan Public School Employees' Retirement System Pension Plus Plan 2	Michigan PSERS PPP2
Michigan State Employees' Retirement System	Michigan SERS
Michigan State Police Retirement System	Michigan SPRS
Milwaukee City Employees' Retirement System	Milwaukee City ERS
Milwaukee County Employees' Retirement System	Milwaukee County ERS
Minnesota General Employees Retirement Plan	Minnesota GERF
Minnesota Public Employees Police & Fire Plan	Minnesota PEPFP
Minnesota State Employees Retirement Fund	Minnesota SERF
Minnesota Teachers Retirement Association	Minnesota TRA
Missouri Department of Transportation and Highway Patrol Employees' Retirement System	Missouri DOT
Missouri Local Government Employees Retirement System	Missouri LGERS
Missouri Public Education Employee Retirement System	Missouri PEERS
Missouri Public School Retirement System	Missouri PSRS
Missouri State Employees' Retirement System	Missouri SERS
Montana Public Employees' Retirement System	Montana PERS
Montana Teachers' Retirement System	Montana TRS
Montgomery County (MD) Employees' Retirement System	Montgomery County (MD) ERS
Municipal Employees' Retirement System of Rhode Island	Rhode Island MERS
Nebraska Public Employees Retirement System - State Employees Cash Balance	Nebraska PERS-CB
Nebraska Public Employees Retirement Systems - School Employees Plan	Nebraska SEP
New Hampshire Retirement System	New Hampshire RS
New Jersey Police & Firemen's Retirement System - Local Division	New Jersey PFRS-L
New Jersey Police & Firemen's Retirement System - State Division	New Jersey PFRS-S
New Jersey Public Employees' Retirement System - Local Plan	New Jersey PERS-L
New Jersey Public Employees' Retirement System - State Plan	New Jersey PERS-S
New Jersey Teachers' Pension & Annuity Fund	New Jersey TPAF
New Mexico Educational Retirement Board	New Mexico ERB
New Mexico Public Employees Retirement Association	New Mexico PERA
New York City Employees' Retirement System	New York City ERS
New York City Fire Pension Fund	New York City Fire
New York Police Pension Fund	New York City Police
New York State and Local Retirement System - Employees' Retirement System	New York SLRS ERS
New York State and Local Retirement System - Police and Fire Retirement System	New York SLRS PFRS
New York State Teachers' Retirement System	New York STRS
North Carolina Local Government Employees' Retirement System	North Carolina LGERS
North Carolina Teachers' and State Employees' Retirement System	North Carolina TSERS
North Dakota Public Employees Retirement System	North Dakota PERS
North Dakota Teachers' Fund for Retirement	North Dakota TFR
Ohio Highway Patrol Retirement System	Ohio HRS
Ohio Police and Fire Pension Fund	Ohio PFPF
Ohio Public Employees' Retirement System	Ohio PERS
Ohio School Employees' Retirement System	Ohio SERS
Ohio State Teachers' Retirement System	Ohio STRS
Oklahoma Firefighters Pension & Retirement System	Oklahoma FRS
Oklahoma Law Enforcement Retirement System	Oklahoma LERS
Oklahoma Police Pension and Retirement System	Oklahoma PPRS
Oklahoma Public Employees Retirement System	Oklahoma PERS
Oklahoma Teachers' Retirement System	Oklahoma TRS
Orange County Employees Retirement System	Orange County ERS
Oregon Public Employees Retirement System – Tier 1/2 and OPSRP Combined	Oregon PERS
Pennsylvania Municipal Retirement System	Pennsylvania MRS
Pennsylvania Public School Employees' Retirement System	Pennsylvania PSERS
Pennsylvania State Employees' Retirement System	Pennsylvania SERS
Philadelphia Municipal Retirement System	Philadelphia Municipal
Phoenix Employees' Retirement System	Phoenix ERS

* This year there were three plans in Equable's dataset that did not provide sufficient data to be included in State of Pensions analysis.

RETIREMENT SYSTEMS IN OUR DATASET (Kansas City Missouri Police – Wyoming RS)

Retirement System Full Name	Pension Plan Shorthand
Police Retirement System of Kansas City, Missouri	Kansas City Missouri Police
Public Employee Retirement System of Idaho	Idaho PERS
Public Employees' Retirement System of Mississippi	Mississippi PERS
Public Employees' Retirement System of Nevada - Police and Firefighters Subfund	Nevada PERS-PF
Public Employees' Retirement System of Nevada - Regular Subfund	Nevada PERS-R
Public School Retirement System of the City of St. Louis	St. Louis School Employees
Public School Teachers' Pension and Retirement Fund of Chicago	Chicago Teachers
Retirement Plan for Chicago Transit Authority Employees	Chicago Transit
Sacramento County Employees' Retirement System	Sacramento County ERS
San Bernardino County (CA) Employees Retirement Association	San Bernardino ERA
San Diego City Employees' Retirement System	San Diego City ERS
San Diego County Employees Retirement Association	San Diego County
San Francisco City & County Employees' Retirement System	San Francisco City & County
Seattle Employees' Retirement System	Seattle ERS
South Carolina Police Officers' Retirement System	South Carolina PORS
South Carolina Retirement System	South Carolina RS
South Dakota Retirement System	South Dakota RS
St Louis Employees Retirement System	St. Louis Employees
St Louis Police Retirement System	St. Louis Police
St. Paul Teachers Retirement Fund	St. Paul Teachers
State Police Retirement System of New Jersey	New Jersey SPRS
Teachers' Retirement System of the City of New York	New York City Teachers
Tennessee Public Employees Retirement Plan	Tennessee PERP
Tennessee Teacher Legacy Pension Plan	Tennessee TLPP
Tennessee Teacher Retirement Plan	Tennessee TRP
Texas County & District Retirement System	Texas CDRS
Texas Employees Retirement System	Texas ERS
Texas Law Enforcement & Custodial Officer Supplemental Retirement Plan	Texas LECOS
Texas Municipal Retirement System	Texas MRS
Tucson Supplemental Retirement System	Tucson Supplemental RS
University of California Retirement System	California URS
Utah Firefighters Retirement System	Utah FRS
Utah Judges Retirement System	Utah Judges
Utah Public Employees Contributory Retirement System	Utah CRS
Utah Public Employees Noncontributory Retirement System	Utah NRS
Utah Public Safety Retirement System - Contributory	Utah PSC
Utah Public Safety Retirement System - Noncontributory	Utah PSN
Utah Tier 2 Public Employees Contributory Retirement System	Utah CRS-T2
Utah Tier 2 Public Safety and Firefighter Contributory Retirement System	Utah PSC-T2
Vermont Municipal Employees' Retirement System	Vermont Muni
Vermont State Employees' Retirement System	Vermont SERS
Vermont State Teachers' Retirement System	Vermont STRS
Virginia Judicial Retirement System	Virgina JRS
Virginia Law Officers' Retirement System	Virgina LORS
Virginia Retirement System - Political Subdivisions	Virginia RS-L
Virginia Retirement System - State Employees Division	Virginia RS-S
Virginia Retirement System - Teachers Division	Virginia RS-T
Virginia State Police Officers' Retirement System	Virgina SPORS
Washington Law Enforcement Officers' and Firefighters Retirement System - Plan 1	Washington LEOFF Plan 1
Washington Law Enforcement Officers' and Firefighters Retirement System - Plan 2	Washington LEOFF Plan 2
Washington Public Employees' Retirement System - Plan 1	Washington PERS 1
Washington Public Employees' Retirement System - Plan 2 & 3	Washington PERS 2/3
Washington Public Safety Employees' Retirement System - Plan 2	Washington PSERS 2
Washington School Employees' Retirement System - Plan 2/3	Washington SERS 2/3
Washington State Patrol Retirement System Plan 1 & 2	Washington SPRS 1/2
Washington Teachers Retirement System Plan 1	Washington TRS 1
Washington Teachers Retirement System Plan 2 & 3	Washington TRS 2/3
West Virginia Public Employees' Retirement System	West Virginia PERS
West Virginia Teachers' Retirement System	West Virginia TRS
Wisconsin Retirement System	Wisconsin RS
Wyoming Retirement System	Wyoming RS

ABOUT THIS REPORT

State of Pensions is an annual report on the status of statewide public pension systems, put into a historic context. State and local governments face a wide range of challenges in general — and some of the largest are growing and unpredictable pension costs. The scale and effects of these challenges are best understood by considering the context of multi-decade financial trends that have brought public sector retirement systems to this moment.

Our analyses begin with the topline aggregated trends over the past two decades and proceed by digging into some of those data points to show how the trends vary across the states and over time. Learning from history and looking beyond the headline figures is important for finding paths into the future that can bring states closer to sustainable and accountable retirement systems that ensure retirement security for all public workers. In effect, we can use patterns of behavior from the past two decades as a guide to what might happen in the coming decade and identify areas of concern that should be monitored closely or acted upon immediately.

We focus in this report on the largest statewide and municipal retirement systems (measured as those with at least $1 billion in promised benefits). We use publicly available data reported by the retirement systems themselves, primarily from valuation reports and annual comprehensive financial reports.

Reviewing historic trends is an important assessment tool because it allows us to avoid becoming too caught up in the moment-to-moment data. One of the best years on record for annualized investment returns (2021) was followed up by one of the worst years (2022), with widespread losses that nearly canceled out the previous year. And all of that was preceded by a highly volatile marketplace in 2020. At any point over the past several years pension funded status might have looked particularly good or bad. However, taken as a whole, the last four years have seen slight improvement.

Ultimately, the analysis of state and local retirement system trends leads to two enduring and essential points that should always be kept in mind when assessing a government pension plan:

There is a wide range of financial performance for pension plans; a few states are well managed, some states are on the brink of pension insolvency, and most are somewhere in between.

The problems facing states are not an inherent result of offering pensions in the first place; the problems stem from a political apathy toward the steadily growing rate of unfunded liabilities and the costs they produce.