

2023 Public Pension Funding Study

Rebecca A. Sielman, FSA
Richard L. Gordon, FSA



Highlights

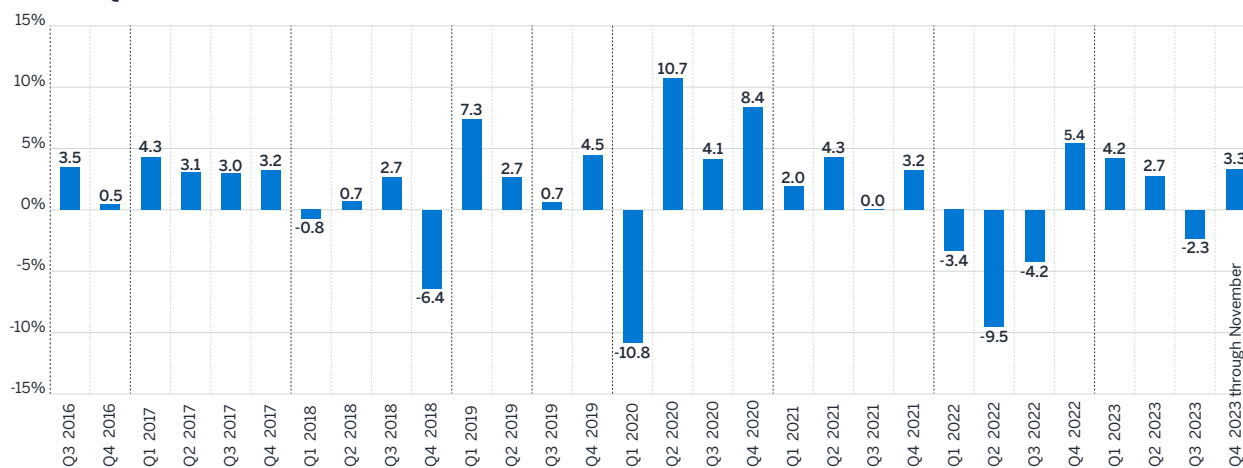
- After peaking at 85.5% as of December 31, 2021, the aggregate funded ratio shed more than 15% in the following nine months and has hovered in the low- to mid-70% since then; we estimate the funded ratio as of November 30, 2023, is 75.9%
- The funding gap between plan assets and liabilities stands at \$1.50 trillion as of November 30, 2023
- Aggregate asset allocation has noticeably shifted from fixed income and equities into alternative investments, specifically private equity and real estate funds
- Plans have seen significant growth in their retiree populations, with a 10% increase since our 2022 study

Introduction

The Milliman Public Pension Funding Study annually explores the funded status of the 100 largest U.S. public pension plans. We report the plans' own assessments of how well funded they are. We also recalibrate the liability for each plan based on our independent assessment of the expected real return on each plan's investments. This 2023 report is based on the most recently published fiscal year-end reports available for each plan—June 30, 2022, is the *measurement date* for three-quarters of the plans in our 2023 study. Some plans have subsequently issued data regarding their investment performance for more recent time periods, but that information has not been incorporated into this study.

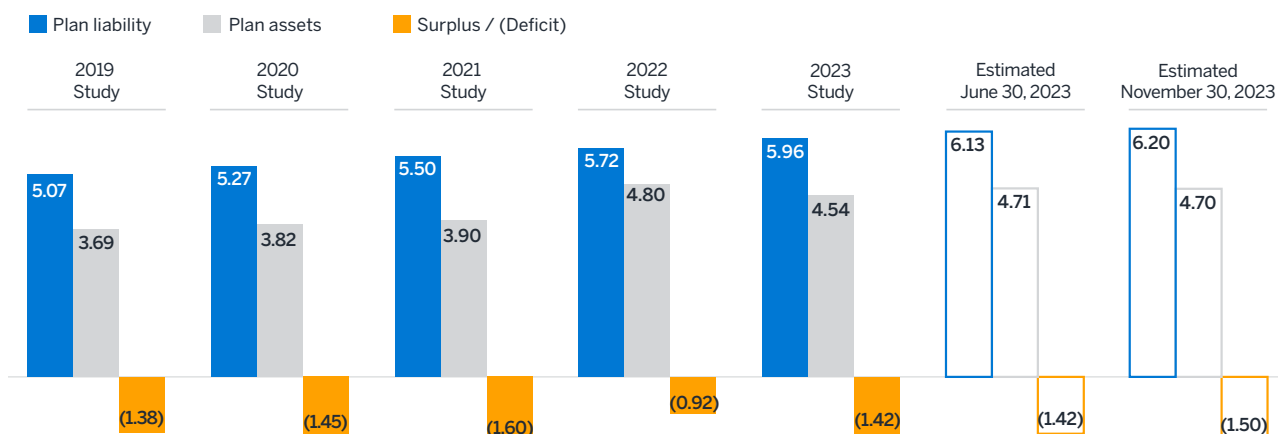
For 91 of the 100 plans in this study with a measurement date between June 30, 2022, and December 31, 2022, reported asset levels reflected a pullback from the aggregate high-water mark as of December 31, 2021. During the first nine months of 2022, market values fell significantly, and since that point asset levels have largely just managed to keep pace with liability growth. Aggregate plan assets that were reported as of the most recent measurement dates stood at \$4.54 trillion, and we estimate that asset levels increased to \$4.71 trillion as of June 30, 2023, and stand at \$4.70 trillion as of November 30, 2023. We estimate that the plans experienced a median annualized return on assets of 7.8% in the period between their measurement dates and June 30, 2023. Our estimate of the aggregate return on assets for the 2023 calendar year to date (January through November) is 8.0%.

FIGURE 1: QUARTERLY INVESTMENT RETURNS



The aggregate Total Pension Liability reported at the measurement dates was \$5.96 trillion, growing from \$5.72 trillion as of the prior measurement dates. We estimate that the Total Pension Liability has further increased to \$6.13 trillion as of June 30, 2023, and to \$6.20 trillion as of November 30, 2023. The aggregate plan-reported underfunding as of the measurement dates stood at \$1.42 trillion, which is higher than the \$0.92 trillion of underfunding one year earlier (the lowest level of underfunding since our study commenced in 2012). However, as mentioned earlier, the market performance since the measurement dates has just kept pace with the liability growth, and we estimate that the gap between assets and liabilities has remained at the same level of \$1.42 trillion as of June 30, 2023. As of November 30, 2023, we estimate the gap has slightly widened to \$1.50 trillion.

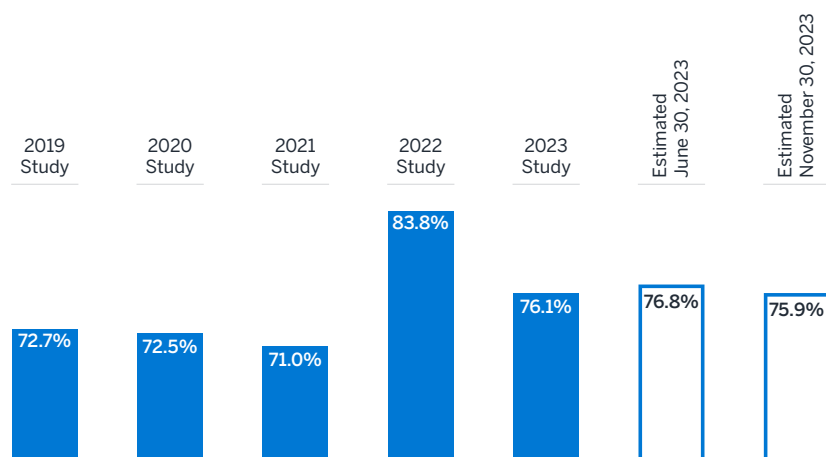
FIGURE 2: AGGREGATE PLAN-REPORTED FUNDED STATUS (\$ TRILLIONS)



Note: Yearly study results (solid bars) generally reflect measurements from one year prior.

The aggregate funded ratio reported by plan sponsors as of the most recent measurement dates declined noticeably since our prior study, from 83.8% to 76.1%, primarily because the asset levels reported on the most recent measurement dates reflect the market pullback during the first nine months of 2022. We estimate that the funded ratio stood at 76.8% as of June 30, 2023, and at 75.9% as of November 30, 2023.

FIGURE 3: AGGREGATE PLAN-REPORTED FUNDED RATIO



Note: Yearly study results (solid bars) generally reflect measurements from one year prior.

FIGURE 4: INDIVIDUAL PLAN-REPORTED FUNDED RATIOS AT MEASUREMENT DATES (SOLID BARS) AND ESTIMATED AT JUNE 30, 2023 (DOTTED LINES)

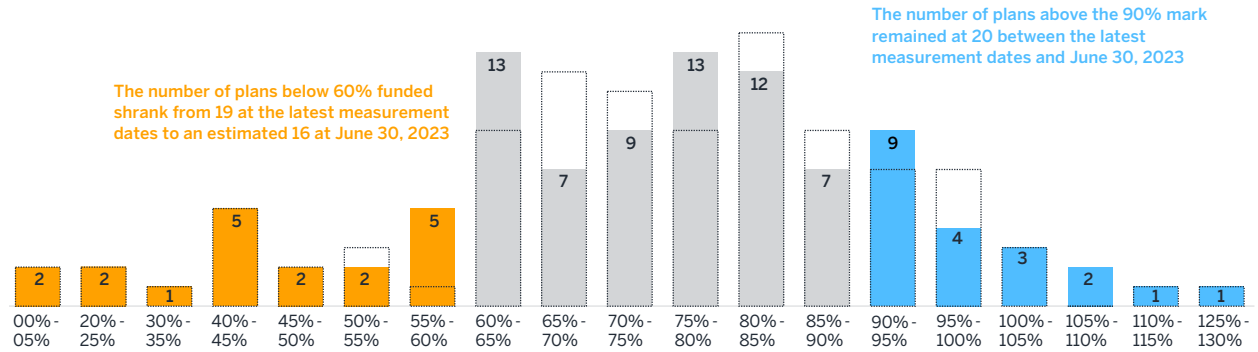
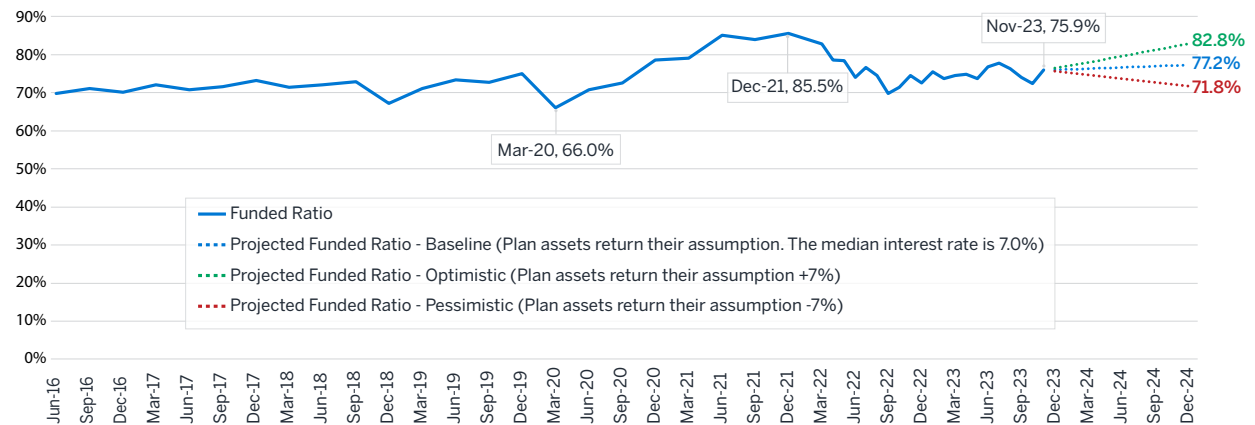


Figure 5 shows the history of the Milliman Public Pension Funding Index since June 2016. We have also projected the aggregate funded status forward from November 30, 2023, to December 31, 2024, under three scenarios. The baseline scenario assumes each plan's future investment returns equals that plan's current reported interest rate assumption (median rate = 7.0% in this study). The "optimistic" and "pessimistic" scenarios assume each plan's investment returns are 7% higher and lower, respectively, than that plan's current reported interest rate assumption.

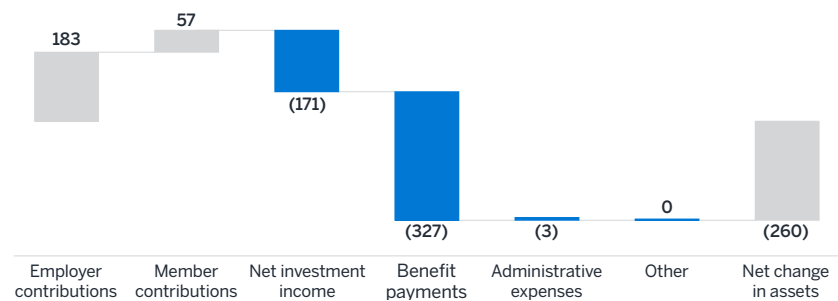
FIGURE 5: MILLIMAN PUBLIC PENSION FUNDING INDEX – FUNDED RATIO WITH PROJECTIONS



Reported cash flows

Overall, the 100 plans reported benefit payouts totaling \$327 billion in their most recent measurement years. Reported contributions totaled \$240 billion, with \$183 billion and \$57 billion provided by employers and members, respectively. Figure 6 summarizes the change in asset balances reported by the plans in their most recent measurement years.

FIGURE 6: REPORTED CHANGE IN ASSETS, MOST RECENT MEASUREMENT YEAR (\$ BILLIONS)



We project that in the period July 2023 to June 2024 the plans will receive combined contributions from employers and members of \$249 billion and pay out a total of \$360 billion in benefits and administrative expenses, for a net cash outflow of \$111 billion. This continues a steady trend of increases in both contributions flowing into the plans *and* benefits flowing out of the plans, as shown in Figure 7. Over the period shown, the net cash outflow has remained relatively stable.

FIGURE 7: REPORTED CASH FLOWS (\$ BILLIONS)

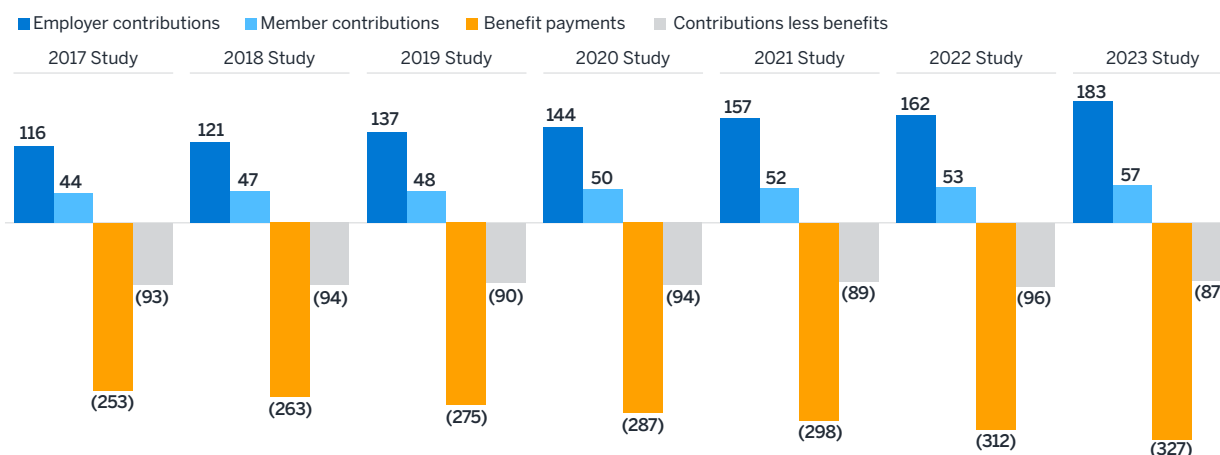
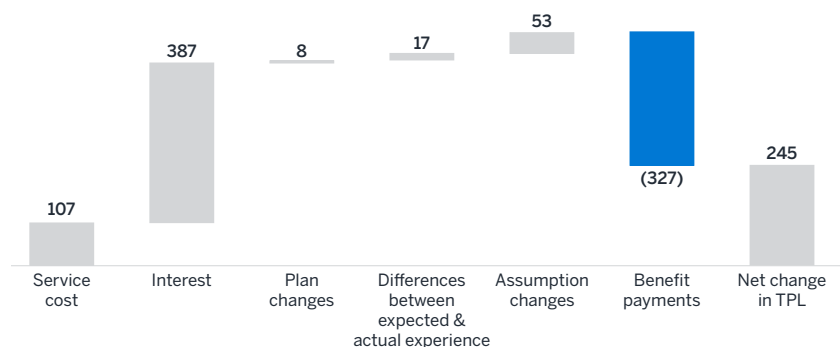


Figure 8 summarizes the change in Total Pension Liability reported by the plans in their most recent measurement years. In general, a plan’s liability is increased by service cost and interest, and reduced by benefit payments. Changes in assumptions or plan provisions can increase or decrease a plan’s liability, depending on the nature of the change.

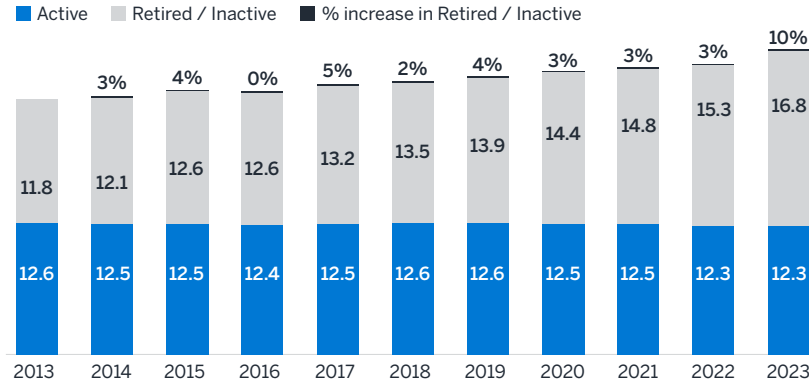
FIGURE 8: REPORTED CHANGE IN TOTAL PENSION LIABILITY, MOST RECENT MEASUREMENT YEAR (\$ BILLIONS)



Liabilities

The plans reported an aggregate Total Pension Liability of \$5.96 trillion for the 29.1 million members covered by the plans in the study. The plans continue the trend of growing more mature. Figure 9 illustrates that the number of active members covered by these plans has been essentially flat for the past 11 years, while the number of retired and inactive members has increased each year. There was a 10% increase in the number of retirees and inactive members as of the current measurement dates, a marked jump compared to prior years. This is presumably a result of the COVID-19 pandemic accelerating member retirements.

FIGURE 9: NUMBER OF PLAN MEMBERS (MILLIONS)



The 100 public plans individually range in size of Total Pension Liability from \$12 billion to \$576 billion. Collectively, the 10 largest plans (ranked by liability) cover 36% of the total members, hold 41% of the aggregate assets, and have 38% of the aggregate liability.

FIGURE 10: COMPARISON OF PLANS RANKED BY TOTAL PENSION LIABILITY

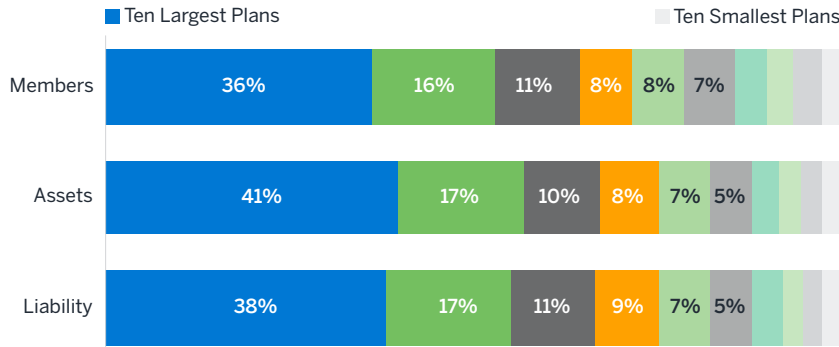


Figure 11 illustrates the relative size of the Total Pension Liability for the 100 plans in this study.

FIGURE 11: TOTAL PENSION LIABILITY (\$ BILLIONS)



Note: For plans where Total Pension Liability figures are not published on an aggregate basis, we have estimated this figure based on available data.

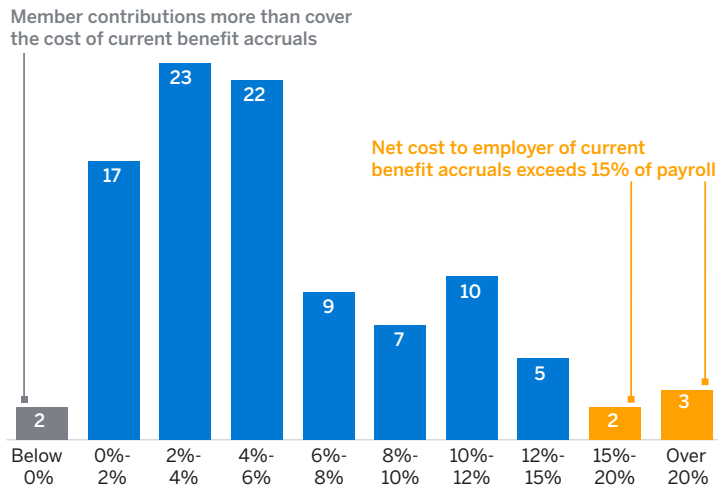
Cost of benefits earned each year

Service cost is the portion of the actuarial present value of projected benefit payments that is attributable to a given year. In other words, it is the cost to the plan to provide the benefits that active members earn by working one more year. The plans report the service cost in their Governmental Accounting Standards Board (GASB) 67/68 disclosures as a component of the change in the Total Pension Liability from one reporting date to the next.

In order to determine the relative value of pension benefits the plans provide annually to their active members, we started with each plan's reported service cost. We then subtracted out the portion of that cost that is paid for with contributions from the active members during the year. And we then divided by each plan's total payroll so that we could adjust for the relative size of a plan. The resulting metric is the net employer-paid service cost as a percentage of payroll and represents the relative richness of the pension benefits that are being paid for by the employers.

Overall, 80% of the plans provide an estimated employer-paid pension benefit in the range of 0% to 10% of payroll; the most common level of employer-paid pension benefits is 2% to 4% (23 plans). There are two plans with a negative net service cost, which means that contributions from active members more than cover the annual cost of their own annual pension accruals. On the flip side, there are five plans with a net cost of 15% of payroll or more, indicating relatively costly benefits.

FIGURE 12: EMPLOYER-PAID NET SERVICE COST AS PERCENTAGE OF PAYROLL

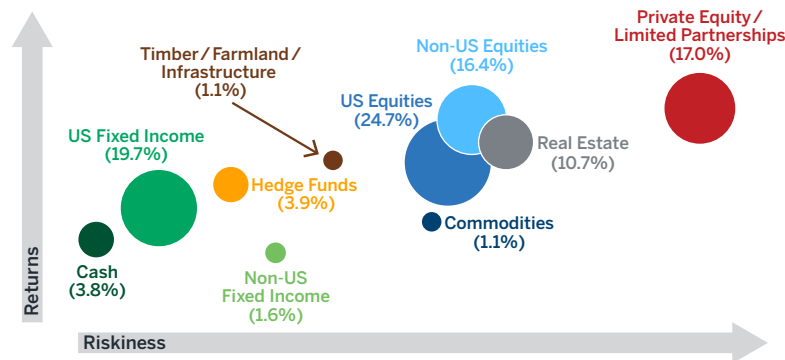


There is very little correlation between the richness of the benefits provided and the funded status of the plan; that is, plans with generous benefits are neither better funded nor more poorly funded than plans with modest benefits.

Assets

The plans included in this study are invested in a mix of asset classes with different risk/return characteristics, as illustrated in Figure 13.

FIGURE 13: ASSET ALLOCATION, 2023 STUDY



Note: The expected return and riskiness metrics are based on Milliman's capital market assumptions as of June 30, 2023.

From 2013 through 2022, there was very little change in the overall asset allocation of these plans (see Figure 14), with just a modest, gradual shift from equities and fixed income to alternative investments. However, our 2023 study results display a noticeable shift from fixed income and equities into alternative investments, specifically private equity and real estate (see Figure 15).

FIGURE 14: AGGREGATE ASSET ALLOCATIONS OVER TIME

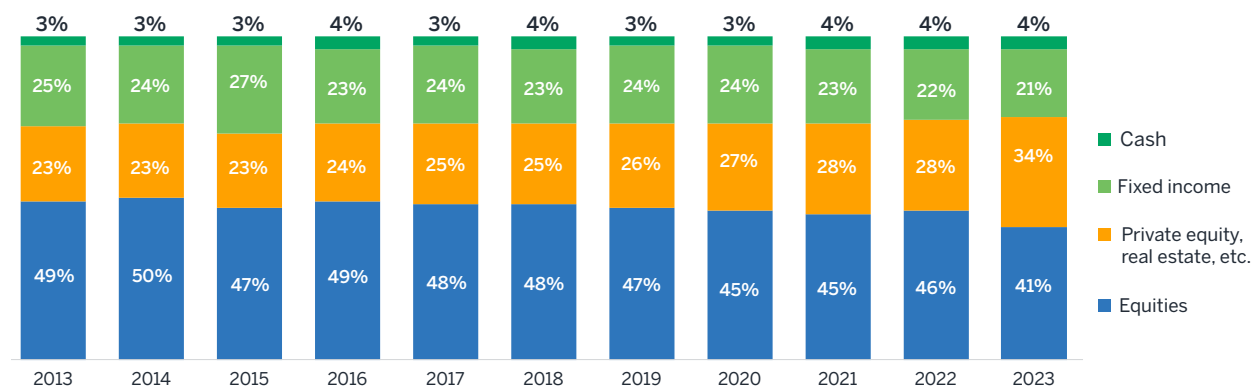
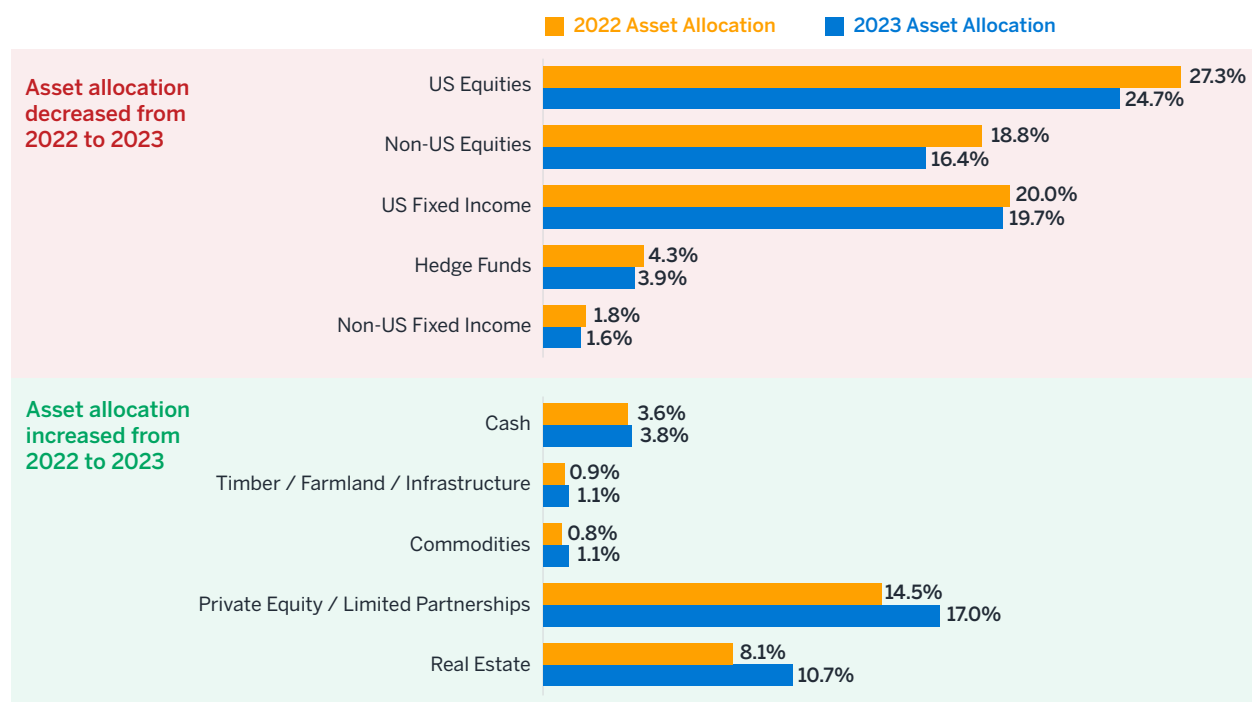


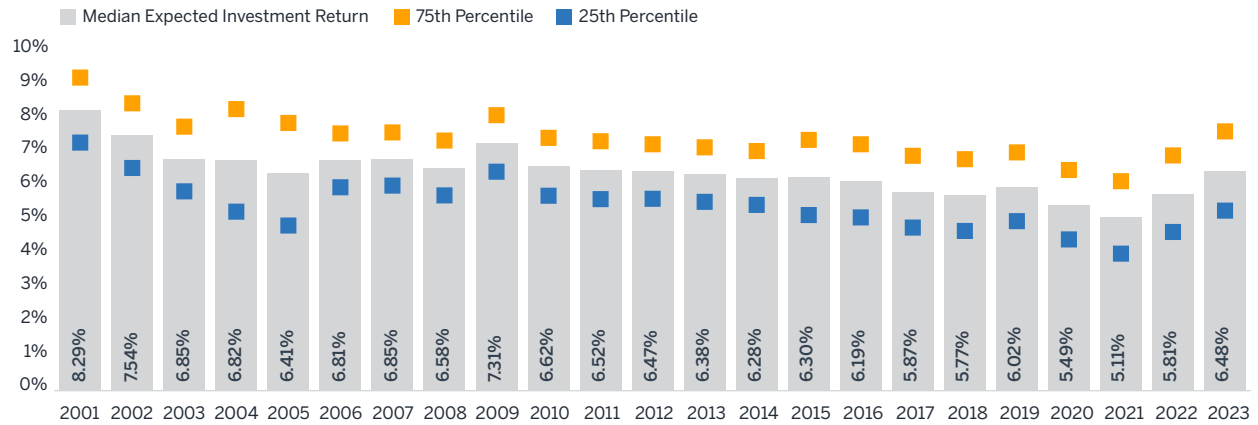
FIGURE 15: DETAILED INVESTMENT ALLOCATION 2022 VS. 2023



The market’s consensus views on long-term future investment returns have been declining since the turn of the millennium. Figure 16 illustrates this trend by showing the expected long-term future return for a hypothetical asset allocation, based on Milliman’s capital market assumptions for each year since 2000. Over this period, the median expected investment return for the illustrated hypothetical asset allocation fell from 8.29% for 2001 to a low of 5.11% at the start of 2021. Reflecting this decline, where interest rate assumptions of 8.00% were once the norm, 99 of the plans in the study now have assumptions of 7.50% or below (the same as the 99 in the 2022 study). Twenty-six of the plans lowered their assumptions from Milliman’s 2022 study to the 2023 study; all plans have lowered their assumptions at least once since our inaugural 2012 study. Since early 2021, however, the expected investment return surged upward to 5.81% at the start of 2022, and it stood at 6.48% at the start of 2023. This

rapid rise reflected the combination of high inflation, high interest rates, and depressed equity markets experienced in 2022. In the midst of the current economic turmoil, there is considerable uncertainty over when and how much equity markets will recover, and where inflation and interest rates will settle out. If inflation and interest rates return to their very low pre-pandemic levels, then plan sponsors are unlikely to raise their expected investment return assumptions. But if the “new normal” of inflation and interest rates is somewhat higher than was the case through 2019, then there may be some upward movement in expected investment returns.

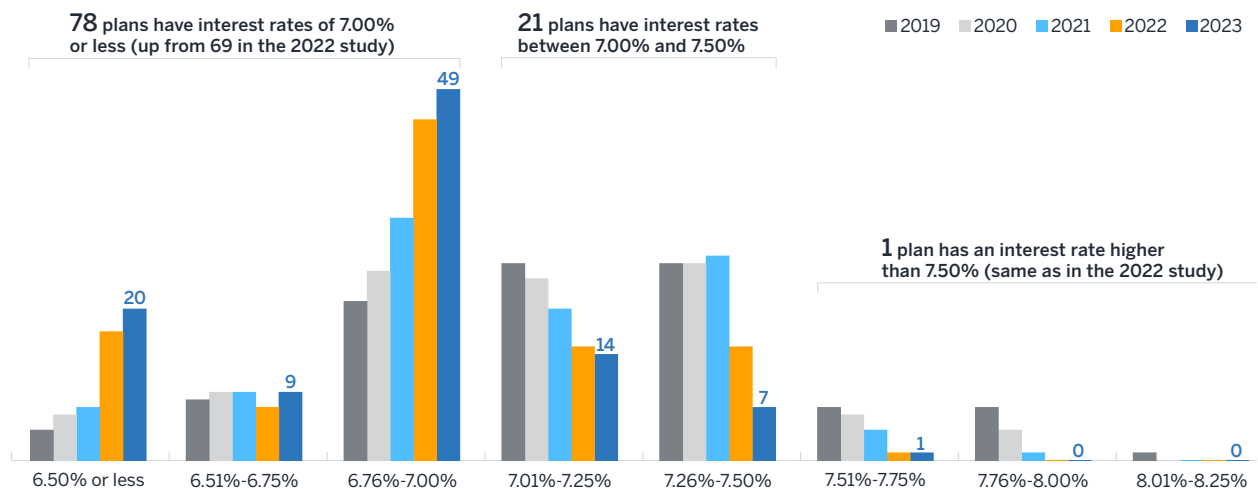
FIGURE 16: EXPECTED 30-YEAR COMPOUNDED ANNUAL RETURN FOR A HYPOTHETICAL ASSET ALLOCATION BASED ON MILLIMAN’S CAPITAL MARKET ASSUMPTIONS



Note: Hypothetical asset allocation consists of 35% broad U.S. equities, 15% developed foreign equities, 25% core fixed income, 5% high-yield bonds, 10% mortgages, 5% real estate, and 5% short-term investments; the inflation assumption is fixed at 2.5% for all years.

The terms “interest rate” and “discount rate” are often used interchangeably; both represent a rate that is used to translate future expected benefit payments into current liabilities. For this study, we use the term “interest rate” to indicate the assumption the plan has chosen to determine contribution amounts, and we use the term “discount rate” to indicate the rate that is used to measure liabilities for GASB 67/68 financial reporting purposes. Interest rates have continued to move lower each year, with a median of 7.00% and ranges from 2.16% to 7.55% (see Figure 17). For most of the plans in this study, the funding interest rate and the financial reporting discount rate are the same. However, GASB 67/68 reporting requires that the discount rate be adjusted downward in situations where current contribution policy is projected (using the GASB-mandated testing methodology) to result in a plan running out of plan assets at some future date. Such a downward adjustment currently occurs for six of the plans in the study.

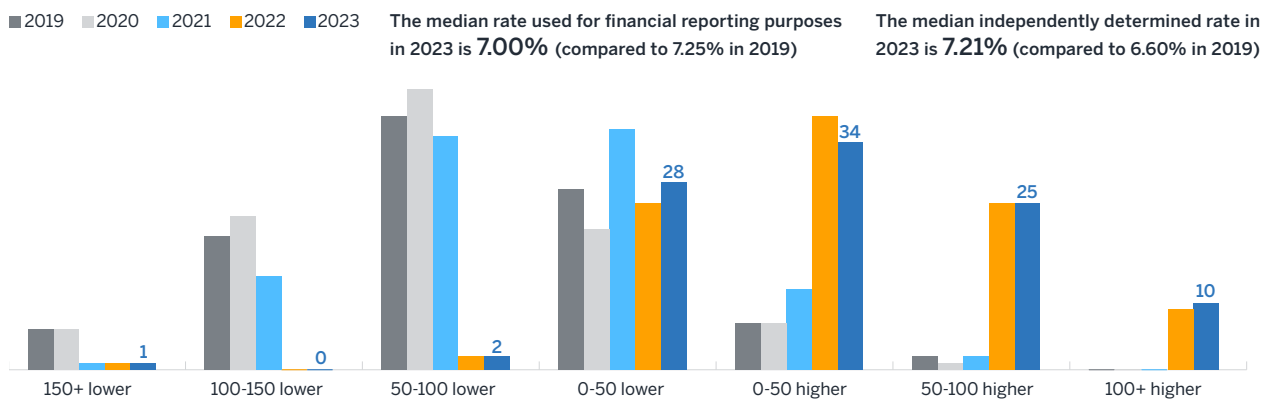
FIGURE 17: PLAN-REPORTED FUNDING INTEREST RATE



Recalibrating the Total Pension Liability

Using each plan’s specific asset allocation, we determined the 50th-percentile 30-year geometric average annual real rate of return based on Milliman’s June 30, 2023, capital market assumptions. We then applied each plan’s reported inflation assumption to arrive at our independently determined expected investment return for that plan. For purposes of the following analysis, we will use these expected returns as if they were the investment return assumptions for each plan. The median of the resulting independently determined investment return assumptions is 7.21%, which is 21 basis points higher than the 7.00% median discount rate used by the plans. Figure 18 shows that 69 of the plans have an independently determined interest rate that is higher than the reported discount rate. This continues the trend that first emerged in our 2022 study, where our independently determined investment return assumption is higher than the median reported discount rate. As discussed above, however, our independently determined figures reflect current economic conditions as of June 30, 2023, which may prove to be transitory; plan sponsors may wait until markets return to more normal levels before concluding that a change in their investment return assumption is appropriate.

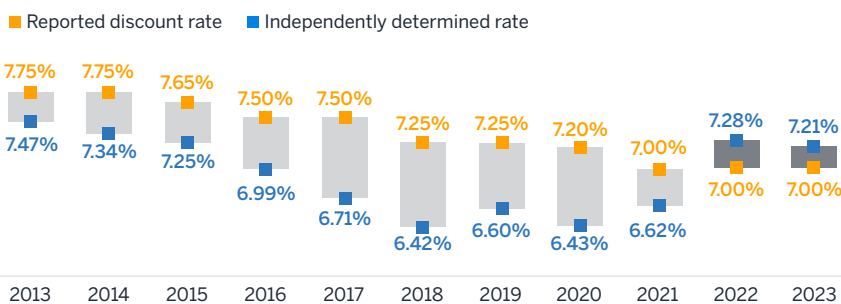
FIGURE 18: GAP BETWEEN INDEPENDENTLY DETERMINED AND PLAN-REPORTED RATES



Note: Difference shown is in basis points, so “100+ higher” indicates at least a 1.00% difference.

Plans periodically reassess their interest rate assumptions to ensure that they reflect updated market expectations about future investment returns. The frequency of reassessment varies by plan, with some plans reassessing annually and others using as long as five-year or six-year review cycles. As Figure 16 above illustrates, market expectations had been falling for the past two decades, but have ticked upward the past two years. Plans have been lowering their interest rate assumptions, but have often failed to keep pace with market expectations. For the past two years we see the reverse occurring, where plans understandably have not reacted quickly to changing market expectations. The median independently determined interest rate increased significantly from 6.62% in 2021 to 7.28% in 2022, and has declined very slightly to 7.21% in 2023.

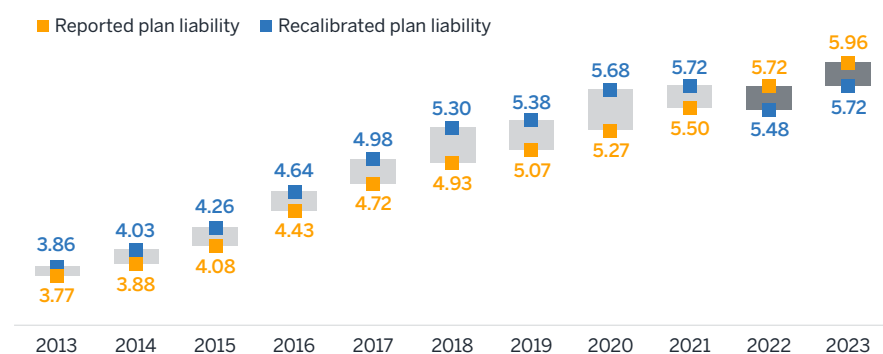
FIGURE 19: REPORTED VS. INDEPENDENTLY DETERMINED RATES



The 2023 gap between the 7.00% median discount rate used for financial reporting purposes and the 7.21% median independently determined rate indicates it is possible that plans may consider an increase to their interest rate assumptions.

We used each plan's independently determined investment return assumption to recalibrate the plan's Total Pension Liability. In aggregate, these plans have a recalibrated Total Pension Liability of \$5.72 trillion, compared with a plan-reported Total Pension Liability of \$5.96 trillion. Similar to the gap movement in the investment return assumption analysis above, the difference in the recalibrated versus plan-reported liability has flipped such that the recalibrated plan liability is currently less than the reported plan liability.

FIGURE 20: AGGREGATE RECALIBRATION RESULTS (\$ TRILLIONS)



ASOP 51 and plan maturity measures

Actuarial Standards of Practice (ASOP) 51 directs pension actuaries to provide plan sponsors with information regarding the risks faced by pension plans. Pension actuaries in particular are directed to include metrics with respect to each plan's maturity level, because a plan's maturity affects everything from how sensitive the liability is to changes in the discount rate to asset allocation decisions to cash management and liquidity considerations. Figure 21 illustrates the range of maturity levels for the plans in this study using five of the maturity metrics discussed in ASOP 51.

Market value of assets compared to payroll: This metric provides the plan sponsor with insight into managing the plan's liquidity needs. If annual benefit payouts are small relative to the overall size of plan assets, the liquidity needs of the plan will be low and more of the assets can be invested in longer-term or less liquid holdings. However, as a plan's membership shifts to more retirees drawing monthly benefits, care is needed to ensure that cash is available to pay benefits.

Benefit payments compared to market value of assets: This metric provides the plan sponsor with insight into managing the plan's liquidity needs. If annual benefit payouts are small relative to the overall size of plan assets, the liquidity needs of the plan will be low and more of the assets can be invested in longer-term or less liquid holdings. However, as a plan's membership shifts to more retirees drawing monthly benefits, care is needed to ensure that cash is available to pay benefits.

Net cash flows compared to market value of assets: The liquidity pressures caused by high levels of benefit payments may be mitigated by similarly high levels of contributions flowing into the plan from employers and members. Plans with net cash flows close to zero may therefore be in better positions to invest in longer-term or less liquid holdings even though significant funds are being expended annually on benefits. Nearly all of the plans in this study have negative cash flows, meaning that benefit payments and administrative expenses exceed incoming contributions.

Benefit payments compared to employer contributions: As with the preceding two metrics, this metric helps plan sponsors understand and manage their cash flows and liquidity needs. For plans where benefit payouts are significantly higher than incoming contributions, greater attention may need to be devoted to investments that throw off higher interest or dividend income in order to meet cash flow needs.

Duration of the liability: This metric helps plan sponsors understand how sensitive their liabilities are to a change in discount rates of 100 basis points. A relatively small change in the discount rate can have a significant impact on the Total Pension Liability. A less mature plan with more active members than retirees typically has a higher sensitivity to discount rate changes than a more mature plan with a bigger retiree population. Other factors, such as automatic cost-of-living features, also come into play in determining a plan's sensitivity.

FIGURE 21: MATURITY METRICS



ASOP 4

Actuarial Standards of Practice (ASOP) 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*, contains new disclosure requirements for pension funding valuation reports issued on or after February 15, 2023, with measurement dates that are also on or after February 15, 2023. All funding valuation reports will now include information on actuarial gains and losses, commentary on the plan's funding policy, and measurement of the plan's liability and funded status utilizing a low-default-risk obligation measure (LDROM).

See <https://www.milliman.com/en/insight/dear-actuary-asop-4> for more details on the ASOP 4 changes.

Methodology

This study is based on the most recently available Annual Comprehensive Financial Reports for the 100 largest public pension plans, which reflect measurement dates ranging from June 30, 2019, to December 31, 2022; 91 are from June 30, 2022, or later. For the purposes of this study, the reported asset allocation of each of the plans has been analyzed to determine an independent measure of the expected long-term median real rate of return on plan assets. The plan-reported Total Pension Liability for each plan has then been recalibrated to reflect this independently determined investment return assumption. This study therefore adjusts for differences between each plan's reported discount rate and an independently calibrated current market assessment of the expected real return based on actual asset allocations. This study is not intended to price the plans' liabilities for purposes of determining contribution amounts or near-term plan settlement purposes nor to analyze the funding of individual plans.

Financial Reporting vs. Funding

The Governmental Accounting Standards Board (GASB) sets the accounting standards for public entities. Statements No. 67 and 68 specify the financial reporting requirements for U.S. public pension plans and their participating employers. These standards require all plans to report a standardized measure of actuarial liability, referred to as the *Total Pension Liability*. The Total Pension Liability must be calculated using a uniform actuarial cost method (the individual entry age cost method), which may differ from the actuarial cost method the plan uses to determine contribution amounts. Under certain circumstances, generally when the plan is receiving a low level of funding, the discount rate used to calculate the Total Pension Liability may be lower than the investment return assumption used for funding purposes. Consequently, for some plans, the liability measurement used in determining amounts that should be contributed to fund the plan differs from the Total Pension Liability. Additionally, each plan is required to disclose how sensitive its Total Pension Liability is to changes in the discount rate.

Acknowledgements

Principal authors:

Rebecca A. Sielman, FSA
Richard L. Gordon, FSA

Principal researchers:

Nick Collier, ASA
Ryan Falls, FSA
Abby Hirshkowitz
Alexander Ignatenko
Steve Kowalski, FSA
Rebecca Ross, EA
Zachary Porter

Contact

Rebecca A. Sielman
becky.sielman@milliman.com

Richard L. Gordon
rick.gordon@milliman.com

Study technical appendix: Methodology

EXPECTED INVESTMENT RETURN

For the purposes of this study, we recalibrated liabilities for included plans to reflect discounting at our independently calculated expected rate of return on current plan assets. To develop the expected rate of return used in these calculations, we relied on the most recently available asset statements for each plan, particularly on Statements of Plan Net Assets as disclosed in published Annual Comprehensive Financial Reports. We did not make adjustments for potential differences between actual asset allocations and target policy asset allocations.

Our method to calculate the expected rate of return was a “building-block method,” using geometric averaging methodology. We used Milliman’s June 30, 2023, capital market assumptions to calculate the 50th-percentile 30-year real rate of return, and then combined the estimated real rate of return with the plan’s inflation assumption to arrive at the total expected investment return on plan assets. Where the plan inflation assumption was not available, we used an inflation assumption of 2.50%. We did not make any adjustment to the expected rate of return for plan expenses, nor did we include any assumption for investment alpha (i.e., we did not assume any excess return over market averages resulting from active versus passive management).

LIABILITY RECALIBRATION

We performed the recalibration of liabilities for pension plans included in the study using the sensitivity information disclosed in published Comprehensive Annual Financial Reports. Where this information was not available, we made adjustments based on available information.

Appendix

PLAN-REPORTED DATA

Plan Name	Measurement Date	GASB 68 Discount Rate	Total Pension Liability (\$ millions)	Fiduciary Net Position (\$ millions)	Net Pension Liability (\$ millions)	Funded Ratio	Count of Active Members	Count of Inactive / Retired Members
Alabama Employees' Retirement System	9/30/22	7.45%	21,657	12,999	8,658	60.0%	84,571	101,567
Alabama Teachers' Retirement System	9/30/22	7.45%	41,122	25,581	15,541	62.2%	134,034	129,400
Alaska Public Employees' Retirement System	6/30/22	7.25%	15,913	10,816	5,097	68.0%	8,996	52,327
Arizona Public Safety Personnel Retirement System	6/30/22							
Arizona State Retirement System	6/30/22	7.00%	63,411	47,089	16,322	74.3%	214,210	423,176
Arkansas Public Employees Retirement System	6/30/22	7.15%	12,430	9,734	2,696	78.3%	42,771	56,456
Arkansas Teacher's Retirement System	6/30/22	7.25%	24,958	19,679	5,278	78.9%	71,378	66,734
California Public Employees' Retirement System	6/30/22							
California State Teachers' Retirement System	6/30/22	7.10%	369,542	300,056	69,486	81.2%	449,418	552,631
Chicago Municipal Employees' Annuity and Benefit Fund	12/31/22	7.00%	19,108	3,952	15,156	20.7%	35,369	28,076
Chicago Teachers' Pension Fund	6/30/22	6.34%	27,777	11,765	16,012	42.4%	31,261	34,499
Colorado Public Employees' Retirement Association	12/31/22	7.25%	86,474	55,428	31,047	64.1%	206,646	465,265
Connecticut State Employees Retirement System	6/30/21	6.90%	38,344	17,081	21,264	44.5%	48,014	55,785
Connecticut State Teachers' Retirement System	6/30/21	6.90%	38,043	23,117	14,926	60.8%	52,200	50,644
Contra Costa County Employees' Retirement Association	12/31/22	6.75%	11,752	10,054	1,698	85.5%	10,082	14,553
Cook County Employees' Annuity and Benefit Fund	12/31/22	4.63%	24,851	12,019	12,832	48.4%	18,107	38,157
Delaware State Employees' Pension Plan	6/30/22	7.00%	12,171	10,803	1,368	88.8%	38,206	34,330
Florida State Retirement System	6/30/22	6.70%	217,434	180,226	37,208	82.9%	442,762	580,845
Georgia Employees' Retirement System	6/30/22	7.00%	20,509	13,831	6,678	67.4%	52,526	125,167
Georgia Teachers' Retirement System	6/30/22	6.90%	119,595	87,123	32,472	72.8%	230,344	273,812
Hawaii State Employees' Retirement System	6/30/22	7.00%	34,823	21,855	12,968	62.8%	64,234	87,893
Idaho Public Employee Retirement System	6/30/22	6.35%	23,288	19,349	3,939	83.1%	74,409	103,393
Illinois Municipal Retirement Fund	12/31/22							
Illinois State Employees' Retirement System	6/30/22	6.58%	54,561	22,225	32,337	40.7%	61,056	107,714
Illinois State Teachers' Retirement System	6/30/22	7.00%	146,674	62,834	83,840	42.8%	165,566	274,267
Illinois State Universities Retirement System	6/30/22	6.39%	51,601	22,523	29,078	43.6%	60,281	159,287
Indiana Public Employees' Retirement Fund	6/30/22	6.25%	18,002	14,848	3,154	82.5%	120,967	131,496
Indiana State Teachers' Retirement Fund	6/30/22	6.25%	22,214	12,610	9,604	56.8%	66,858	71,563
Iowa Public Employees' Retirement System	6/30/22	7.00%	43,970	40,192	3,778	91.4%	176,186	216,539
Kansas Public Employee Retirement System	6/30/22	7.00%	35,085	24,472	10,612	69.8%	144,251	172,121
Kentucky County Employees Retirement System	6/30/22	6.25%	20,962	10,682	10,280	51.0%	87,033	189,927
Kentucky Employees Retirement Systems	6/30/22	5.32%	17,600	3,825	13,775	21.7%	33,168	116,709
Kentucky Teachers' Retirement System	6/30/22	7.10%	40,598	22,900	17,698	56.4%	74,785	69,128
Los Angeles City Employees' Retirement System	6/30/22	7.00%	24,079	17,013	7,066	70.7%	24,917	32,778
Los Angeles City Water and Power Employees' Retirement Plan	6/30/22	6.50%	16,130	15,514	616	96.2%	10,799	11,451
Los Angeles County Employees Retirement Association	6/30/22	7.13%	83,931	70,290	13,642	83.7%	96,539	90,618
Los Angeles Fire and Police Pension Plan	6/30/22	7.00%	25,907	25,259	649	97.5%	12,771	14,544

Appendix

PLAN-REPORTED DATA (CONTINUED)

Plan Name	Measurement Date	GASB 68 Discount Rate	Total Pension Liability (\$ millions)	Fiduciary Net Position (\$ millions)	Net Pension Liability (\$ millions)	Funded Ratio	Count of Active Members	Count of Inactive / Retired Members
Louisiana State Employees' Retirement System	6/30/22	7.25%	20,798	13,239	7,560	63.7%	37,358	113,960
Louisiana Teachers' Retirement System	6/30/22	7.25%	34,593	25,046	9,547	72.4%	86,364	121,739
Maine Public Employees Retirement System	6/30/22	6.50%	21,021	18,357	2,663	87.3%	52,717	60,854
Maryland State Employees' Combined System	6/30/22	6.80%	29,867	21,429	8,438	71.7%	78,696	107,337
Maryland Teachers Combined System	6/30/22	6.80%	49,235	39,126	10,109	79.5%	110,980	106,496
Massachusetts State Employees' Retirement System	6/30/22	7.00%	48,041	34,131	13,910	71.0%	85,999	73,189
Massachusetts Teachers' Retirement System	6/30/22	7.00%	61,273	35,385	25,888	57.7%	98,926	69,727
Michigan Municipal Employees' Retirement System	12/31/22	7.00%	51,956	58,814	(6,858)	113.2%	26,320	54,863
Michigan Public School Employee's Retirement System	9/30/22	6.00%	97,125	59,197	37,928	60.9%	157,893	240,995
Michigan State Employees Retirement System	9/30/22	6.00%	19,524	13,065	6,459	66.9%	4,785	62,051
Minnesota Public Employees Police and Fire Plan	6/30/22	5.40%	14,767	10,415	4,352	70.5%	11,629	13,971
Minnesota Public Employees Retirement Association	6/30/22	6.50%	33,954	26,034	7,920	76.7%	149,987	184,616
Minnesota State Retirement System	6/30/22	6.75%	17,473	15,830	1,643	90.6%	51,219	64,668
Minnesota Teachers Retirement Association	6/30/22	7.00%	33,604	25,596	8,007	76.2%	84,308	126,606
Mississippi Public Employees' Retirement System	6/30/22	7.55%	51,375	30,791	20,584	59.9%	144,416	205,352
Missouri Public School Retirement System	6/30/22	7.30%	55,405	47,671	7,734	86.0%	78,973	77,721
Missouri State Employees' Plan	6/30/22	6.95%	15,409	8,248	7,161	53.5%	41,595	71,800
Nebraska Public Employees Retirement Systems School Retirement System	6/30/22	7.20%	14,958	14,143	816	94.5%	43,586	55,288
Nevada State Public Employees' Retirement System	6/30/22	7.25%	72,569	54,514	18,055	75.1%	108,635	98,560
New Hampshire Retirement System	6/30/22	6.75%	16,444	10,708	5,736	65.1%	48,687	45,405
New Jersey Police and Firemen's Retirement System	6/30/22	7.00%	48,519	30,709	17,810	63.3%	42,188	47,578
New Jersey Public Employees' Retirement System	6/30/22	7.00%	70,174	32,568	37,606	46.4%	239,902	189,154
New Jersey Teachers' Pension and Annuity Fund	6/30/22	7.00%	76,317	24,641	51,677	32.3%	158,156	111,736
New Mexico Educational Retirement Board	6/30/22	7.00%	23,972	15,551	8,422	64.9%	59,887	107,245
New Mexico Public Employees Retirement Association	6/30/22	7.25%	23,582	16,355	7,227	69.4%	47,793	67,769
New York City Employees' Retirement System	6/30/22	7.00%	96,693	78,589	18,105	81.3%	180,981	242,650
New York City Police Pension Fund	6/30/22	7.00%	61,515	51,799	9,716	84.2%	35,006	55,401
New York City Teachers' Retirement System	6/30/22	7.00%	78,721	64,009	14,711	81.3%	124,276	105,038
New York State and Local Employees Retirement System	3/31/22	5.90%	223,875	232,049	(8,175)	103.7%	473,915	645,000
New York State and Local Police & Fire	3/31/22	5.90%	42,237	41,669	568	98.7%	32,169	42,289
New York State Teachers' Retirement System	6/30/22	6.95%	133,883	131,965	1,919	98.6%	253,258	188,786
North Carolina Local Governmental Employees' Retirement System	6/30/22	6.50%	35,579	29,937	5,641	84.1%	132,235	172,791
North Carolina Teachers and State Employees Retirement System	6/30/22	6.50%	93,572	78,730	14,842	84.1%	305,271	437,294

Appendix

PLAN-REPORTED DATA (CONTINUED)

Plan Name	Measurement Date	GASB 68 Discount Rate	Total Pension Liability (\$ millions)	Fiduciary Net Position (\$ millions)	Net Pension Liability (\$ millions)	Funded Ratio	Count of Active Members	Count of Inactive / Retired Members
Ohio Police and Fire Pension Fund	12/31/22	7.50%	25,607	16,108	9,499	62.9%	29,618	30,817
Ohio Public Employees Retirement System	12/31/21	6.90%	118,474	110,168	8,306	93.0%	280,490	917,576
Ohio Schools Employees' Retirement System	6/30/22	7.00%	22,371	16,963	5,409	75.8%	155,063	87,269
Ohio State Teachers Retirement System	6/30/22	7.00%	105,264	83,034	22,230	78.9%	174,036	320,933
Oklahoma Teachers' Retirement System	6/30/22	7.00%	27,411	19,202	8,209	70.1%	99,844	95,322
Orange County Employees Retirement System	12/31/22	7.00%	25,081	19,690	5,391	78.5%	22,061	28,572
Oregon Public Employees Retirement System	6/30/22	6.90%	99,082	83,770	15,312	84.5%	177,739	210,326
Pennsylvania Public School Employees' Retirement System	6/30/22	7.00%	114,987	70,528	44,459	61.3%	247,873	273,737
Pennsylvania State Employees' Retirement System	12/31/21	7.00%	52,936	40,231	12,705	76.0%	97,857	141,597
Puerto Rico Government Employees Retirement System	6/30/21	2.16%	30,707	0	30,707	0.0%	90,139	123,171
Puerto Rico Teachers Retirement System	6/30/19	3.50%	16,802	0	16,802	0.0%	26,283	48,196
Rhode Island Employees Retirement System	6/30/22	7.00%	12,004	7,330	4,674	61.1%	24,175	31,152
Sacramento County Employees' Retirement System	6/30/22	6.75%	13,579	11,830	1,749	87.1%	12,757	18,058
San Bernardino County Employees' Retirement Association	6/30/22	7.25%	15,628	13,303	2,325	85.1%	21,276	24,066
San Diego County Employees Retirement Association	6/30/22	6.50%	20,183	14,504	5,679	71.9%	18,138	29,079
San Francisco City and County Employees' Retirement System	6/30/22	7.20%	35,490	32,799	2,691	92.4%	33,199	43,804
South Carolina Retirement System	6/30/22	7.00%	56,455	32,213	24,242	57.1%	200,989	367,367
South Dakota Retirement System	6/30/22	6.50%	14,117	14,126	(9)	100.1%	41,878	44,243
Tennessee Consolidated Retirement System	6/30/22	6.75%	27,492	28,986	(1,494)	105.4%	48,108	84,831
Texas County & District Retirement System	12/31/22							
Texas Employees' Retirement System	8/31/22	7.00%	45,862	31,986	13,876	69.7%	133,751	277,868
Texas Municipal Retirement System	12/31/22							
Texas Teacher Retirement System	8/31/22	7.00%	243,553	184,186	59,367	75.6%	928,418	1,020,489
University of California Retirement Plan	6/30/22	6.75%	102,636	81,363	21,273	79.3%	134,900	198,393
Utah Retirement Systems	12/31/22	6.85%	44,774	42,075	2,699	94.0%	99,491	139,668
Virginia Employees Retirement System	6/30/22	6.75%	109,999	93,836	16,163	85.3%	340,035	283,597
Washington Public Employees' Retirement System	6/30/22	7.00%	67,003	67,927	(924)	101.4%	165,113	155,870
Washington State Law Enforcement Officer's and Fire Fighters' Plan 1 and 2	6/30/22	7.00%	21,015	26,601	(5,586)	126.6%	18,619	16,966
Washington State Teachers' Retirement System	6/30/22	7.00%	31,686	29,981	1,705	94.6%	81,649	67,885
Wisconsin Retirement System	12/31/21	6.80%	133,788	141,848	(8,060)	106.0%	258,647	404,676