State of Pensions 2020

Pension Trends in the Age of Covid-19

December 2020 Update

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State of Pensions 2020: Mid-Year Update

The swirling winds around public sector retirement systems in 2020 have created a chaotic environment for pension fund executives and boards of trustees. Some have managed through it exceptionally so far, while others have struggled. Unfortunately, the uncertainty these leaders face will continue into 2021. But as we reach the end of the year, there is at least some clarity on how severe the headwinds created by the pandemic this spring are likely to be in the coming months.

The headwinds created by the investment return climate this year look to be as challenging as pre-pandemic, but not more severe than before. Most state pension funds did fail to meet their investment targets in fiscal year 2020. However, many of the financial losses from February to April have been recouped and more. Going forward into 2021 and beyond, state pension funds still face the challenge of highly optimistic investment assumptions in a low interest rate environment, but that was a problem before Covid-19.

State of Pensions 2020

is Equable Institute's first annual report on the status of public pensions put into a historical context. State and local governments face a wide range of challenges – growing, and unpredictable pension costs are some of the largest. The report, and this mid-year update, assess the scale and effects of theses challenges within the view of the multi-decade financial and policy trends that have brought us to this point.

Visit Equable.org/StateofPensions to read the original report.

By contrast, headwinds related to fully funding state pension plans look to be as bad, if not worse, than anticipated. Back in the summer it appeared that states and cities would receive significant financial assistance from Congress to help backstop budget deficits, but that help never materialized. And at the same time the Covid-19 pandemic has persisted, including a third swell of known cases during the fall going into the winter. Consumer spending is unlikely to quickly return to pre-pandemic levels and states and cities are bracing for the worst of their estimated revenue shortfalls. This means the pressure on states to underfund their pension plans in the coming fiscal year will likely be particularly intense.

When we published our **State of Pensions 2020** report in July we highlighted two key concerns about the pandemic's effect on public plan resilience:

1. **Financial losses and general volatility will prevent pension funds from earning their assumed rates of return. This will add unfunded liabilities.**
2. **The economic recession will reduce tax revenue for state and local governments, putting pressure on their budgets while public health costs are increasing. This will lead to states and cities taking actions that reduce their near-term pensions costs.**

We now have preliminary 2020 fiscal year investment return numbers for most state plans, and it is clear that the majority will add unfunded liabilities. Some of these will be mitigated if investment returns for the 2021 fiscal year are strong, but the overall fiscal pressure of unfunded liabilities won't go away.

What is included in this update

When we published State of Pensions in July 2020, there were still roughly 20% of state pension plans that had not released complete data for the fiscal year ending 2019. This report updates our estimated 2019 figures with actual numbers that have since been released. Similarly, at that time most states had not released their preliminary investment returns for the fiscal year 2020, but we now have these (or partial year actual returns) from 90% of the plans in our dataset. Overall, the figures in this report include the following:

- Revised figures to reflect updated FY 2019 data reported by state pension plans.
- Updated 2020 funding estimates based on actual investment returns reported by state pension plans.
- Updated figures that include the addition of 11 plans to our database, improving the scope of the picture of public plans nationwide that our data reflects.

How these updates have changed our findings

The trendlines are largely unchanged from our July 2020 report. This is because the majority of data updates in this report reflect changing FY 2019 data for 25 plans from estimates to actuals. There are some aggregate total changes as a result from adding plans to the dataset, but they are minor and don't change the trendlines — which was the focus our of findings in State of Pensions 2020. The most notable changes are to our 2020 funded ratio forecast, which has been refined using actual investment return figures, and will be further refined with actual actuarial data with the release of State of Pensions 2021 next year.

Here is a brief rundown of changes resulting from the updated data:

- The overall funded ratio for statewide plans shifted from 72.6% to 72.9% in 2019. Our estimated ratio for 2020 increased from 67.9% to 69.4%, suggesting plans may have been in slightly better position heading into the COVID recession.
- Unfunded liabilities totaled $1.34 trillion across all plans, a decrease of $6.07 billion from our initial report.
- Numerous plans continued the trend of lowering their assumed rates of investment return in 2019, lowering the aggregate rate for FY 2019 to 7.17%.
- The actual average investment return that we forecast for this fiscal year has improved to 2.14% from -0.44%, based on returns through September 2020.

Looking Forward: Trends to Watch in 2021

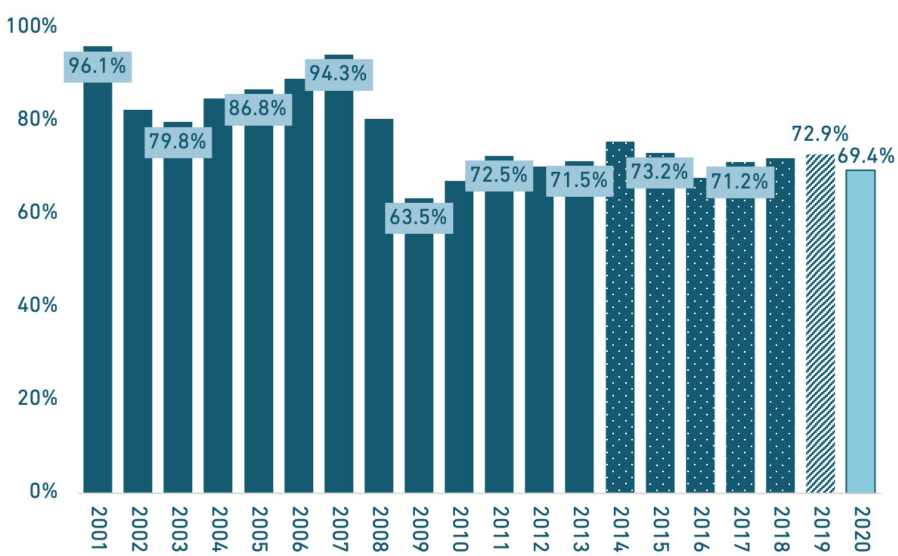
The key thing to watch in 2021 is how state legislatures and governors handle their pension bills:

- Will states pay less than the actuarially determined contribution?
- Will legislatures pause previously approved automatic increased in necessary contributions?
- Will pension boards avoid appropriate reductions in investment returns to elude a near-term increase in contribution rates?
- Will governments ask their employees to contribute more into pension funds?

FUNDED RATIOS ARE STILL UNLIKELY TO REBOUND ENTERING 2021

DESPITE MARKET REBOUND IN Q3-4, MOST STATES DID NOT REVERSE UNDERPERFORMANCE

FIGURE 1: FUNDED RATIO AVERAGE FOR STATEWIDE PENSION PLANS | 2001 - 2019 + 2020 ESTIMATE



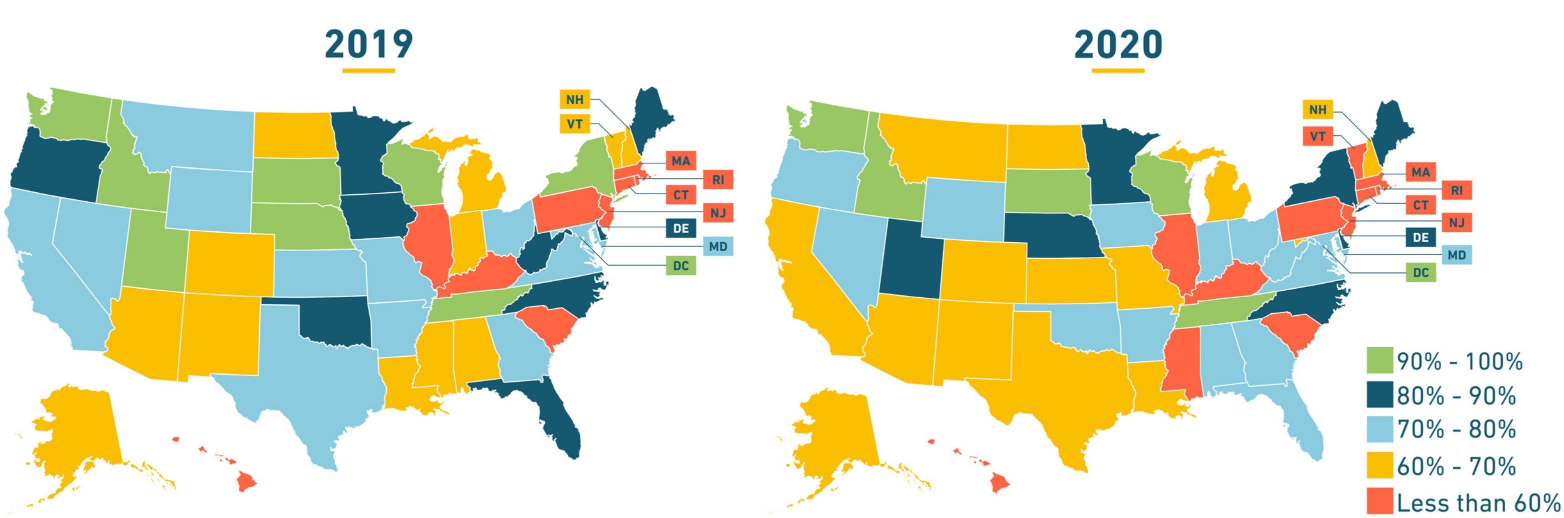
NOTE: Funding estimates for 2020 are based on actual investment returns and actuarial data as of November 15, 2020. Investment return data are as of September 2020 for plans with fiscal years ending on December 31.

One of the key findings from State of Pensions 2020 is that public plans at the end of 2019 had not fully recovered from the last financial crisis, and therefore were entering the Covid Recession period in a weaker position than they were before the Great Recession. The revised data for this update have slightly increased the funded ratio figures for 2019 and 2020, but not so much as to change that finding.

Data from state pension reports are still showing that the 72.9% funded ratio for state plans in 2019 was below both the figures for 2007 and 2008. Our estimate for 2020 was revised up to 69.4% based on reported investment returns — and this will change again once we have complete investment return data for state pensions that end their fiscal year in December.

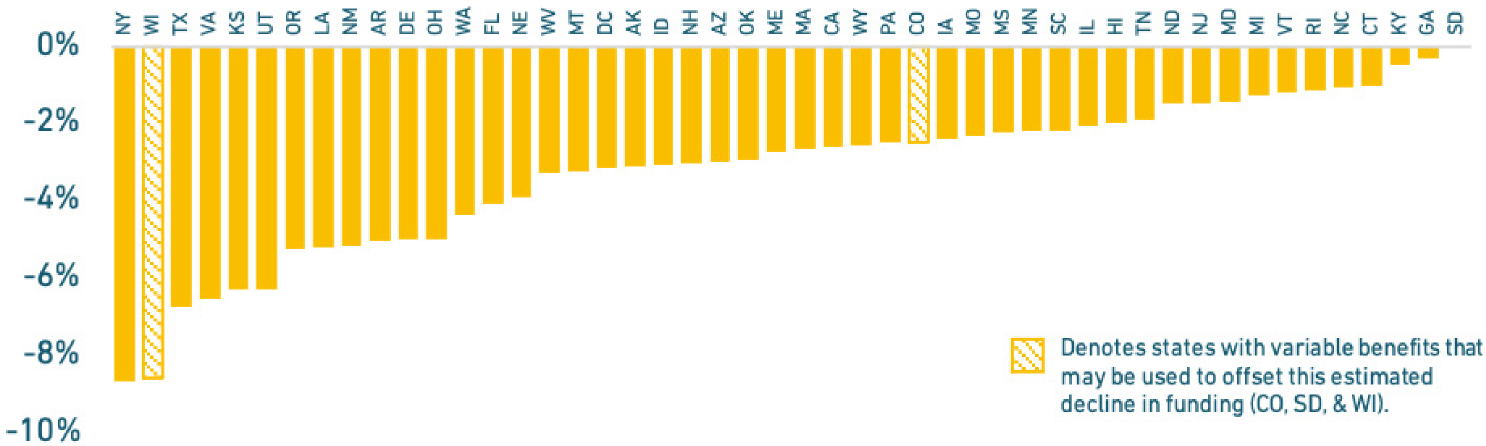
Another key finding from our report is that because most states will miss their assumed rates of return for FY 2020, their funded ratios (based on a fair market value of assets) will decline when formal reports are released next year. The figures below show an updated comparison of 2019 versus 2020 funded ratios aggregated within each state.

FIGURE 2: AGGREGATE STATEWIDE FUNDED RATIOS | 2019 ACTUAL v. 2020 ESTIMATE



The decline in funded ratios should not be treated as the only measure of the health of a pension fund. Some states have risk-sharing and cost-sharing tools that they've created to help them absorb investment losses and bounce back quickly. It will be important to monitor states over the next few years to see how well these work.

FIGURE 3: DECLINE IN FUNDED RATIO | 2019 TO 2020



NOTE: We estimate three states (AL, IN, and NV) will improve their funded ratios from 2019 to 2020.

But declining funded ratios do signal a coming increase in contribution rates, which is particularly important right now given the decline in tax revenue. According to a readout of state budget officers in July, 28 states were anticipating larger gaps in their FYE 2021 budgets than in 2020 (14 indicated smaller gaps and 9 were unable to offer a clear indication), suggesting that the worst effects of the Covid recession have yet to be fully felt by state governments and public retirement systems.

The chart above shows our estimate on declines in funded ratios for 2020. Any changes from our July release are primarily due to being able to now use actual investment return data instead of our benchmark methodology. We have also updated our 2020 estimates to reflect states that have variable benefit formulas that will allow them to absorb some of the investment losses from this year. For instance, our previous 2020 estimate showed a market value of assets decline in South Dakota dropping them below 90% funded, but the adjustable benefits for that state's pension plan mean liabilities will decline enough to keep them 100% funded on an actuarial basis.

TABLE 1: BEST AND WORST REPORTED INVESTMENT RETURNS IN FISCAL 2020

Top 2020 Investment Returns		Worst 2020 Investment Returns	
State, Plan FYE Date(s)	Return (Assumed)	State, Plan FYE Date(s)	Return (Assumed)
Connecticut (6/30)	9.36% (6.91%)	Texas (8/31, 12/31)	-2.35% (7.32%)
Nevada (6/30)	7.20% (7.50%)	New York (3/31, 6/30)	-1.93% (7.04%)
Arizona (6/30)	6.58% (7.46%)	New Mexico (6/30)	-1.25% (7.13%)
Georgia (6/30)	5.43% (7.26%)	Louisiana (6/30, 12/31)	-1.10% (6.79%)
Tennessee (6/30)	4.90% (7.25%)	Pennsylvania (6/30, 12/31)	-0.95% (7.03%)

NOTE: Figures reflect asset-weighted aggregate plan returns for fiscal 2020. Plans who have not reported investment returns for fiscal 2020 are included in our analysis but are not listed here. Table shows the fiscal year end date that state pension plans measure their annualized returns on.

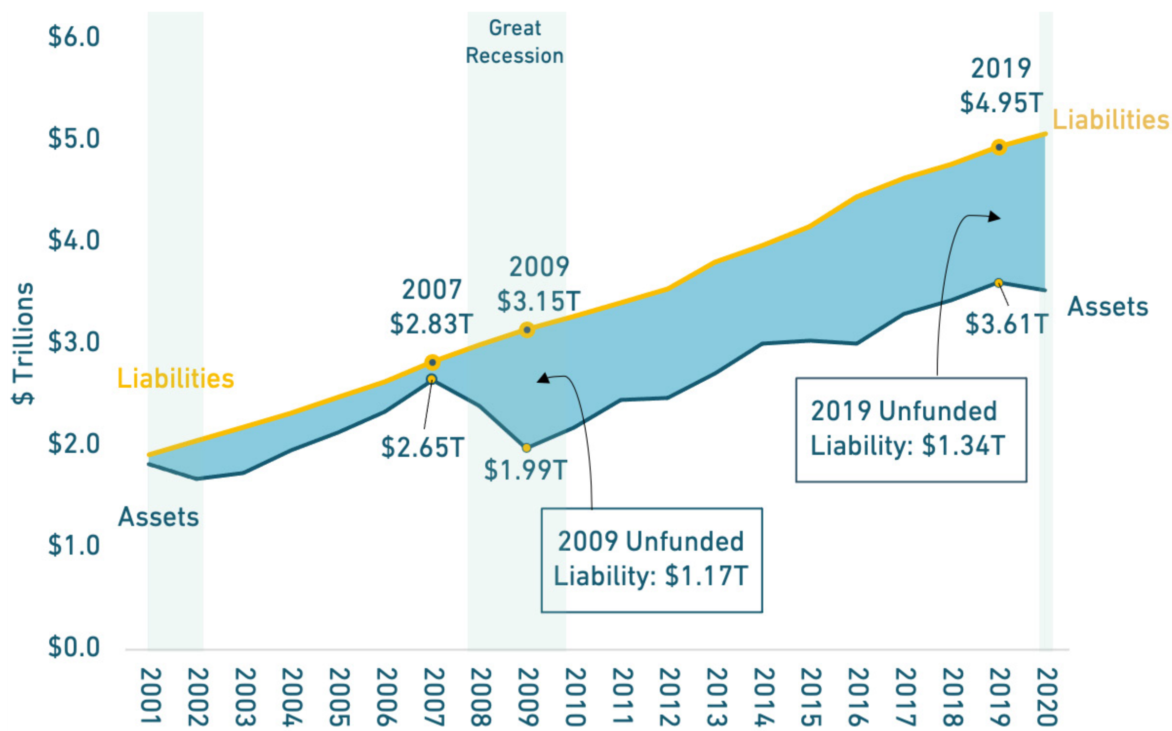
To see all investment returns by state, see appendix page 11

UNFUNDED LIABILITES FOR 2020 NOW ESTIMATED TO SURPASS $1.55 TRILLION

STATES WILL NEED TO ADDRESS RISING CONTRIBUTION RATES

Our updated figures show that the total unfunded liabilities for statewide pension plans at the end of the 2019 fiscal year are $1.34 trillion (down slightly from our previously reported $1.35 trillion). This change is partially because of the addition of 11 state plans to our database, but also to the use of reported actual figures for the 25 plans estimated in our original report. We project unfunded liabilities will surpass $1.55 trillion in 2020 (an improvement over our previous estimate of $1.62 trillion).

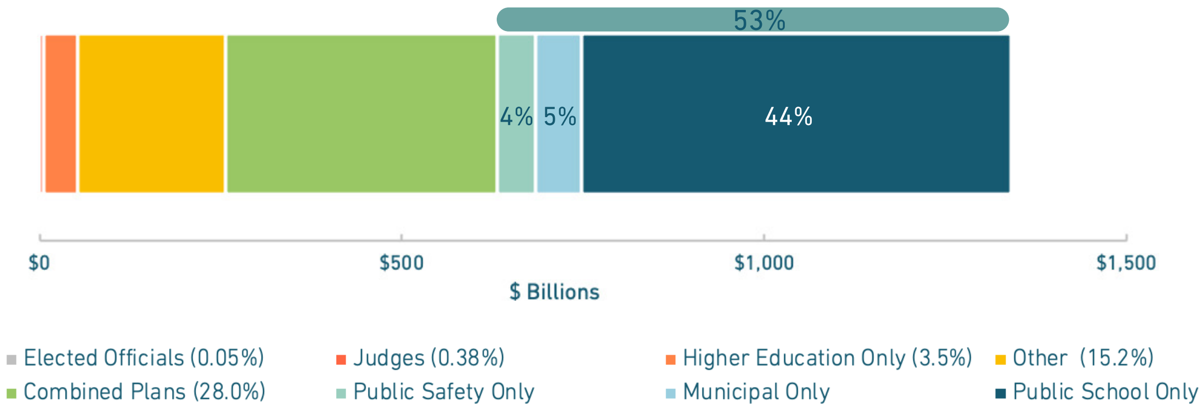
FIGURE 4: TOTAL UNFUNDED LIABILITIES FOR STATEWIDE PENSION PLANS | 2001 - 2019 + 2020 ESTIMATE



To the degree that states have to face additional contribution rates in the coming years because of additional unfunded liabilities, it will be important to monitor which states decide to pass on some of these costs to public employees. The next page shows a distribution of unfunded liabilities and funded ratios based on job types. There are some public professions that are in more trouble than others.

DIVING DEEPER: UNFUNDED LIABILITIES BY PROFESSION

SHARE OF UNFUNDED LIABILITIES BY PLAN TYPE | 2019

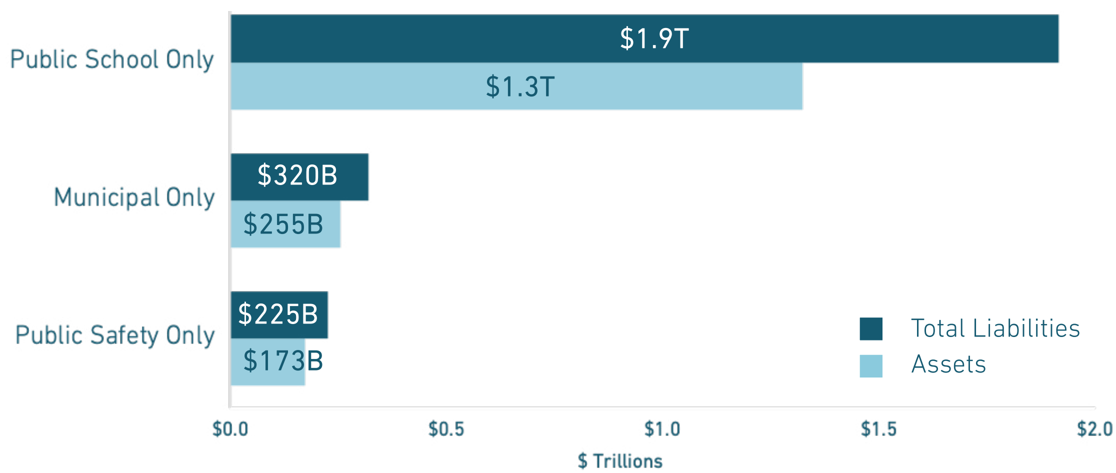


Looking pension plans set up for individual job groupings, retirement systems separately covering Public School, Municipal, and Public Safety employees account for 53% of all public pension unfunded liabilities.

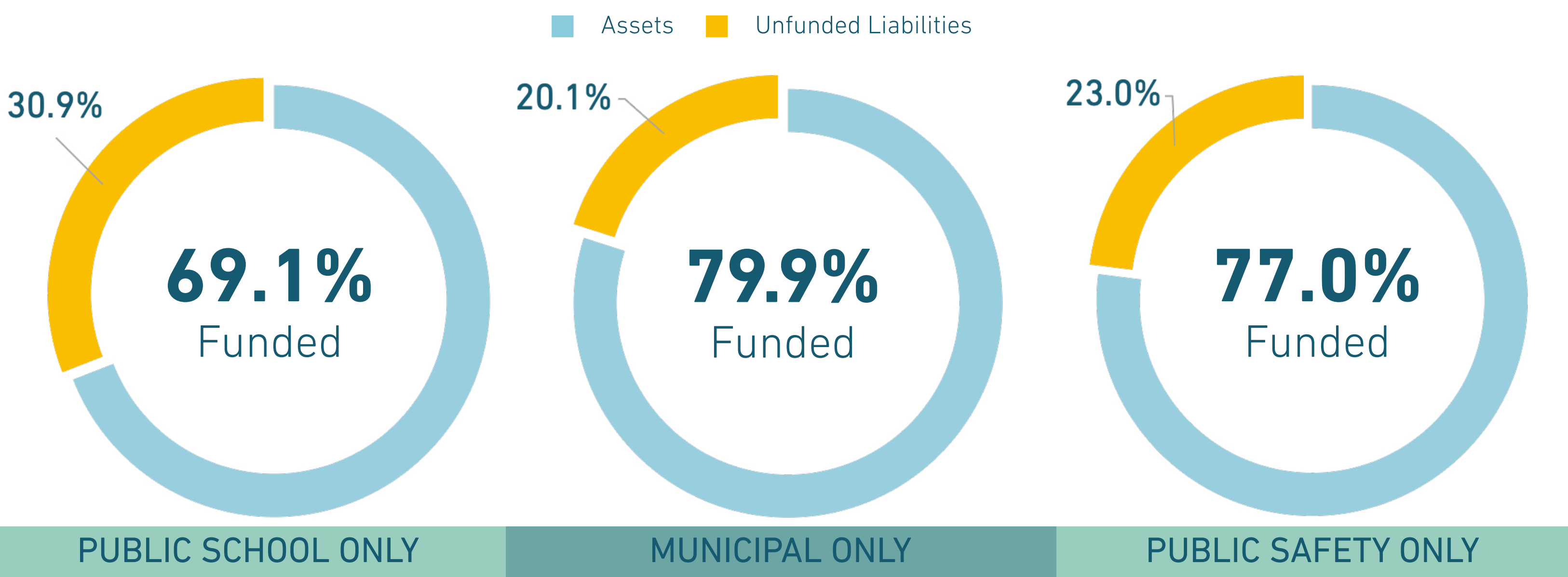
While plans covering Public School employees have greater enrollment than Municipal and Public Safety plans, they are significantly worse funded, carrying a disproportionate share of unfunded liabilities.

The charts below show each profession's funded ratio.

LIABILITIES BY PROFESSION | 2019



FUNDED RATIO BY PROFESSION | 2019

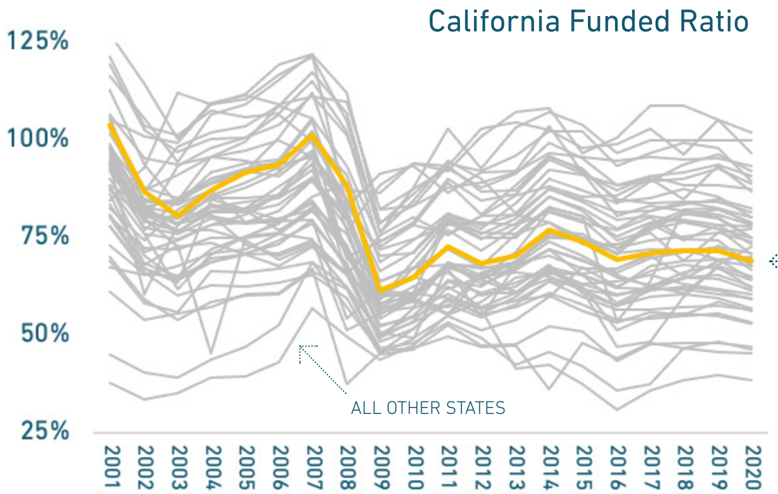


For all data by profession, see appendix page 14

LOOKING BACK: STATE FUNDED RATIO HISTORIES

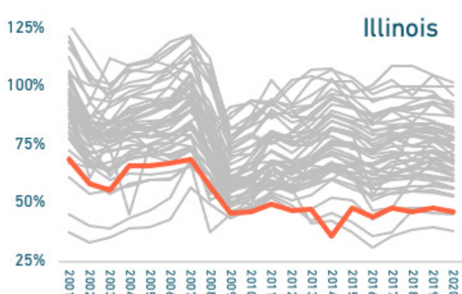
SOME STATES HAVE FIGURED OUT PENSION MANAGEMENT, MOST STATES HAVE STRUGGLED

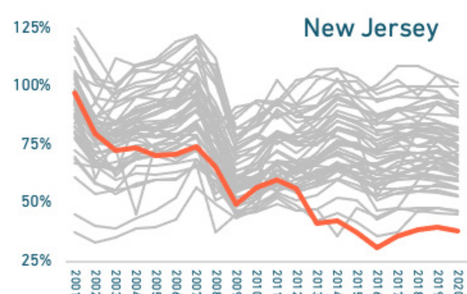
Nationally, state pension funds have struggled to meaningfully improve their funded ratios in recent years. This isn't the only way to measure the health of a pension fund, but it is a common benchmark to compare states against each other. Funded ratio trendlines for select states over the past two decades are below.

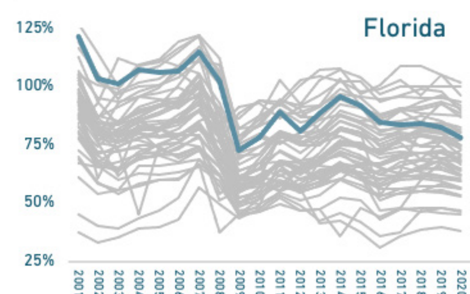


California and its large pension funds are a bellweather for the country as a whole. At the turn of the century its statewide retirement systems were reportedly 100% funded. But over the past decade they've struggled at around 70% funded.

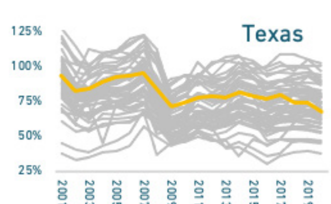
Other large states have struggled for deacdes, while some were hit hard by the 2008 financial crisis and never returned to their pre-Great Recession status.

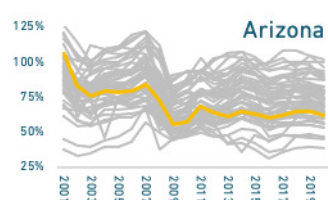


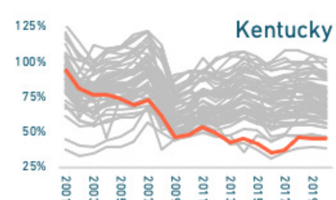


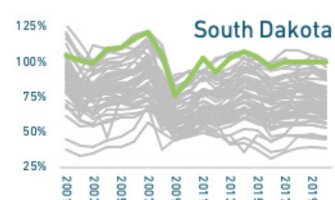


Some states have witnessed steady erosion of pension funding status, others have had persistently low funded ratios for more than two decades, and still others have maintained a consistently strong funded ratio.

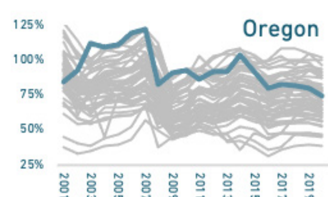


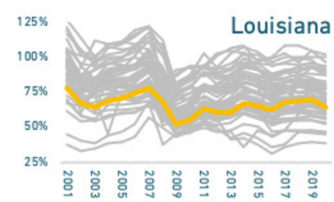


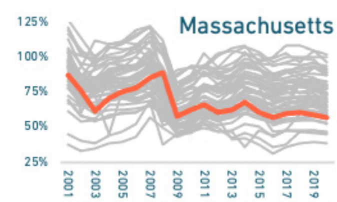




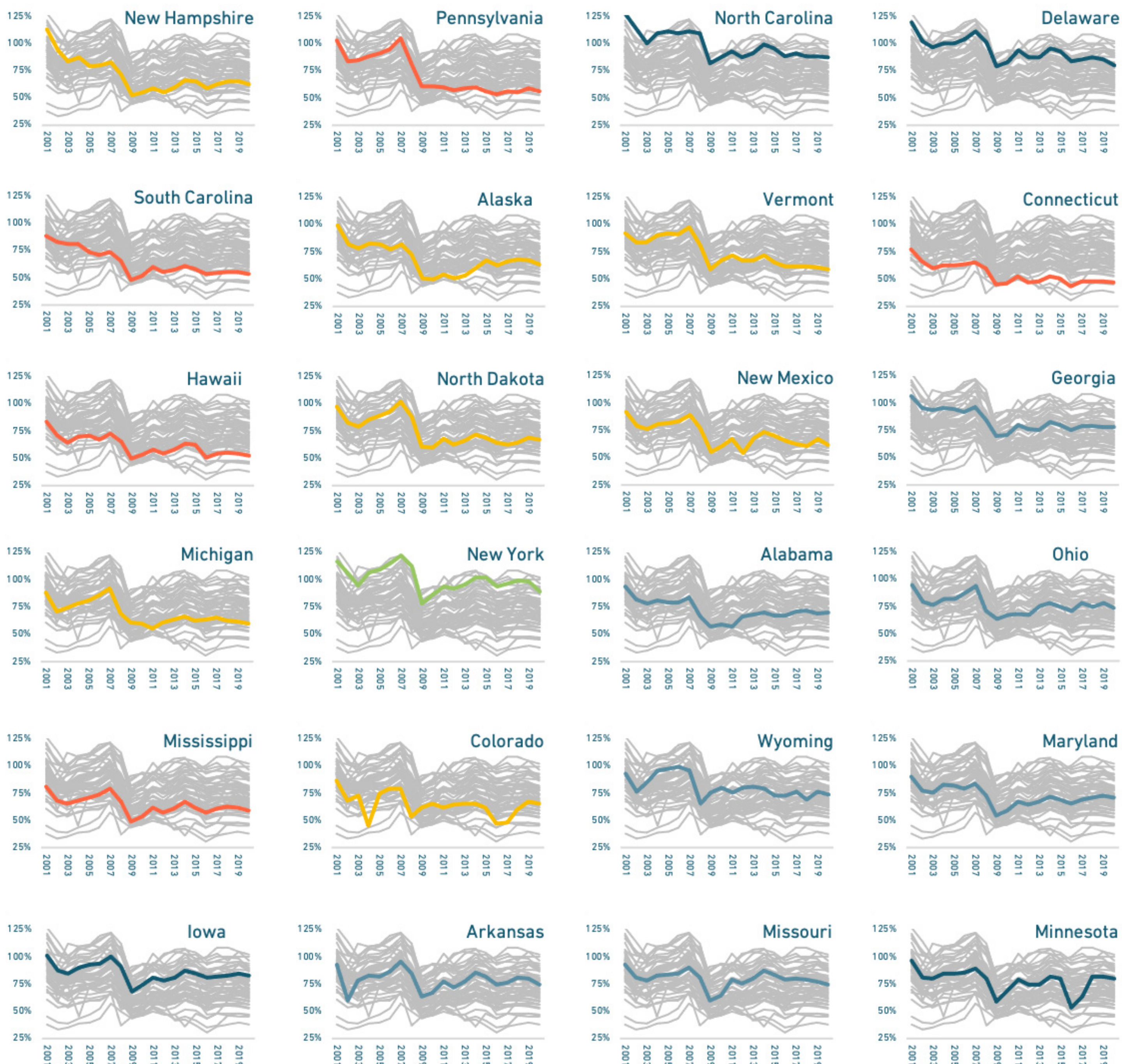
View and download all state graphics here: equable.org/stateofpensions







Why "Funded Ratios" Matter: When a state pension plan's funded ratio is below 100%, that means additional money is needed to ensure all promised benefits can be paid out in the future. Pension plans count on having a certain amont of money under management that they can use to generate investment returns, which are a critical resource of revenue for paying the retirement checks promised by states. The longer a pension fund remains below the 100% mark, the more expensive it can be for a state to get all of the "pension debt" owed to the retirement system paid off, like interest accruing on a mortgage.



90% - 100% | 80% - 90% | 70% - 80% | 60% - 70% | Less than 60%

Note: Color-coding reflects estimated 2020 funded ratio. States featured in this graphic are sorted by greatest to least absolute change in funded ratio.

APPENDIX

METHODOLOGY

All data and analyses in this report for pension plans from 2001 through 2019 are based on data published by the retirement systems through their actuarial valuations, comprehensive annual financial reports, or other plan-specific publications.

Equable's estimates for assets and liabilities for fiscal year 2020 are based on reported actual plan returns for fiscal 2020 whenever available. We use either the reported or estimated investment returns to approximate figures for assets and liabilities to estimate unfunded liability and funded ratio levels for fiscal 2020.

For plans whose fiscal year 2020 ends on December 31, 2020, we use the most current reported preliminary investment returns (either through June 30 or September 30) and weight our estimated changes to plan liabilities based on the proportion of the year still remaining. Preliminary investment return data for fiscal year 2020 was not publicly available for 15 of our 154 plans (seven of which are plans within the Utah Retirement System). For those 15 plans we estimate their 2020 investment returns following the methodology used in our July publication of this report, using benchmarks for each plan's reported asset allocations to produce an approximate estimated return.

PLAN ADDITIONS

The analytical focus of this report is on statewide retirement systems with defined benefit plans that hold at least $1 billon in accrued liabilities. Equable's dataset shows data at the "plan level," meaning we break apart the assets and liabilities of certain retirement systems into respective plans that have independently measured and reported assets liabilities, contribution rates, and other data (for example, Colorado PERA is one retirement system, but we count four different plans from within that system because each has independently measured liabilities worth over $1 billion). Since we released State of Pensions 2020 in July, we have expanded our dataset beyond the population of 143 plans across the 50 states and Washington D.C. to include additional 11 plans.

These additional 11 plans increase the focus of our report to 154 defined benefit plans. They include a few plans that have only recently reached the $1 billion in accrued liabilities threshold, newly created plans, or a further breakout of plans that have been previously included in our data as part of a larger pension system but are now broken out with more specific detail (e.g. Michigan Public School Employees' Retirement System's Pension Plus Plan and Pension Plus Plan 2).

For a list of the plans previously included in our analyses, please see slides 78 through 80 of our State of Pensions Report. The plans that have been added to our analyses include the following:

- Arizona Public Safety Personnel Retirement System – Tier 3
- Arkansas State Highway Employees Retirement System
- Colorado Fire and Police Pension Association
- Judges' Retirement System of Illinois
- Louisiana State Police Retirement System
- Michigan State Police Retirement System
- Michigan Public School Employees' Retirement System Pension Plus Plan
- Michigan Public School Employees' Retirement System Pension Plus Plan 2
- Nebraska Public Employees Retirement System – State Employees Cash Balance
- State Police Retirement System of New Jersey
- Washington State Patrol Retirement System Plans 1 & 2

ADDITIONAL DATA

ASSUMED v. ACTUAL RETURN BY STATE, 2020

Plan	Fiscal Year End Date	2020 Actual Investment Returns	Returns Valid As Of Date	Equable Estimated Returns	2019 Assumed Return	2020 Return on Assets v. Assumed
Alabama ERS	9/30/20	Not Reported	9/30/20	7.49%	7.70%	-0.21%
Alabama TRS	9/30/20	Not Reported	9/30/20	7.38%	7.70%	-0.32%
Alaska PERS	6/30/20	3.83%	6/30/20	Actual ROA Used	7.38%	-3.55%
Alaska TRS	6/30/20	3.82%	6/30/20	Actual ROA Used	7.38%	-3.56%
Arizona CORP	6/30/20	0.50%	6/30/20	Actual ROA Used	7.30%	-6.80%
Arizona EORP	6/30/20	0.50%	6/30/20	Actual ROA Used	7.30%	-6.80%
Arizona PSPRS	6/30/20	0.50%	6/30/20	Actual ROA Used	7.30%	-6.80%
Arizona PSPRS Tier 3	6/30/20	0.50%	6/30/20	Actual ROA Used	7.00%	-6.50%
Arizona SRS	6/30/20	0.80%	6/30/20	Actual ROA Used	7.50%	-6.70%
Arkansas DOT	6/30/20	9.07%	6/30/20	Actual ROA Used	8.00%	1.07%
Arkansas PERS	6/30/20	2.40%	6/30/20	Actual ROA Used	7.15%	-4.75%
Arkansas TRS	6/30/20	-1.40%	6/30/20	Actual ROA Used	7.50%	-8.90%
California JRF	6/30/20	Not Reported	6/30/20	0.00%	3.00%	-3.00%
California JRF II	6/30/20	4.70%	6/30/20	Actual ROA Used	6.50%	-1.80%
California URS	6/30/20	Not Reported	6/30/20	-1.12%	6.75%	-7.87%
CalPERS	6/30/20	4.70%	6/30/20	Actual ROA Used	7.38%	-2.68%
CalSTRS	6/30/20	3.90%	6/30/20	Actual ROA Used	7.00%	-3.10%
Colorado DPS	12/31/20	-0.80%	6/30/20	Actual ROA Used	7.25%	-8.05%
Colorado Local	12/31/20	-0.80%	6/30/20	Actual ROA Used	7.25%	-8.05%
Colorado P&F	12/31/20	3.67%	6/30/20	Actual ROA Used	7.00%	-3.33%
Colorado Schools	12/31/20	-0.80%	6/30/20	Actual ROA Used	7.25%	-8.05%
Colorado State	12/31/20	-0.80%	6/30/20	Actual ROA Used	7.25%	-8.05%
Connecticut MERS	6/30/20	2.03%	6/30/20	Actual ROA Used	7.00%	-4.97%
Connecticut SERS	6/30/20	1.86%	6/30/20	Actual ROA Used	6.90%	-5.04%
Connecticut TRS	6/30/20	1.85%	6/30/20	Actual ROA Used	6.90%	-5.05%
D.C. POFRP	9/30/20	5.30%	9/30/20	Actual ROA Used	6.50%	-1.20%
D.C. TRP	9/30/20	0.20%	9/30/20	Actual ROA Used	6.50%	-6.30%
Delaware SEPP	6/30/20	0.50%	6/30/20	Actual ROA Used	7.00%	-6.50%
Florida RS	6/30/20	2.58%	6/30/20	Actual ROA Used	7.20%	-4.62%
Georgia ERS	6/30/20	5.50%	6/30/20	Actual ROA Used	7.30%	-1.80%
Georgia TRS	6/30/20	5.42%	6/30/20	Actual ROA Used	7.25%	-1.83%
Hawaii ERS	6/30/20	1.26%	6/30/20	Actual ROA Used	7.00%	-5.74%
Idaho PERS	6/30/20	2.80%	6/30/20	Actual ROA Used	7.00%	-4.20%
Illinois JRS	6/30/20	4.60%	6/30/20	Actual ROA Used	6.50%	-1.90%
Illinois MRF	12/31/20	2.98%	9/30/20	Actual ROA Used	7.25%	-4.27%
Illinois SERS	6/30/20	4.60%	6/30/20	Actual ROA Used	6.75%	-2.15%
Illinois SURS	6/30/20	2.60%	6/30/20	Actual ROA Used	6.75%	-4.15%
Illinois TRS	6/30/20	0.60%	6/30/20	Actual ROA Used	7.00%	-6.40%
Indiana 1977 P&F	6/30/20	2.56%	6/30/20	Actual ROA Used	6.75%	-4.19%
Indiana PERF	6/30/20	2.56%	6/30/20	Actual ROA Used	6.75%	-4.19%
Indiana TRF 1996	6/30/20	2.56%	6/30/20	Actual ROA Used	6.75%	-4.19%
Indiana TRF Pre-96	6/30/20	2.56%	6/30/20	Actual ROA Used	6.75%	-4.19%

Plan	Fiscal Year End Date	2020 Actual Investment	Returns Valid As Of Date	Equable Estimated Returns	2019 Assumed Return	2020 Return on Assets v. Assumed
Iowa MFPRS	6/30/20	2.30%	6/30/20	Actual ROA Used	7.50%	-5.20%
Iowa PERS	6/30/20	3.40%	6/30/20	Actual ROA Used	7.00%	-3.60%
Kansas JRS	6/30/20	4.90%	6/30/20	Actual ROA Used	7.75%	-2.85%
Kansas PERS-L	12/31/20	2.10%	6/30/20	Actual ROA Used	7.75%	-5.65%
Kansas PERS-S	12/31/20	2.10%	6/30/20	Actual ROA Used	7.75%	-5.65%
Kansas PERS-T	12/31/20	2.10%	6/30/20	Actual ROA Used	7.75%	-5.65%
Kansas PF	12/31/20	2.10%	6/30/20	Actual ROA Used	7.75%	-5.65%
Kentucky CERS	6/30/20	1.20%	6/30/20	Actual ROA Used	6.25%	-5.05%
Kentucky ERS	6/30/20	1.20%	6/30/20	Actual ROA Used	6.25%	-5.05%
Kentucky TRS	6/30/20	5.80%	6/30/20	Actual ROA Used	7.50%	-1.70%
Louisiana LASERS	6/30/20	-3.80%	6/30/20	Actual ROA Used	7.60%	-11.40%
Louisiana MPERS	6/30/20	2.70%	6/30/20	Actual ROA Used	7.13%	-4.43%
Louisiana SPERS	12/31/20	Not Reported	9/30/20	3.28%	6.75%	-3.47%
Louisiana SPRS	6/30/20	Not Reported	6/30/20	2.38%	7.00%	-4.62%
Louisiana SRS	6/30/20	0.27%	6/30/20	Actual ROA Used	7.06%	-6.79%
Louisiana TRS	6/30/20	-1.20%	6/30/20	Actual ROA Used	7.65%	-8.85%
Maine CPPLD	6/30/20	1.80%	6/30/20	Actual ROA Used	6.75%	-4.95%
Maine SETP	6/30/20	1.80%	6/30/20	Actual ROA Used	6.75%	-4.95%
Maryland ECS	6/30/20	3.60%	6/30/20	Actual ROA Used	7.40%	-3.80%
Maryland TCS	6/30/20	3.60%	6/30/20	Actual ROA Used	7.40%	-3.80%
Massachusetts SERS	6/30/20	2.40%	6/30/20	Actual ROA Used	7.25%	-4.85%
Massachusetts TRS	6/30/20	2.40%	6/30/20	Actual ROA Used	7.25%	-4.85%
Michigan MERS	12/31/20	2.71%	9/30/20	Actual ROA Used	7.00%	-4.29%
Michigan PSERS	9/30/20	0.10%	9/30/20	Actual ROA Used	6.80%	-6.70%
Michigan PSERS PPP	9/30/20	0.10%	9/30/20	Actual ROA Used	6.80%	-6.70%
Michigan PSERS PPP2	9/30/20	0.10%	9/30/20	Actual ROA Used	6.00%	-5.90%
Michigan SERS	9/30/20	0.10%	9/30/20	Actual ROA Used	6.70%	-6.60%
Michigan SPRS	9/30/20	0.10%	9/30/20	Actual ROA Used	6.80%	-6.70%
Minnesota GERF	6/30/20	4.20%	6/30/20	Actual ROA Used	7.50%	-3.30%
Minnesota PEPFP	6/30/20	4.20%	6/30/20	Actual ROA Used	7.50%	-3.30%
Minnesota SERF	6/30/20	4.20%	6/30/20	Actual ROA Used	7.50%	-3.30%
Minnesota TRA	6/30/20	4.20%	6/30/20	Actual ROA Used	7.50%	-3.30%
Mississippi PERS	6/30/20	3.40%	6/30/20	Actual ROA Used	7.75%	-4.35%
Missouri DOT	6/30/20	-1.51%	6/30/20	Actual ROA Used	7.00%	-8.51%
Missouri LGERS	6/30/20	1.60%	6/30/20	Actual ROA Used	7.25%	-5.65%
Missouri PEERS	6/30/20	3.90%	6/30/20	Actual ROA Used	7.50%	-3.60%
Missouri PSRS	6/30/20	3.90%	6/30/20	Actual ROA Used	7.50%	-3.60%
Missouri SERS	6/30/20	5.20%	6/30/20	Actual ROA Used	7.10%	-1.90%
Montana PERS	6/30/20	2.68%	6/30/20	Actual ROA Used	7.65%	-4.97%
Montana TRS	6/30/20	2.72%	6/30/20	Actual ROA Used	7.50%	-4.78%
Nebraska PERS-CB	6/30/20	2.20%	6/30/20	Actual ROA Used	7.50%	-5.30%
Nebraska SEP	6/30/20	2.20%	6/30/20	Actual ROA Used	7.50%	-5.30%
Nevada PERS-PF	6/30/20	7.20%	6/30/20	Actual ROA Used	7.50%	-0.30%
Nevada PERS-R	6/30/20	7.20%	6/30/20	Actual ROA Used	7.50%	-0.30%
New Hampshire RS	6/30/20	1.10%	6/30/20	Actual ROA Used	7.25%	-6.15%
New Jersey PERS-L	6/30/20	1.21%	6/30/20	Actual ROA Used	7.30%	-6.09%

Plan	Fiscal Year End Date	2020 Actual Investment Returns	Returns Valid As Of Date	Equable Estimated Returns	2019 Assumed Return	2020 Return on Assets v. Assumed
New Jersey PERS-S	6/30/20	1.21%	6/30/20	Actual ROA Used	7.30%	-6.09%
New Jersey PFRS-L	6/30/20	1.21%	6/30/20	Actual ROA Used	7.30%	-6.09%
New Jersey PFRS-S	6/30/20	1.21%	6/30/20	Actual ROA Used	7.30%	-6.09%
New Jersey SPRS	7/1/20	1.21%	7/1/20	Actual ROA Used	7.30%	-6.09%
New Jersey TPAF	7/1/20	1.21%	7/1/20	Actual ROA Used	7.30%	-6.09%
New Mexico ERB	6/30/20	-0.97%	6/30/20	Actual ROA Used	7.25%	-8.22%
New Mexico PERA	6/30/20	-1.50%	6/30/20	Actual ROA Used	7.25%	-8.75%
New York SLRS ERS	3/31/20	-2.68%	3/31/20	Actual ROA Used	7.00%	-9.68%
New York SLRS PFRS	3/31/20	-2.68%	3/31/20	Actual ROA Used	7.00%	-9.68%
New York STRS	6/30/20	Not Reported	6/30/20	-0.64%	7.10%	-7.74%
North Carolina LGERS	6/30/20	4.40%	6/30/20	Actual ROA Used	7.00%	-2.60%
North Carolina TSERS	6/30/20	4.40%	6/30/20	Actual ROA Used	7.00%	-2.60%
North Dakota PERS	6/30/20	3.41%	6/30/20	Actual ROA Used	7.75%	-4.34%
North Dakota TFR	6/30/20	3.46%	6/30/20	Actual ROA Used	7.75%	-4.29%
Ohio PERS	12/31/20	-3.79%	6/30/20	Actual ROA Used	7.20%	-10.99%
Ohio PFPF	12/31/20	0.14%	6/30/20	Actual ROA Used	8.00%	-7.86%
Ohio SERS	6/30/20	2.96%	6/30/20	Actual ROA Used	7.50%	-4.54%
Ohio STRS	6/30/20	3.14%	6/30/20	Actual ROA Used	7.45%	-4.31%
Oklahoma PERS	6/30/20	4.50%	6/30/20	Actual ROA Used	7.00%	-2.50%
Oklahoma PPRS	6/30/20	1.90%	6/30/20	Actual ROA Used	7.50%	-5.60%
Oklahoma TRS	6/30/20	1.30%	6/30/20	Actual ROA Used	7.50%	-6.20%
Oregon PERS	6/30/20	0.52%	6/30/20	Actual ROA Used	7.20%	-6.68%
Pennsylvania MRS	12/31/20	Not Reported	6/30/20	-7.54%	5.25%	-12.79%
Pennsylvania PSERS	6/30/20	1.10%	6/30/20	Actual ROA Used	7.25%	-6.15%
Pennsylvania SERS	12/31/20	-4.58%	6/30/20	Actual ROA Used	7.13%	-11.71%
Rhode Island ERS-S	6/30/20	3.80%	6/30/20	Actual ROA Used	7.00%	-3.20%
Rhode Island ERS-T	6/30/20	3.80%	6/30/20	Actual ROA Used	7.00%	-3.20%
Rhode Island MERS	6/30/20	3.80%	6/30/20	Actual ROA Used	7.00%	-3.20%
South Carolina PORS	6/30/20	1.60%	6/30/20	Actual ROA Used	7.25%	-5.65%
South Carolina RS	6/30/20	1.60%	6/30/20	Actual ROA Used	7.25%	-5.65%
South Dakota RS	6/30/20	1.60%	6/30/20	Actual ROA Used	6.50%	-4.90%
Tennessee PERP	6/30/20	4.90%	6/30/20	Actual ROA Used	7.25%	-2.35%
Tennessee TLPP	6/30/20	4.90%	6/30/20	Actual ROA Used	7.25%	-2.35%
Tennessee TRP	6/30/20	4.90%	6/30/20	Actual ROA Used	7.25%	-2.35%
Texas CDRS	12/31/20	-2.46%	9/30/20	Actual ROA Used	8.00%	-10.46%
Texas ERS	8/31/20	4.69%	8/31/20	Actual ROA Used	7.50%	-2.81%
Texas LECOS	8/31/20	4.69%	8/31/20	Actual ROA Used	7.50%	-2.81%
Texas MRS	12/31/20	-4.30%	6/30/20	Actual ROA Used	6.75%	-11.05%
Texas TRS	8/31/20	-3.30%	8/31/20	Actual ROA Used	7.25%	-10.55%
Utah CRS	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah CRS-T2	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah FRS	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah NRS	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah PSC	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah PSC-T2	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%
Utah PSN	12/31/20	Not Reported	9/30/20	-1.33%	6.95%	-8.28%

Plan	Fiscal Year End Date	2020 Actual Investment Returns	Returns Valid As Of Date	Equable Estimated Returns	2019 Assumed Return	2020 Return on Assets v. Assumed
Vermont SERS	6/30/20	4.00%	6/30/20	Actual ROA Used	7.50%	-3.50%
Vermont STRS	6/30/20	4.00%	6/30/20	Actual ROA Used	7.50%	-3.50%
Virgina JRS	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Virgina LORS	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Virgina SPORS	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Virginia RS-L	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Virginia RS-S	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Virginia RS-T	6/30/20	1.40%	6/30/20	Actual ROA Used	6.75%	-5.35%
Washington LEOFF Plan 1	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington LEOFF Plan 2	6/30/20	3.71%	6/30/20	Actual ROA Used	7.40%	-3.69%
Washington PERS 1	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington PERS 2/3	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington SERS 2/3	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington SPRS 1/2	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington TRS 1	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
Washington TRS 2/3	6/30/20	3.71%	6/30/20	Actual ROA Used	7.50%	-3.79%
West Virginia PERS	6/30/20	2.20%	6/30/20	Actual ROA Used	7.50%	-5.30%
West Virginia TRS	6/30/20	2.20%	6/30/20	Actual ROA Used	7.50%	-5.30%
Wisconsin RS	12/31/20	4.70%	9/30/20	Actual ROA Used	7.00%	-2.30%
Wyoming RS	12/31/20	Not Reported	9/30/20	-1.33%	7.00%	-8.33%

Note: Most pension plans have not published their 2020 assumed rates of return. We use their rates from 2019 to illustrate how their FY 2020 returns have underperformed relative to their most recently published assumptions.

PENSION PLAN ASSETS BY JOB TYPE, 2019

Profession	Assets	Liabilities	Unfunded Liabilities	Funded Ratio
Elected Officials	$286,065,000	$949,242,000	$663,177,000	30.1%
Judges	$3,540,727,917	$8,599,373,045	$5,058,645,128	41.2%
Higher Education	$89,996,310,961	$136,842,008,000	$46,845,697,039	65.8%
Public Safety ONLY	$173,070,782,731	$224,900,765,088	$51,829,982,357	77.0%
Municipal ONLY	$255,461,201,700	$319,591,997,851	$64,130,796,151	79.9%
All Other Employee Categories	$253,863,261,047	$457,738,853,104	$203,875,592,057	55.5%
Combined Plans (More than 1 Group)	$1,510,206,116,031	$1,885,958,097,257	$375,751,981,225	80.1%
Public School ONLY	$1,322,999,115,023	$1,915,175,874,386	$592,176,759,363	69.1%
Totals	$3,609,423,580,410	$4,949,756,210,731	$1,340,332,630,321	72.9%