2021 Public Pension Funding Study

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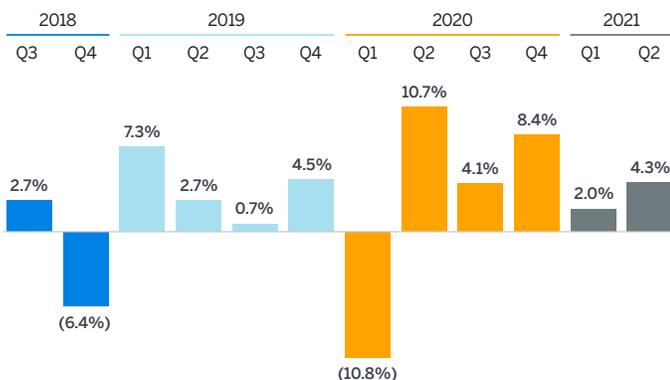**Richard L. Gordon**, FSA

⬛ Milliman

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 assessment of how well funded a plan is. We also recalibrate the liability for each plan based on our independent assessment of the expected real return on each plan's investments.

This 2021 report is based on the most recently published fiscal-year-end reports available for each plan —June 30, 2020, is the *measurement date* for three-quarters of the plans in our 2021 study. Some plans have subsequently issued data regarding their investment performance for more recent time periods, but such information has not been incorporated into this study. At the time of the measurement dates used in this study, plan assets had generally not yet fully recovered from the market drop at the onset of the COVID-19 pandemic. However, market performance since the measurement dates has been robust, and we estimate that aggregate plan assets rose significantly from $3.90 trillion as of the most recent measurement dates to $4.82 trillion as of June 30, 2021. We estimate that the plans experienced a median annualized return on assets of 27% in the period between their measurement dates and June 30, 2021.

While the significant improvement in funded status is welcome news to public pension plan stakeholders, it is important to remember that a market correction could quickly send plan assets back down to more typical levels. In addition, most pension systems use one or more smoothing mechanisms to dampen the impact of market volatility on contribution levels; as a result, it is unlikely that the recent strong market performance will result in budgetary relief in the short term.

Highlights

- As of June 30, 2021, the aggregate funded ratio is estimated to be 85.0%, a stunning improvement from 70.7% one year earlier

- Surging market returns have propelled pension assets far beyond previous levels, driving the estimated funding deficit below $1 trillion for the first time since 2012

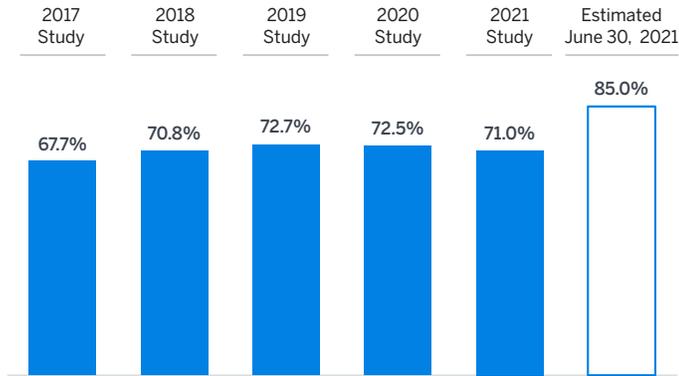- We estimate that nearly half of the plans in the study stood above 90% funded as of June 30, 2021

The aggregate Total Pension Liability reported at the measurement dates was $5.50 trillion, growing from $5.27 trillion as of the prior measurement dates. We estimate that the Total Pension Liability has further increased to $5.67 trillion as of June 30, 2021. The aggregate plan-reported underfunding as of the measurement dates stood at $1.60 trillion, which is higher than the $1.45 trillion of underfunding a year earlier, and marks the highest level of underfunding since our study commenced in 2012. However, as mentioned earlier, the strong market performance since the measurement dates has significantly outpaced the liability growth, and we estimate that the gap between assets and liabilities has narrowed to $0.85 trillion as of June 30, 2021. To the extent that plans lowered their interest rate assumptions (often referred to as the investment return assumption) after measurement dates reflected in this report, our estimated figures as of June 30, 2021, likely understate the aggregate liability and the aggregate underfunding.

FIGURE 1: QUARTERLY INVESTMENT RETURNS

FIGURE 2: AGGREGATE PLAN-REPORTED FUNDED STATUS ($ TRILLIONS)
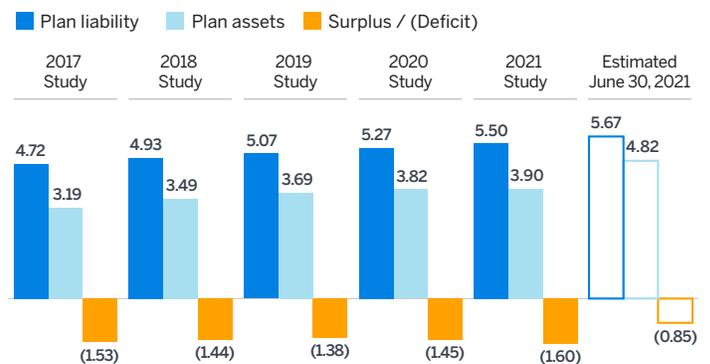
Due in large part to extreme market volatility amid the onset of the COVID-19 pandemic in the early part of 2020, the aggregate funded ratio had fallen slightly to 71.0% as of the measurement dates, but we estimate that it has improved dramatically and stands at 85.0% as of June 30, 2021.
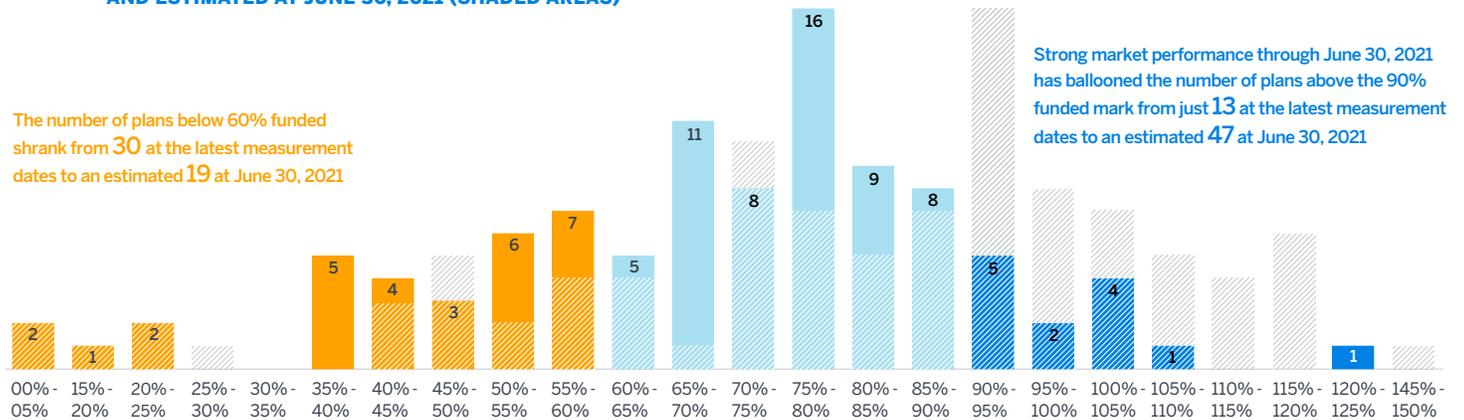
FIGURE 3: AGGREGATE PLAN-REPORTED FUNDED RATIO

2017 Study	2018 Study	2019 Study	2020 Study	2021 Study	Estimated June 30, 2021
67.7%	70.8%	72.7%	72.5%	71.0%	85.0%

Impact of COVID-19 Pandemic

Since early 2020, the COVID-19 pandemic has been affecting public pension plans across the United States in a number of ways. Most visible is the market volatility, which has impacted plan asset levels. In addition, we expect that furloughs and shutdowns have impacted pay levels and employee contribution amounts. Constrained tax revenues and shifting budget priorities may have caused some employers to pull back on their contributions as well. Because most of the information we collected for this 2021 study is from measurement years that ended June 30, 2020, or earlier, we do not yet have insight into these forces. More concrete evidence of the pandemic's impact will be available once next year's financial statements are published.

FIGURE 4: INDIVIDUAL PLAN-REPORTED FUNDED RATIOS AT MEASUREMENT DATES (SOLID BARS AND NUMBERS) AND ESTIMATED AT JUNE 30, 2021 (SHADED AREAS)

The number of plans below 60% funded shrank from 30 at the latest measurement dates to an estimated 19 at June 30, 2021

Strong market performance through June 30, 2021 has ballooned the number of plans above the 90% funded mark from just 13 at the latest measurement dates to an estimated 47 at June 30, 2021

Overall, the 100 plans reported benefit payouts totaling $298 billion in their most recent measurement years. Reported contributions totaled $209 billion, with $157 billion and $52 billion provided by employers and members, respectively. Figure 5 summarizes the change in asset balances reported by the plans in their most recent measurement years.

FIGURE 5: REPORTED CHANGE IN ASSETS, MOST RECENT MEASUREMENT YEAR ($ BILLIONS)
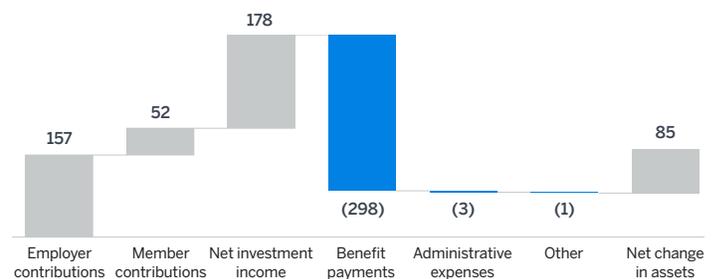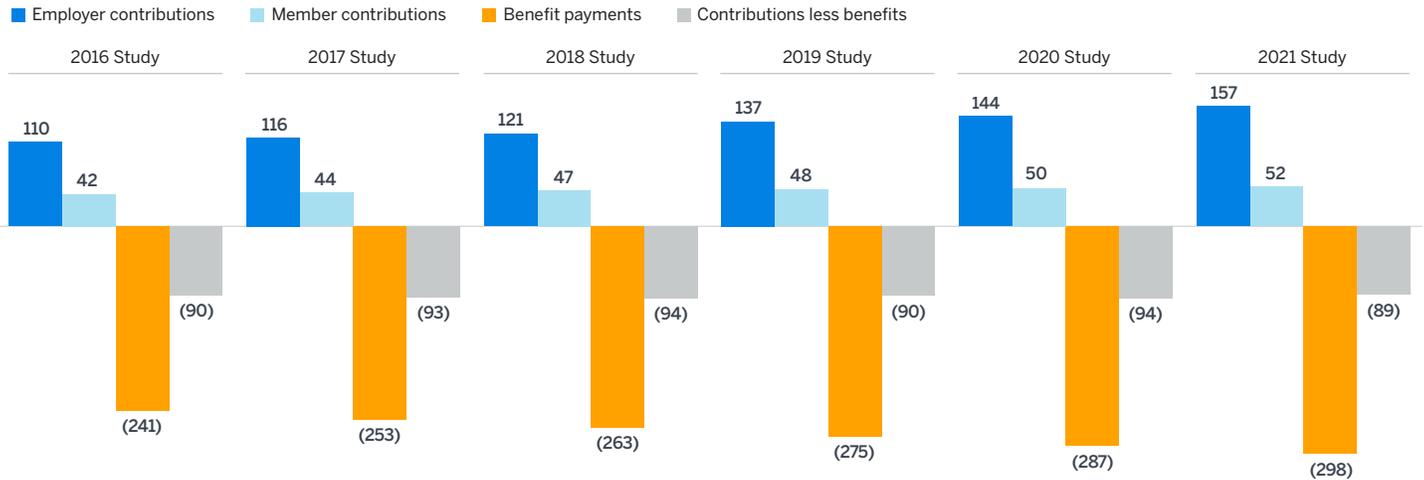

Employer contributions	Member contributions	Net investment income	Benefit payments	Administrative expenses	Other	Net change in assets
157	52	178	(298)	(3)	(1)	85

FIGURE 6: REPORTED CASH FLOWS ($ BILLIONS)

■ Employer contributions   ■ Member contributions   ■ Benefit payments   ■ Contributions less benefits

We project that in the period July 2021 to June 2022 the plans will receive combined contributions from employers and members of $225 billion and pay out a total of $323 billion in benefits and administrative expenses, for a net cash outflow of $98 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 6.

Figure 7 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 it is 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 7: REPORTED CHANGE IN TOTAL PENSION LIABILITY, MOST RECENT MEASUREMENT YEAR ($ BILLIONS)
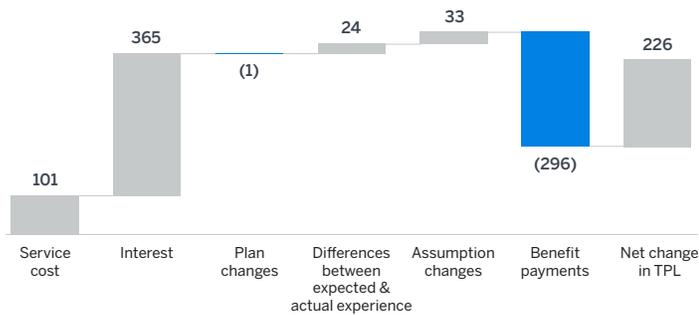
Liabilities

The plans reported an aggregate Total Pension Liability of $5.50 trillion for the 27.3 million members covered by the plans in the study. The plans continue the trend of growing more mature. Figure 8 illustrates that the number of active members covered by these plans has been essentially flat for the past eight years, while the number of retired and inactive members has increased each year.

FIGURE 8: NUMBER OF PLAN MEMBERS (MILLIONS)

■ Active   ■ Retired / Inactive
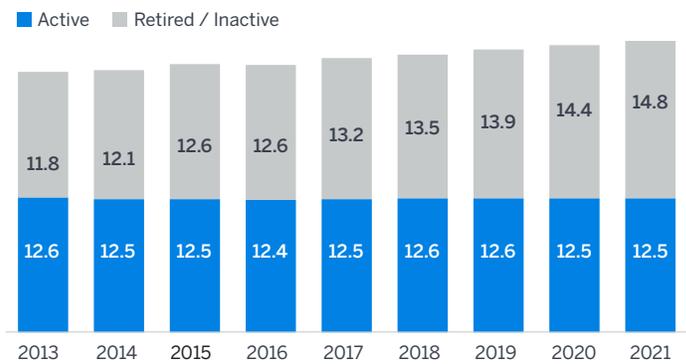
The 100 public plans individually range in size of Total Pension Liability from $11 billion to $521 billion. Collectively, the 10 largest plans (ranked by liability) cover 36% of the total members, hold 40% of the aggregate assets, and have 38% of the aggregate liability.

FIGURE 9: COMPARISON OF PLANS RANKED BY TOTAL PENSION LIABILITY

■ Ten Largest Plans   ■ Ten Smallest Plans

Figure 10 illustrates the relative size of the Total Pension Liability for the 100 plans in this study.

FIGURE 10: 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.
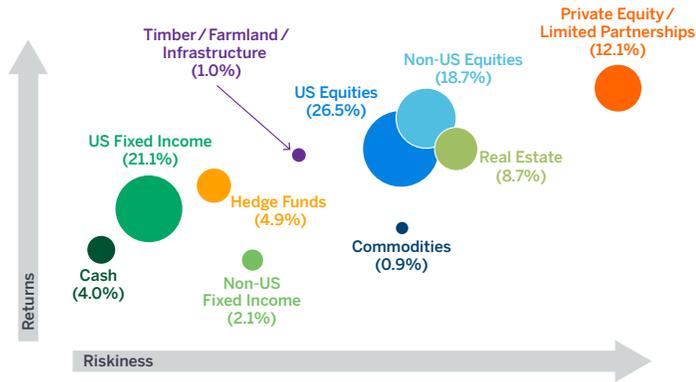
Cost of benefits being earned each year

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 the 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 4% to 6% (24 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 seven plans with a net cost of 15% of payroll or more, indicating relatively costly benefits.

FIGURE 11: 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 12.

**FIGURE 12: ASSET ALLOCATION, 2021 STUDY**

Note: The expected return and riskiness metrics are based on Milliman's capital market assumptions as of June 30, 2021.

Over the past nine years there has been very little change in the overall asset allocation of these plans (see Figure 13), with just a modest, gradual shift from equities to alternative investments.

We found little correlation between plans' asset allocations or reported interest rate assumptions and how well funded or poorly funded (as measured by their funded ratios) the plans are.

FIGURE 13: AGGREGATE ASSET ALLOCATIONS OVER TIME
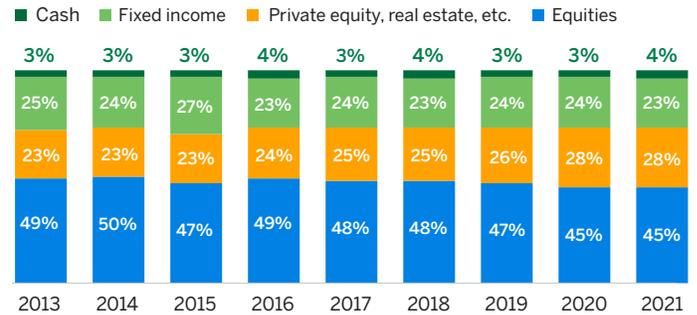
The market's consensus views on long-term future investment returns have been declining since the turn of the millennium. Figure 14 below illustrates this trend by showing the expected long-term future return for a hypothetical asset allocation, based on Milliman's capital market assumptions for each 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 period low of 5.11% for 2021. Where interest rate assumptions of 8.00% were once the norm, 95 of the plans in the study now have assumptions of 7.50% or below (compared to 90 in the 2020 study). Twenty-four of the plans lowered their assumptions from the 2020 study to the 2021 study; nearly all plans (98 of the 100) have lowered their assumptions at least once since our inaugural 2012 study.

FIGURE 14: EXPECTED 30-YEAR COMPOUNDED ANNUAL RETURN FOR A HYPOTHETICAL ASSET ALLOCATION BASED ON MILLIMAN'S CAPITAL MARKET ASSUMPTIONS
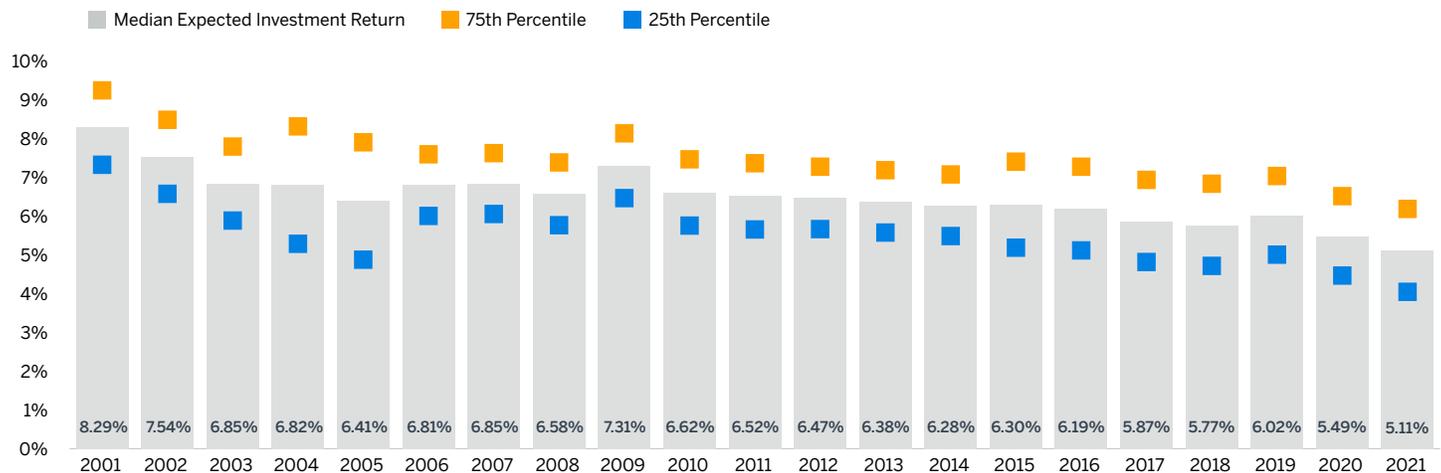
Note: Hypothetical asset allocation consists of 35% broad U.S. equities, 15% developed foreign equities, 25% core fixed income, 5% high-yield bonds, 10% mortgages, 5% real estate, and 5% short-term investments; inflation assumption is fixed at 2.5% for all years.

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 7.11% and ranges from 3.58% to 8.00% (see Figure 15 below). 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 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 eight of the plans in the study.

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, 2021, capital market assumptions. We then applied each plan's reported inflation assumption to arrive at our independently determined investment return assumption for that plan. The median of the resulting independently determined investment return assumptions is 6.62%, which is 38 basis points lower than the 7.00% median discount rate used by the plans.

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 a five-year or six-year review cycle.

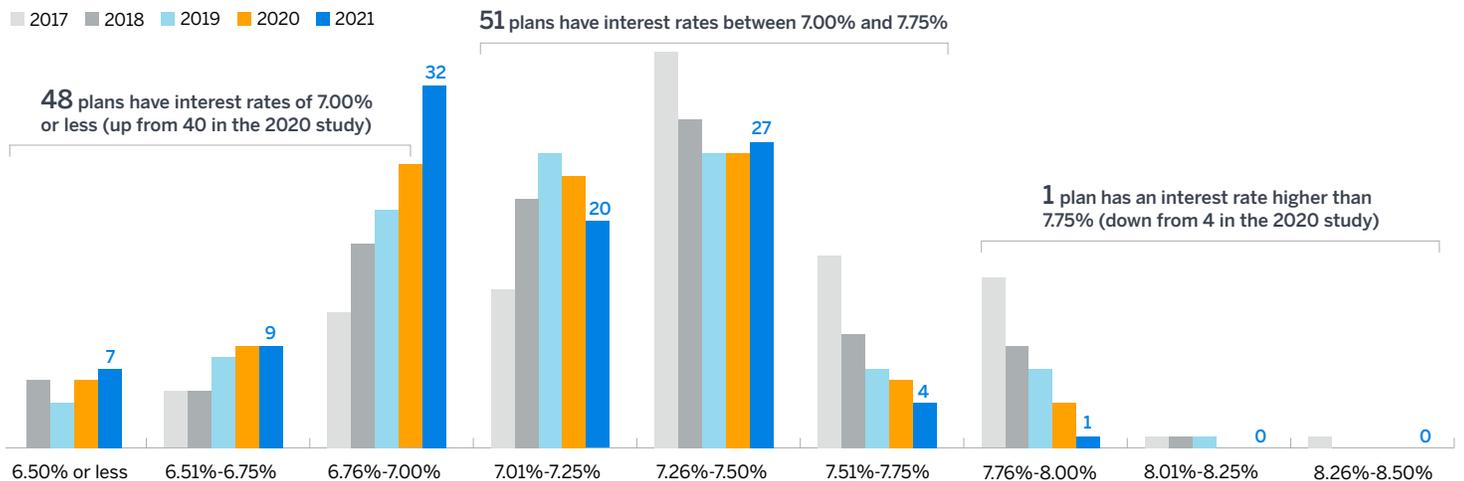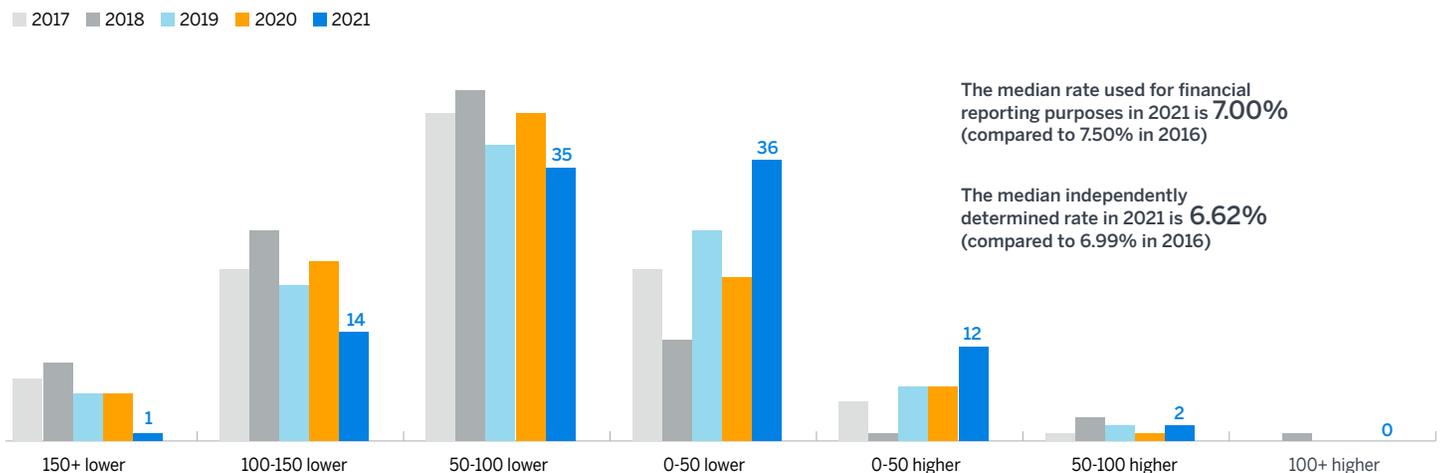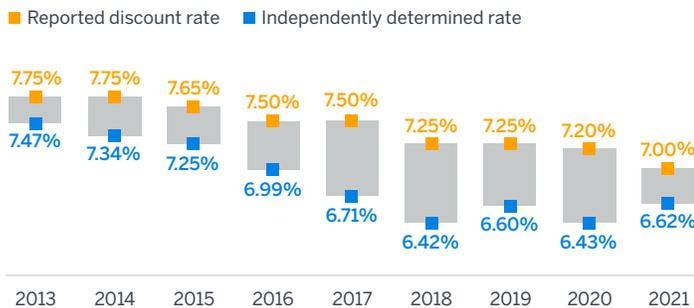**FIGURE 15: PLAN-REPORTED FUNDING INTEREST RATE**

48 plans have interest rates of 7.00% or less (up from 40 in the 2020 study)

51 plans have interest rates between 7.00% and 7.75%

1 plan has an interest rate higher than 7.75% (down from 4 in the 2020 study)

FIGURE 16: GAP BETWEEN INDEPENDENTLY DETERMINED AND PLAN-REPORTED RATES

The median rate used for financial reporting purposes in 2021 is **7.00%** (compared to 7.50% in 2016)

The median independently determined rate in 2021 is **6.62%** (compared to 6.99% in 2016)

As Figure 14 above illustrates, market expectations have been falling for the past two decades. Plans have been lowering their interest rate assumptions in response, but have often failed to keep pace with market expectations. The decline in the median discount rate from 7.20% in 2020 to 7.00% in 2021 represents one of the steepest one-year drops in the history of the Milliman Public Pension Funding Study and has led to a considerable narrowing of the gap between reported discount rates and Milliman's independently determined rate (shown in Figure 17). Twenty-four of the plans in the study have followed the market trend and lowered their interest rate assumptions since the previous study.

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 $5.50 trillion. Similar to the gap movement in the investment return assumption analysis above, the difference in the recalibrated versus plan-reported liability has narrowed to 2014-2016 levels.

FIGURE 17: REPORTED VS. INDEPENDENTLY DETERMINED RATES

■ Reported discount rate ■ Independently determined rate

The 2021 gap between the 7.00% median discount rate used for financial reporting purposes and the 6.62% median independently determined rate indicates it is likely that plans will continue to reduce their interest rates.

FIGURE 18: AGGREGATE RECALIBRATION RESULTS ($ TRILLIONS)

■ Reported plan liability ■ Recalibrated plan liability

Financial Reporting vs. Funding

The Governmental Accounting Standards Board (GASB) sets the accounting standards for public entities. Statements No. 67 and No. 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.

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 19 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, also known as the Asset Volatility Ratio, helps plan sponsors anticipate the impact of investment volatility on actuarially determined contribution rates. A lower ratio means that plan assets are relatively small compared to payroll; this implies that a single-year deviation in asset performance may not move the contribution rate much. A higher ratio, on the other hand, signals that a similar single-year asset gain or loss could translate into a signficiant shift in the actuarially determined contribution rate. It is unsurprising that, as pension plans have accumulated assets and their member populations have matured, asset volatility rates have risen. These higher ratios mean that actuarially determined contribution rates are now more sensitive than they once were to investment volatility, despite the use of asset-smoothing methods to help mitigate the impact of market movements.

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 a better position 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 popoulation. Other factors, such as automatic cost-of-living features, also come into play in determining a plan's sensitivity.

FIGURE 19: MATURITY METRICS
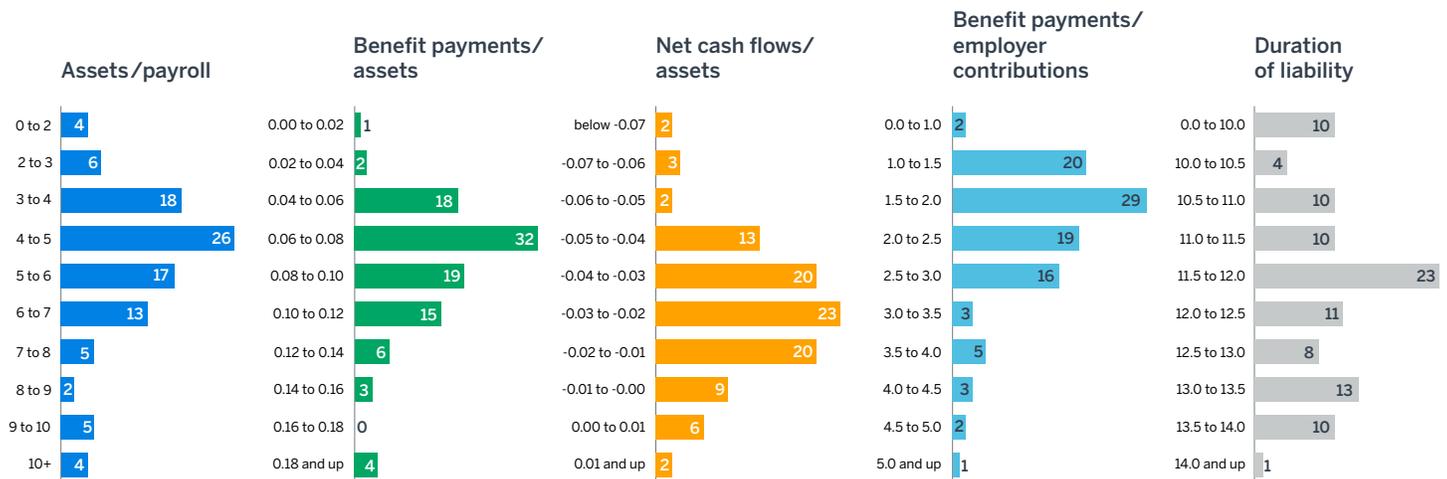
Methodology

This study is based on the most recently available Comprehensive Annual Financial Reports for the 100 largest public pension plans, which reflect measurement dates ranging from June 30, 2017, to December 31, 2020; 91 are from June 30, 2020, 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.

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 Comprehensive Annual 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, 2021, 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

SPONSOR-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	9/30/20	7.70%	19,707	13,151	6,556	66.7%	84,534	88,045
Alabama Teachers' Retirement System	9/30/20	7.70%	38,316	25,946	12,370	67.7%	136,325	119,414
Alaska Public Employees' Retirement System	6/30/20	7.38%	15,370	9,469	5,901	61.6%	11,162	43,348
Arizona Public Safety Personnel Retirement System	6/30/20							
Arizona State Retirement System	6/30/20	7.50%	56,494	39,168	17,327	69.3%	214,810	404,587
Arkansas Public Employees Retirement System	6/30/20	7.15%	11,633	8,769	2,864	75.4%	44,373	54,516
Arkansas Teacher's Retirement System	6/30/20	7.50%	22,563	16,902	5,661	74.9%	70,539	63,471
California Public Employees' Retirement System	6/30/20							
California State Teachers' Retirement System	6/30/20	7.10%	343,893	246,984	96,909	71.8%	448,419	527,574
Chicago Municipal Employees' Annuity and Benefit Fund	12/31/20	7.00%	17,815	4,090	13,725	23.0%	31,327	27,603
Chicago Public Schools	6/30/20	6.37%	26,378	10,937	15,441	41.5%	30,091	38,039
Colorado Public Employees' Retirement Association	12/31/20	7.25%	83,891	58,273	25,618	69.5%	200,858	160,329
Connecticut State Employees Retirement System	6/30/19	6.90%	36,088	13,276	22,812	36.8%	49,429	53,930
Connecticut State Teachers' Retirement System	6/30/19	6.90%	35,566	18,493	17,073	52.0%	50,594	48,931
Cook County Employees' Annuity and Benefit Fund	12/31/20	3.68%	27,635	12,650	14,985	45.8%	19,102	35,846
Delaware State Employees' Pension Plan	6/30/20	7.00%	11,045	9,639	1,406	87.3%	37,724	32,934
Florida State Retirement System	6/30/20	6.80%	204,910	161,568	43,341	78.8%	477,495	567,094
Georgia Employees' Retirement System	6/30/20	7.30%	17,717	13,502	4,215	76.2%	57,059	116,744
Georgia Teachers' Retirement System	6/30/20	7.25%	105,385	81,162	24,224	77.0%	231,047	252,797
Hawaii State Employees' Retirement System	6/30/20	7.00%	32,692	17,385	15,306	53.2%	66,750	81,342
Idaho Public Employee Retirement System	6/30/20	7.05%	19,714	17,392	2,322	88.2%	73,657	63,361
Illinois Municipal Retirement Fund	12/31/20							
Illinois State Employees' Retirement System	6/30/20	6.35%	54,066	19,197	34,869	35.5%	62,621	102,779
Illinois State Teachers' Retirement System	6/30/20	7.00%	138,532	52,316	86,215	37.8%	163,115	264,206
Illinois State Universities Retirement System	6/30/20	6.49%	50,237	19,617	30,620	39.0%	63,206	152,916
Indiana Public Employees' Retirement Fund	6/30/20	6.75%	16,282	13,261	3,020	81.4%	125,780	126,011
Indiana State Teachers' Retirement Fund	6/30/20	6.75%	20,372	9,986	10,385	49.0%	67,788	69,892
Iowa Public Employees' Retirement System	6/30/20	7.00%	41,072	34,048	7,025	82.9%	170,380	204,960
Kansas Public Employee Retirement System	6/30/20	7.50%	31,080	20,607	10,474	66.3%	148,199	161,385
Kentucky County Employees Retirement System	6/30/20	6.25%	20,092	9,407	10,685	46.8%	90,669	128,232
Kentucky Employees Retirement Systems	6/30/20	5.32%	17,724	2,998	14,725	16.9%	35,797	85,991
Kentucky Teachers' Retirement System	6/30/20	7.50%	35,552	20,717	14,835	58.3%	73,151	65,768
Los Angeles City Employees' Retirement System	6/30/20	7.00%	22,527	14,932	7,595	66.3%	27,490	22,902
Los Angeles City Water and Power Employees' Retirement Plan	6/30/20	7.00%	14,465	13,354	1,112	92.3%	10,778	11,133
Los Angeles County Employees Retirement Association	6/30/20	7.13%	76,580	58,510	18,069	76.4%	100,108	84,180
Los Angeles Fire and Police Pension Plan	6/30/20	7.00%	23,970	21,397	2,573	89.3%	13,486	13,866
Louisiana State Employees' Retirement System	6/30/20	7.55%	19,691	11,421	8,271	58.0%	39,487	110,075
Louisiana Teachers' Retirement System	6/30/20	7.45%	32,341	21,217	11,124	65.6%	86,860	115,908

Appendix

SPONSOR-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
Maine Public Employees Retirement System	6/30/20	6.75%	18,364	15,153	3,212	82.5%	52,471	58,029
Maryland State Employees' Combined System	6/30/20	7.40%	27,534	18,251	9,283	66.3%	81,656	106,516
Maryland Teachers	6/30/20	7.40%	44,981	33,215	11,766	73.8%	109,597	104,465
Massachusetts State Board of Retirement System	6/30/20							
Massachusetts Teachers' Retirement System	6/30/20	7.15%	57,863	29,318	28,545	50.7%	94,103	67,110
Michigan Municipal Employees' Retirement System	12/31/20	7.60%	37,693	40,526	(2,833)	107.5%	28,677	52,771
Michigan Public School Employee's Retirement System	9/30/20	6.80%	86,490	51,456	35,034	59.5%	168,202	238,532
Michigan State Employees Retirement System	9/30/20	6.70%	18,773	12,028	6,746	64.1%	6,857	63,073
Minnesota Public Employees Retirement Association	6/30/20	7.50%	28,627	22,631	5,995	79.1%	173,394	192,235
Minnesota State Retirement System	6/30/20	7.50%	15,184	13,856	1,328	91.3%	51,742	61,252
Minnesota Teachers Retirement Association	6/30/20	7.50%	30,133	22,745	7,388	75.5%	83,149	121,534
Mississippi Public Employees' Retirement System	6/30/20	7.75%	47,186	27,827	19,359	59.0%	149,855	188,528
Missouri Public School Retirement System	6/30/20	7.50%	49,641	40,710	8,931	82.0%	78,848	73,867
Missouri State Employees' Plan	6/30/20	6.95%	14,258	7,911	6,348	55.5%	45,999	68,055
Nebraska Public Employees Retirement Systems School Retirement System	6/30/20	7.50%	13,849	12,286	1,563	88.7%	43,177	32,676
Nevada State Public Employees' Retirement System	6/30/20	7.50%	60,663	46,735	13,928	77.0%	111,815	90,139
New Hampshire Retirement System	6/30/20	6.75%	15,494	9,097	6,396	58.7%	48,479	42,273
New Jersey Police and Firemen's Retirement System	6/30/20	7.00%	46,638	27,412	19,226	58.8%	42,520	45,602
New Jersey Public Employees' Retirement System	6/30/20	7.00%	67,705	29,045	38,660	42.9%	249,045	183,434
New Jersey Teachers' Pension and Annuity Fund	6/30/20	5.40%	87,523	21,529	65,993	24.6%	156,402	108,297
New Mexico Educational Retirement Board	6/30/20	3.89%	33,285	13,019	20,266	39.1%	61,091	102,311
New Mexico Public Employees Retirement Association	6/30/20	7.25%	22,141	14,692	7,449	66.4%	48,159	60,396
New York City Employees' Retirement System	6/30/20	7.00%	91,381	70,301	21,079	76.9%	196,038	198,752
New York City Police Pension Fund	6/30/20	7.00%	57,268	46,463	10,806	81.1%	36,401	52,864
New York City Teachers' Retirement System	6/30/20	7.00%	75,116	59,319	15,797	79.0%	121,764	102,728
New York State and Local Employees Retirement System	3/31/20	6.80%	194,596	168,116	26,481	86.4%	497,659	589,893
New York State and Local Police & Fire	3/31/20	6.80%	35,309	29,964	5,345	84.9%	32,888	40,303
New York State Teachers' Retirement System	6/30/20	7.10%	123,243	120,480	2,763	97.8%	252,091	181,710
North Carolina Local Governmental Employees' Retirement System	6/30/20	7.00%	31,372	27,799	3,573	88.6%	132,058	154,590
North Carolina Teachers and State Employees Retirement System	6/30/20	7.00%	86,164	74,082	12,082	86.0%	311,736	405,864
Ohio Police and Fire Pension Fund	12/31/20	8.00%	23,228	16,411	6,817	70.7%	29,551	30,014
Ohio Public Employees Retirement System	12/31/19	7.20%	111,348	91,791	19,557	82.4%	294,015	867,353
Ohio Schools Employees' Retirement System	6/30/20	7.50%	21,034	14,420	6,614	68.6%	156,579	86,505
Ohio State Teachers Retirement System	6/30/20	7.45%	98,672	74,476	24,196	75.5%	167,838	318,594
Oklahoma Teachers' Retirement System	6/30/20	7.00%	25,979	16,489	9,490	63.5%	91,471	78,869

Appendix

SPONSOR-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
Orange County Employees Retirement System	12/31/20	7.00%	23,010	18,797	4,213	81.7%	21,559	26,237
Oregon Public Employees Retirement System	6/30/20	7.20%	90,143	68,319	21,823	75.8%	180,757	199,770
Pennsylvania Public School Employees' Retirement System	6/30/20	7.25%	107,796	58,557	49,239	54.3%	256,246	265,517
Pennsylvania State Employees' Retirement System	12/31/19	7.13%	49,274	31,096	18,178	63.1%	102,850	139,483
Puerto Rico Government Employees Retirement System	6/30/18	3.87%	27,607	0	27,607	0.0%	112,615	120,441
Puerto Rico Teachers Retirement System	6/30/17	3.58%	16,418	517	15,901	3.1%	35,474	44,405
Rhode Island Employees Retirement System	6/30/20	7.00%	11,789	6,320	5,469	53.6%	24,829	30,092
Sacramento County Employees' Retirement System	6/30/20	6.75%	12,694	9,979	2,714	78.6%	12,650	16,523
San Bernardino County Employees' Retirement Association	6/30/20	7.25%	14,296	10,287	4,008	72.0%	21,814	21,327
San Diego City Employees' Retirement System	6/30/20	6.50%	11,133	7,637	3,496	68.6%	5,535	13,307
San Diego County Employees Retirement Association	6/30/20	7.00%	17,724	12,909	4,815	72.8%	18,451	26,706
San Francisco City and County Employees' Retirement System	6/30/20	7.40%	32,031	26,620	5,411	83.1%	34,521	40,677
South Carolina Retirement System	6/30/20	7.25%	51,844	26,292	25,552	50.7%	200,264	335,405
South Dakota Retirement System	6/30/20	6.50%	12,293	12,297	(4)	100.0%	41,327	40,945
Tennessee Consolidated Retirement System	6/30/20	7.25%	24,732	25,456	(724)	102.9%	53,486	84,366
Texas County & District Retirement System	12/31/20							
Texas Employees' Retirement System	8/31/20	3.62%	65,937	27,946	37,991	42.4%	142,062	133,105
Texas Municipal Retirement System	12/31/20							
Texas Teacher Retirement System	8/31/20	7.25%	218,974	165,416	53,558	75.5%	914,752	558,000
University of California Retirement Plan	6/30/20	6.75%	92,625	70,916	21,709	76.6%	134,953	179,901
Utah Retirement Systems	12/31/20	6.95%	40,380	38,996	1,383	96.6%	97,919	132,812
Virginia Employees Retirement System	6/30/20	6.75%	102,466	76,453	26,013	74.6%	337,914	283,180
Washington Public Employees' Retirement System	6/30/20	7.40%	57,287	52,478	4,809	91.6%	164,010	145,929
Washington State Law Enforcement Officer's and Fire Fighters' Plan 1 and 2	6/30/20	7.40%	16,915	20,843	(3,928)	123.2%	18,848	14,972
Washington State Teachers' Retirement System	6/30/20	7.40%	26,738	22,794	3,945	85.2%	79,836	64,473
West Virginia Teachers' Retirement System	6/30/20	7.50%	11,065	7,844	3,221	70.9%	34,108	39,635
Wisconsin Retirement System	12/31/19	7.00%	108,868	112,093	(3,225)	103.0%	260,251	388,235