

State of Pensions 2023

Equable Institute's Annual Report

Market Uncertainty, Politics, and
Risk Addiction in the Age of Volatility

THE STATE OF PENSIONS IN 2023

- [Takeaways from the 2023 Report](#)

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

- [National Trends for State & Local Pension Plans](#)

The 2022 funded ratio for state and local plans is **75.4%**, based on plans' reported market valued assets. We estimate this will increase slightly to **77.4%** as of June 30, 2023. Despite the small improvement, we estimate average investment returns in 2023 will underperform the assumed return. Also, for the first time, employer contributions have passed **30%** of payroll on average.

- [Public Pension Trends Beyond 2023: Addicted to Risk](#)

Around one-third (**34.0%**) of pension fund money is dependent entirely on valuation processes (like for private equity or real estate). This is three times the level of valuation risk that pension funds had in 2001.

- [Special Section: The State of Pension Funds & ESG](#)

There were more laws related to pension fund investments and ESG adopted in 2023 than any other year on record. The enacted pieces of legislation have very different approaches and goals depending on the state.

- [Within the Trends: Funded Status](#)

There is a wide range of funded ratio variance from state to state. To better understand trends, we group plans by historic behavior and break down how unfunded liabilities fall between state and local plans.

- [Within the Trends: Investment Assumptions](#)

If assumed rates of return had matched interest rate trends over the past two decades, the national average would be **6.5%**, which is considerably lower than the **6.9%** average assumption reported as of June 2023.

- [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 Retirement Systems in Our Data Set

ABOUT EQUABLE INSTITUTE

Equable is a bipartisan non-profit 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 Equable.org/stateofpensions2023.

Some states have not released their final data points for 2022. We will be updating our 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 2023 State of Public Pensions in the United States Is Fragile

The funded status of state and local pension plans in the United States improved marginally between 2022 and 2023, but not in a meaningful way.

June 30th marks the end of the fiscal year for most public retirement plans. We estimate the average funded ratio for the largest public pension plans will slightly improve from 75.4% (2022) to 77.4% (2023). While it is positive that funded status did not decline, the funded status of public pension plans remains Fragile as it has for the last 15 years.

Investment return data this past year has been mixed, with a bear market during the 2022 calendar year and some improvement in returns during the first six months of 2023. The timing of markdowns for private equity and real estate investment values has also varied, as has the degree to which public plans are doubling down on alternative investments. As a result, in December the final data for 2023 may ultimately show a slight increase — *or decrease* — in funded status once all figures for the year are finalized.

However, there isn't much of a difference between a 2% increase or a 2% decrease relative to the status quo of funded ratios stagnating around 80%. The bottom line — state and local retirement plans are facing a crisis of investment **risk addiction**, **market uncertainty**, and **increasing politicization of asset management activities**.

Beyond fragile finances for state and local retirement plans, public pension contribution rates for government employers and public employees are rising while the value of retirement benefits for new pension plan members is falling. Even with supplemental contributions made during budget surplus years, only a few pension plans have a Resilient funded status as of 2023.

[Click here](#) for a more detailed assessment and a framework for improvement.

Takeaways from the 2023 Report

- Preliminary 2023 investment returns are 5.3% on average for state and local plans ([Page 12](#)). Improving financial markets over the summer and stabilizing inflation could mean stronger average returns by December, but most plans are likely going to miss their assumed rates of return—6.9% on average—which is the main target to hit to prevent further growth of unfunded liabilities.
- We project the average funded ratio for state and local plans will increase slightly from 75.4% to 77.4% ([Page 9](#)). And we estimate pension debt will stay about the same at \$1.49 trillion, down from \$1.57 trillion in 2022 ([Page 10](#)). While states helped offset mediocre returns over the last two years with supplemental payments (from large surpluses), at a fundamental level, 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 43](#)).
- Employer contribution rates have passed 30% of payroll on average for the first time in U.S. history ([Page 15](#)). Roughly two-thirds of costs (63.7%) are for unfunded liability payments. Between 2001 and 2022 pension debt payments have increased 2,089% ([Page 16](#)).
- More laws related to pensions and ESG were adopted in 2023 than any other year on record ([Page 39](#)). However, only a few are likely to influence pension fund investing decisions.
- Pension funds have more money in alternative investments like private equity, real estate, and hedge funds than at any point in history ([Page 13](#)) — both in dollar terms (\$1.63 trillion) and in share of asset allocations (34.0%).
- The share of pension fund investments in private equity and real estate increased in 2022 partially because of the lagged timeframe for re-valuing those asset classes ([Page 26](#)). Markdowns to both asset classes in 2023 emphasize how dependent public pension funded status is on proper asset valuation ([Page 29](#)).
- Despite capital market forecasts widely suggesting only around a 40% chance of earning a 6.9% return ([Page 12](#)), the average assumed rate of return only dipped from 6.92% to 6.88%.
- Negative cash flows (benefit payments being larger than income) keep expanding ([Page 17](#)) even as contribution rates from members and employers keep growing ([Pages 14, 15](#)).

Major Factors Contributing to the Current Level of Unfunded Liabilities

1

Underperforming Investments

States have consistently overestimated the size of their long-term investment returns. Even when performance has been positive, it has not always kept up with the assumed rate of return. This has led to a trend of states and cities taking on more investment risk by shifting pension assets to private equity, hedge funds, and other alternative strategies.

2

Lowering Assumed Rates of Return Too Slowly After the Financial Crisis

Pension funds have reduced their assumed rates of return from an average of 8% before the financial crisis to less than 7% today. This positive trend has meant recognizing unfunded liabilities on the books that weren't previously reported (and thus there is more pension debt). However, states are continuing to use relatively high investment assumptions as a way to avoid recognizing the level of contributions necessary to truly solve pension debt problems.

3

Interest on the Debt

States and cities have gotten better at paying their full actuarially required contributions. But those rates have often not been enough to keep up with growing interest on unfunded liabilities.

4

Negative Cash Flow + Low Funded Status

Maturing pension plans with negative cash flow mean each year there is less additional money being allocated to asset pools. This creates a problem for already poorly funded pension plans as there is less of an asset base than there should be upon which to earn investment returns.

5

Too Many Separate Pension Fund Managers

Some states commingle the assets of various statewide pension funds to invest together, but many do not — e.g., Louisiana has at least eight separately invested pension funds for statewide groups of employees. Across the country, state and local pension fund CIOs are looking for opportunities to buy equities at bargain prices or to invest in promising real estate. But statistically, these hundreds of CIOs and investment managers can't all find the same great deals. And in many cases the state pension funds might be competing against one another for investment opportunities and prices.

Note: Two commonly cited factors are not major contributors: mortality rates (this has been an issue but not a large dollar effect) and failure to pay pension bills (after years of steady improvement, only a few large states are still paying less than their actuarial requirement).

Comparing Equable's 2022 Forecast Against 2022 Actual Experience

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

In January 2023, we estimated that the FY 2022 average investment return for state and local retirement systems would be -6.14% (using preliminary returns and projected asset class benchmarks updated through December 31, 2022).

- The actual average return for FY 2022 reported by state and local plans is -5.94%, using data published as of June 30, 2023.*

We estimated as of June 30, 2022, a 77.3% market valued funded ratio among state and local plans (\$1.45 trillion in unfunded liabilities).

- The actual FY 2022 funded ratio is 75.7%, among plans that have reported actual data.
- Once the small number of plans who have outstanding 2022 actuarial valuations publish their reports, we anticipate the actual FY 2022 unfunded liability number will be \$1.57 trillion.*

We warned in our 2022 report of continued "investment return volatility" that would mean "contribution rates continuing to grow."

- The actual experience of pension funds was the roller coaster swing of a bear market that rebounded in the spring of 2023, pocketed by swings in asset performance related to Federal Reserve interest rate, the Silicon Valley Bank-led community banking crash, and events like the bankruptcy of cryptocurrency exchange FTX.
- Meanwhile, employer contribution rates continued to incrementally climb, again nudging up from 29.7% of payroll in 2022 to 30.05% of payroll in fiscal year 2023.

** There are still a handful of retirement systems that have yet to release actual figures for the fiscal year ending 2022. As of this publication, actual FY 2022 figures have been reported for approximately 94.6% 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 2022 estimates for plans that have not yet released actual data for 2022.*

Looking to the future: The average contribution rate for public pension funds won't stop at 30% of payroll. Addressing more than \$1.4 trillion in pension debt for states, cities, counties, and school districts will require steadily increasing costs absent a significant set of policy changes. Current trends are toward lower investment returns, increased investment risks to counter those lower returns, changes to assumptions that will recognize off-the-books unfunded liabilities, and demographic turnover that puts pressure on cash flows.

It is now clear that states and pension fund trustees have pushed ahead with alternative investments to avoid higher contribution rates in the near term. What remains unclear is:

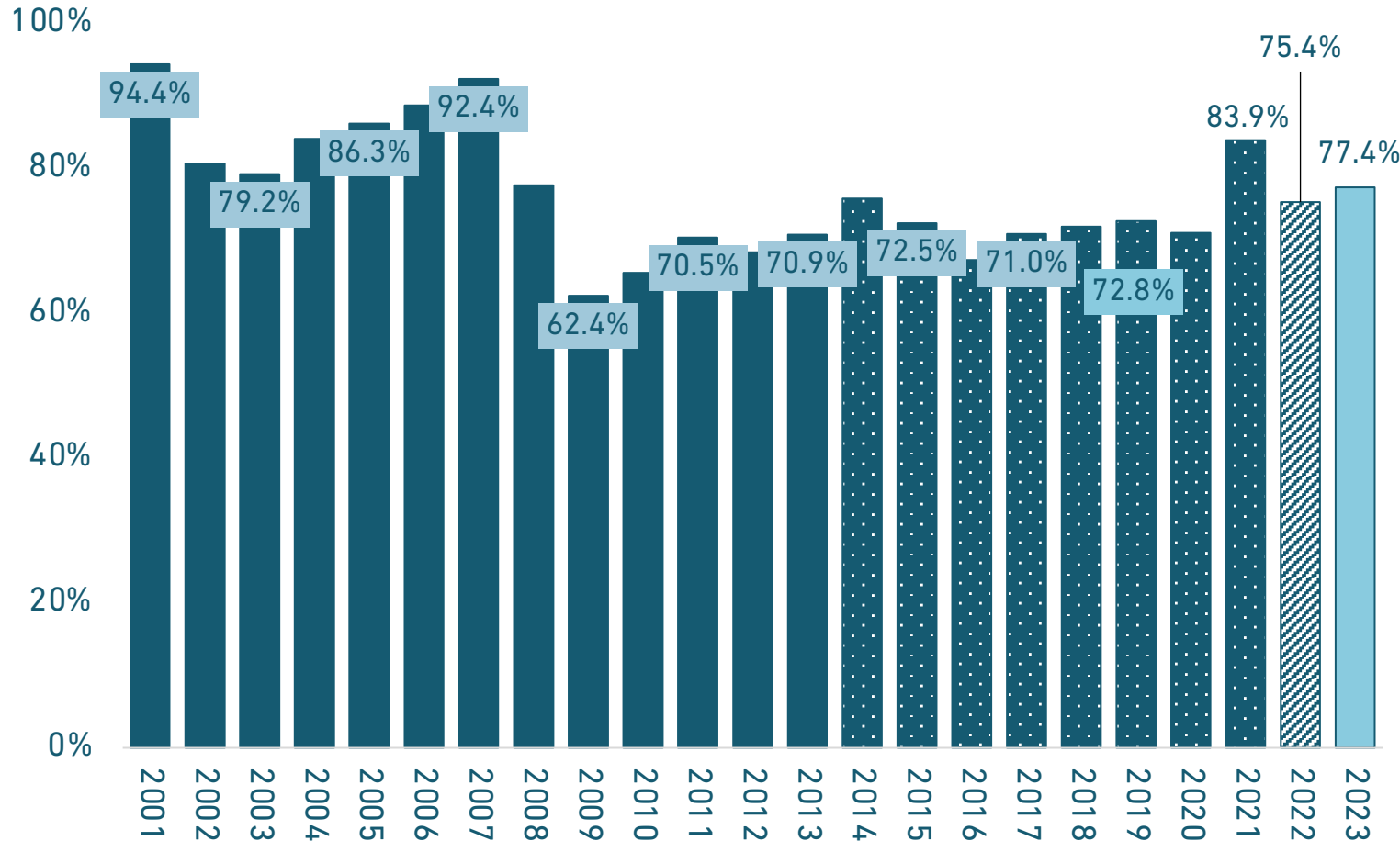
1. whether the performance of private equity and real estate will be enough to warrant the risks;
2. which state pension funds will win and which will lose in the private equity game — they won't all find successful opportunities;
3. how much influence political fights (like ESG) will have on pension fund performance; and
4. whether another market shock will destabilize some of the distressed or fragile plans.



National Trends for State & Local Pension Plans

FUNDED RATIO AVERAGE

FOR STATE & LOCAL PENSION PLANS | 2001–2022 + 2023 Estimate



The aggregate funded ratio for statewide and municipal pension plans is slightly better in 2023 than 2022. Generally, this is a relatively flat change year over year.

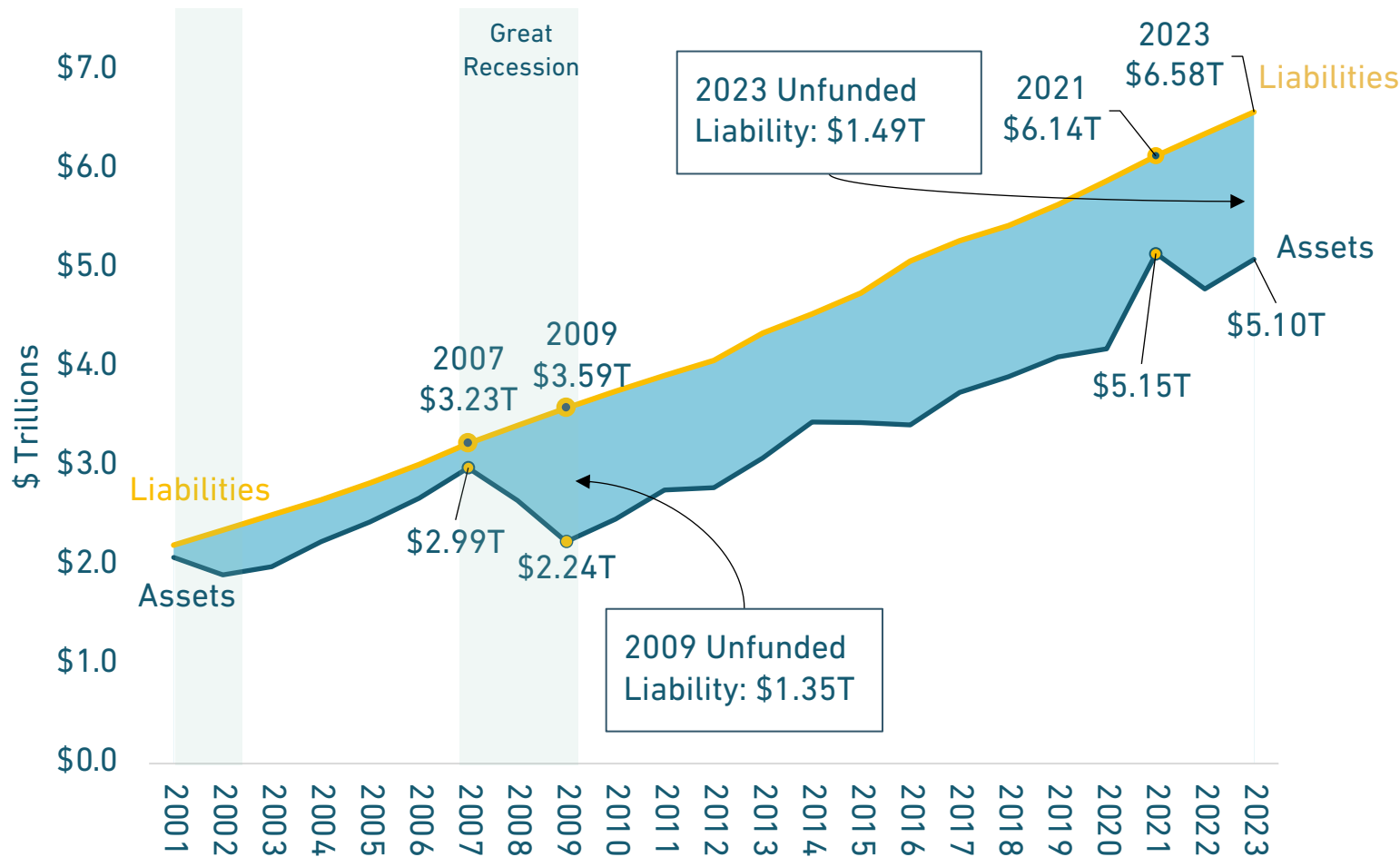
In general, plans are better than before the pandemic, but are still below their 2021 highs.

To view funded ratios by state see [Page 19](#).

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2022 Data Availability
- 2023 Estimate Based on June 30 Returns

TOTAL UNFUNDED LIABILITIES

FOR STATE & LOCAL PENSION PLANS | 2001–2022 + 2023 Estimate

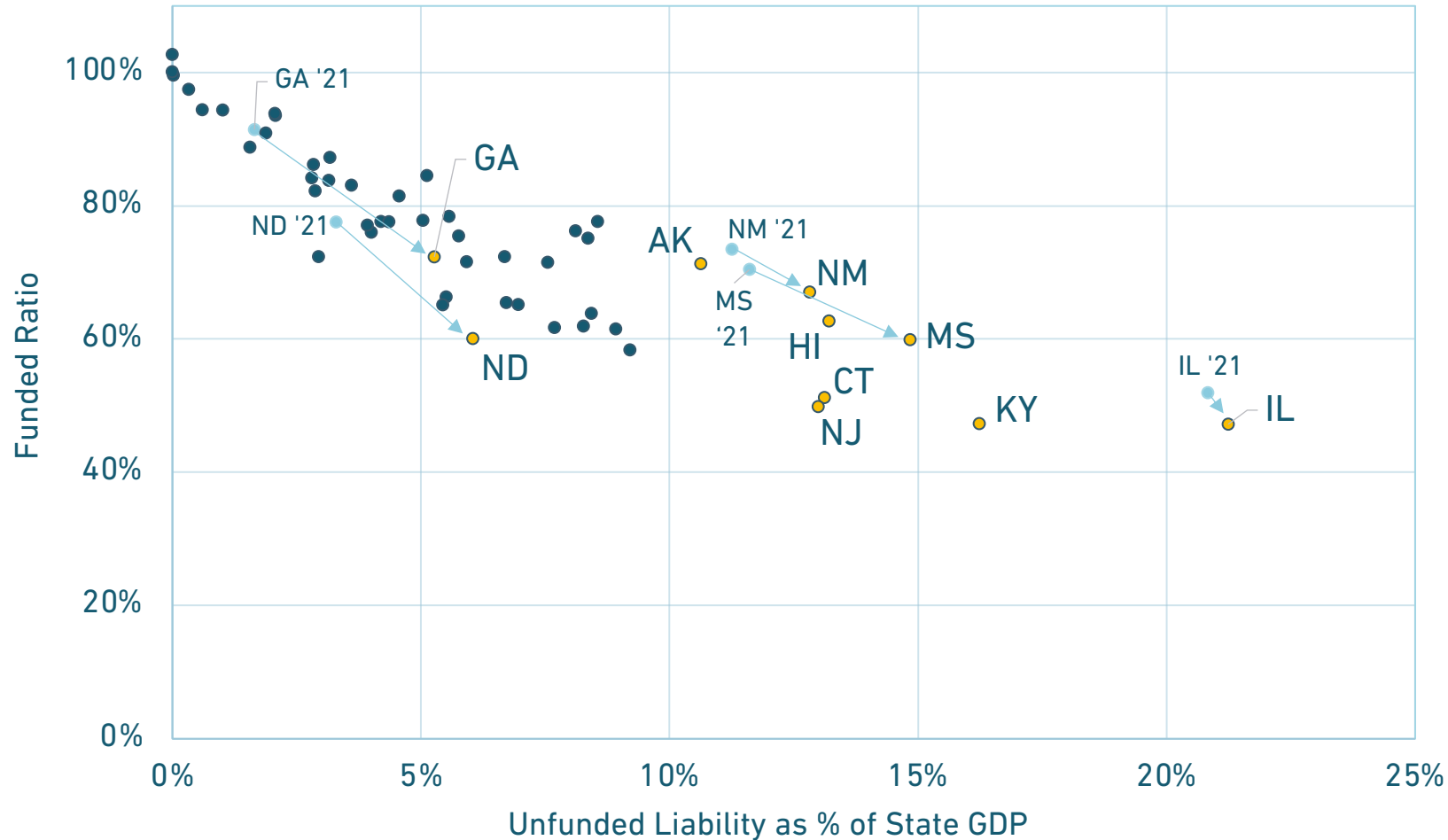


There has been relatively little change in the national shortfall in assets for state and local pension plans since the Financial Crisis. Unfunded liabilities decreased to their lowest level in 2021, but since then have reverted to just a slight improvement from pre-Covid 19 pandemic levels.

Total unfunded liabilities for state and municipal plans have moved from *\$1.35 trillion* in 2009 to a peak of *\$1.70 trillion* in 2020.

We estimate that 2023 unfunded liabilities will stay relatively stable, decreasing slightly to *\$1.49 trillion* from *\$1.57 trillion* in 2022.

2022 FUNDED STATUS AS A SHARE OF STATE ECONOMIC OUTPUT



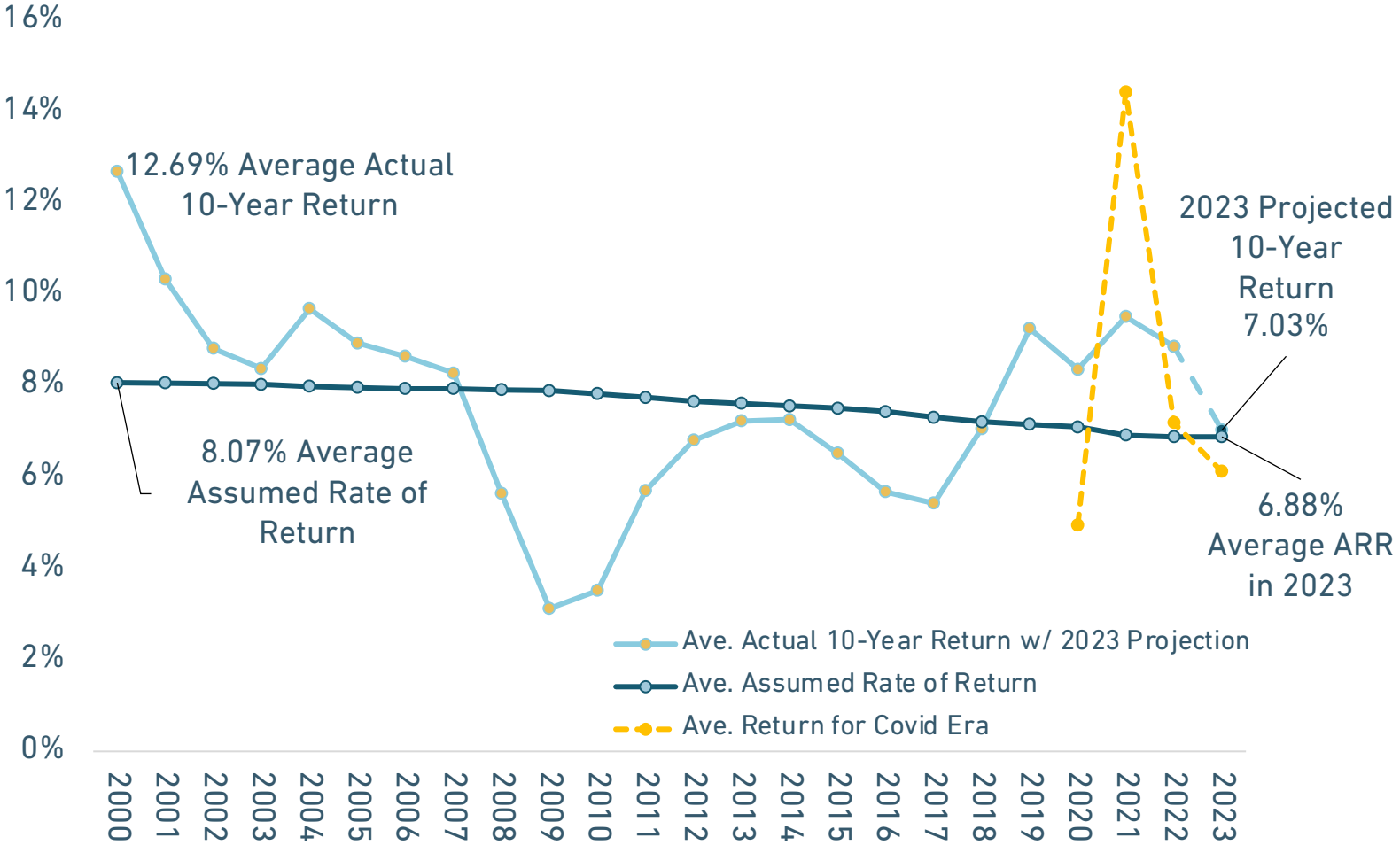
Funded ratio and unfunded liability levels on their own are not perfect indicators of a retirement plan's fiscal health or sustainability.

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. The chart shows this for state totals and highlights how some states moved between 2021 and 2022.

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](#)

INVESTMENT RETURN AVERAGES COMPARED TO ASSUMED RATES OF RETURN | 2001–2023



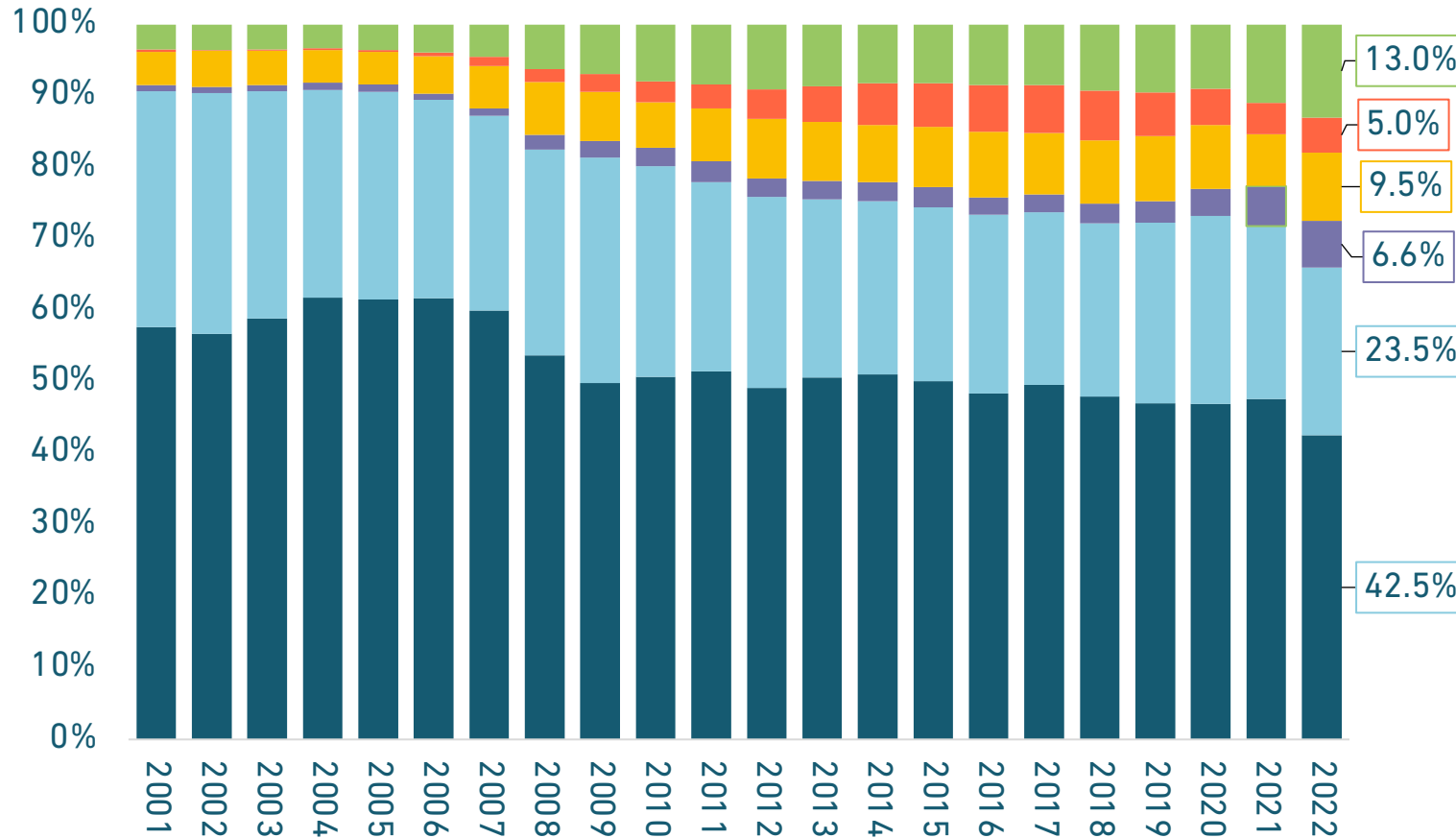
We estimate 2023 investment returns will average 5.3% (based on data through June 30). Federal Reserve policy to address inflation ended an era of easy money, which translated into a bear market for public equities and write downs for private equity and real estate.

The average 10-year return has fallen to around the average assumed rate of return for the first time since 2018.

The average return for the Covid-Era (2020-2023) is 6.13%, which is below average assumptions.

ASSET ALLOCATION TREND

OF STATE & LOCAL PENSION FUNDS | 2001–2022

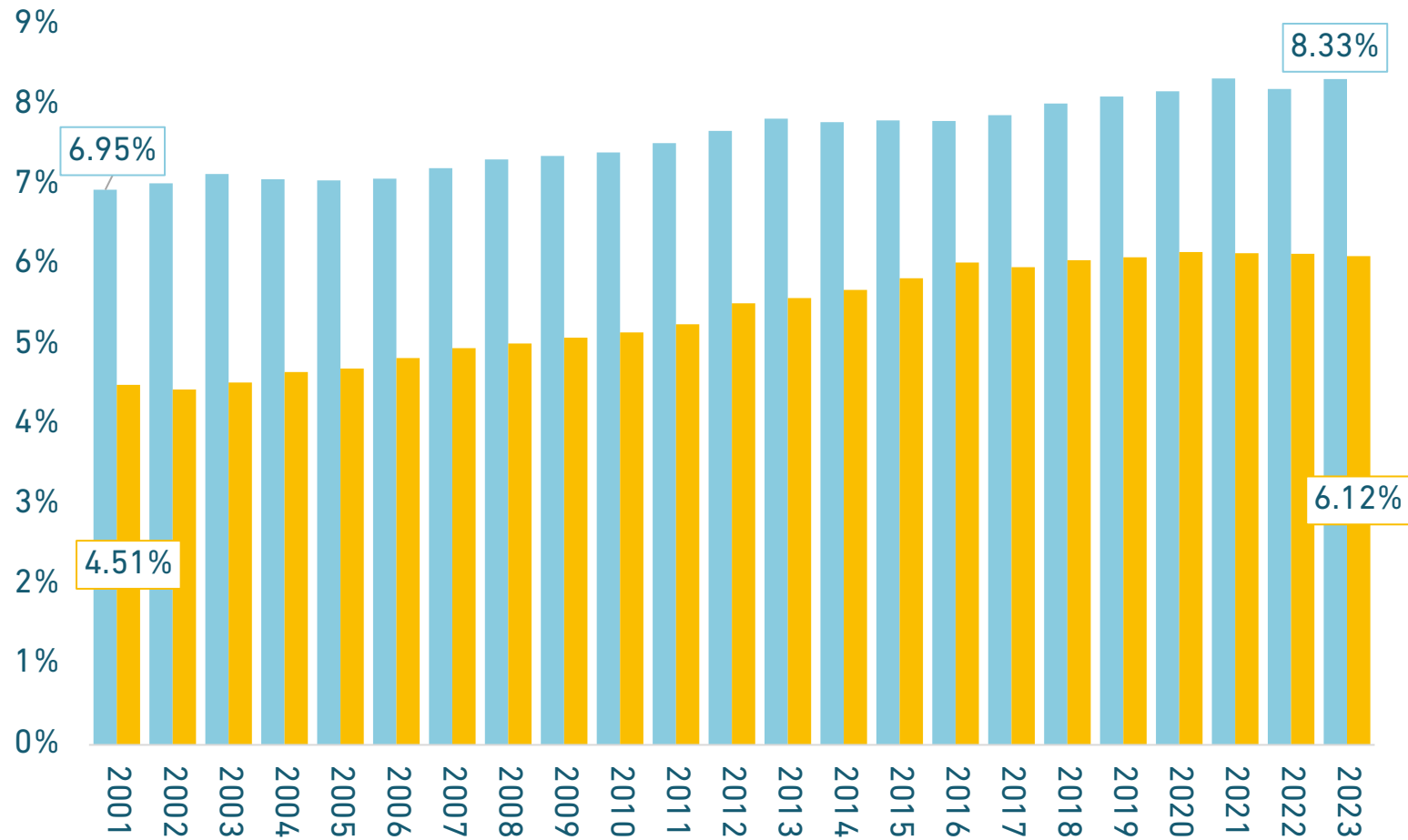


Public pension asset allocations have shifted away from transparent public equities and relatively safe fixed income investments into riskier categories as trustees search for stronger investment returns.

“Alternatives” comprise a third of pension fund investments (34.0%), the largest share in history. Notably, private equity jumped to 13.0% of allocations.



AVERAGE MEMBER PAYROLL CONTRIBUTIONS BASED ON SOCIAL SECURITY PARTICIPATION | 2001–2023



State and local employee contributions to their own retirement plans have been steadily increasing.

Public sector workers who are also enrolled in Social Security paid *161 basis points more (a 35.7% increase)* during the 2023 fiscal year than they did during the 2001 fiscal year and *21.8% more* than they did in 2008 before the financial crisis.

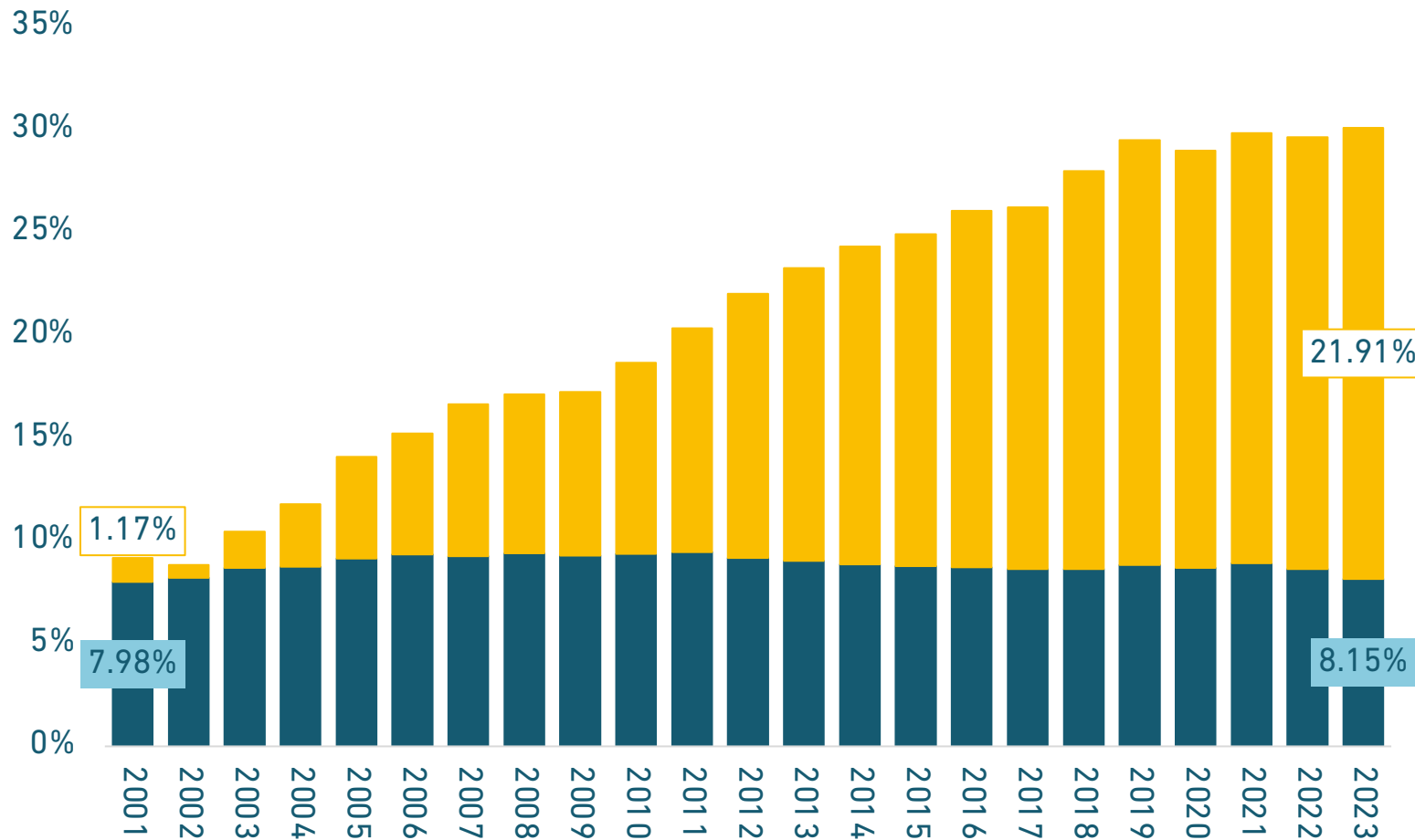
Those who do not participate in Social Security paid *19.9% more this year* than in 2001 and *13.7% more* than in 2008.

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

AVERAGE EMPLOYER CONTRIBUTION RATES

AS A PERCENTAGE OF PAYROLL | 2001–2023 Fiscal Year



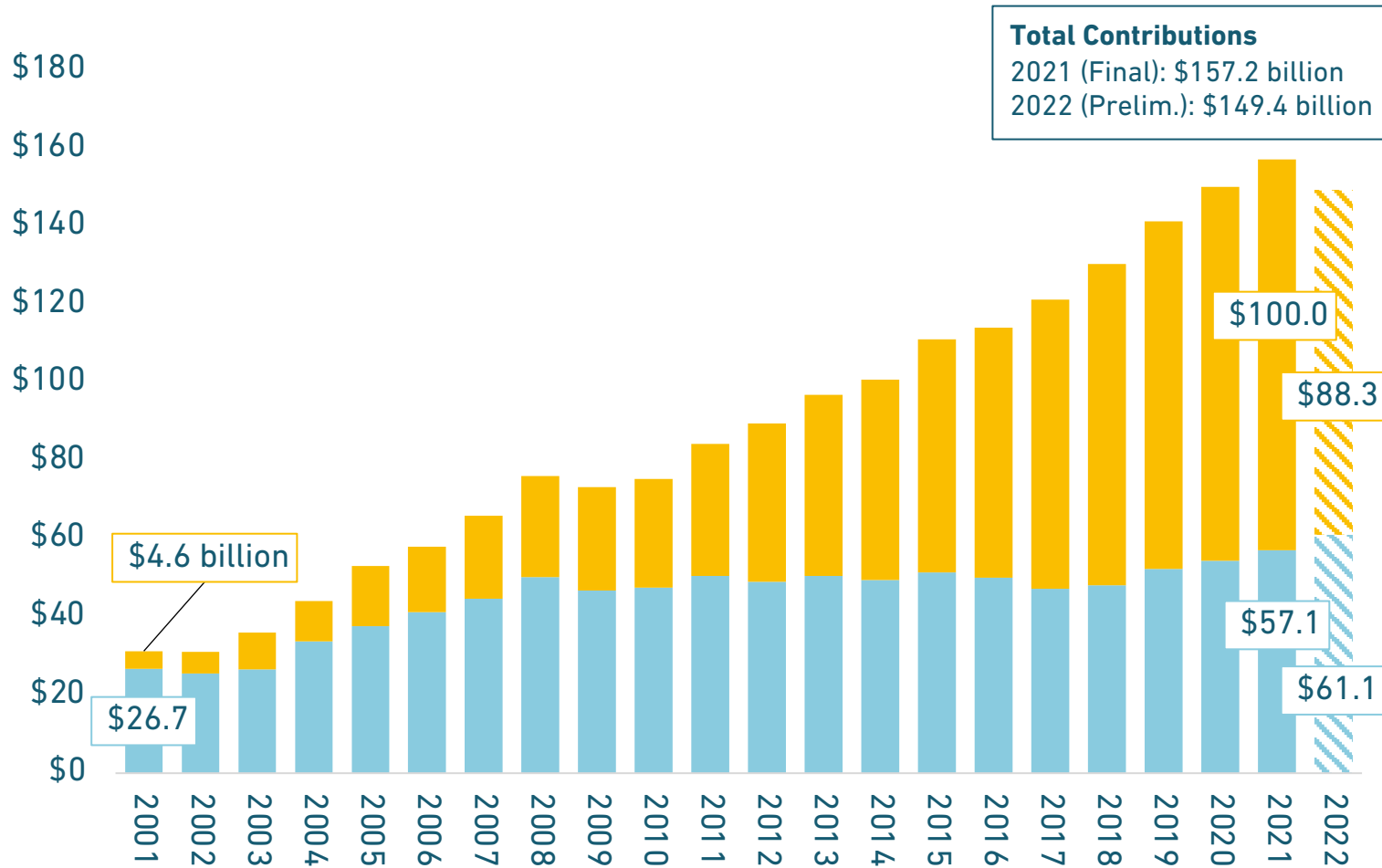
Government employer contributions have steadily increased over the past two decades, mostly because of increased payments to cover pension funding shortfalls (e.g., unfunded liability amortization payments).

Combined state and local employer contributions in 2001 were 9.15% of payroll. During the fiscal year ending 2023, employer contributions are 30.05% of payroll.



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

EMPLOYERS CONTRIBUTION SHARES TOWARD NORMAL COST V. PENSION DEBT | 2001–2021 + 2022*



Between 2001 and 2021 normal cost payments have *doubled*. But adjusted for inflation they've grown more level, from \$44.5 billion to \$62.3 billion – a 40% increase (see [Page 66](#)).

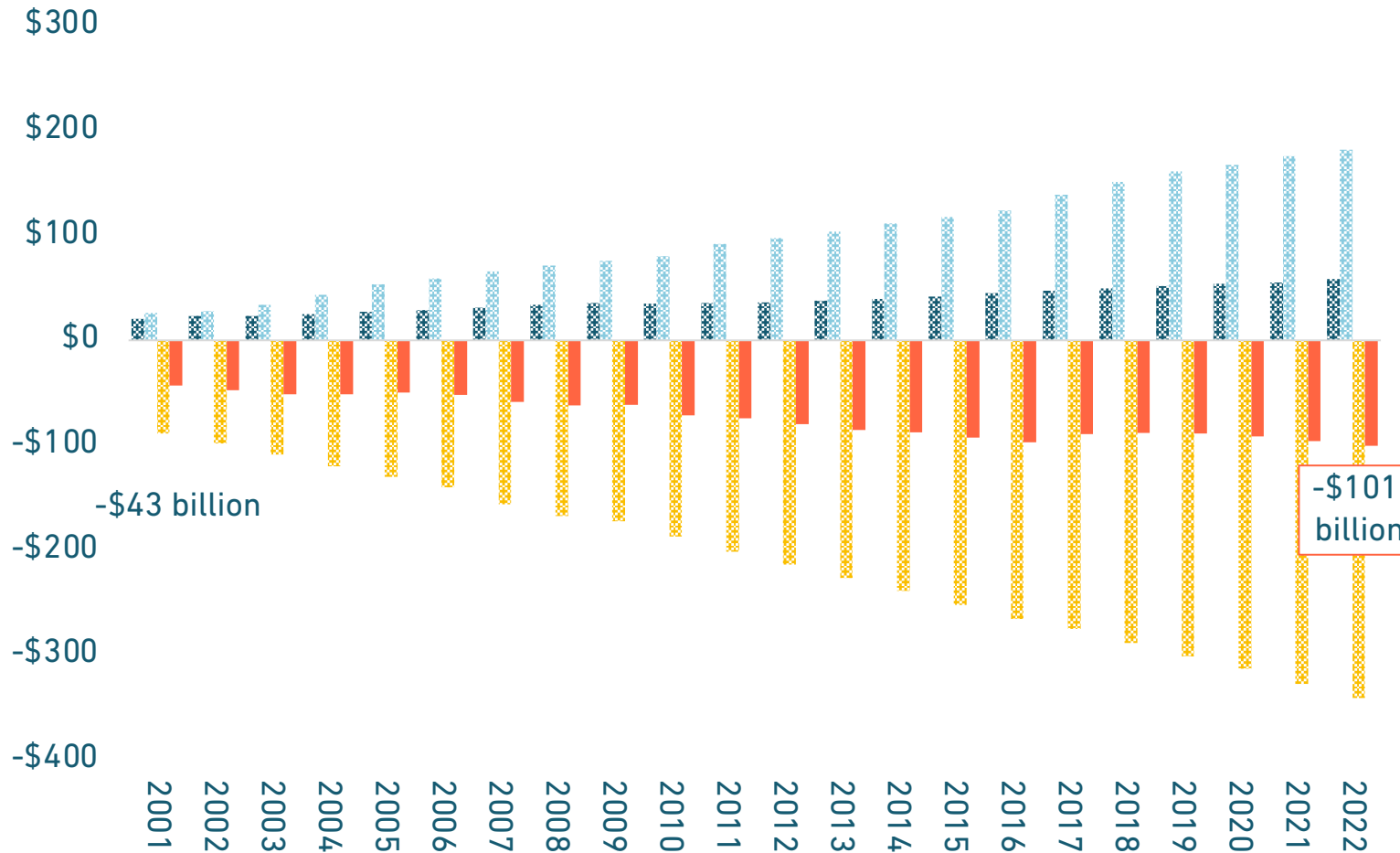
Unfunded liability payments however have *risen 2,089%* during the same two-decade period from under \$4.6 billion in 2001 (or \$7.6 billion, adjusted for inflation) to over \$100 billion annually in 2021.

2022 contributions data is incomplete pending reports from retirement plans yet to publish data, including CalPERS (likely available in fall 2023).



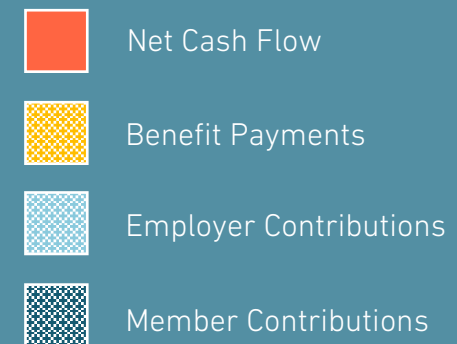
AGGREGATE CASH FLOW

FOR STATE & LOCAL PENSION PLANS | 2001–2022



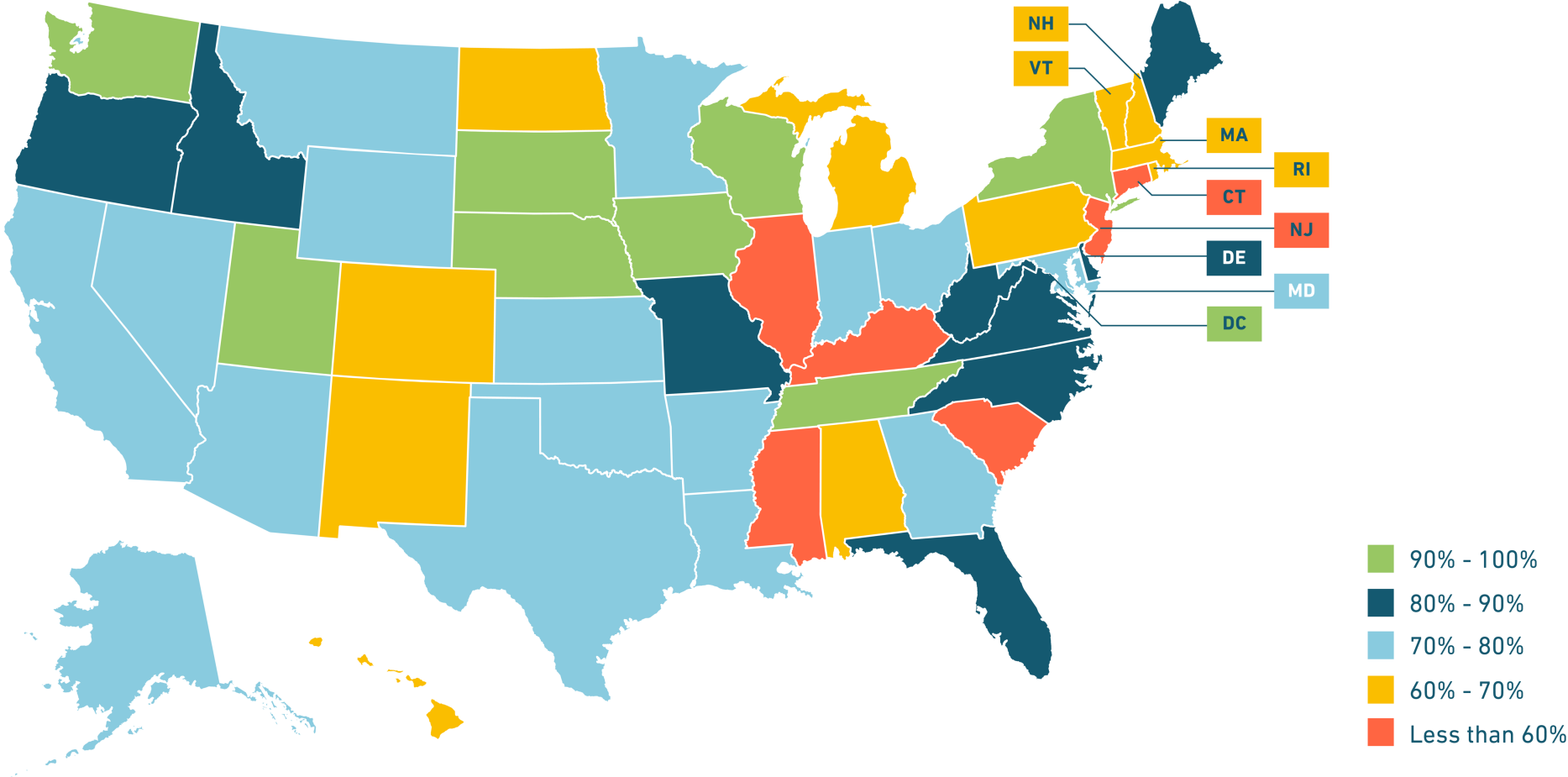
Negative net cash flows from contributions and benefit payments have steadily increased over the past two decades, reflecting more “mature” pension plans.

2022 contributions data does not yet include retirement plans that haven't published final data, including CalPERS.



[See our interactive version for all values](#)

2022 FUNDED RATIOS BY STATE BASED ON MARKET VALUED ASSETS REPORTED BY STATE & LOCAL PLANS



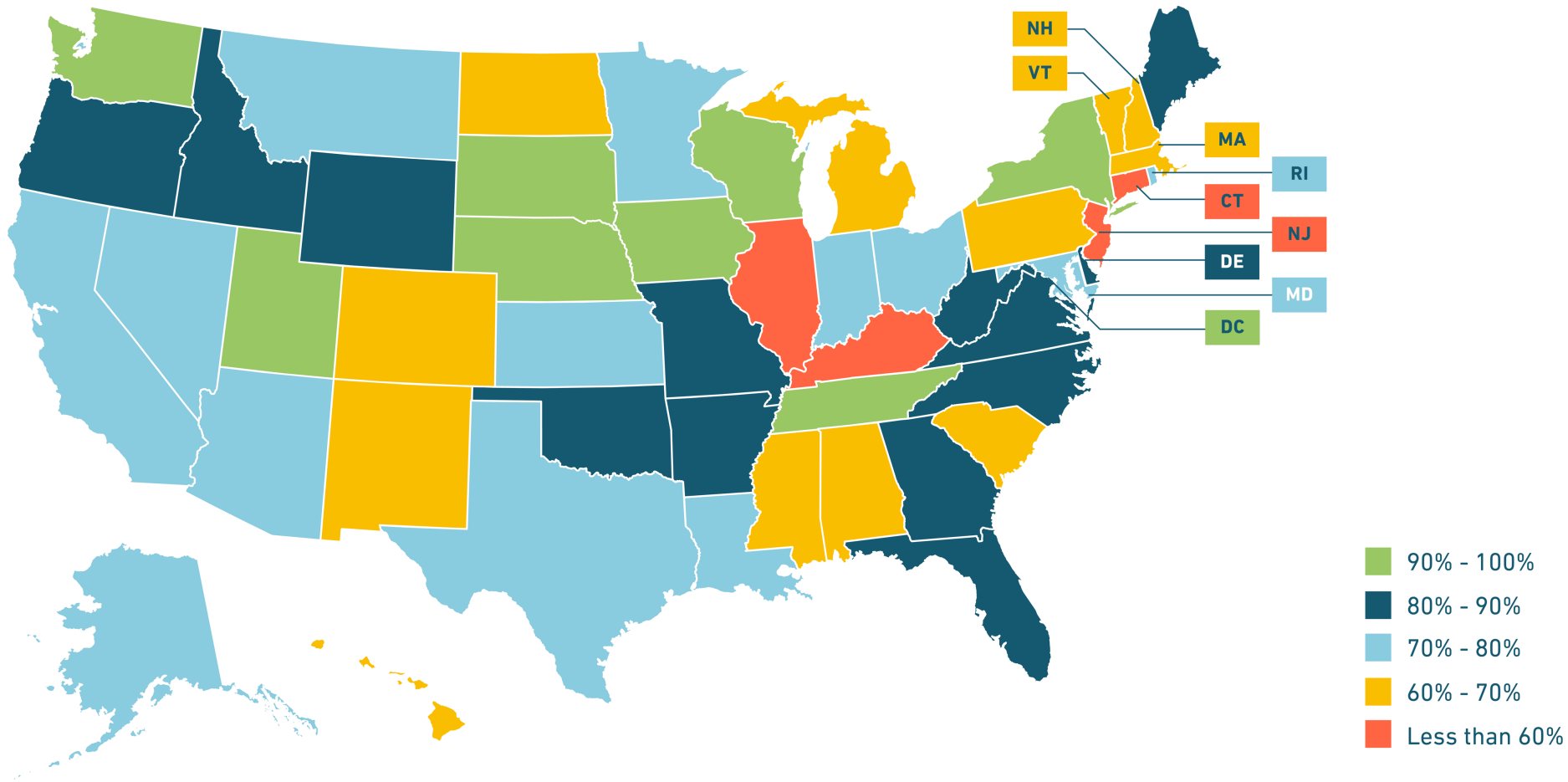
The weighted average funded ratio for each state was highly varied in 2022. Almost every state looked worse than in 2021, due to investment losses.

Among all statewide plans, 153 out of 167 have reported their final 2022 figures. The notable exception is CalPERS (which is estimated using reported asset allocation + investment return data).

Among local plans, 41 out of 58 have reported their 2022 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.

2023 ESTIMATED FUNDED RATIOS BY STATE BASED ON ESTIMATED ASSETS FOR STATE & LOCAL PENSION PLANS



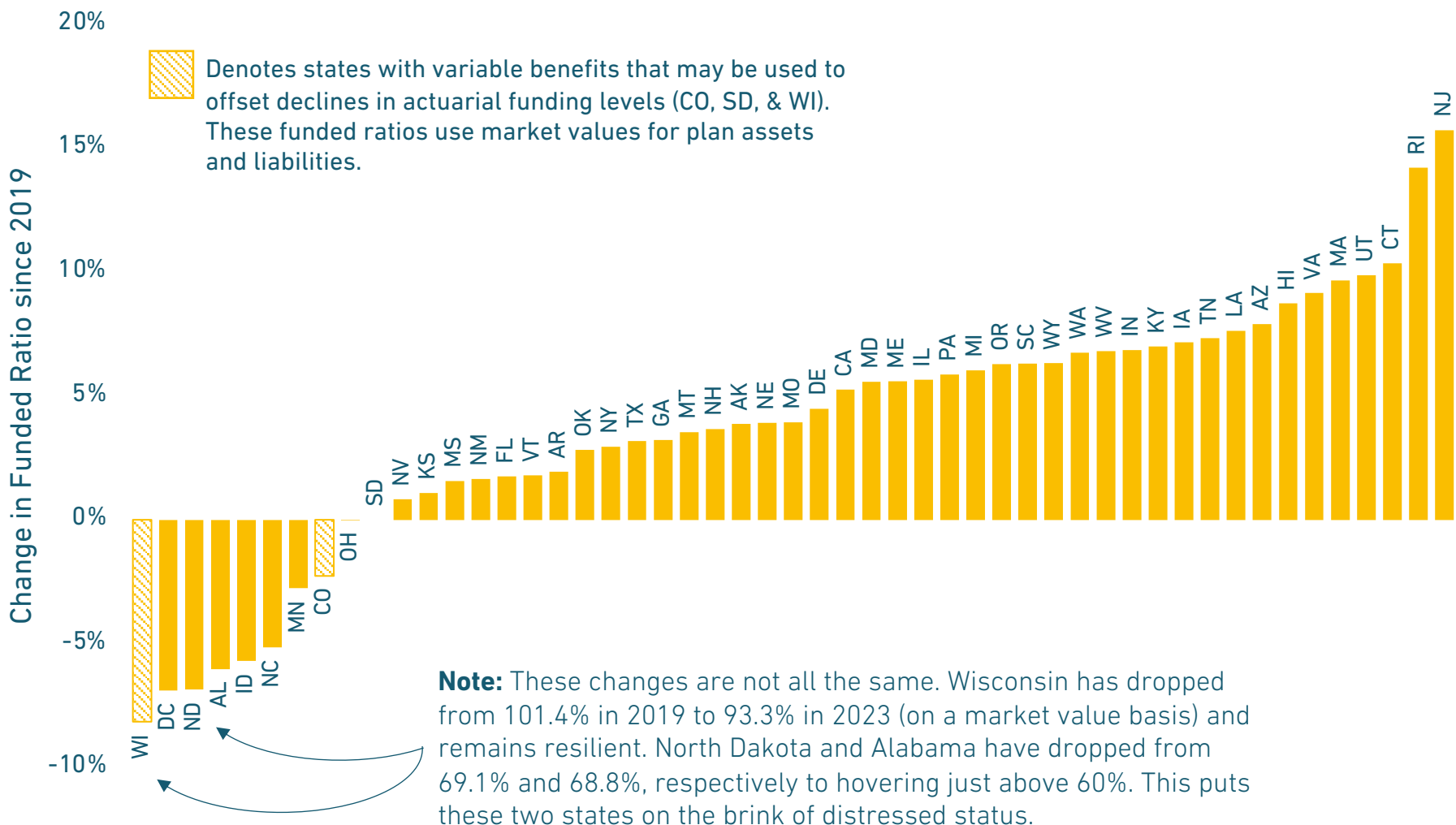
Most states are going to have flat funded status from 2022 to 2023: only 7 states changed color on the map from 2022.

However, few pension funds are projected to *lose money* in 2023 (unlike last year), there are a few that are likely to see a *reduced funded status* because of investment returns below assumed rates of return.

We estimate that 46 out of the 225 plans in our analysis will have a lower funded ratio in 2023 than the previous year.

ESTIMATED CHANGE IN FUNDED RATIO 2019–2023

ALL STATEWIDE & LOCAL PLANS COMBINED WITHIN EACH STATE



Financial market volatility has meant most plans' funded ratios declined between 2019 and 2020, then increased in 2021, and now are balancing out with weak investment performance for 2022-23.

There will be varied levels of funded ratio change from 2019 (pre-pandemic) to 2023 once final plan numbers are available.

However, it's likely that in 2023 the funded ratio for *most states will be in a better condition than at the end of 2019.*

Analysis: What We See in the National Trends

Unfunded liabilities are relatively unchanged from 2022 to 2023, slightly decreasing from \$1.57 trillion to \$1.49 trillion ([Page 10](#)). Similarly, we estimate the 2023 funded ratio for state and local pension plans will improve from 75.4% to 77.4% ([Page 9](#)). While it is nice to not have a year with another sharp decline in public pension funded status, these relatively mild changes are not significant enough to change the long-term trajectory of pension funding. Stagnating funded status will result in contribution rates continuing to rise, as we've seen this year ([Page 15](#)).

- Asset allocation trends toward alternative investments like private equity and real estate have become not-so-alternative. More than 33% of public pension assets have been committed to private equity, hedge funds, real estate, and other alternatives — as opposed to public equities or fixed income — since 2015, and the share is only growing ([Page 13](#)). In 2022, allocations to private equity were 13.0% and real estate jumped to 9.5%, even factoring in declining valuations for those asset classes.
- Projected investment returns average 5.3% as of June 30, 2023, which is short of the 6.9% average assumed rate of return for public plans ([Page 12](#)).
- Member contribution rates increased again in 2023 for public employees concurrently enrolled in Social Security, from 8.2% to 8.3% of salary on average ([Page 14](#)). Public employees without Social Security access had their contribution rates effectively unchanged, a welcome reprieve after increases over 20 years.
- Increased employer contributions ([Page 15](#)) have not been sufficient to balance the steady increase in benefit payments (outflows) over the past two decades. As a result, statewide pension plans collectively face consistent “negative cash flow” ([Page 17](#)). This puts pressure on investment returns to make up the difference between inflows/outflows.

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.



Public Pension Trends Beyond 2023: Addicted to Risk

PENSION FUNDS ARE ADDICTED TO RISK IN THEIR EFFORT TO AVOID CONTRIBUTION RATES BEING EVEN HIGHER



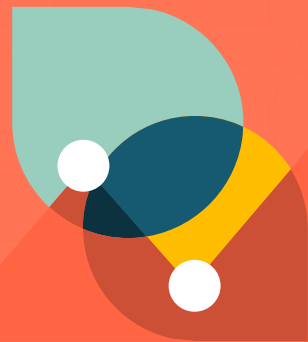
The risk profiles of U.S. state and local pension funds have changed significantly in recent years. Consider the following:

1. Pension fund asset allocations continue to expand into private equity and other alternatives ([Page 26](#)). The value of investments in alternative asset classes has grown from around \$100 billion in 2001 to over \$1.6 trillion in 2022.
2. There is no way that pension funds can meet their investment targets using simple stock and bond passive portfolios. The probability of earning just a 6% return over the next decade is less than 50% ([Page 56](#)). This is particularly notable since public retirement systems have done a better job lowering their assumed returns over the last two decades ([Page 27](#)), but they are still unrealistically high.
3. Therefore, the choices are to either: (1) increase contributions into pension funds beyond their currently historically high levels, or (2) roll the dice and take on more risk.

And it appears that the “take more risk” route is likely for the major pension funds. For example, the new CIO of CalPERS [said in late 2022](#) that previous investment strategies had inappropriately tried to “limit downside [risk]” and as a result “missed out on a big chunk of growth” from public and private markets.

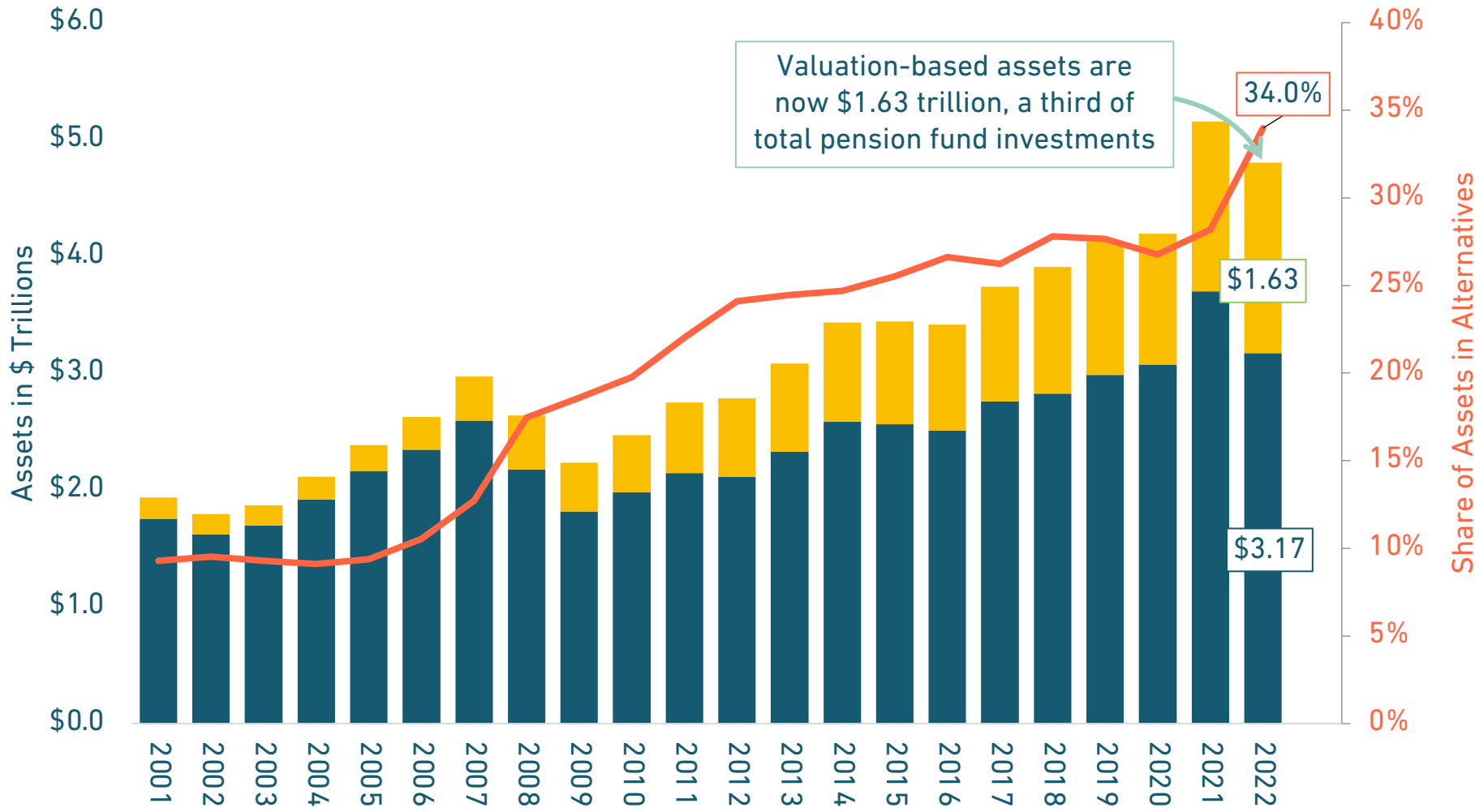
Simply put, pension funds are addicted to risk.

DIFFERENT KINDS OF PENSION INVESTMENT RISK: ASSET RISK, OPPORTUNITY RISK, & VALUATION RISK



- The main type of risk that pension funds are addicted to is “**asset risk**” — trying to generate returns that require taking high risk/high reward bets. In theory, there is a premium to earn from illiquid investments or investments few others know about. But it’s not clear that these bets always pay off. For example, over the last decade private equity generated large returns for some, but falling internal rates of return over the last two years suggest those might have just been paper profits ([Page 27](#)).
- The addiction to chasing investment yields also comes with “**opportunity risk**” — for example, are actual risk-adjusted returns worth the dice roll? There is also “management risk” — can pension fund trustees effectively select and monitor managers to deploy their capital in a way that is worth the high fees paid?
- And public pension funds now face an emerging concern: “**valuation risk**” — the reported value of assets used to determine contribution rates is dependent on the accuracy of “fair price” valuations. Roughly one-third of the \$4.8 trillion in assets that pension funds reported having in 2022 was based entirely on non-transparent valuation approaches from asset managers (not market-based prices like stocks). If these valuations are off, then today’s contribution rates have been miscalculated.

PENSION FUND ASSETS WITH VALUATION RISK COMPARED TO MARKET PRICED ASSETS



The share of pension fund assets in alternatives has grown to 34% of assets as of 2022, up from an average of 10% between 2001-07.

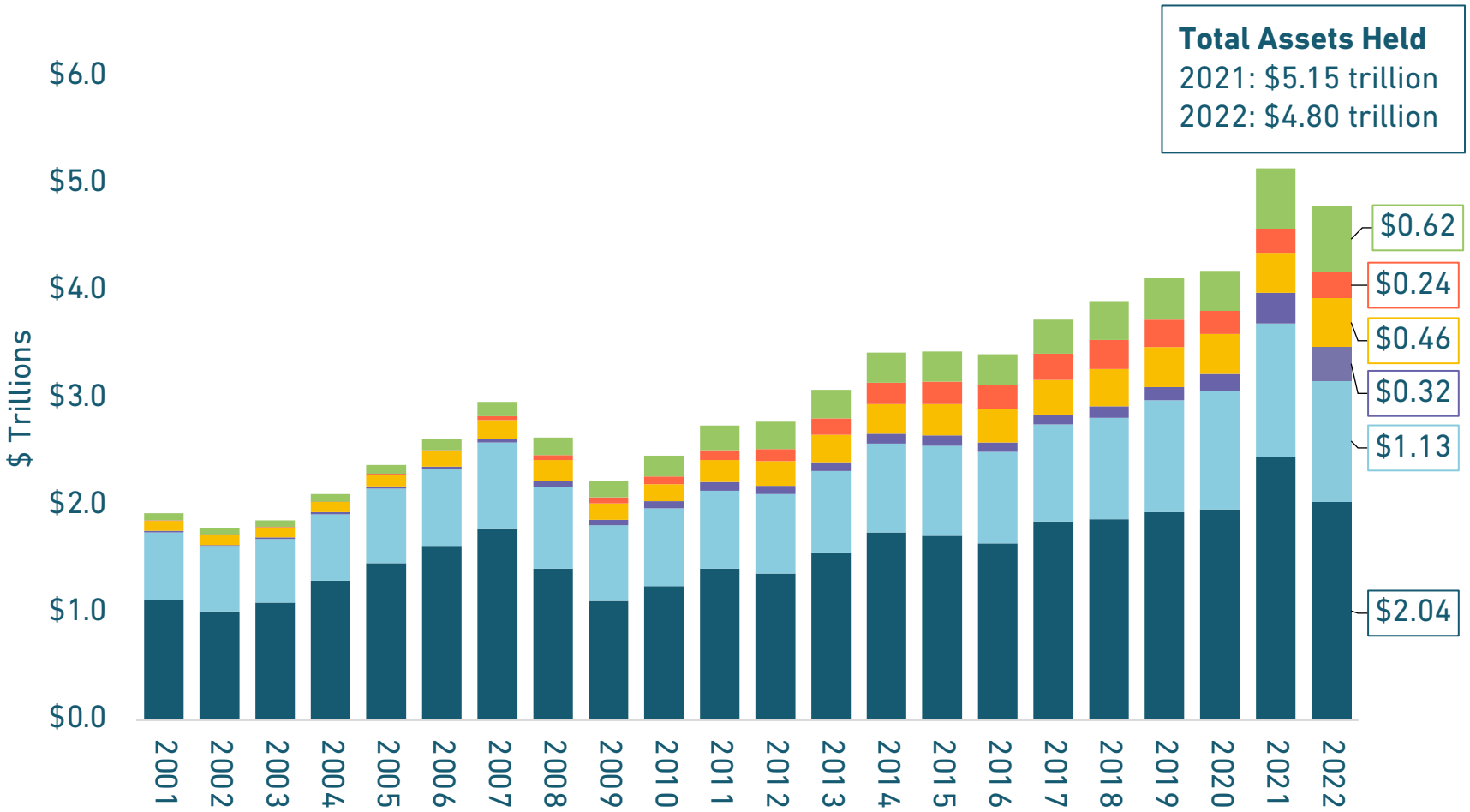
Generally, alternative investments like private equity and real estate are priced based on valuations.

This means the share of pension fund asset with "valuation risk" has more than tripled since the Great Recession / Financial Crisis.

- Share of Pension Fund Assets Invested in Alternatives
- "Valuation Priced" Assets (All Alternatives)
- "Market Priced" Assets (Public Equities + Fixed Income)

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

DOLLAR DISTRIBUTION OF PENSION FUND INVESTMENTS BY ASSET CLASS, 2001-2022



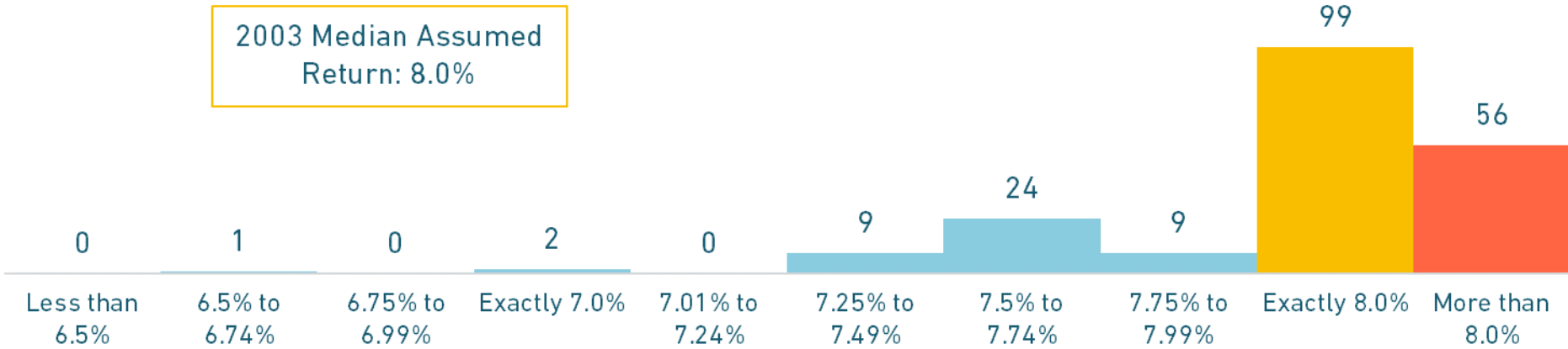
As of 2022 there is over \$620 billion from public pension funds invested in private equity, \$460 billion in real estate, \$310 billion in commodities and other miscellaneous alternative assets, and around \$240 billion in various hedge fund strategies.

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

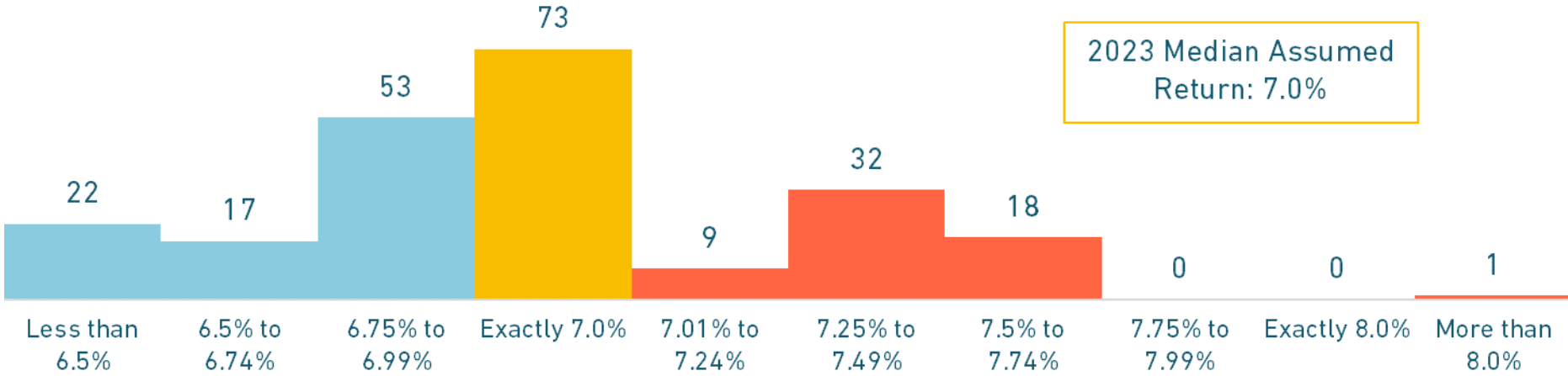
Source: Equable Institute analysis of public plan valuation reports and ACFRs. Data for 2022 is incomplete pending the release of investment data from late-reporting systems.
Note: "Alternative" investments include private equity, hedge funds, real estate, commodities, and tactical asset allocations.

DISTRIBUTION OF ASSUMED RATES OF RETURN BY PENSION PLAN COUNT, AS OF JUNE 2003 & JUNE 2023

2003 Median Assumed Return: 8.0%



2023 Median Assumed Return: 7.0%



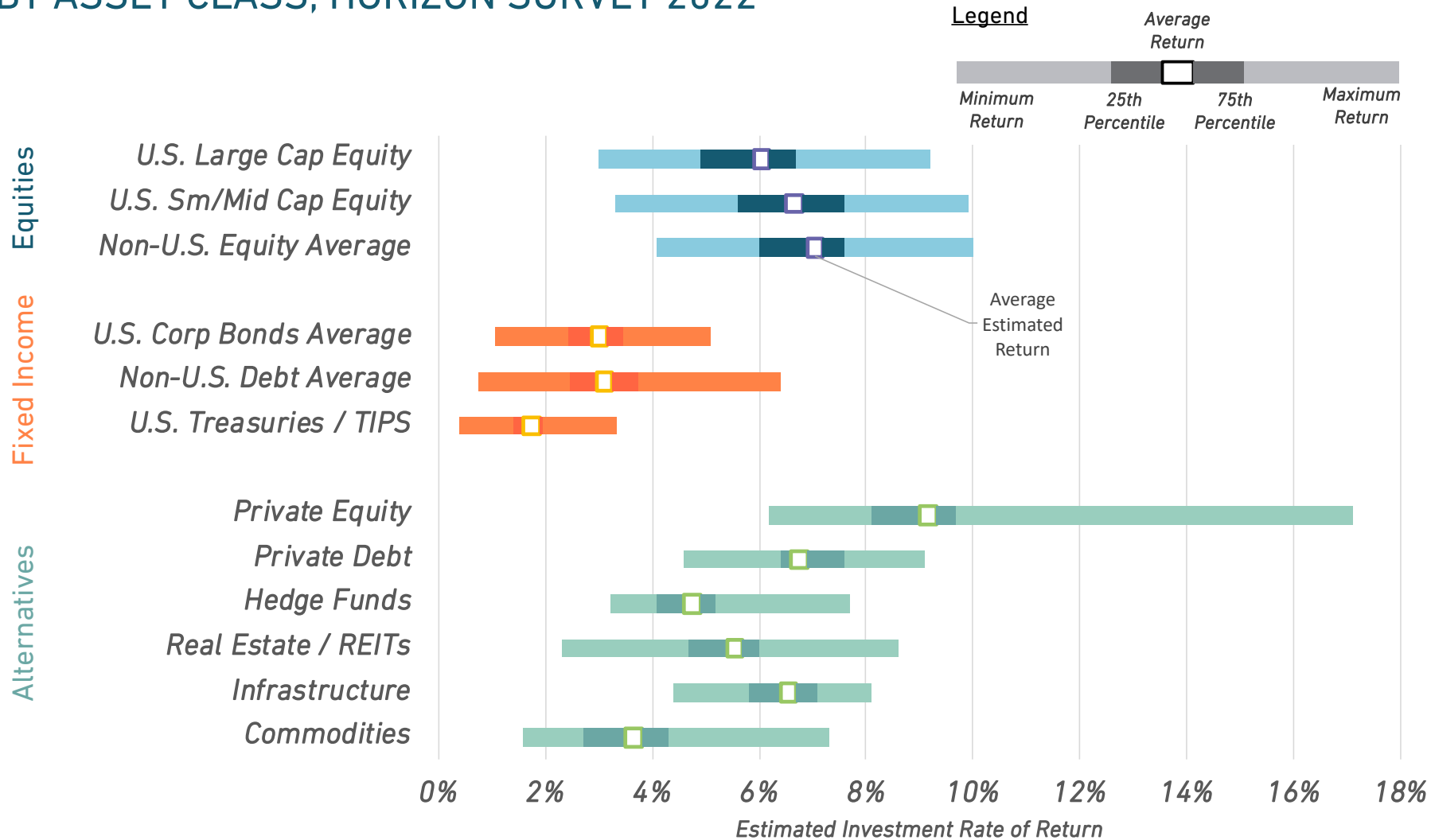
There were 197 major public pension plans with assumed rates of return higher than 7% in 2003. Today, that number has fallen to just 60 plans, including 19 plans using a 7.5%+ return assumption.

The median assumed return in 2003 is 7%, but the average is 6.88% and continuing to decline (see [Page 12](#)).

Still, just 37 plans have assumed returns 6.5% or less. 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 2023 were cross-checked against published board materials, news reports, and other secondary sources to corroborate any changes in plan assumptions from 2022 to 2023.

RANGE OF 10-YEAR INVESTMENT RETURN ESTIMATES BY ASSET CLASS, HORIZON SURVEY 2022



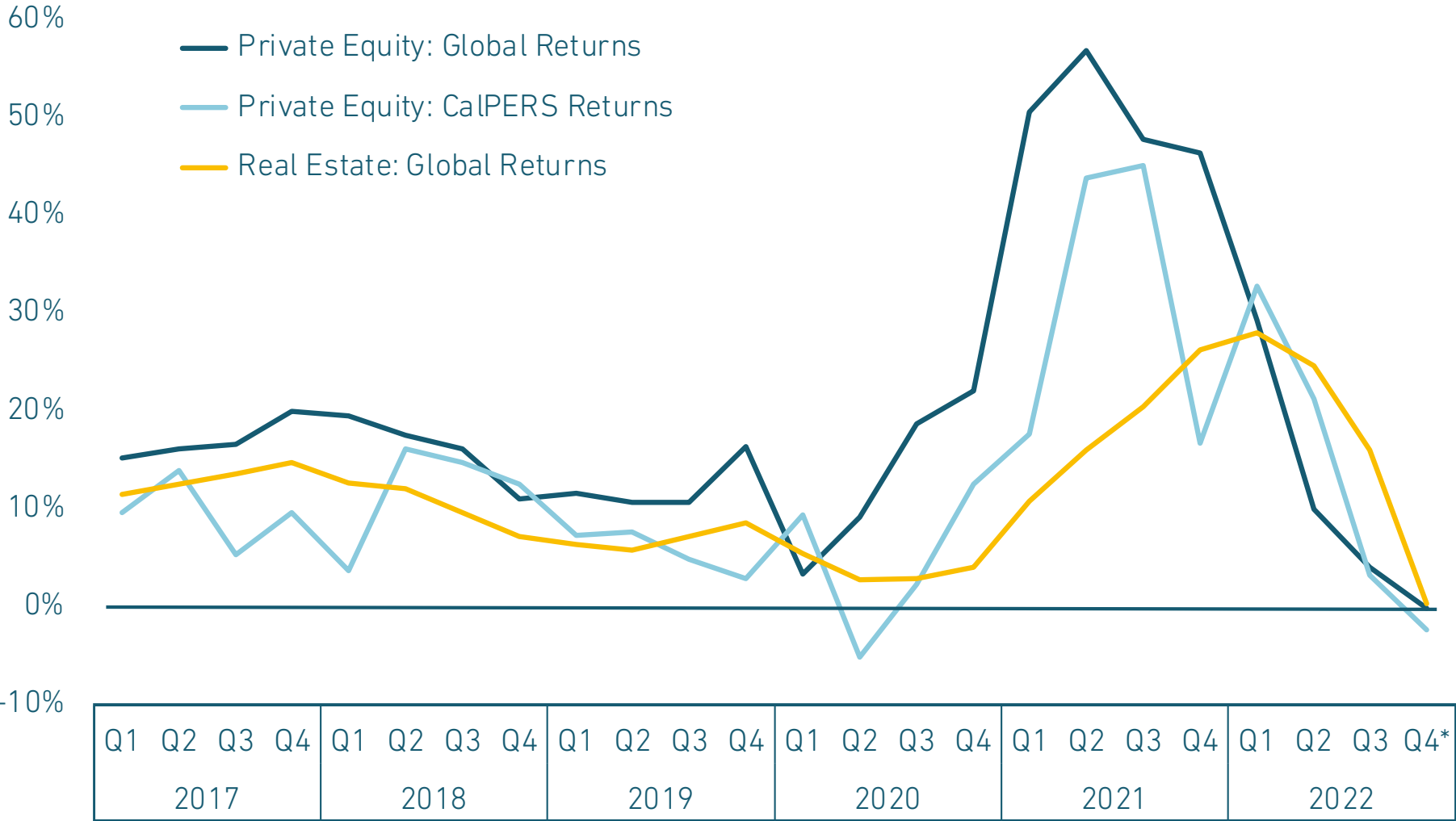
This chart shows the range of what kind of investment returns different experts have forecasted for varying asset classes.

One way to think about investment risk for pension funds is how wide the range of possible returns is for any given asset class.

The wider the range, the more potential risk there is for investment performance. Private equity has the widest range and most potential. U.S. Treasury bonds have the narrowest band and lowest potential.

DECLINING PRIVATE EQUITY AND REAL ESTATE RETURNS

ONE-YEAR ROLLING INTERNAL RATES OF RETURN, 2017-2022



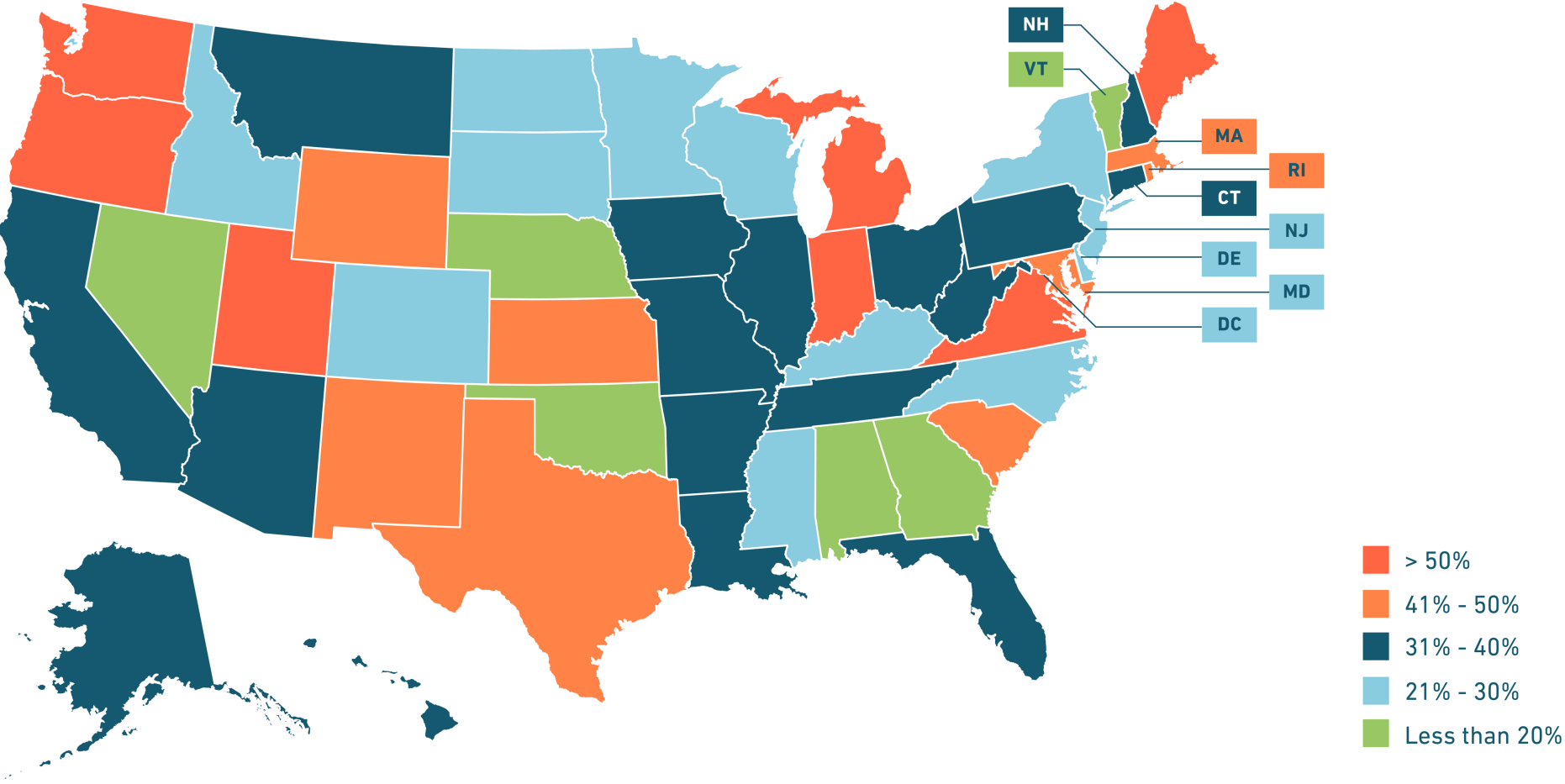
Private equity and real estate investments are spread across a complex range of funds and assets. The process of updating the valuation of those investments typically has a three-to-nine-month lag from the point of time being measured.

Private equity and real estate returns in 2021 were strong and that was reflected in 2022 fiscal year reporting. However, global average return data and CalPERS (as a proxy for public pension private equity investment) suggest that 2023 fiscal year reporting will be muted performance at best.

Sources: Global return data is published by PitchBook in "Global Fund Performance Report as of Q3 2022," May 2023. (including preliminary figures for 2022 Q4). The CalPERS data comes 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.

STATES BY SHARE OF PENSION ASSETS IN ALTERNATIVES

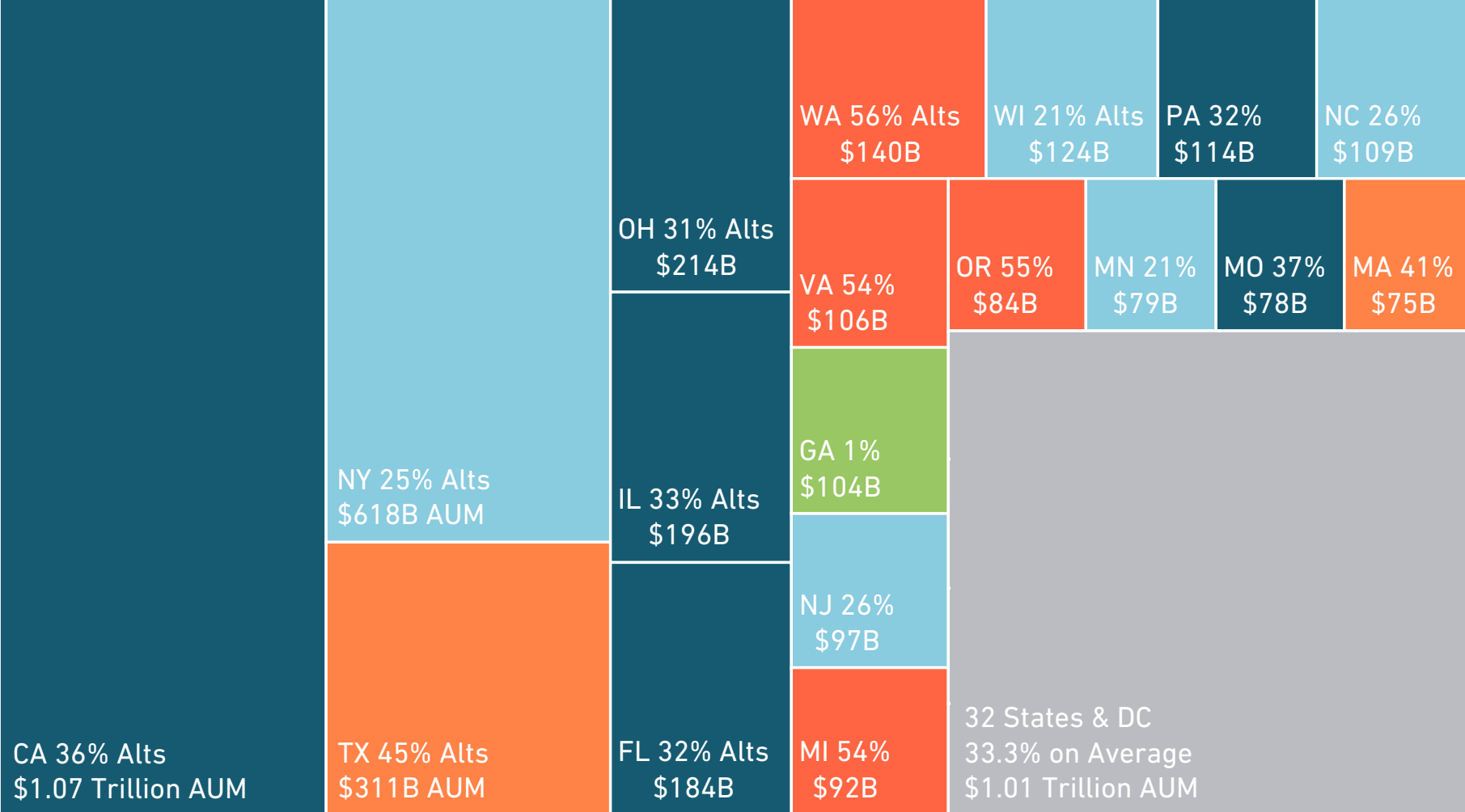
BASED ON 2022 ASSET ALLOCATION DATA AND ASSET VALUES



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

Most states have between 21% and 36% 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.

STATES BY TOTAL ASSETS UNDER MANAGEMENT & SHARE OF INVESTMENTS IN ALTERNATIVES | 2022



Most public pension assets are held by a small set of states — roughly half are managed by just five: CA, NY, TX, OH, IL.

While the share of pension investments in alternative assets matters for each individual state, there are certain states that drive a greater share of the national level of investments in alts.

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

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

TOP 20 PENSION INVESTMENT FUNDS BY SHARE OF ASSETS IN ALTERNATIVES


Rank	Investment Fund	Alts Share	ARR
#1	Louisiana School Employees' Retirement System	59.7%	6.8%
#2	Michigan Department of Treasury (MSERS & MPSERS)	58.5%	6.0%
#3	San Francisco City & County Employees' Retirement System	58.0%	7.2%
#4	Washington State Investment Board (Washington Retirement System)	57.2%	7.0%
#5	Virginia Retirement System	55.5%	6.75%
#6	Indiana Public Employees Retirement System	55.4%	6.25%
#7	Oregon Investment Council (Oregon PERS)	55.3%	6.90%
#8	Maine Public Employees Retirement System	53.9%	6.50%
#9	Illinois State Teachers' Retirement System	52.3%	7.00%
#10	Houston Firefighters Relief and Retirement Fund	52.0%	7.00%

Rank	Investment Fund	Alts Share	ARR
#11	Utah Retirement System	51.1%	6.85%
#12	Missouri DoT and Highway Patrol Employees' Retirement System	50.5%	6.50%
#13	New Mexico Public Employees Retirement Association	50.2%	7.25%
#14	Texas Teachers Retirement System	49.1%	7.00%
#15	Louisiana Teachers' Retirement System	48.2%	7.25%
#16	Arizona Public Safety Personnel Retirement System	47.7%	7.15%
#17	Wyoming Retirement System	47.2%	6.80%
#18	Arkansas Teacher Retirement System	45.8%	7.25%
#19	Kern County (CA) Employees' Retirement Association	45.7%	7.25%
#20	Houston Municipal Employees Pension System	45.4%	7.00%

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.



Special Section: State of Pension Funds & ESG

- Types of ESG laws that have been adopted
- States that have not adopted any ESG-related rules

WHAT IS ESG: “ENVIRONMENTAL, SOCIAL, AND GOVERNANCE” INVESTING

Last year in “State of Pensions 2022” Equable Institute noted the growing trend of pension fund politicization and divestment. During this past year, more legislation was adopted related to pension funds and ESG than ever before. Here’s what that looks like:

1. Environmental, social, and governance (ESG) considerations are a broad management framework that can guide corporate and government decision-making. Similar frameworks: “stakeholder capitalism” or “sustainable investing.”
2. State pension fund trustees could use ESG factors to guide their asset allocation decisions. Financial asset managers could use ESG factors when making investment decisions. Ratings agencies commonly provide “social scores” for different companies that consider ESG factors, which could guide asset manager decisions. Pension funds could also encourage corporate behaviors (through proxy voting) based on ESG factors.
3. As a framework, ESG considerations can take several forms, such as:

Air and Water Pollution
Clean & Renewable Energy
Carbon Emissions / Fracking
Climate Sustainability
Energy Efficiency
Plastic Pollution

Environmental

Data Privacy
Firearms / Nuclear Weapons
Gender and Racial Diversity
Human Rights
Labor Relations / Working Conditions
Tobacco / “Vice” Products

Social

Audit / Accounting Practices
Board Composition / Diversity
Executive Compensation
Lobbying
Reporting Transparency
Shareholder Rights

Governance

TYPES OF ESG-RELATED LAWS AND FIDUCIARY DECISIONS

1 Proactive laws that require certain actions

- *Ex. State law requires ESG investing* (e.g., Illinois requires its state pension funds' investments to consider "sustainability factors")
- *Ex. State law restricts ESG investing* (e.g., Kansas does not allow assets to be invested with firms that prioritize ESG)

3 Laws requiring "prudent person" decision-making, but which do not have ESG + pension rules

Most states have laws that require all trustees governing pension fund functions and investments to follow prudent person norms related to conduct, including prudent investor rules. Such norms do not make explicit reference to ESG. Fiduciaries can interpret this to mean no ESG-related actions are allowed, or that they are permissible to mitigate risks and ensure long-term returns.

5 Voluntary action by pension fund fiduciaries for or against ESG factors

In some states, pension fund fiduciaries have interpreted the general "prudent investor" rules to include making ESG-related decisions, voluntarily adopting policies such as the "carbon neutral" targets of the [New York Common Fund](#), [NYC pension funds](#), and [CalSTRS](#). In other states, fund managers have interpreted the prudent investor rules differently and either ordered divestment from asset managers who factor ESG and/or explicitly stated in investment policy documents that ESG factors are not to be considered (for example, see Missouri and Nevada).

2 Divestment laws that require unwinding specific investments

- *Ex. State law requires divesting from fossil fuel companies* (e.g., Maine adopted law, and California law under consideration)
- *Ex. State law requires divesting from companies or asset managers that boycott the oil & gas industry* (e.g., Oklahoma)

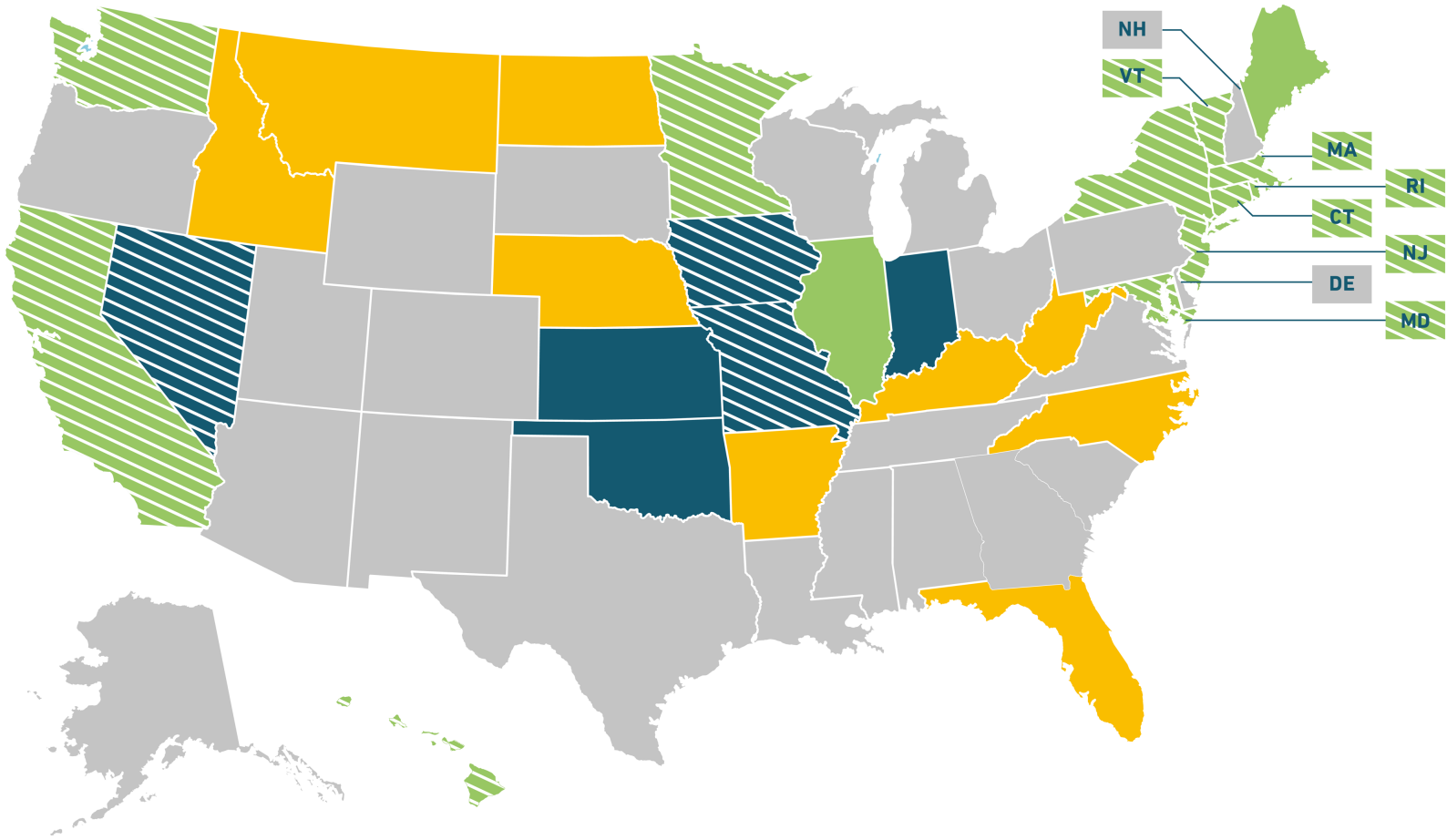
4 Laws that prioritize fiduciary decision-making, but otherwise restrict ESG investments







Laws that require prioritizing fiduciary responsibility or "pecuniary" factors are sometimes equated with restricting ESG-related investments if the statute adds that ESG can't be considered, even though it is already saying that financial factors must drive decision-making. Formally, these laws do not actually restrict an investment that could be classified as ESG so long as that investment has a reasonable financial justification. Some of these laws are generally more permissive of ESG investing (e.g., Arkansas) while most others explicitly aim to push back on ESG unless it can be clearly justified as prudent.

6 Laws that direct proxy voting for or against ESG

Some state laws require that pension funds use their proxy votes to either support or oppose corporate ESG initiatives.

ADOPTION OF ESG-RELATED POLICIES FOR STATE AND LOCAL RETIREMENT SYSTEMS



-  State law requires certain ESG investments or divesting from oil and gas
-  Select pension fund fiduciary managers have chosen to prioritize ESG investment
-  State law has "prudent investor" requirement with no specific pension fund law related to ESG*
-  State law requires fiduciary decision-making, but also explicitly opposes ESG
-  Select pension fund fiduciary managers have chosen to avoid any ESG-related investment
-  State law explicitly restricts ESG investments or requires oil and gas boycott-related divesting

*Colorado and Maryland require their statewide pension funds to publish climate risk assessment, but they do not direct specific investment activity. Texas' anti-ESG law only requires pension fund action if consistent with fiduciary responsibility.

See [this interactive table](#) for more details on each state's laws and conflicting legislation. See Appendix 2 for a list of plans that have taken voluntary action.

Note: See previous page for more details on these categories. This map is focused only on state or municipal rules that are related to pension fund management, outside the scope of the analysis are state laws or executive orders that apply ESG-related frameworks (pro or con) to non-pension fund investments (like state land trusts) or state procurement practices.

PENSION DOLLARS IN THE ESG POLITICAL FIGHT

VALUE OF PORTFOLIOS AS OF 2022

Type of ESG-Related Provisions		# of States	# of Retirement Plans in Those States	Dollar Value of Those Plan's Combined Portfolios
Pro-ESG States	State law requires certain ESG investments or divesting from oil and gas	2	15	\$214.5 Billion
Pro-ESG Trustees	Select pension fund fiduciary managers have chosen to prioritize ESG investment	11	63	\$2,225.9 Billion
Prudent Investor	State law has "prudent investor" requirement with no specific pension fund law related to ESG	22	97	\$1,636.9 Billion
Fiduciary & Anti-ESG	State law requires fiduciary decision-making, but also explicitly opposes ESG	9	22	\$434.3 Billion
Anti-ESG Trustees	Select pension fund fiduciary managers have chosen to avoid any ESG-related investment	3	12	\$176.0 Billion
Anti-ESG States	State law explicitly restricts ESG investments or requires oil and gas boycott-related divesting	3	14	\$98.0 Billion
Total		50	223	\$4.79 Trillion

There are significantly more pension fund assets in states where ESG is treated favorably than in states that oppose ESG.

This is largely driven by pro-ESG trustees in Illinois, New York, and California.

While most laws adopted in 2023 were "Fiduciary & Anti-ESG," the dollar amount of pension assets in those states is less than 10% of nationwide assets.

See [this interactive table](#) for more details on each state's laws and conflicting legislation. See Appendix 2 for a list of plans that have taken voluntary action.

STATE PENSION FUNDS ARE INCREASINGLY BEING POLITICIZED, BUT SO FAR MOST ARE NOT BEING EXPLICITLY GUIDED BY ESG-RELATED LAWS

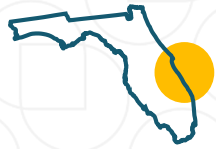
- *22 states have neither a law explicitly linking state pension funds to an ESG-related preference or retirement fund fiduciaries voluntarily addressing ESG (for or against) in their investment policies.*
- *14 states have retirement system trustees making ESG-related decisions on their own, interpreting state laws related to prudent investing. Oregon's treasurer is seeking to make his state the 15th in 2024.*
- *9 states have laws that require pension fund fiduciaries to use only financial factors when making investment decisions.* Such laws generally do not stop pension funds from making investments that would be classified as ESG (such as a solar company or a minority-owned business), they just require that the decisions be justified on fiduciary grounds.
- *Only 5 states have adopted proactive investment laws related to ESG (for or against).* California may be sixth if their State Assembly adopts a proposal from the State Senate to require divestment from the largest 200 fossil fuel companies.
- *Most state ESG-related laws will not meaningfully change how pension funds are invested:*
 - State laws that require divestment *will influence* investments — whether divesting from fossil fuels (or companies with other ESG factors) or divesting from financial firms that boycott fossil fuels.
 - *However,* rules simply requiring fiduciary duty are likely not going to fundamentally change any asset allocation. Investments that are positive for the environment, or voting proxy shares based on certain governance factors, can all be framed as prudent and following a fiduciary duty if wanted.

See [this interactive table](#) for more details on each state's laws and conflicting legislation. See Appendix 2 for a list of plans that have taken voluntary action.

2023 WAS THE LARGEST YEAR OF ESG LEGISLATIVE ACTIVITY

- There were 13 states that adopted a bill, issued a joint resolution (LA), or had an executive order (NH) related to ESG during the spring 2023 legislative sessions. Another 10 states filed ESG-related bills but did not pass them.
- Among these bills, resolutions, and orders adopted in 2023: most (9) require investment decisions to be based solely on financial (pecuniary) factors and *also* make some negative reference to ESG.
 - 2 states (IN, KS) require investment decisions to be based on financial factors but also further appear to require divesting from financial firms that boycott fossil fuels based on the strict text of the statute.
 - Utah similarly passed a new law requiring investment decisions be based solely on pecuniary (financial) factors, but unlike other laws this year it made no explicit reference to ESG in adopting the requirement; any anti-ESG sentiment was implicit not explicit.
 - Arizona's legislature passed a law requiring pension fund investments be based on a fiduciary standard, with anti-ESG sentiments, but it was vetoed by the state governor. (North Carolina's governor vetoed a similar law, which was overridden by the legislature.)
- Just 1 state adopted a pro-ESG law during the year, with Illinois requiring investment fund managers to consider environmental and sustainability factors.
- There are 6 other states with pending ESG legislation as of June 30, 2023, including proposals to divest from fossil fuel companies (CA, VT) and proposals to require only financial/pecuniary factors in investment decisions (OH, SC).
 - Bills introduced and pending in both CT and WA have ESG elements but may not influence pension fund investments.

EXAMPLES OF STATE APPROACHES TO ESG DECISION-MAKING



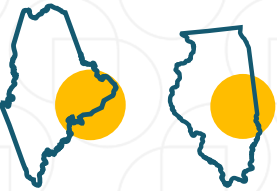
Fiduciary focus on financial or pecuniary factors: Florida versus Indiana

- *Florida's HB3 (2023) says that state pension fund investments must only take into account "pecuniary" factors, which are defined as those "expected to have a material effect on the risk or returns of an investment based on appropriate investment horizons consistent with applicable investment objectives and funding policy. The term does not include the consideration of the furtherance of any social, political, or ideological interests."*
- *Indiana's HB1008 (2023) has almost the same language related to "financial" factors. But it goes further and effectively directs future divestment, saying the state pension fund shall not "continue a contract... with a service provider that has made an ESG commitment unless taking [action] violates the board's fiduciary duty to the system's participants and beneficiaries."*



State law requires ESG consideration: Maine and Illinois

- *Maine law (H65, 2021) requires divesting from fossil fuels by 2026.*
- *Illinois passed two bills (HB2782, SB2152) that require using sustainability factors in investing and proxy voting.*



Retirement system trustees have interpreted ESG investing as fiduciarily responsible

- *New York Common Fund has adopted a "Climate Action Plan" and a "2040 Net Zero Carbon Emissions" target.*
- *New York City Pension Funds have a "2040 Net Zero Emissions" goal and proactively invest in "climate change solutions."*
- *New York State Teachers Retirement System has a "Climate Change Action Plan" that includes some fossil fuel divestment.*



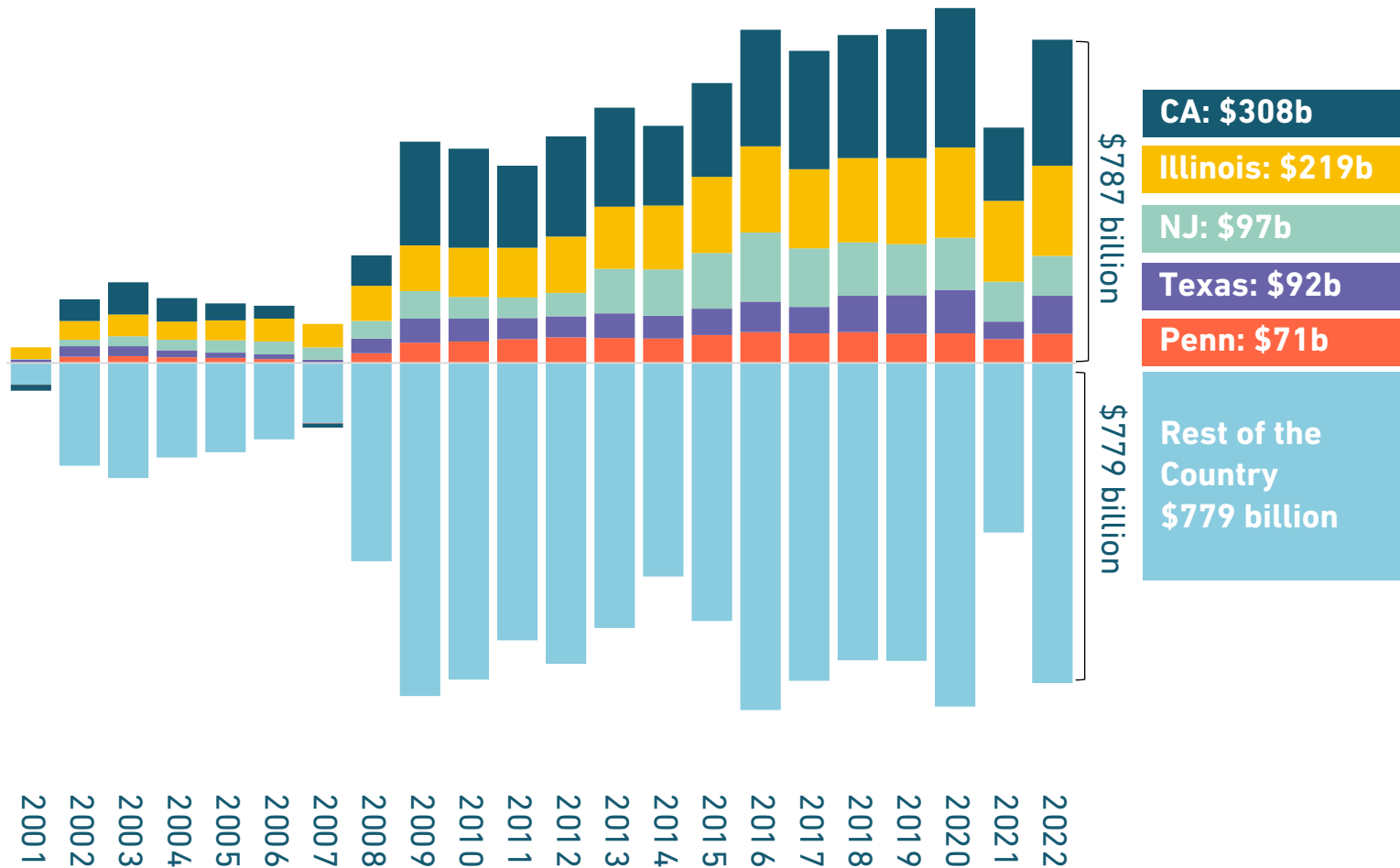


Within the Trends: 2022 Funded Status

- Funded Ratio
- Unfunded Liabilities

UNFUNDED LIABILITY HISTORY

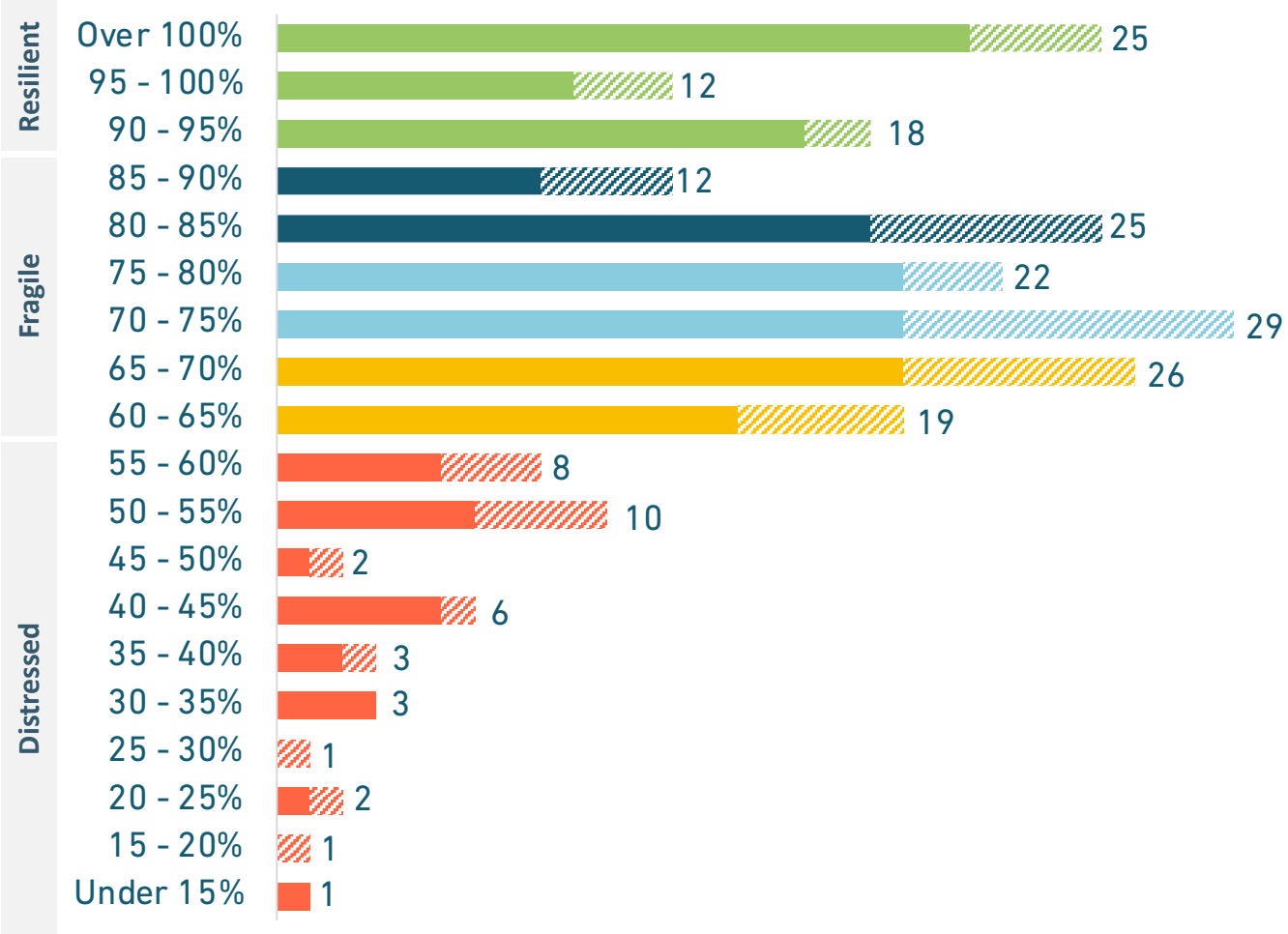
GROUPED BY STATE | 2001–2022



The five largest states by unfunded liabilities have a shortfall (*\$787.3 billion*) that is slightly larger than the rest of the country combined (*\$778.6 billion*).

More than one-third (33.7%) of national unfunded liabilities are in just in just California and Illinois combined (\$527.1 billion).

STATE & LOCAL PENSION PLANS 2022 FUNDED RATIO



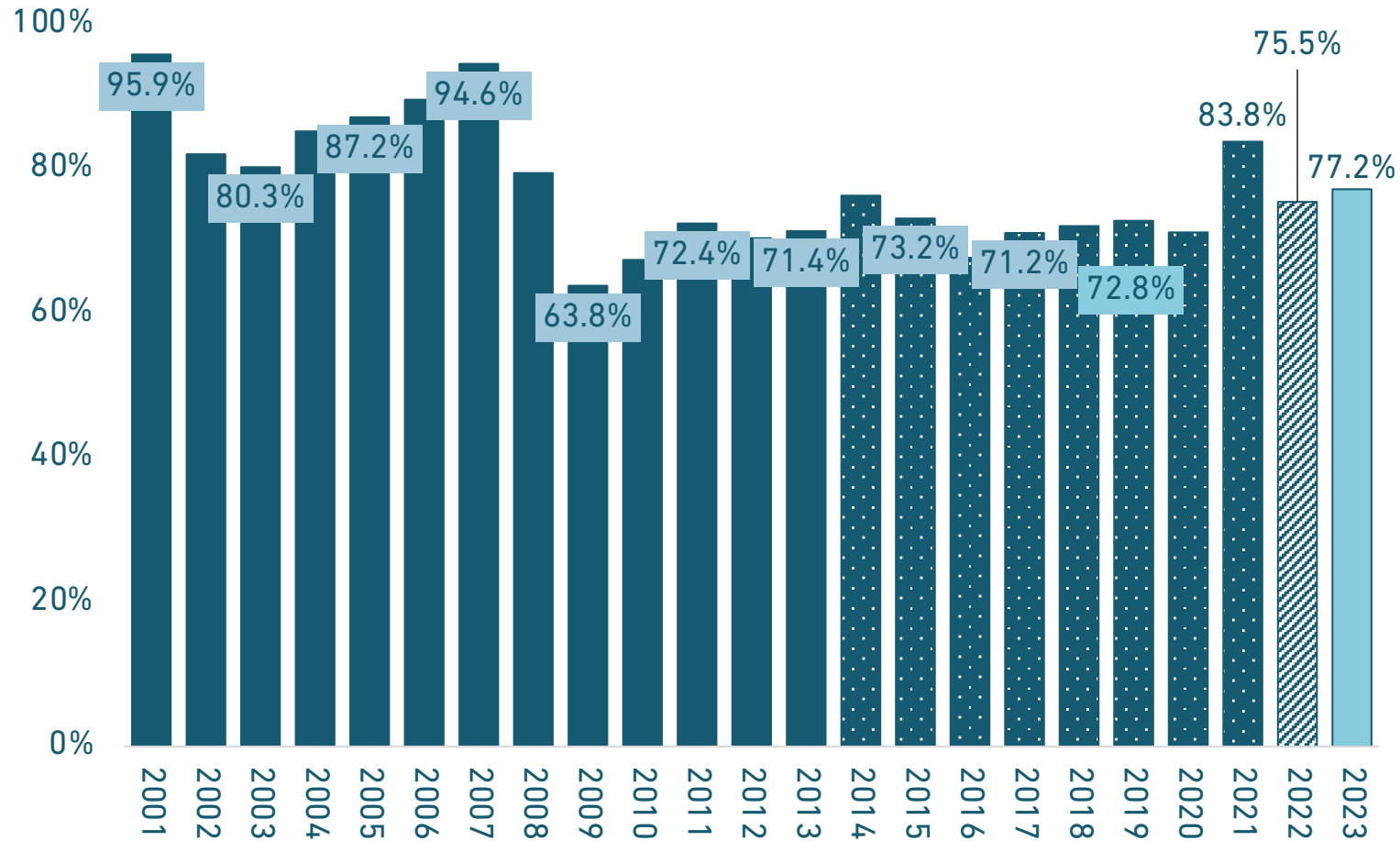
The funded ratio is a quick first look at the health of a pension plan but isn't the only factor to measure. Actuarial assumptions, funding policies, and governance also matter.

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

FUNDED RATIO AVERAGE

FOR STATEWIDE PENSION PLANS ONLY | 2001–2022 + 2023 Estimate



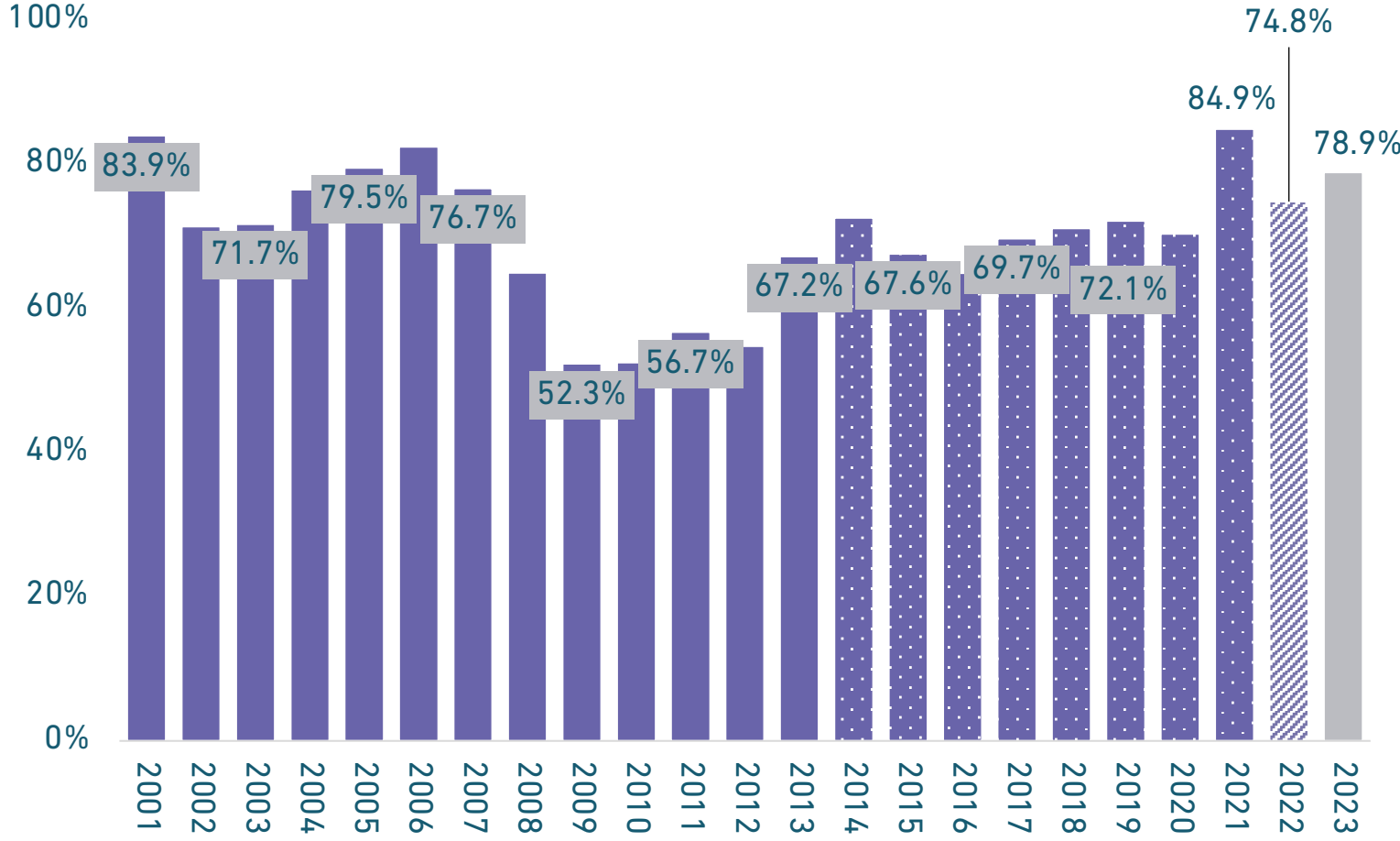
The aggregate funded ratio for statewide plans collectively is worse than in 2008. However, the trend from 2019 to 2023 still shows improvement despite mediocre returns in 2023.

To view funded ratios by state, [click here](#).

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2022 Data Availability
- 2023 Estimate Based on June 30 Returns

FUNDED RATIO AVERAGE

FOR LOCAL PENSION PLANS ONLY | 2001–2022 + 2023 Estimate



The aggregate funded ratio for municipally-managed plans in 2023 is unfortunately under 80%. However, this is still near its highest point in recent history.

- Based on Accrued Liabilities
- Based on Total Pension Liabilities
- Based on 2022 Data Availability
- 2023 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.

2022: THE TOP 10 AND BOTTOM 10 STATEWIDE PLANS AMONG STATE PLANS THAT HAVE REPORTED FYE 2022 DATA

Top 10 Statewide Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#1	Michigan Public Schools Pension Plus 2	179.9%
#2	Washington Law Officers Plans 1 & 2*	126.6%
#3	Michigan Public Schools Pension Plus	115.5%
#4	Utah Firefighters	109.9%
#5	Arizona Public Safety Tier 3	107.2%
#6	Washington PERS Plans 2/3	106.7%
#7	Washington Public Safety Plan 2	106.0%
#8	Tennessee Teachers Legacy Pension	105.4%
#9	Tennessee Teachers Hybrid	104.9%
#10	Washington DC Police & Fire	103.9%

Bottom 10 Statewide Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#158	Illinois Teachers	42.8%
#159	Illinois Judges	42.4%
#160	Illinois State Employees	40.7%
#161	New Jersey Teachers	39.3%
#162	Indiana Teachers Pre-96**	36.4%
#163	New Jersey State Police and Fire	32.9%
#164	Arizona Elected Officials	32.0%
#165	New Jersey State Employees	30.1%
#166	Kentucky State Employees	21.7%
#167	California Judges**	1.9%

2022: THE TOP 10 AND BOTTOM 10 LOCAL PLANS AMONG LOCAL PLANS THAT HAVE REPORTED FYE 2022 DATA

Top 10 Local Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#1	Detroit Police & Fire Plan 1	112.8%
#2	Detroit General Employees Plan 1	106.7%
#3	Montgomery County MD Employees	103.3%
#4	Houston Firefighters	102.6%
#5	New York City Board of Education	97.9%
#6	Los Angeles Fire and Police	97.5%
#7	Los Angeles Water and Power	96.2%
#8	San Francisco City & County Employees	92.4%
#9	Contra Costa County	91.2%
#10	Austin Firefighters	88.3%

Bottom 10 Local Plans, by Funded Ratio

Rank	Plan	Funded Ratio
#49	Chicago Transit	53.5%
#50	Cincinnati Employees	52.8%
#51	Chicago Water	51.4%
#52	Cook County Employees	50.1%
#53	Dallas Police and Firefighters	45.2%
#54	Chicago Teachers	42.4%
#55	Chicago Laborers	39.9%
#56	Chicago Police	25.5%
#57	Chicago Municipal	20.7%
#58	Chicago Firefighters	18.8%

TYPES OF PENSION FUNDS AND THEIR FUNDED STATUS | 2022

	<i>Plan Count</i>	<i>Unfunded Liabilities</i>	<i>Funded Ratio</i>
Statewide Systems & Local Plans for Teachers and Public School Employees Only*	<i>51 Plans</i>	<i>\$624.0 billion</i>	<i>72.5%</i>
Statewide Systems for Higher Education Only	<i>California URS + Illinois SURS</i>	<i>\$50.4 billion</i>	<i>67.4%</i>
Statewide Systems for All Public Employees Doing Any Public Service Job in the State	<i>10 Plans</i>	<i>\$109.0 billion</i>	<i>82.9%</i>
Statewide Systems for State Employees Only	<i>17 Plans</i>	<i>\$193.3 billion</i>	<i>59.8%</i>
Statewide Systems for Municipal Civilian Employees	<i>21 Plans</i>	<i>\$66.6 billion</i>	<i>81.6%</i>
Municipally-Managed Systems for Civilian Employees**	<i>38 Plans</i>	<i>\$118.2 billion</i>	<i>75.9%</i>
Statewide Systems for Public Safety Only***	<i>39 Plans</i>	<i>\$54.8 billion</i>	<i>80.5%</i>
Municipally-Managed Systems for Public Safety Only***	<i>13 Plans</i>	<i>\$41.4 billion</i>	<i>.9%</i>

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).

** 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.

COMPARING CHANGES IN UNFUNDED LIABILITY & FUNDED RATIO STATEWIDE VERSUS LOCAL PLANS

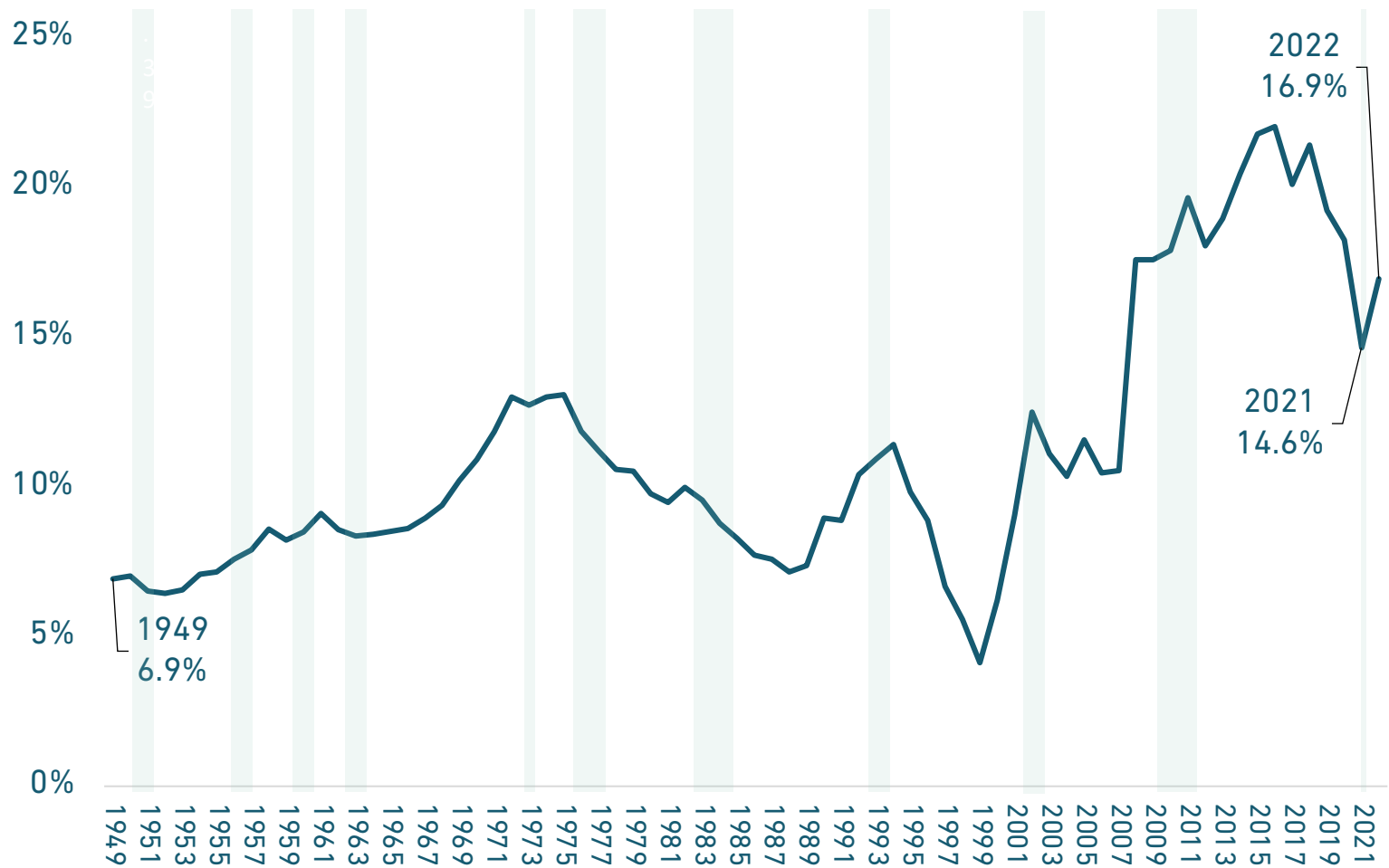
	<i>Statewide Retirement Plan Unfunded Liabilities & Funded Ratio</i>	<i>Municipally-Managed Plan Unfunded Liabilities & Funded Ratio</i>	<i>Combined Unfunded Liabilities & Funded Ratio</i>
2019	<i>\$1.35 trillion 72.8% funded</i>	<i>\$190.3 billion 72.1% funded</i>	<i>\$1.54 trillion 72.8% funded</i>
2020	<i>\$1.49 trillion 71.2% funded</i>	<i>\$212.8 billion 70.3% funded</i>	<i>\$1.70 trillion 71.1% funded</i>
2021	<i>\$0.87 trillion 83.8% funded</i>	<i>\$111.7 billion 84.9% funded</i>	<i>\$0.98 trillion 83.9% funded</i>
2022 (Partially Complete)	<i>\$1.37 trillion 75.5% funded</i>	<i>\$192.7 billion 74.8% funded</i>	<i>\$1.57 trillion 75.4% funded</i>
2023 (Estimate)	<i>\$1.32 trillion 77.2% funded</i>	<i>\$167.3 billion 78.9% funded</i>	<i>\$1.49 trillion 77.4% funded</i>

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 | 1949–2022



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:

2022 State & Municipal Debt: 12.8% GDP

2022 Total Student Debt: 6.9% GDP

2022 Consumer Credit Debt: 3.5% GDP

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 has historically Resilient statewide pension systems — including New York, South Dakota, and Wisconsin. However, in 2022 the funded status of Wisconsin did take a hit down to nearly 90% on a market value of asset basis. Their actuarially valued funded ratio is still 98%, suggesting they will demonstrate their usual resilience in the coming years.
- Roughly half of national unfunded liabilities are for retirement systems that cover teachers and public school employees ([Page 48](#)).
- After significant losses in 2022, only a few plans were above 90% funded: around a quarter (27.5%) of major statewide plans and just 15.5% of municipally managed plans ([Page 43](#)).
- A plurality of state and local plans (59.1%) are Fragile as of 2022, with a funded ratio between 60% and 90% ([Page 43](#)).
- More than 16% of all statewide plans and local plans were Distressed as of 2022 ([Page 43](#)). These plans face a considerable uphill climb to recovery, despite strong returns in 2021, which were followed by sharp losses in 2022. 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 2 to 3 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.

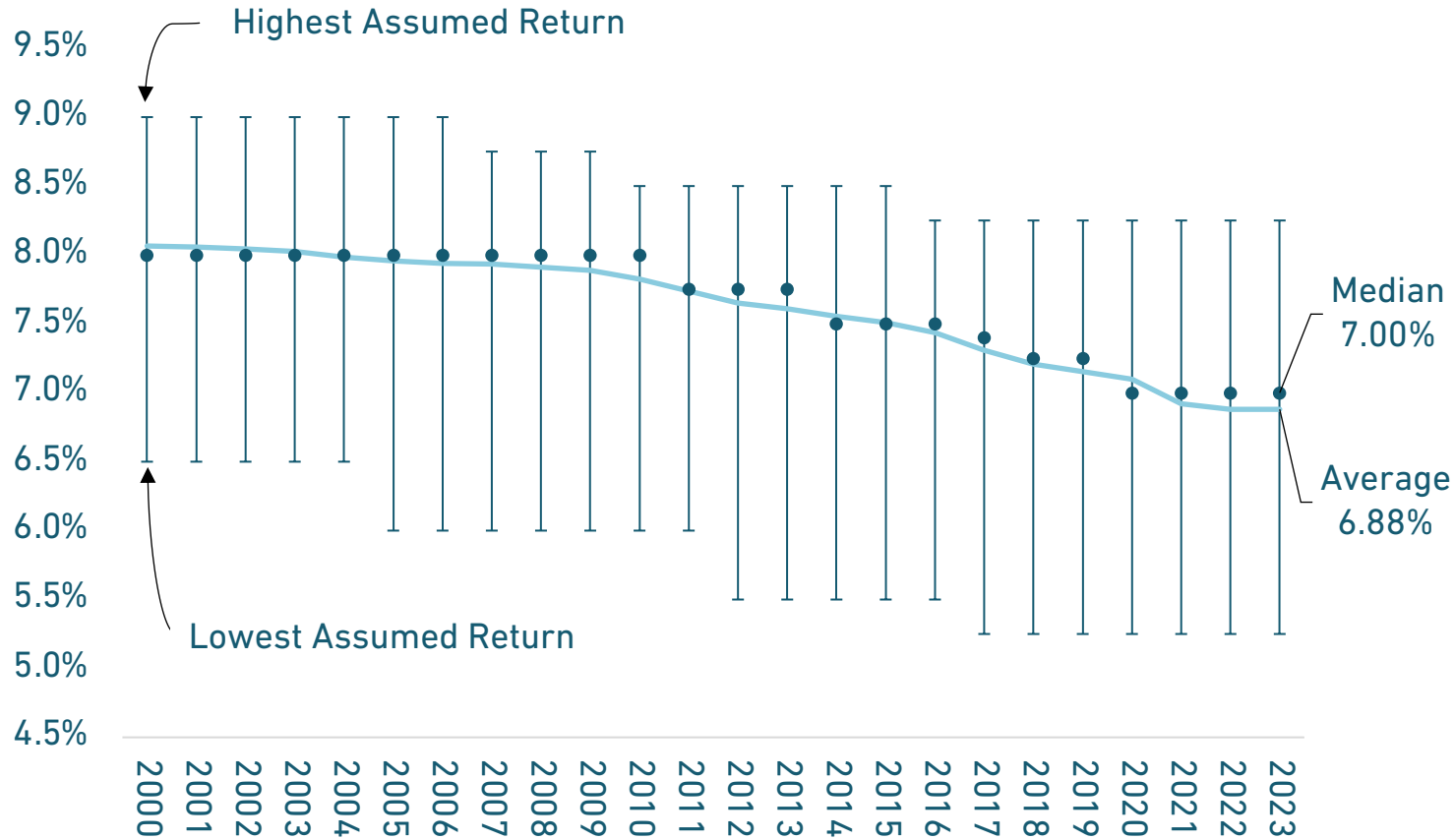
Moody's Analytics uses an alternative process for measuring liabilities from most actuaries and winds up with a discount rate usually 5% or less. Actuarial firm Milliman measures liabilities using an assumed rate of return (6.6%) that is much lower than the national average.



Within the Trends: Investment Assumptions

- Interest Rates
- Assumed Rate of Return

AVERAGE ASSUMED RATE OF RETURN FOR STATE & LOCAL PLANS | 2001–2023

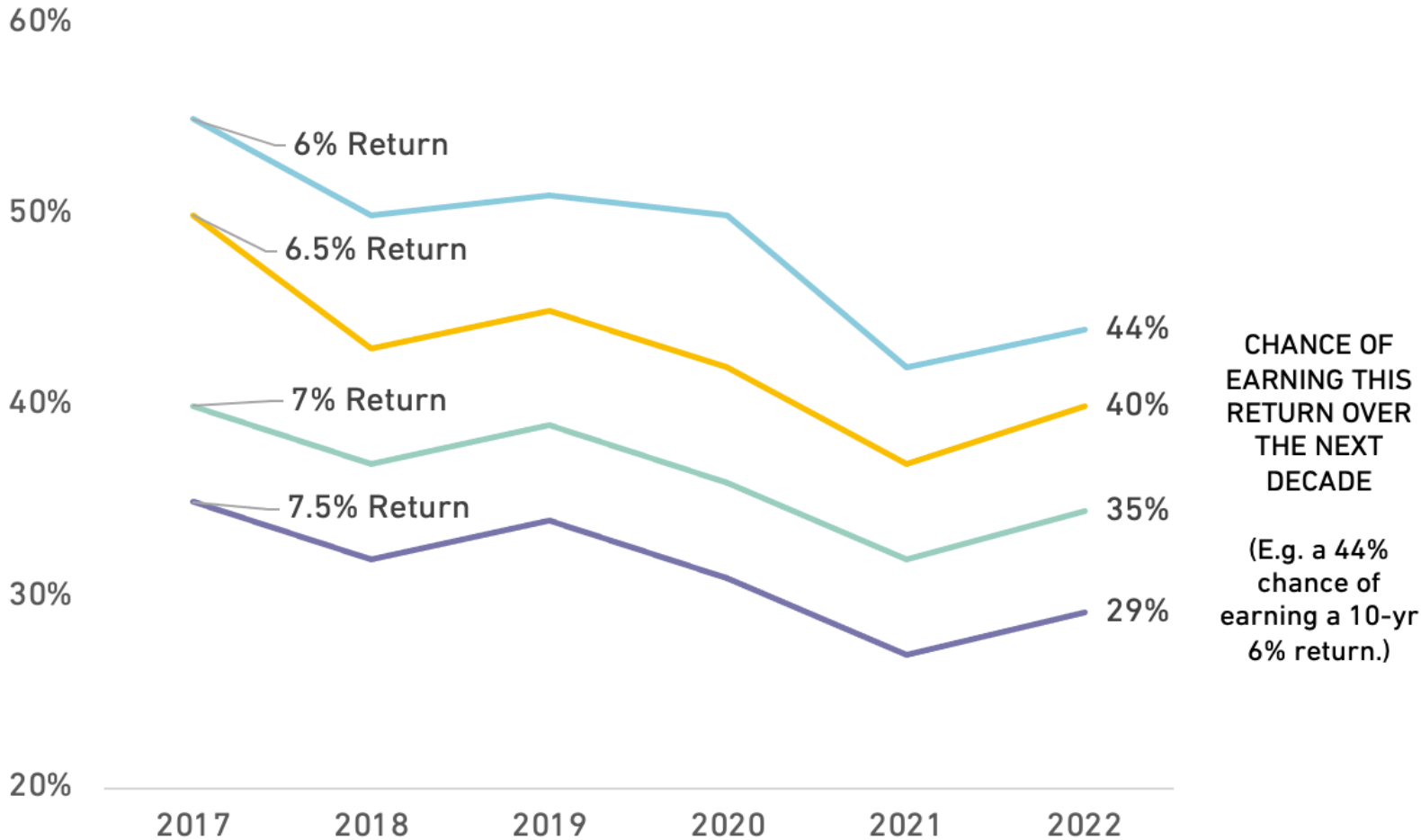


The average assumed rate of return has gradually declined from *8.07%* in 2001 to *6.88%* in 2023.

Over the past two decades there has been a wider range in assumptions adopted by plans. The lowest rate adopted by any plan is *5.25%*.

The highest rate currently used by a statewide plan is *7.55%*, and the highest rate by a local plan is *8.25%*.

PROBABILITY OF A STANDARD PENSION FUND EARNING RETURNS BETWEEN 6% AND 7.5% 10-YEAR CAPITAL MARKET FORECAST AVERAGE



The average financial market forecast of investment returns suggests that a typical pension plan has a 50% chance to earn 5.6% over the next decade or 6.3% over the next 20 years.

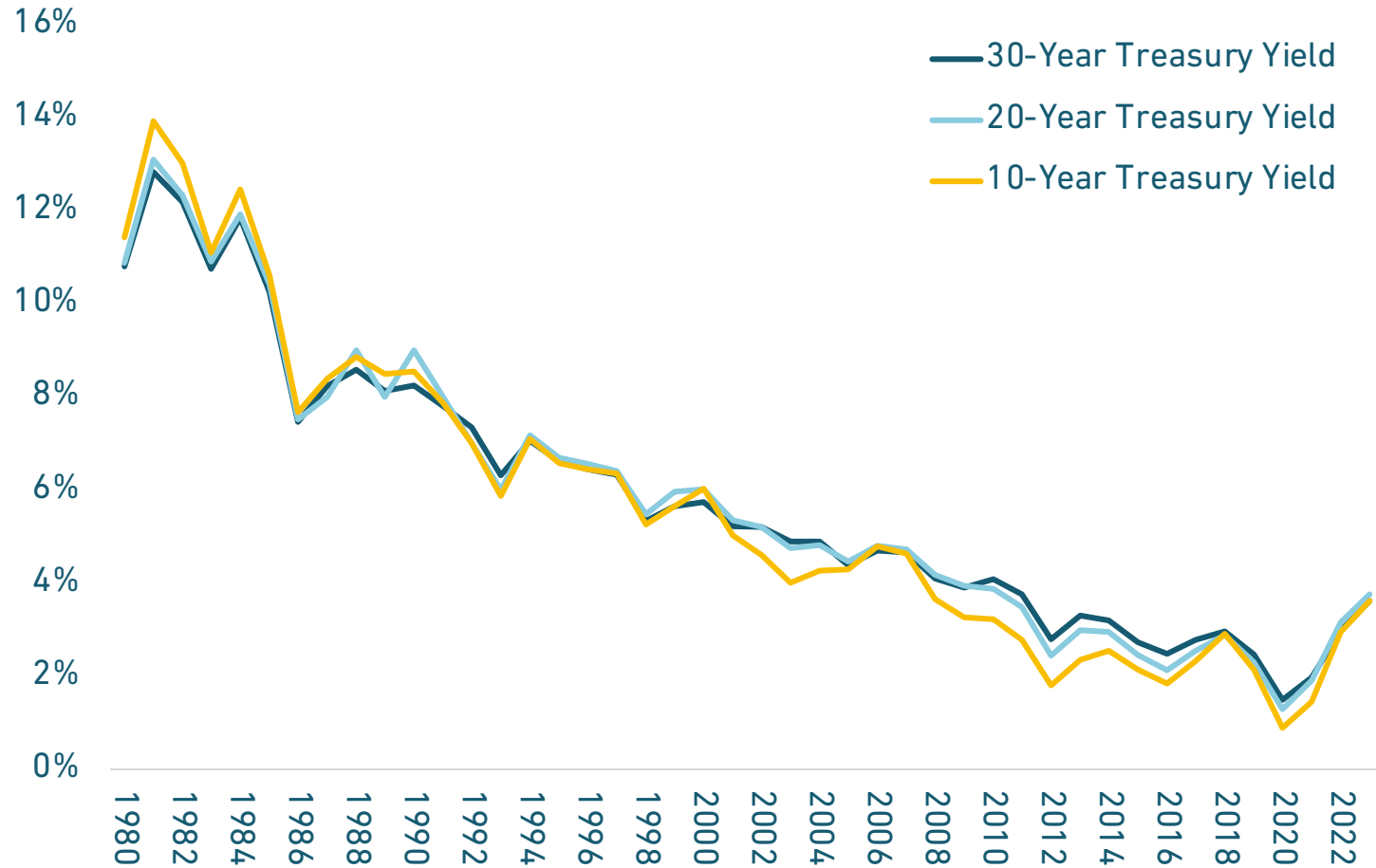
The odds of earning a 7% annual average return over the next decade is *just 35%*, and *only 38%* over the next two decades.

Even a 6.5% return has odds of just 40% to 47% over the next one to two decades, respectively.

- 6% Return over 10-Years
- 6.5% Return over 10-Years
- 7% Return over 10-Years
- 7.5% Return over 10-Years

INTEREST RATE TRENDS

TREASURY YIELDS CHANGE OVER TIME | 1980–2023



One of the most significant events to influence public pensions over the past 50 years was the steady decline in interest rates between 1980 and 2020.

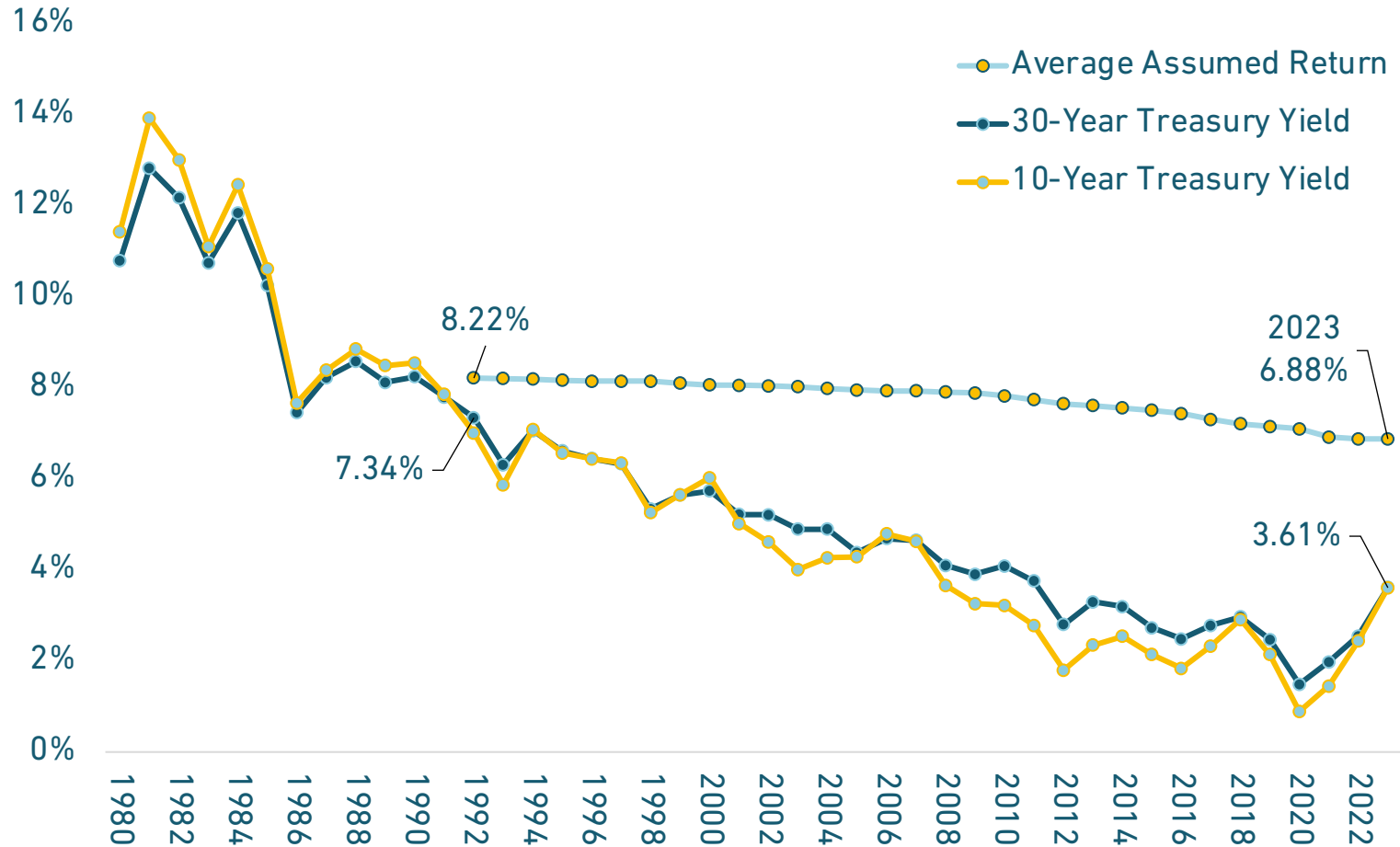
Lower interest rates raised the costs of financial guarantees, like pensions and life insurance.

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.

INTEREST RATE TRENDS

ASSUMED RETURN VERSUS INTEREST RATES | 1980–2023

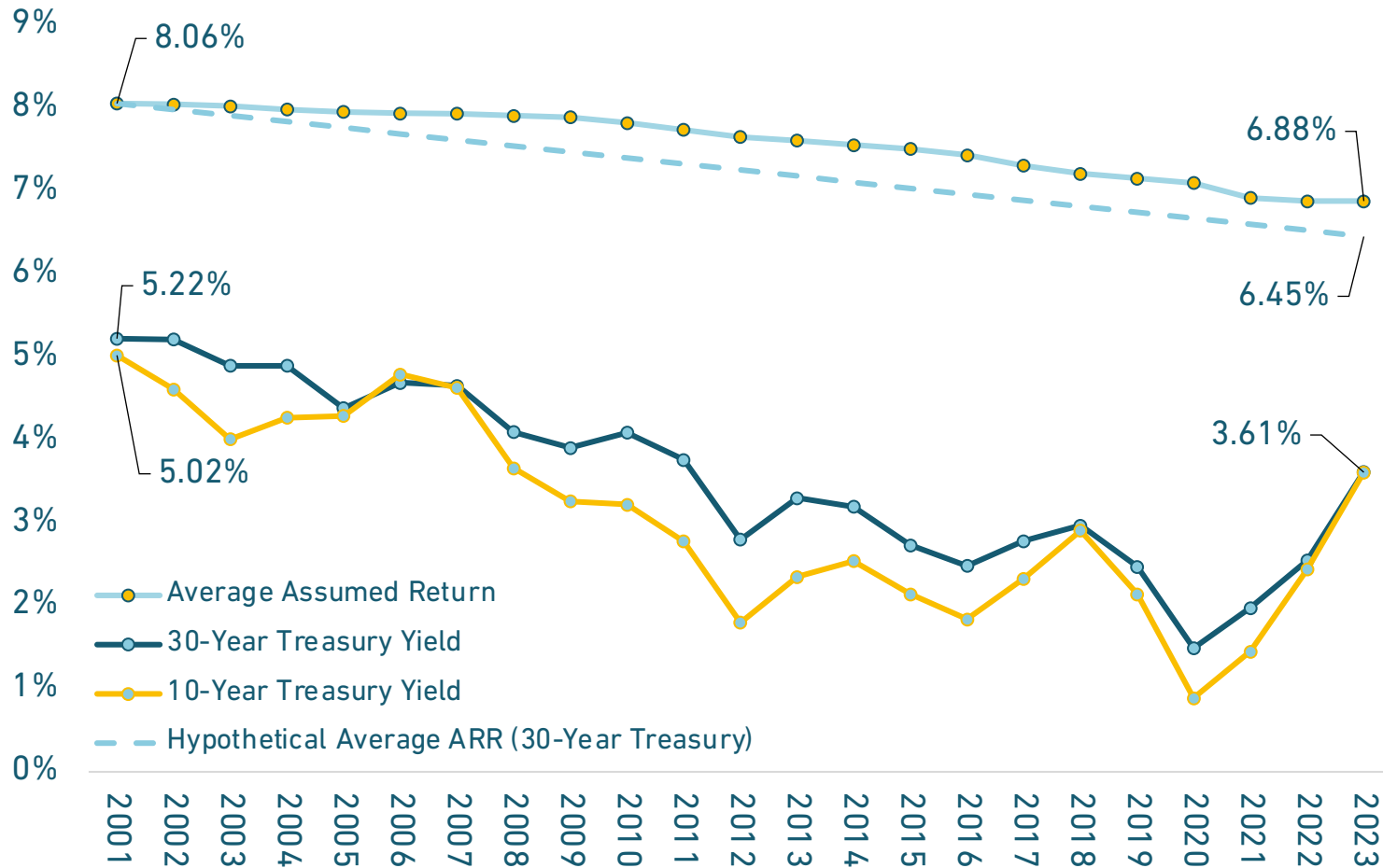


States and pension boards have been slow to reduce their assumed rates of return, relative to declining interest rates.

Even factoring in recent hikes in treasury yields, the gap between interest rates and assumed rates of return reflects an increased amount of risk that pension funds are accepting relative to two or three decades ago.

INTEREST RATE TRENDS

ASSUMED RETURN VERSUS INTEREST RATES | 2001–2023



Looking at the same comparison of assumed returns and interest rates over the past two decades provides a clearer picture of the divergence between these trendlines.

If assumed returns had kept pace with declining interest rates since 2001, the average assumption in 2023 would have been around 6.45%.

For some public plans that is an achievable target in the coming year.

PLANS BEING LEFT BEHIND: ASSUMED RETURNS 7.5% OR HIGHER

AS OF ANNOUNCEMENTS THROUGH JUNE 2023

	Current Assumed Return	Reported Funded Ratio
Chicago Transit Authority Employees Retirement Plan	8.25%	54.99% (2021)
Omaha Police & Fire Retirement System	7.75%	55.1% (2021)
Mississippi Public Employees' Retirement System*	7.55%	59.2% (2022)

Plans with 7.5% Assumed Rates of Return

Arkansas State Highway Employees' Retirement System	Milwaukee (WI) City Employees' Retirement System
Birmingham (AL) Retirement & Relief System	Milwaukee (WI) County Employees' Retirement System
Cincinnati Employees' Retirement System	Montgomery County (MD) Employees' Retirement System
City of Memphis Retirement System	Oklahoma Law Enforcement Retirement System
Iowa Municipal Fire and Police Retirement System	Oklahoma Police Pension and Retirement System
Minnesota General Employees Retirement Plan	Oklahoma Firefighters Pension & Retirement System
Minnesota Public Employees Police & Fire Plan	Ohio Police and Fire Pension Fund
Minnesota State Employees Retirement Fund	Texas County & District Retirement System
Minnesota Teachers Retirement Association	
St. Paul (MN) Teachers Retirement Fund	

The pension board trustees, state legislatures, and municipalities of the plans on these lists are embracing high risks that future asset growth will underperform expectations — leading to unfunded liabilities.

Note: Assumed returns shown are reported in each plan's most recent published actuarial valuation.

* Mississippi PERS has adopted a policy to automatically decrease its assumed rate of return when actual investment returns exceed certain thresholds; that policy suggests there will be no changes to the plan's assumed return in 2023 absent a separate decision by the board of trustees.

Analysis: What We See in the Investment Trends

In 2020, there were 54 state and local pension plans using a 7.5% assumed rate of return or higher, but as of June 2023, 65% of those have since lowered their assumptions. Today there are 19 plans using 7.5% assumed return rates or higher, most of whom were using higher rates back in 2020. Investment assumption patterns are trending down. In fact, there are just two municipally-managed plans with assumptions above 7.55% ([Page 60](#)), and the only statewide plan using a 7.55% assumption (Mississippi PERS) is planning to eventually lower their rate to 7%.

- States have finally moved away from unrealistic 8% investment return assumptions, but it took nearly 15 years. That slow pattern of change, compared to changes in interest rates ([Pages 58 and 59](#)) tacitly meant pension funds took on two competing risks: (1) the risks associated with alternative investments that promise high returns ([Page 13](#)); and (2) the risk that pension funds won't earn their targeted return, in turn leads to a growth in unfunded liabilities.
- The 6.88% average assumed rate of return ([Page 55](#)) 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 5.5% and 7%.

There is a clear trend toward adopting assumed returns below 7% ([Pages 27 and 55](#)). Any state or retirement plan delaying the reduction of their investment assumption to below 7% is falling behind the pattern of other states making meaningful steps away from relatively high assumed returns.

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.

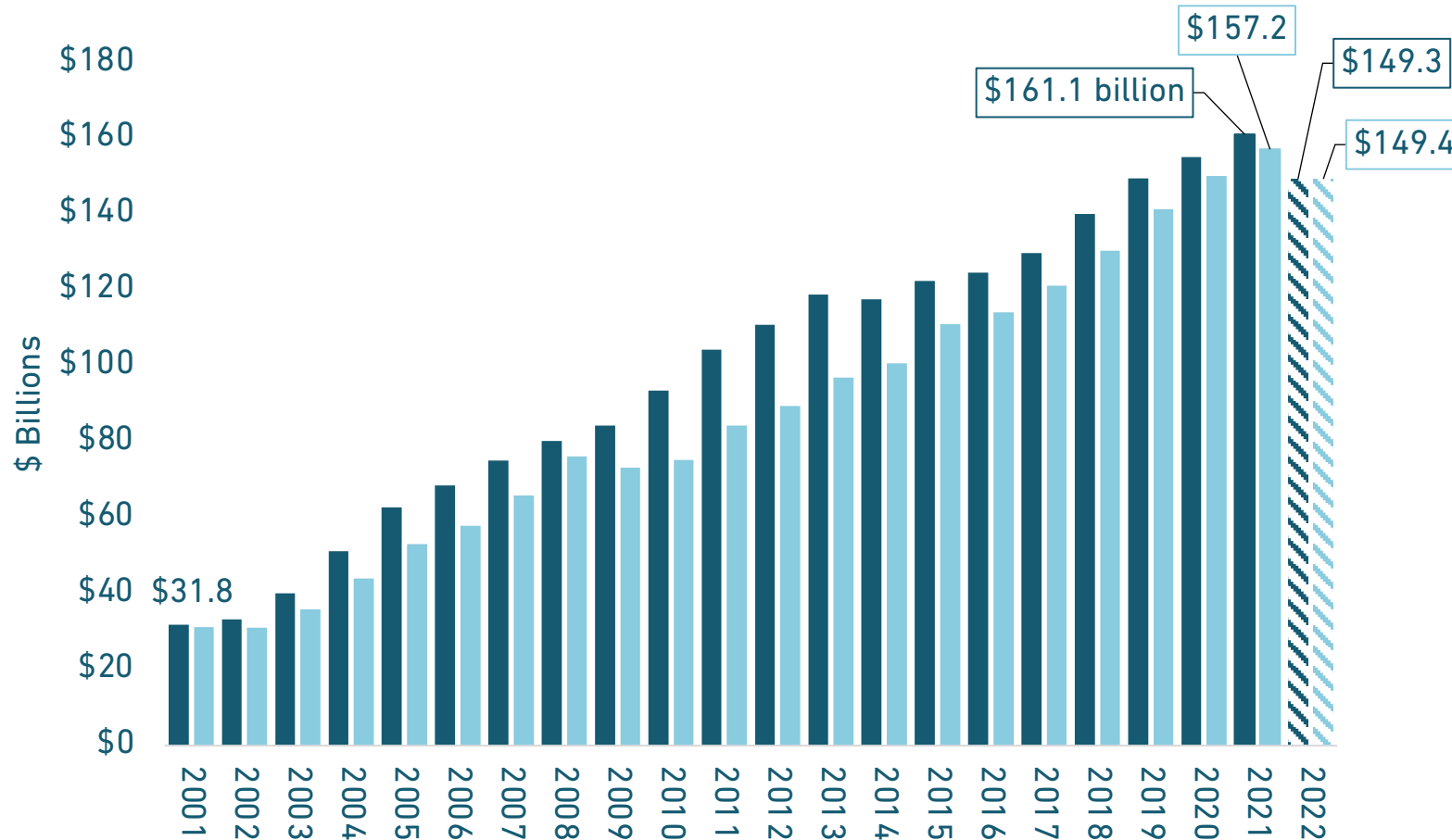
The assumed rate of return is the annual target for a pension fund. Just earning a return greater than 0% is not good enough. If a state plan is assuming 7.25%, then anything less than that will add unfunded liabilities.



Within the Trends: Contribution Policy




- Actuarially Determined Employer Contributions
- Funding Policy Trends

ACTUAL v. REQUIRED EMPLOYER CONTRIBUTIONS | 2001–2022

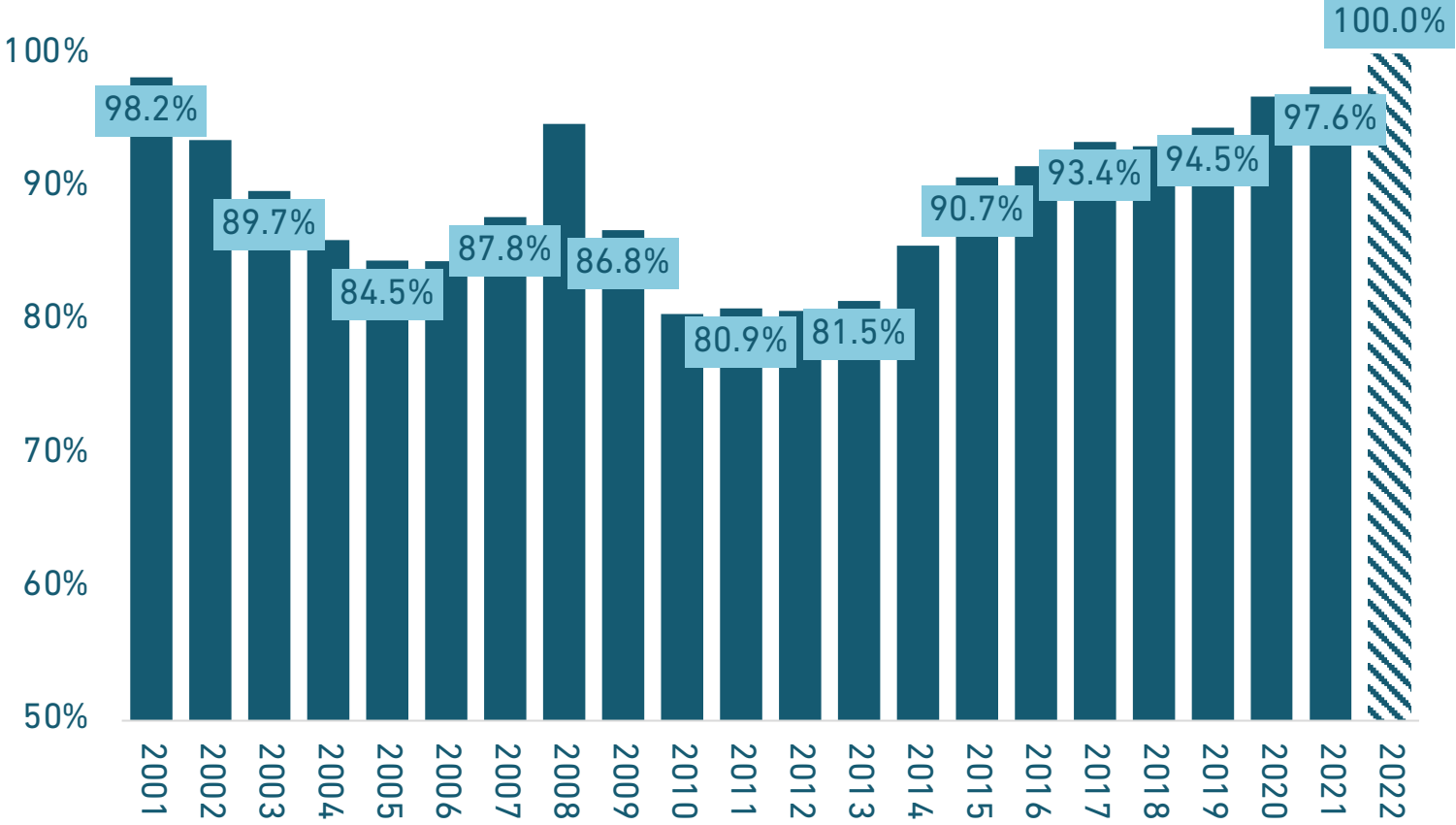


Actuarially required contributions have grown steadily over the past two decades, and in many years, states have struggled to keep up.

The total dollar amount of required contributions that were not paid between 2001-2022 was \$214.4 billion.

-  Actual Contributions (in billions)
-  Required Contributions (in billions)
-  Indicates that the data for 2022 are incomplete. There are 48 plans that have yet to report these data, including CalPERS. The chart will be revised in updates to the report with new data.

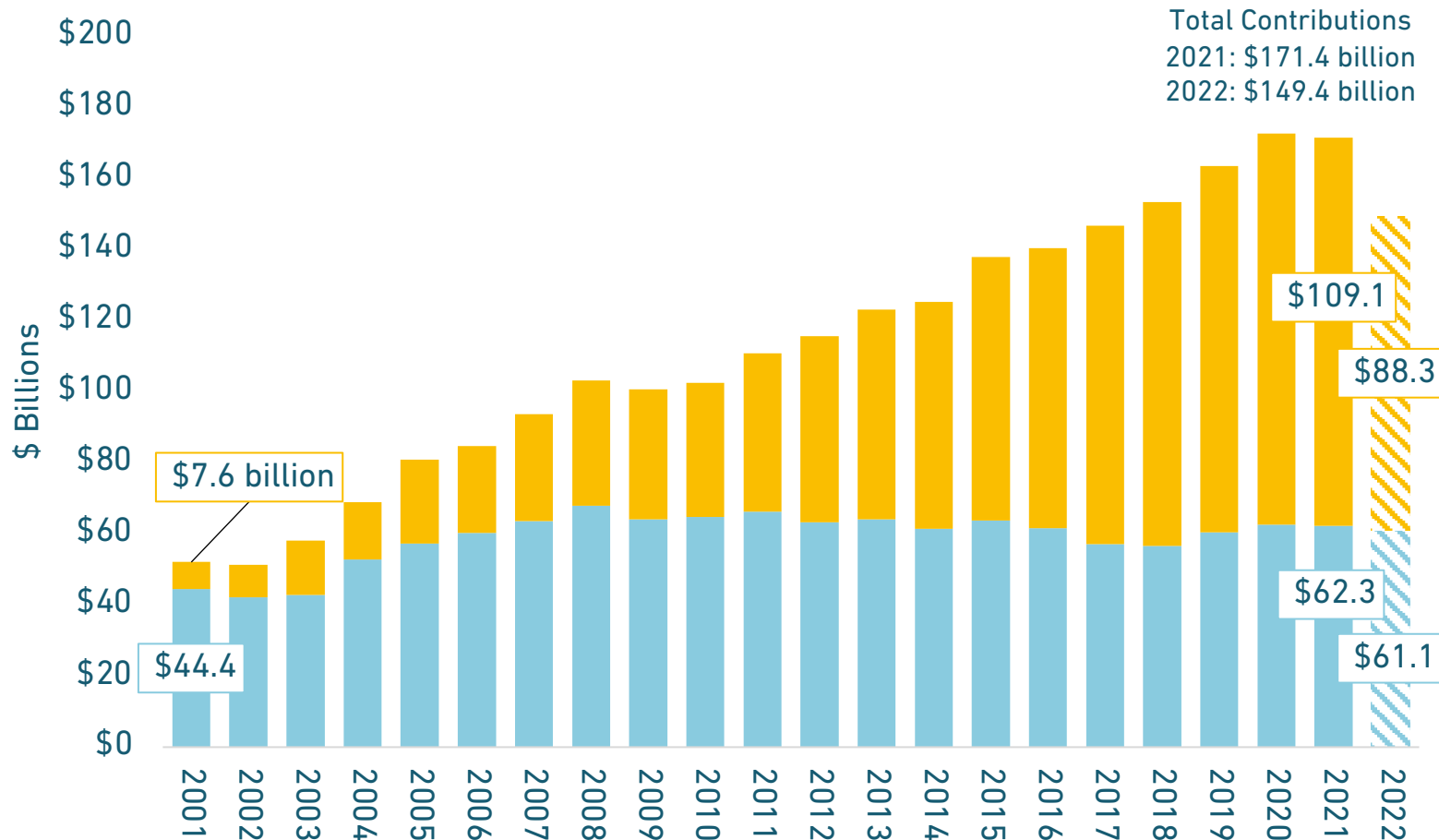
SHARE OF REQUIRED CONTRIBUTIONS PAID BY STATEWIDE PLANS | 2001–2022



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 did not fully fund their required contributions in 2022, on net, states collectively paid closer to the actuarially determined rates than in any year since 2001.

NC v. UAL: INFLATION ADJUSTED HISTORY OF ACTUAL EMPLOYER CONTRIBUTIONS | 2001–2022



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 \$7.6 billion in 2001 to \$109.1 billion in 2021.



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 four-year stretch of paying at least 95% of their collective required contribution — including an estimated 100% paid in 2022, among states that have reported data thus far ([Page 65](#)).

- 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 2022 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 continued the same at the end of its 2023 fiscal year.

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 or not 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 (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, there are a number of states that 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.

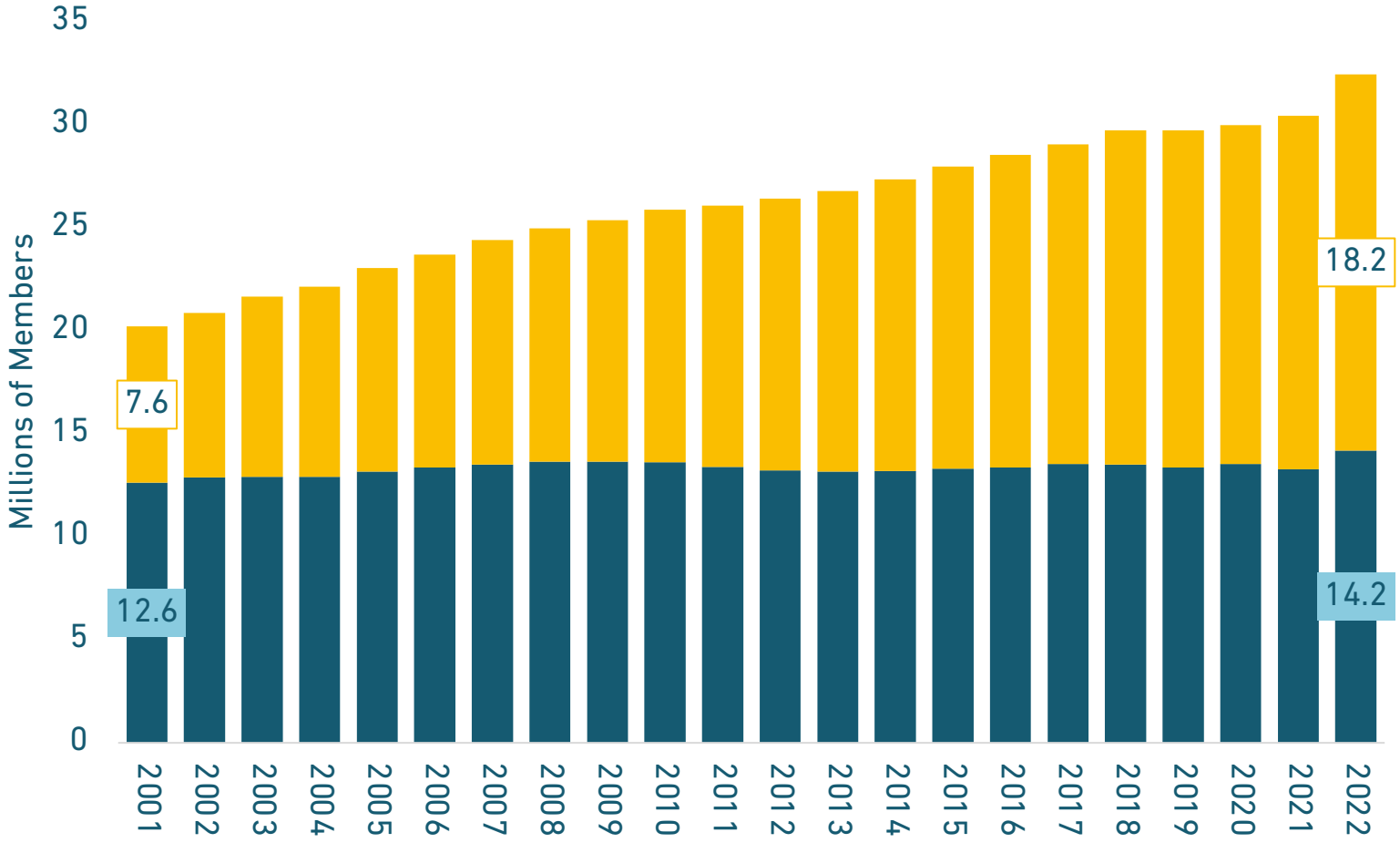
If the assumptions and funding policies are flawed, then the ADC alone cannot put a pension plan on the path to full funding.



Within the Trends: Cash Flows & Maturing Plans

- Active Members to Retirees Ratio
- Benefit to Asset Ratio

RATIO OF ACTIVE MEMBERS TO RETIREES | 2001–2022

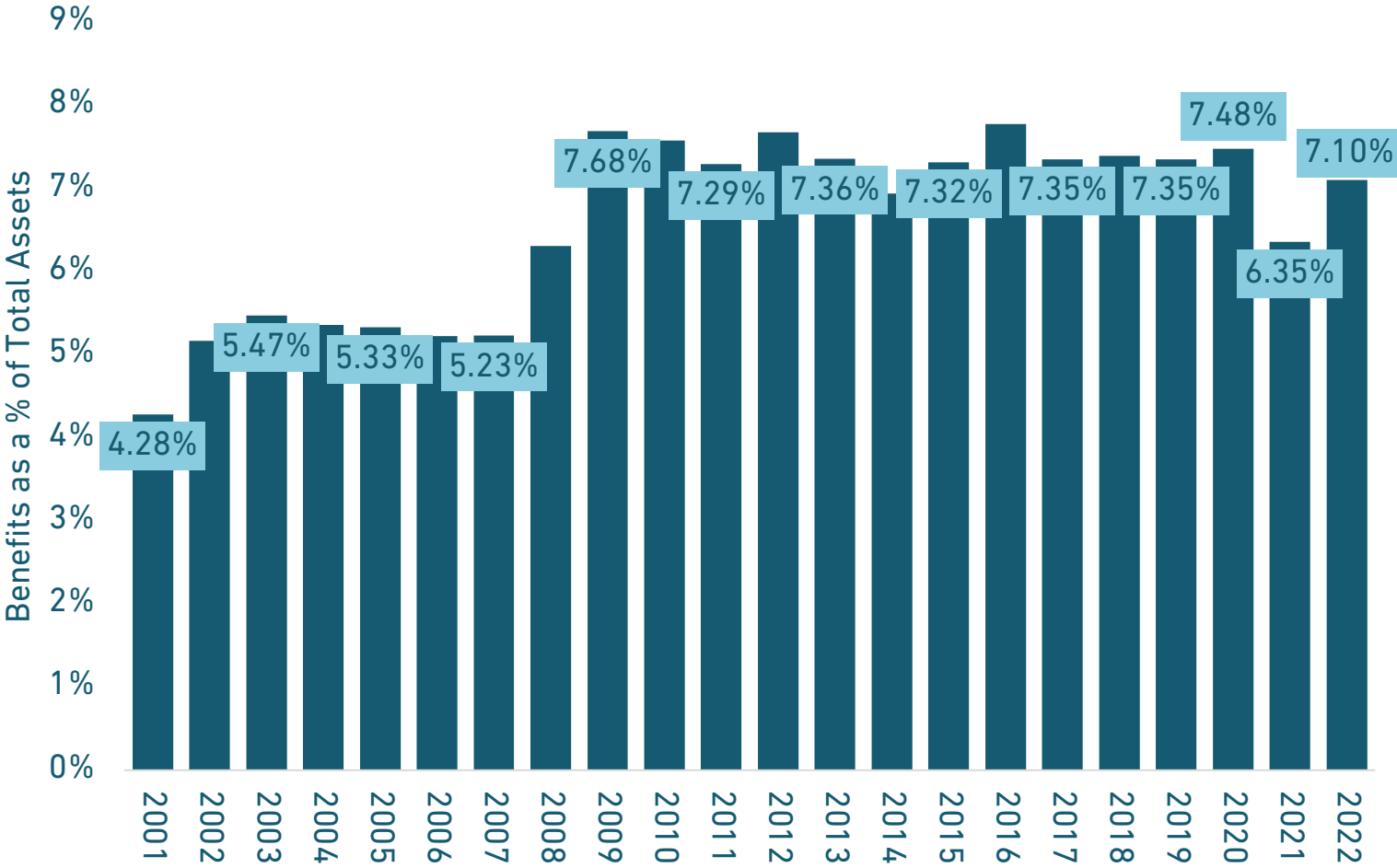


The ratio of active workers to retirees provides a signal about cash flows into and out of pension funds.

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.



BENEFIT PAYMENTS AS A SHARE OF ASSETS | 2001–2022



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.

<i>Benefit : Asset Ratio</i>	
1 : 23	1 : 14
2001	2022

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

Analysis: What We See in the Cash Flow Trends

It is going to be harder in coming years to earn massive investment returns. Plans are cash flow negative from contributions and benefit payments ([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 10](#)).

- Total retirees passed active members for the first time in 2015 ([Page 70](#)). This is driving ever-increasing benefit payments.
- Collectively, there are more benefit payment outflows than contribution inflows ([Page 17](#)), and this is not going to change at any point in the near term. Benefit payments relative to assets are slightly below the ratios displayed throughout the 2010s ([Page 71](#)).
- Because investment returns have been less than expected in most years during the past two decades ([Page 12](#)) and asset values haven't kept up ([Page 10](#)), the ratio of benefits to assets has been trending down since 2001 ([Page 71](#)). 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) and pre-fund benefits for active members (which are not being fully funded, meaning continued unfunded liabilities). 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: (a) the value of the benefits was calculated correctly, and (b) 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. And the existing challenge for statewide pension plans is that promised benefits are outpacing the growth of assets (Page 10). 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 are required to 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 (TPL), 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 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 a long-term period of time.
- **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 that are 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: years worked and 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

ADOPTION OF ESG-RELATED POLICIES FOR STATE AND LOCAL RETIREMENT SYSTEMS

Retirement System Investment Funds That Have Voluntarily Taken Actions Related to ESG

Funds Taking Actions Supporting ESG

California Public Employees' Retirement System
California State Teachers' Retirement System
Connecticut Retirement Plans and Trust Funds
Delaware Public Employees' Retirement System
Hawaii Employees' Retirement System
Maryland State Retirement and Pension System
Massachusetts Pension Reserves Investment Management
Minnesota State Board of Investment
New Jersey Division of Investment
New York State Teachers' Retirement System

New York City Pension Funds
New York State Common Fund
Texas Teachers Retirement System*
Washington State Investment Board

Funds Taking Actions Opposing ESG

Missouri State Employees' Retirement System
Iowa Public Employees' Retirement System
Nevada Public Employees' Retirement System

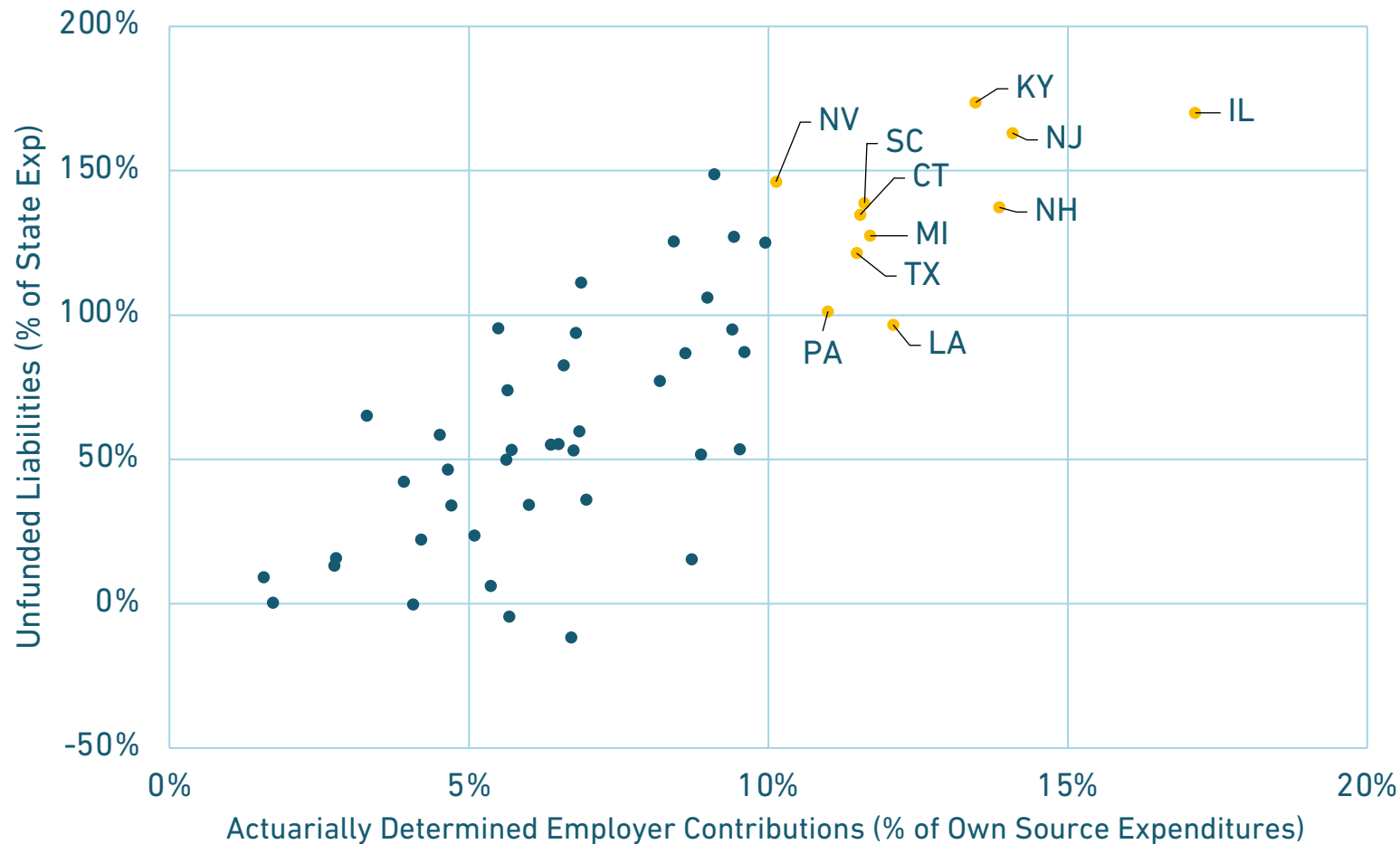
States with Explicitly Pro-ESG or Anti-ESG Laws

Illinois (Pro-ESG)
Maine (Pro-ESG)
Indiana (Anti-ESG)
Nebraska (Anti-ESG)
Oklahoma (Anti-ESG)

States with Fiduciary Decision Requirements, but also Anti-ESG

Arkansas
Florida
Kentucky
Idaho
Montana
Nebraska
North Carolina
North Dakota
West Virginia

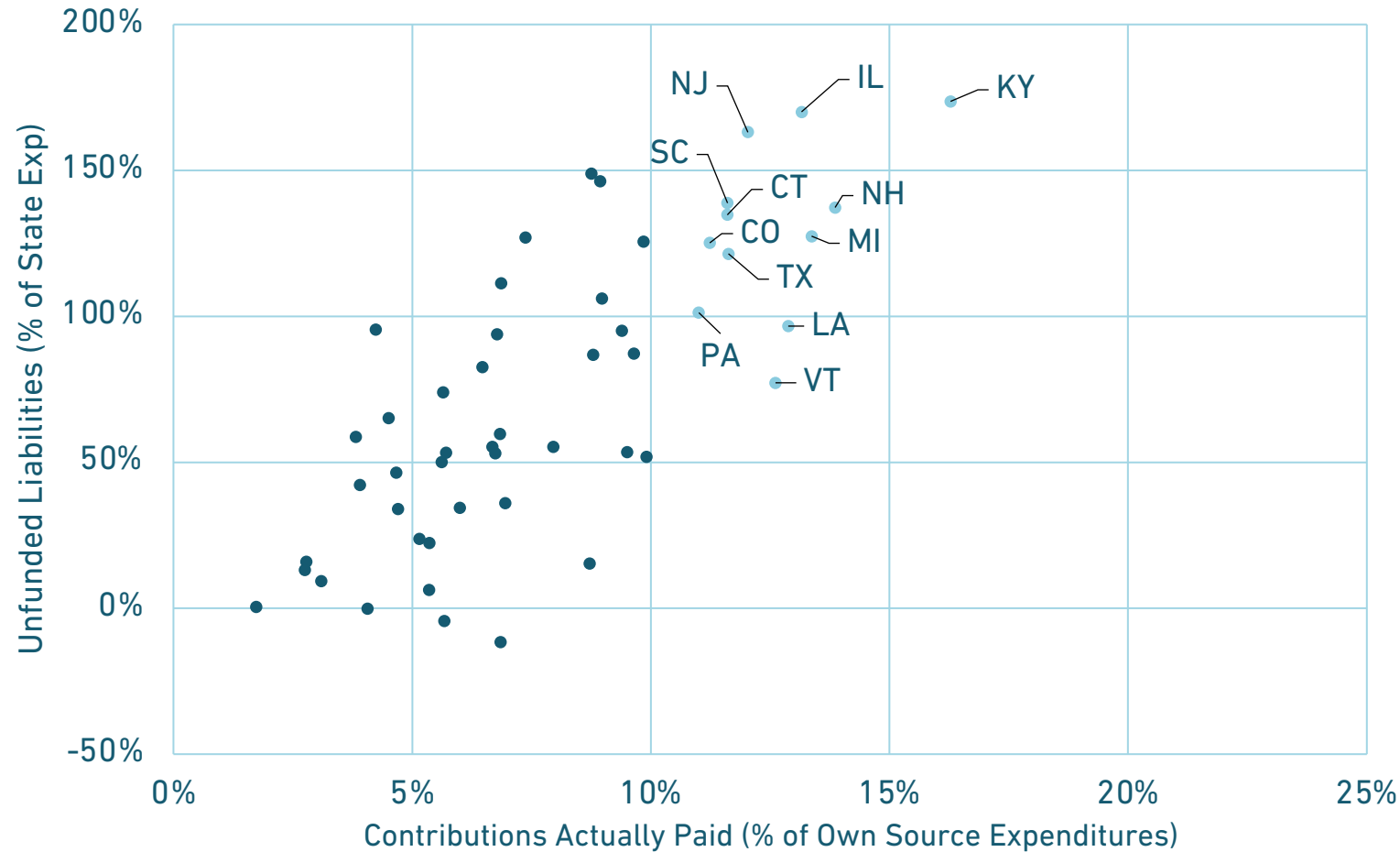
SHARE OF 2022 STATE BUDGETS REQUIRED BY ACTUARIALLY DETERMINED CONTRIBUTIONS



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

	2001	2009	2022
IL	7.0%	10.9%	17.1%
NJ	2.2%	10.1%	14.1%
NH	3.1%	7.9%	13.9%
KY	3.0%	7.3%	13.5%
LA	6.1%	8.3%	12.1%
MI	2.9%	5.7%	11.7%
SC	5.8%	6.9%	11.6%
CT	4.9%	7.6%	11.5%
TX	5.7%	6.4%	11.5%
PA	0.8%	5.8%	11.0%

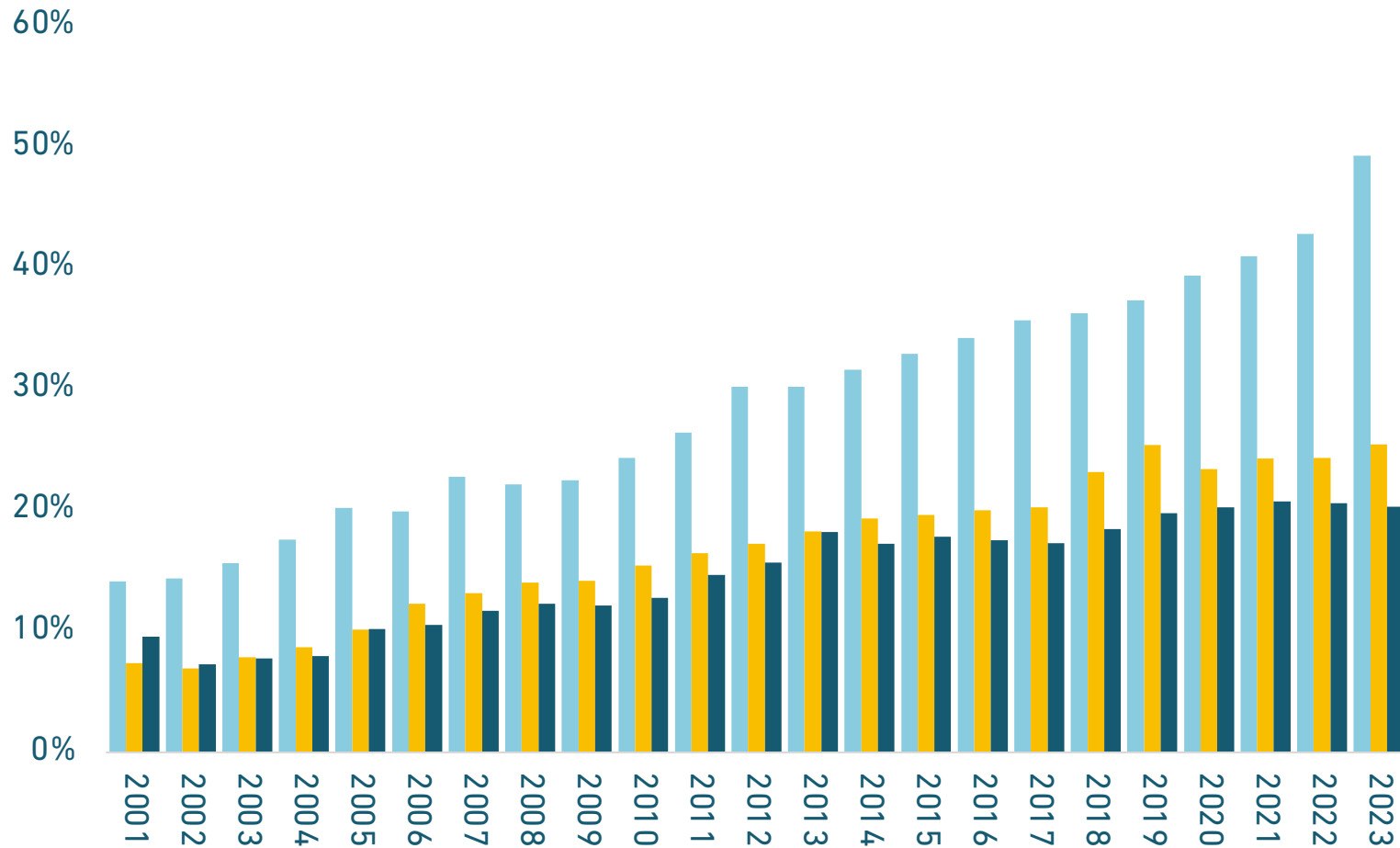
SHARE OF 2022 STATE BUDGETS REQUIRED BY ACTUAL CONTRIBUTIONS PAID



Actual Contributions to Statewide Plans as % of the State's General Fund Budget

	2001	2009	2022
KY	3.2%	5.3%	16.3%
NH	3.1%	7.9%	13.9%
MI	3.1%	5.7%	13.4%
IL	5.8%	8.2%	13.2%
LA	6.7%	8.5%	12.9%
VT	2.4%	2.5%	12.6%
NJ	0.4%	3.0%	12.0%
TX	5.9%	6.2%	11.6%
SC	5.8%	6.9%	11.6%
CT	4.7%	7.3%	11.6%

AVERAGE STATE PLAN EMPLOYER CONTRIBUTIONS BY SOCIAL SECURITY PARTICIPATION | 2001-2023

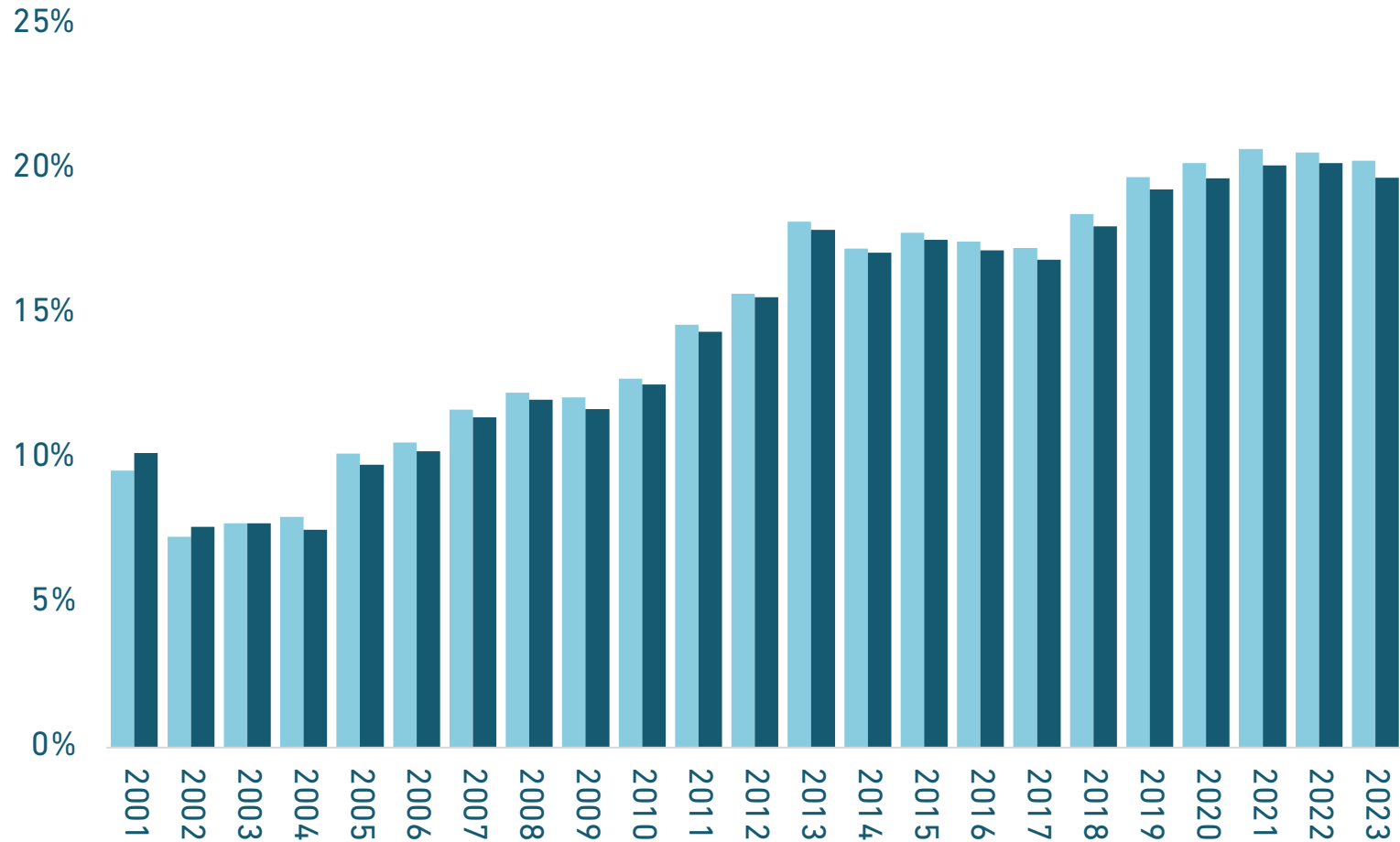


The total employer contribution rates for state and local pension plans vary depending on the degree to which those employers participate in Social Security.

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 Participation in SSA

AVERAGE STATE PLAN EMPLOYER CONTRIBUTIONS FOR MIXED SSA PARTICIPATION PLANS | 2001-2023



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.

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

FUNDING POLICY TRENDS, EXAMPLES SINCE THE GREAT RECESSION: ADOPTING A PLAN TO RAMP UP CONTRIBUTION RATES OVER TIME

● *California Teachers' Retirement System, FY2014-15 to 2023-24*

Phased-in rate increase for district employers (8.25% to 20.25%), members (8% to 9.2% or 10.25% depending on hire date), and the state's supplemental payment; rate changes were modified in 2020.

● *Texas Teachers Retirement System, FY2019-20 to 2024-25*

Phased-in rate increase for the state (6.8% to 8.25% in two steps over five years), members on a two-year delay (7.7% to 8.25% between FY22-24), and district employers (10 basis points steps between FY21-25).

● *South Carolina Retirement System, FY2017-18 to 2022-23*

A five-year, 100-basis point ramp up of employer contributions following a first year 200-basis point increase from the previous 11.56% rate.

● *Arkansas Teachers' Retirement System, FY2019-20 to 2023-24*

District employers and members will each have a 25-basis-point-a-year increase in contributions for four years.

● *Wyoming Retirement System, September 2018 to July 2021*

Member and employer contributions increased in 25 basis point steps up to 9.25% and 9.37%, respectively.

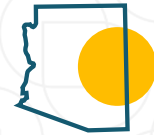
● *New Mexico PERA (State & Local), FY2020-21 to 2025-26*

Member and employer contributions increased 50 basis points a year for four years (two-year delay before municipal employee increase starts).

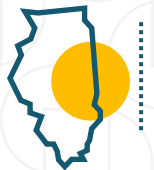
STATES THAT REQUIRE EMPLOYEES TO PAY FOR A PORTION OF UNFUNDED LIABILITY COSTS



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 (7.66% of payroll), meaning they tacitly cover a portion of unfunded liability costs, too.



Ohio TRS (Teachers)
Member contribution rate (14% of payroll) is larger than the normal cost for the plan (10.8% 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.

RISK-SHARING POLICIES ADOPTED SINCE THE GREAT RECESSION

Employer-Employee Cost-Sharing Arrangements

- CalPERS, 50/50 normal cost share (adopted 2012)
- CalSTRS, 50/50 normal cost share (2012)
- AZ Police & Fire Tier 3, 50/50 share (2016)
- AZ Probation Tier 3, 40/60 share (2018)
- MI Teachers Pension Plus 2, 50/50 share (2017)
- ME Local Districts, 55/45 share (2018)

These are preset arrangements that divide up actuarially determined contribution rates between employers and employees based on a fixed percentage. In some cases, the normal cost is divided; in other cases, the entire actuarially determined contribution is divided, including unfunded liability payments.

Variable Employee Contribution Rates

- Utah RS, max employer rate (adopted 2010)
- CT State, linked to ARR change (2017)
- PA State, linked to investment performance (2017)
- PA Teachers, linked to invest. performance (2017)
- CO PERA, linked to ADC change (2018)
- NM State & Local, linked to funded ratio (2020)
- KY Teachers, linked to funded ratio (2021)

These are funding policies that will automatically increase the contribution rate paid by members based on experience, such as a change to the assumed return, actual return, or funded status.

Retiree Risk-Sharing

- MD State & Teachers (adopted 2011)
- RI State & Teachers/Local (2011)
- AZ Police & Fire (2016)
- CO PERA (2018)
- NM State & Local (2020)

These are tools for a pension board to use when funded status declines and usually include reducing cost-of-living adjustments for current retirees. This reduces the unfunded liability level for the pension plan, which in turn reduces required contribution rates from members and employers.

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 167 statewide retirement plans and 58 municipally-managed retirement plans across the 50 states and Washington, D.C. In total, this results in 225 plans that provide benefits for both state and local public employees being included in our analyses. (Note, our data collection includes additional plans — Nashville-Davidson ERS, Omaha Police & Fire, and Providence ERS — however, these have been excluded from this analysis due to extremely limited public data availability for 2021 and 2022 which prevent us from estimating their funded levels and other important information.
- A full list of included plans is available on pages [93 to 96](#).

WHAT YEARS ARE WE MEASURING?

- Our analyses focus on the years 2001 through 2022 (for reported data) and 2023 for our projections.
- We use reported figures for fiscal year ending (FYE) 2022 for all plans that have published their actuarial valuation reports or annual reports for those years. 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 2021 when a roll-forward is not possible.
- We will update this report later this year when all FYE 2022 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 9:** “Funded Ratio Average for Statewide 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 26:** “Distribution of Assumed Rates of Return” shows the current assumed rates of return used by public plans. Most of the rates here are the most recently published in 2020 actuarial valuations. Plans that have announced in the past few months that their boards of trustees have voted to adopt a new assumed rate of return were updated to include that figure in this chart (which will be confirmed when 2021 actuarial valuations are published).
- **Page 35:** “Types of ESG-Related Laws and Fiduciary Decisions” notes that there is a difference between laws governing investments and laws directing proxy voting of shares for public equities. The landscape of proxy voting rules is murkier than for investment rules. The disclosure of such legal frameworks or voluntary investment policies is not always as transparent as rules governing investments generally. However, states that have proactively made some kind of legal choice related to ESG investing have provided similar guidance for how to vote proxy shares. Requirements to vote proxy shares can be narrowly focused on voting for or against corporate directors based on their own ESG positions, or could be broadly defined in directing support or opposition to a range of corporate decisions that are framed as environmental (e.g., a corporate climate change initiative), social (e.g., a corporate policy to extend out-of-state health care benefits for women who live in states that have abortion-rights restrictions), or governance (e.g., a corporate proposal constraining executive compensation).
- **Page 50:** “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; (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), “revolving consumer debt” (Credit Card Debt).
- **Pages 57, 58, & 59:** 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 downward trend.

DATA SOURCES

- Our primary source for state plan data between 2001 and 2022 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.

HOW WE PRODUCED OUR 2023 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 Equity, 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; 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 2023 unfunded liability and funded ratio levels.
- For plans with fiscal years ending later than June 2023, we only rolled their assets and liabilities forward as far as June 30, 2023. 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 2023 to vary from our current estimate.

APPENDIX 4:
STATEWIDE RETIREMENT SYSTEMS
IN OUR DATA SET

RETIREMENT SYSTEMS IN OUR DATA SET (Alameda County – Hartford Muni)

Retirement System Full Name

Alameda County Employees' Retirement Association
 Alaska Public Employees' Retirement System
 Alaska Teachers' Retirement System
 Arizona Corrections Officers Retirement Plan
 Arizona Elected Officials Retirement Plan
 Arizona Public Safety Personnel Retirement System
 Arizona Public Safety Personnel Retirement System – Tier 3
 Arizona State Retirement System
 Arkansas Local Police and Fire Retirement System
 Arkansas Public Employees Retirement System
 Arkansas State Highway Employees Retirement System
 Arkansas Teacher Retirement System
 Atlanta General Employees' Pension Fund
 Atlanta Police Officers' Pension Fund
 Austin Firefighters Relief and Retirement Fund
 Baltimore Fire and Police Employees' Retirement System
 Baton Rouge City Parish Employees' Retirement System
 Birmingham Retirement & Relief System
 Board of Education Retirement System of the City of New York
 California Public Employees Retirement Systems – Judges
 California Public Employees Retirement Systems – PERF
 California Public Employees Retirement Systems – Judges II
 California State Teachers' Retirement System
 Chicago Metropolitan Water Reclamation District Retirement Fund
 Chicago Municipal Employees' Annuity Benefit Fund
 Chicago Policemen's Annuity Benefit Fund
 Cincinnati Employees' Retirement System
 City of Austin Employees' Retirement System
 Colorado Fire and Police Pension Association
 Colorado Public Employees Retirement Association – Judges

Pension Plan Shorthand

Alameda County ERS
 Alaska PERS
 Alaska TRS
 Arizona CORP
 Arizona EORP
 Arizona PSPRS
 Arizona PSPRS Tier 3
 Arizona SRS
 Arkansas Local P&F
 Arkansas PERS
 Arkansas DOT
 Arkansas TRS
 Atlanta ERS
 Atlanta Police
 Austin FRS
 Baltimore Fire and Police
 Baton Rouge City Parish RS
 Birmingham RRS
 New York City BERS
 California JRF
 CalPERS
 California JRF II
 CalSTRS
 Chicago Water
 Chicago Municipal
 Chicago Police
 Cincinatti ERS
 Austin ERS
 Colorado P&F
 Colorado Judges

Colorado Public Employees Retirement Association – Denver Public Schools
 Colorado Public Employees Retirement Association – Local
 Colorado Public Employees Retirement Association – Schools
 Colorado Public Employees Retirement Association – State
 Connecticut Municipal Employees Retirement System
 Connecticut State Employees Retirement System
 Connecticut State Teachers' Retirement System
 Contra Costa County Employees' Retirement Association
 Cook County Employees' Annuity Benefit Fund
 Dallas Police and Firefighters Retirement System
 Delaware State Employees' Pension Plan
 Denver Employees Retirement System
 Detroit General Retirement System - Component I
 Detroit General Retirement System - Component II
 Detroit Police and Fire Retirement System - Component I
 Detroit Police and Fire Retirement System - Component II
 District of Columbia Retirement Board – Teachers
 District of Columbia Retirement Board – Police & Fire
 Educational Employees' Supplementary Retirement System of Fairfax County
 Employees Retirement System of Texas – General
 Employees Retirement System of Texas – LECOS
 Employees' Retirement System of Rhode Island – State
 Employees' Retirement System of Rhode Island - Teachers
 Employees' Retirement System of the State of Hawaii
 Fairfax County Employees' Retirement System
 Firefighters Retirement System of Louisiana
 Firemen's Annuity and Benefit Fund of Chicago
 Florida Retirement System
 Georgia Employees' Retirement System
 Georgia Teachers Retirement System
 Hartford Municipal Employees' Retirement Fund

Colorado DPS
 Colorado Local
 Colorado Schools
 Colorado State
 Connecticut MERS
 Connecticut SERS
 Connecticut STRS
 Contra Costa County
 Cook County ERS
 Dallas PFRS
 Delaware SEPP
 Denver ERS
 Detroit General RS 1
 Detroit General RS 2
 Detroit PFRS 1
 Detroit PFRS 2
 D.C. TRP
 D.C. POFRP
 Fairfax County Schools
 Texas ERS
 Texas LECOS
 Rhode Island ERS-S
 Rhode Island ERS-T
 Hawaii ERS
 Fairfax County ERS
 Louisiana FRS
 Chicago Firemen
 Florida RS
 Georgia ERS
 Georgia TRS
 Hartford MERF

RETIREMENT SYSTEMS IN OUR DATA SET (Houston Fire – Missouri DOT)

Retirement System Full Name

Houston Firefighters Relief and Retirement Fund
 Houston Municipal Employees Pension System
 Illinois Municipal Retirement Fund
 Illinois State Employees Retirement System
 Illinois State Teachers' Retirement System
 Illinois State University Retirement System
 Indiana Public Retirement System – Teachers Pre-96
 Indiana Public Retirement System – 1977 Police & Fire
 Indiana Public Retirement System
 Indiana Public Retirement System – Teachers 1996
 Iowa Municipal Fire and Police Retirement System
 Iowa Public Employees' Retirement System
 Jacksonville General Employees Retirement Plan
 Judges' Retirement System of Illinois
 Kansas City Missouri Employees' Retirement System
 Kansas City Missouri Public School Retirement System
 Kansas Public Employees' Retirement System – Schools
 Kansas Public Employees' Retirement System – Local
 Kansas Public Employees' Retirement System – Judges
 Kansas Public Employees' Retirement System – State
 Kansas Public Employees' Retirement System – Police & Fire
 Kentucky Retirement System – State
 Kentucky Retirement System – County
 Kentucky State Police Retirement System
 Kentucky Teachers' Retirement System
 Kern County Employees' Retirement Association
 Laborers' & Retirement Board and Employees' Annuity and Benefit Fund of Chicago
 Los Angeles City Employees' Retirement System
 Los Angeles City Fire and Police Pension System
 Los Angeles County Employees Retirement Association

Pension Plan Shorthand

Houston PFRS
 Houston MEPS
 Illinois MRF
 Illinois SERS
 Illinois TRS
 Illinois SURS
 Indiana TRF Pre-96
 Indiana 1977 P&F
 Indiana PERF
 Indiana TRF 1996
 Iowa MFPRS
 Iowa PERS
 Jacksonville ERS
 Illinois JRS
 Kansas City Missouri ERS
 Kansas City Missouri Schools
 Kansas PERS-T
 Kansas PERS-L
 Kansas JRS
 Kansas PERS-S
 Kansas PF
 Kentucky ERS
 Kentucky CERS
 Kentucky SPRS
 Kentucky TRS
 Kern County ERS
 Chicago Laborers
 Los Angeles ERS
 Los Angeles Fire and Police
 LA County ERS

Los Angeles Water and Power Employees' Retirement Plan
 Louisiana Municipal Employees Retirement System
 Louisiana Municipal Employees Retirement System
 Louisiana Municipal Police Employees Retirement System
 Louisiana School Employees' Retirement System
 Louisiana State Employees' Retirement System
 Louisiana State Parochial Employees Retirement System
 Louisiana State Parochial Employees Retirement System
 Louisiana State Police Retirement System
 Louisiana Teachers' Retirement System
 Maine Public Employees Retirement System – Local
 Maine Public Employees Retirement System – State & Teacher
 Maryland State Retirement and Pension System – Teachers
 Maryland State Retirement and Pension System – General
 Massachusetts State Employees' Retirement System
 Massachusetts Teachers' Retirement System
 Miami Firefighters' and Police Officers' Retirement Trust
 Michigan Municipal Employees' Retirement System
 Michigan Public School Employees' Retirement System
 Michigan Public School Employees' Retirement System – Pension Plus 2
 Michigan Public School Employees' Retirement System – Pension Plus
 Michigan State Employees' Retirement System
 Michigan State Police Retirement System
 Milwaukee City Employees' Retirement System
 Milwaukee County Employees' Retirement System
 Minnesota Public Employees Retirement Association – General
 Minnesota Public Employees Retirement Association – Police & Fire
 Minnesota State Employees Retirement Fund
 Minnesota Teachers Retirement Association
 Missouri Department of Transportation and Highway Patrol Employees' Retirement System

Los Angeles Water and Power
 Louisiana MERS A
 Louisiana MERS B
 Louisiana MPERS
 Louisiana SRS
 Louisiana LASERS
 Louisiana SPERS A
 Louisiana SPERS B
 Louisiana SPRS
 Louisiana TRS
 Maine CPPLD
 Maine SETP
 Maryland TCS
 Maryland ECS
 Massachusetts SERS
 Massachusetts TRS
 Miami Fire and Police
 Michigan MERS
 Michigan PSERS
 Michigan PSERS PPP2
 Michigan PSERS PPP
 Michigan SERS
 Michigan SPRS
 Milwaukee City ERS
 Milwaukee County ERS
 Minnesota GERF
 Minnesota PEPFP
 Minnesota SERF
 Minnesota TRA
 Missouri DOT

RETIREMENT SYSTEMS IN OUR DATA SET (Missouri LGERS – San Diego City)

Retirement System Full Name

Missouri Local Government Employees Retirement System
 Missouri PSRS/PEERS Combined System
 Missouri PSRS/PEERS Combined System
 Missouri State Employees' Retirement System
 Montana Public Employees' Retirement System
 Montana Teachers' Retirement System
 Montgomery County (MD) Employees' Retirement System
 Municipal Employees' Retirement System of Rhode Island
 Nashville Davidson Metropolitan Employee Benefit System *
 Nebraska Public Employees Retirement System - State Employees Cash Balance
 Nebraska Public Employees Retirement Systems - School Employees Plan
 New Hampshire Retirement System
 New Jersey Police & Firemen's Retirement System – State
 New Jersey Police & Firemen's Retirement System – Local
 New Jersey Public Employees' Retirement System – Local
 New Jersey Public Employees' Retirement System – State
 New Jersey Teachers' Pension & Annuity Fund
 New Mexico Educational Retirement Board
 New Mexico Public Employees Retirement Association
 New York City Employees' Retirement System
 New York City Fire Pension Fund
 New York Police Pension Fund
 New York State Teachers' Retirement System
 New York State and Local Retirement System – Police & Fire
 New York State and Local Retirement System – State
 North Carolina Total Retirement Plans – Teachers and State Employees
 North Carolina Total Retirement Plans – Local
 North Dakota Public Employees Retirement System
 North Dakota Teachers' Fund for Retirement
 Ohio Highway Patrol Retirement System

Pension Plan Shorthand

Missouri LGERS
 Missouri PSRS
 Missouri PEERS
 Missouri SERS
 Montana PERS
 Montana TRS
 Montgomery Co. Maryland ERS
 Rhode Island MERS
 Nashville-Davidson ERS *
 Nebraska PERS-CB
 Nebraska SEP
 New Hampshire RS
 New Jersey PFRS-S
 New Jersey PFRS-L
 New Jersey PERS-L
 New Jersey PERS-S
 New Jersey TPAF
 New Mexico ERB
 New Mexico PERA
 New York City ERS
 New York City Fire
 New York City Police
 New York STRS
 New York SLRS PFRS
 New York SLRS ERS
 North Carolina TSERS
 North Carolina LGERS
 North Dakota PERS
 North Dakota TFR
 Ohio HRS
 Ohio Police and Fire Pension Fund
 Ohio Public Employees' Retirement System
 Ohio School Employees' Retirement System
 Ohio State Teachers' Retirement System
 Oklahoma Firefighters Pension & Retirement System
 Oklahoma Law Enforcement Retirement System
 Oklahoma Police Pension and Retirement System
 Oklahoma Public Employees Retirement System
 Oklahoma Teachers' Retirement System
 Omaha Police & Fire Retirement System *
 Orange County Employees Retirement System
 Oregon Public Employees Retirement System
 Pennsylvania Municipal Retirement System
 Pennsylvania Public School Employees' Retirement System
 Pennsylvania State Employees' Retirement System
 Philadelphia Municipal Retirement System
 Phoenix Employees' Retirement System
 Providence Employee Retirement System *
 Public Employee Retirement System of Idaho
 Public Employees' Retirement System of Mississippi
 Public Employee's Retirement System of Nevada – Regular
 Public Employee's Retirement System of Nevada – Police & Fire
 Public School Retirement System of the City of St. Louis
 Public School Teachers' Pension and Retirement Fund of Chicago
 Retirement Plan for Chicago Transit Authority Employees
 Retirement Systems of Alabama – State Employees
 Retirement Systems of Alabama – Teachers
 Richmond Retirement System
 Sacramento County Employees' Retirement System
 San Diego City Employees' Retirement System

Ohio PFPF
 Ohio PERS
 Ohio SERS
 Ohio STRS
 Oklahoma FRS
 Oklahoma LERS
 Oklahoma PPRS
 Oklahoma PERS
 Oklahoma TRS
 Omaha Police and Fire *
 Orange County ERS
 Oregon PERS
 Pennsylvania MRS
 Pennsylvania PSERS
 Pennsylvania SERS
 Philadelphia Municipal
 Phoenix ERS
 Providence ERS *
 Idaho PERS
 Mississippi PERS
 Nevada PERS-R
 Nevada PERS-PF
 St. Louis School Employees
 Chicago Teachers
 Chicago Transit
 Alabama ERS
 Alabama TRS
 Richmond RS
 Sacramento County ERS
 San Diego City ERS

RETIREMENT SYSTEMS IN OUR DATA SET (San Diego County - Wyoming)

Retirement System Full Name

San Diego County Employees Retirement Association
 San Francisco City & County Employees' Retirement System
 Seattle Employees' Retirement System
 South Carolina Police Officers' Retirement System
 South Carolina Retirement System
 South Dakota Retirement System
 St. Paul Teachers Retirement Fund
 State Police Retirement System of New Jersey
 Teachers' Retirement System of the City of New York
 Tennessee Consolidated Retirement System – Teachers
 Tennessee Consolidated Retirement System – Public Employees Plan
 Tennessee Consolidated Retirement System – Teacher Legacy Plan
 Texas County & District Retirement System
 Texas Municipal Retirement System
 Texas Teachers Retirement System
 Tucson Supplemental Retirement System
 University of California Retirement System
 Utah Retirement System – Public Safety Noncontributory
 Utah Retirement System – Judges
 Utah Retirement System – Contributory
 Utah Retirement System – Fire
 Utah Retirement System – Public Safety Contributory Tier 2
 Utah Retirement System – Contributory Tier 2
 Utah Retirement System – Noncontributory
 Utah Retirement System – Public Safety Contributory
 Vermont Municipal Employees' Retirement System
 Vermont State Employees' Retirement System
 Vermont State Teachers' Retirement System
 Virginia Retirement System – Judges

Pension Plan Shorthand

San Diego County
 San Francisco City & County
 Seattle ERS
 South Carolina PORS
 South Carolina RS
 South Dakota RS
 St. Paul Teachers
 New Jersey SPRS
 New York City Teachers
 Tennessee TRP
 Tennessee PERP
 Tennessee TLPP
 Texas CDRS
 Texas MRS
 Texas TRS
 Tucson Supplemental RS
 California URS
 Utah PSN
 Utah Judges
 Utah CRS
 Utah FRS
 Utah PSC-T2
 Utah CRS-T2
 Utah NRS
 Utah PSC
 Vermont Muni
 Vermont SERS
 Vermont STRS
 Virginia JRS

Virginia Retirement System – State Police
 Virginia Retirement System – Teachers
 Virginia Retirement System – State Employees
 Virginia Retirement System – Law Enforcement Officers
 Virginia Retirement System – Political Subdivisions (Local)
 Washington Law Enforcement Officers' and Firefighters Retirement System
 Washington Law Enforcement Officers' and Firefighters Retirement System
 Washington Public Employees' Retirement System
 Washington Public Employees' Retirement System
 Washington Public Safety Employees' Retirement System
 Washington School Employees' Retirement System
 Washington State Patrol Retirement System
 Washington Teachers Retirement System
 Washington Teachers Retirement System
 West Virginia Public Employees' Retirement System
 West Virginia Teachers' Retirement System
 Wisconsin Retirement System
 Wyoming Retirement System

Virginia SPORS
 Virginia RS-T
 Virginia RS-S
 Virginia LORS
 Virginia RS-L
 Washington LEOFF Plan 1
 Washington LEOFF Plan 2
 Washington PERS 2/3
 Washington PERS 1
 Washington PSERS 2
 Washington SERS 2/3
 Washington SPRS 1/2
 Washington TRS 2/3
 Washington TRS 1
 West Virginia PERS
 West Virginia TRS
 Wisconsin RS
 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.