MILLIMAN WHITE PAPER

2016 Public Pension Funding Study

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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 plan sponsor's 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 process enables us to independently determine funded status without reflecting any bias or lag that may exist in the plan sponsor's own return expectations.

Highlights

- As of June 30, 2016, the aggregate funded ratio is estimated to be 69.8%, as markets took back some of the gains from 2012 to 2014 and discount rates declined
- Plan sponsors continue to reduce interest rate assumptions in the expectation that returns over the coming decades will be lower
- The difference between the average sponsor-reported assumption of 7.50% and our independently determined assumption of 6.99% is the highest we have seen, indicating that pressure to reduce interest rate assumptions is unlikely to abate

Starting with our 2016 edition of the Milliman Public Pension Funding Study, we have shifted our focus away from the accrued liability figures that are used to determine a plan's funding requirements; rather, our study is now based on the Total Pension Liability figures used for financial reporting under Governmental Accounting Standards Board Statements No. 67 and 68 (GASB 67/68), which apply to governmental entities. For many plans, the funding accrued liability and the Total Pension Liability are determined in essentially the same way, but the Total Pension Liability numbers are more directly comparable from plan to plan. Also, importantly, the financial reporting requirements include some key details that enable us to project the Total Pension Liability forward beyond the plan sponsor's fiscal year-end. This permits us to analyze how the funded status of these plans changes over time in response to shifts in the economic climate.

Based on the information the plan sponsors reported at their last fiscal year-ends, we project that the plans experienced a median annualized return on assets of just 1.31% in the period between their fiscal year-ends and June 30, 2016. Total plan assets are estimated to have declined from $3.24 trillion to $3.20 trillion, while the aggregate Total Pension Liability measured using the plan sponsor's discount rates is estimated to have increased from $4.43 trillion to $4.58 trillion. The funded ratio is estimated to stand at 69.8% as of June 30, 2016, with an aggregate underfunding of $1.38 trillion. Look for our funded status updates on a quarterly basis.

Turning to the information reported by the plans as of their most recent fiscal year-ends (see Figure 1), funded ratios dropped by

FIGURE 1: AGGREGATE FUNDED STATUS AS OF MOST RECENT MEASUREMENT DATE ($ TRILLIONS)

	2013		2014		2015		2016	
	SPONSOR REPORTED	RECAL FIGURES	SPONSOR REPORTED	RECAL FIGURES	SPONSOR REPORTED	RECAL FIGURES	SPONSOR REPORTED	RECAL FIGURES
MEDIAN DISCOUNT RATE[1]	7.75%	7.47%	7.75%	7.34%	7.65%	7.25%	7.50%	6.99%
PLAN LIABILITY[2]	$3.77	$3.86	$3.88	$4.03	$4.08	$4.26	$4.43	$4.64
PLAN ASSETS[3]	$2.58	$2.58	$2.75	$2.75	$3.06	$3.06	$3.24	$3.24
FUNDED RATIO	68.5%	66.8%	70.7%	68.2%	75.0%	71.7%	73.3%	69.9%
UNFUNDED LIABILITY	$1.19	$1.28	$1.13	$1.28	$1.02	$1.20	$1.18	$1.40

1 Funding interest rate for 2013-2015; GASB 67/68 discount rate for 2016.

2 Accrued liability used for funding for 2013-2015; GASB 67/68 Total Pension Liability for 2016.

3 Market value of assets; referred to as Fiduciary Net Position in GASB 67/68 reporting.

a few points in the Milliman 2016 Public Pension Funding Study relative to the 2015 study, largely reflecting the downturn in the equity market in 2014 and 2015. Most pension plans saw high market rates of return in both the 2012-2013 and 2013-2014 periods but disappointing returns since then.

The decline in the median discount rate from 2013 to 2016 provides a clear illustration of what many investment experts are referring to as the current "low return environment." Market expectations about future investment returns have fallen substantially since 2000, which has created a significant challenge for public pension plan sponsors. This study's independently recalibrated discount rates are updated annually based on current market expectations, but few plans reevaluate their assumptions as frequently as annually. The downward trend in our recalibrated rates indicates that as plans *do* periodically reassess their assumptions, further reductions in interest rate assumptions are likely to be seen.

Assets

The 100 plans in this study reported assets totaling $3.24 trillion on a market value basis, up from $3.06 trillion in the Milliman 2015 Public Pension Funding Study. The plans included in this study are invested in a wide array of asset classes, as illustrated in Figure 2.

Over the past five years there has been very little change in the overall allocation stance of these plans (see Figure 3). This belies claims that public pension plan sponsors are universally chasing higher returns by shifting into riskier investments.

We found no correlation between plans' asset allocations or reported discount rates and how well or poorly funded they are; that is, there is no evidence supporting the notion that poorly funded plans take on more investment risk or use higher interest rate assumptions than well-funded plans.

New mortality table

The Society of Actuaries (SOA) periodically publishes mortality tables for use in valuing pension liabilities. In October 2014, the SOA issued the latest such table, RP-2014, which is based on mortality experience from private pension plans. The SOA has also embarked on a project to create a mortality table based on experience exclusively from public pension plans. We expect that public plans and their actuaries are reviewing RP-2014 and evaluating whether to adopt some version of it or wait for the table specific to public plans, which is expected to be published in a few years. To the extent that use of a new mortality table projects longer life spans, accrued liabilities will increase and funded ratios will decrease.

FIGURE 2: ASSET ALLOCATION, 2016

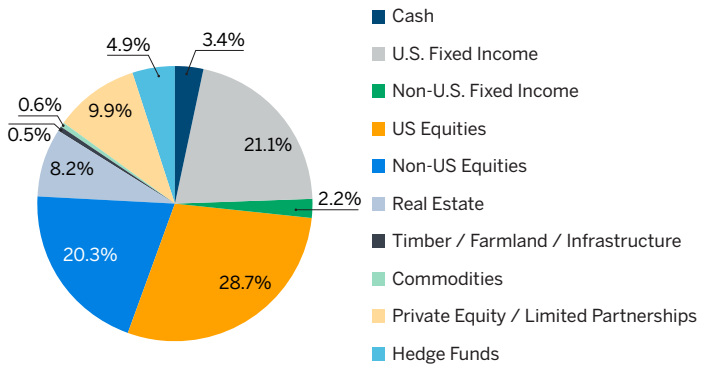


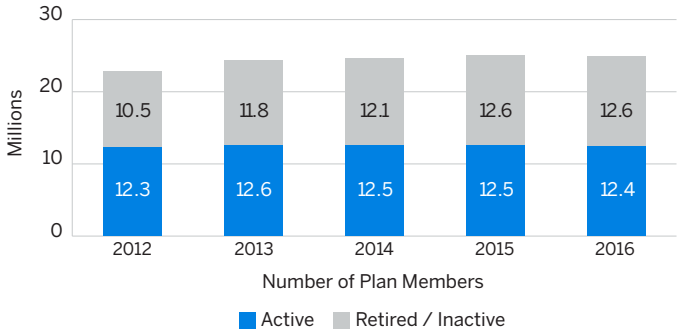
FIGURE 3: ASSET ALLOCATIONS OVER TIME

CLASS	2012	2013	2014	2015	2016
FIXED INCOME	26%	25%	24%	27%	23%
CASH	4%	3%	3%	3%	4%
TOTAL FIXED INCOME	30%	28%	27%	30%	27%
EQUITIES	51%	49%	50%	47%	49%
PRIVATE EQUITY, REAL ESTATE, ETC.	19%	23%	23%	23%	24%
TOTAL NON-FIXED INCOME	70%	72%	73%	70%	73%

Liabilities

The plans reported an aggregate Total Pension Liability of $4.43 trillion for the more than 25 million members covered by the plans in the study. That works out to an average liability of $176,000 per member. Individually, the plans range in size of accrued liability from $9 billion to $387 billion. The 10 largest plans account for nearly 37% of the total accrued liability and the top half of the plans represent more than 81% of the total.

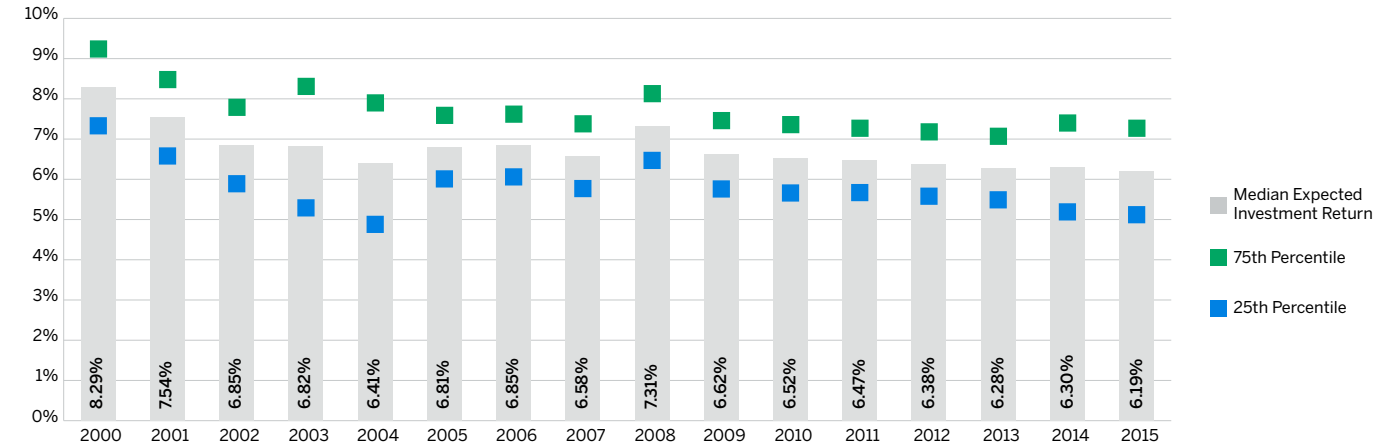
FIGURE 4: NUMBER OF PLAN MEMBERS



Capital market assumptions

The market's consensus views on long-term future investment returns have been declining since the turn of the millennium. Figure 5 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% in 2000 to 6.19% in 2015. Many pension plan sponsors have been shifting their investment return assumptions downward in response to this trend, in some cases via a single significant reduction but more commonly through a series of smaller reductions. Where assumptions of 8.50% were once commonplace, half of the plans in the study now have assumptions of 7.50% or below. Twenty-five of the plans lowered their assumptions from the 2015 study to the 2016 study; 58 of the plans have lowered their assumptions at least once since our inaugural 2012 study.

FIGURE 5: EXPECTED RETURN FOR A HYPOTHETICAL ASSET ALLOCATION BASED ON MILLIMAN'S CAPITAL MARKET ASSUMPTIONS OVER A 30-YEAR PERIOD



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.

Interest rates and pension liabilities: More than one right answer

How much are our pension promises worth? This is a question being asked with increasing urgency as plan sponsors grapple with how to cope with underfunded pension plans. But there is more than one way to determine the answer to this question, and the choice of calculation method depends on *why* the question is being asked. If the context for the question is to do long-range budgeting, to work out how much should be contributed to the plan this year and next year and 20 years from now, then the answer is arrived at by discounting future pension payments using the long-term expected return on the plan's investments. On the other hand, if the context for the question is to determine what it would cost to shut down the pension plan today, or to factor out the riskiness of the underlying assets, then the answer is arrived at by discounting future pension payments using current market interest rates or current default-free rates. Neither answer is more "right" than the other, and both yield useful information to plan sponsors, participants, and the general public.

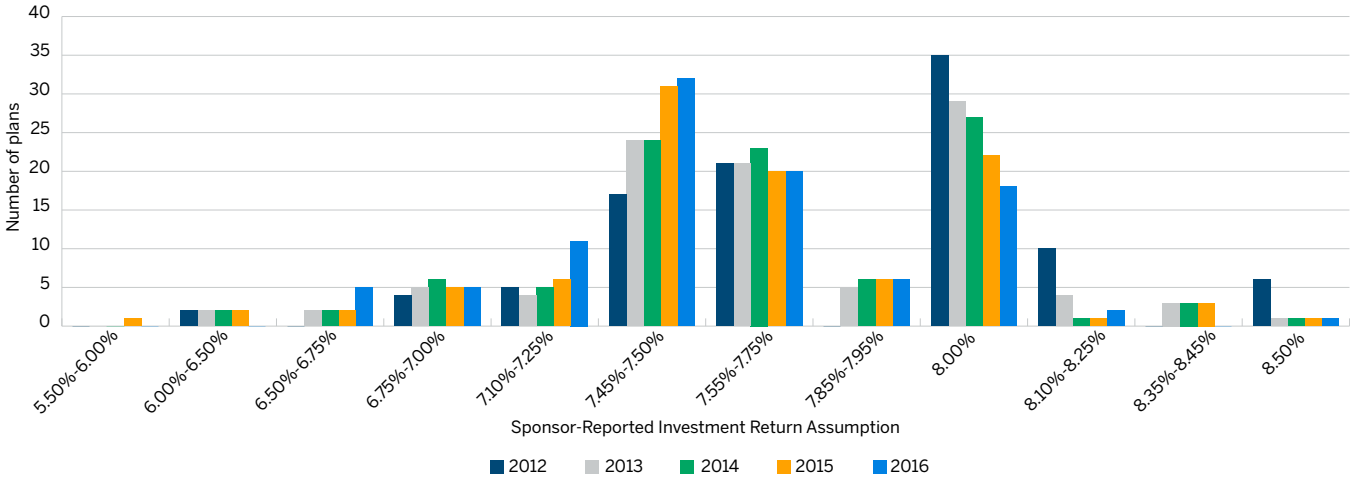
Reported discount rates

The plans in this study reported a wide spread of discount rates, with an ongoing movement to lower rates (see Figure 6). The median reported investment return assumption is 7.50%, down from 7.65% in the Milliman 2015 Public Pension Funding Study. On a liability-weighted basis, which reflects the relative sizes of the plans in the study, the reported discount rate is 7.39%, down from 7.57% in 2015. Note that our previous studies reported on the interest rate assumption used for funding purposes, but starting with our 2016 study we have switched our focus to the discount rate used for financial reporting purposes. For 93 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 to result in a plan running out of plan assets; this is expected to occur for seven 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 capital market assumptions of December 31, 2015. 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 6.99%, which is 51 basis points lower than the 7.50% median discount rate used by the plans. Figure 7 details how the independently determined investment return assumptions compare with the discount rates used by the plans.

FIGURE 6: SPONSOR-REPORTED INVESTMENT RETURN ASSUMPTIONS[1]



1 Funding interest rate for 2013-2015; GASB 67/68 discount rate for 2016.

FIGURE 7: INDEPENDENTLY DETERMINED RATE VS. SPONSOR-REPORTED RATE

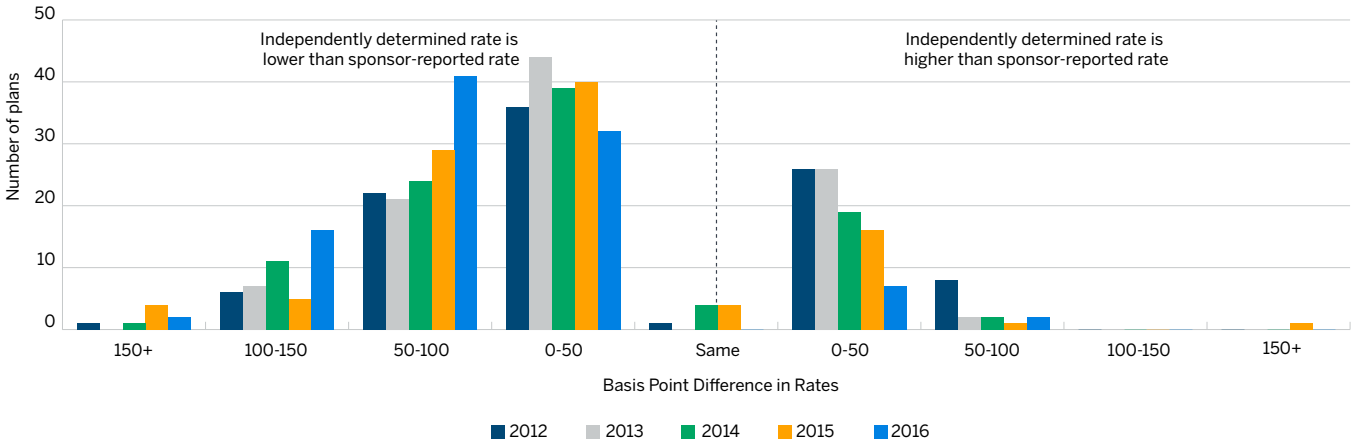
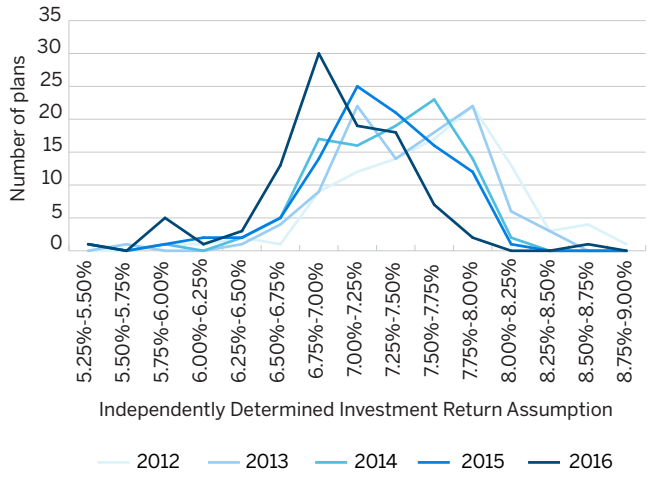


Figure 8 illustrates how the independently determined rates have generally declined over the past five years.

FIGURE 8: INDEPENDENTLY DETERMINED RATES OVER TIME



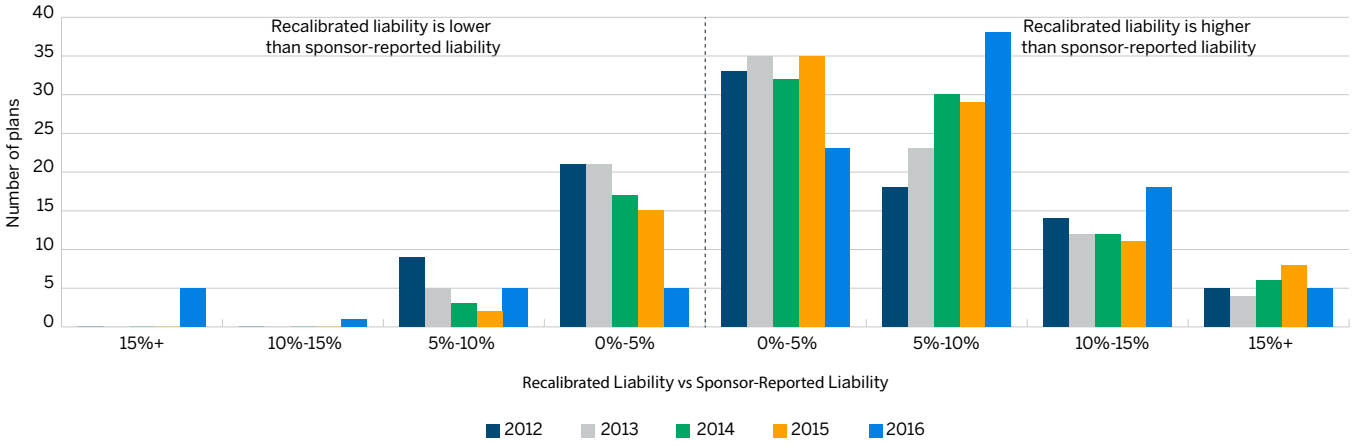
Recalibrated Total Pension Liabilities

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 $4.64 trillion, compared with a sponsor-reported Total Pension Liability of $4.43 trillion. For 71 of the plans in the study, the recalibrated Total Pension Liability is within 10% of the sponsor-reported Total Pension Liability (see Figure 9).

This year's study found that the gap between the recalibrated accrued liability and the sponsor-reported accrued liability continues to widen. As shown in Figure 10, this widening gap in liability mirrors a corresponding widening between the median discount rate reported by the plans in the study and our median independently determined investment return assumption.

In aggregate, this suggests that plans should continue to monitor changing market return expectations and adjust their assumptions as needed, to ensure that liabilities are calculated using assumptions that are based on best-estimate expectations from investment professionals. Note that lower discount rates cause liabilities to increase and therefore cause funded ratios to fall.

FIGURE 9: RECALIBRATED LIABILITY VS. SPONSOR-REPORTED LIABILITY[1]



1 Accrued liability used for funding for 2013-2015; GASB 67/68 Total Pension Liability for 2016.

FIGURE 10: REPORTED VS. RECALIBRATED RESULTS

	2012	2013	2014	2015	2016
MEDIAN REPORTED RATE	8.00%	7.75%	7.75%	7.65%	7.50%
RECALIBRATED RATE	7.65%	7.47%	7.34%	7.25%	6.99%
GAP (IN BASIS POINTS)	35	28	41	40	51
SPONSOR-REPORTED LIABILITY	$3.60	$3.77	$3.88	$4.08	$4.43
RECALIBRATED LIABILITY	$3.71	$3.86	$4.03	$4.26	$4.64
GAP (PERCENTAGE INCREASE)	3.1%	2.4%	3.9%	4.4%	4.7%

Sensitivity analysis

A relatively small change in the discount rate can have a significant impact on the Total Pension Liability. How big that impact is depends on the makeup of the plan's membership: a less "mature" plan with more active members than retirees typically has a higher sensitivity to interest 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. Using a discount rate that is 100 basis points higher or lower than the independently determined investment return assumption moves the aggregate recalibrated Total Pension Liability by anywhere from 8.8% to 12.3% (see Figure 11).

Asset volatility ratio

The *asset volatility* ratio is a metric that helps plan sponsors anticipate the impact of investment volatility on actuarially determined contribution rates. The asset volatility ratio is the ratio of plan assets to the payroll for active members covered by the plan. A lower ratio means that plan assets are relatively small compared with 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 deviation in asset performance could translate into a significant shift in the actuarially determined contribution rate. It is unsurprising that, as pension plans have accumulated assets and their member populations have matured over the past several decades, asset volatility ratios 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. Figure 12 illustrates how changes in the asset volatility ratio over time can alter the relationship between investment volatility and contribution volatility.

Note that not all plans are funded via contribution *rates* that are applied to payroll; for some plans, the contribution is determined as a specific dollar amount that will not exhibit the same volatility relative to payroll.

Financial reporting versus funding

The Governmental Accounting Standards Board (GASB) sets the accounting standards for public entities. Statements No. 67 and 68, which were effective in 2014 and 2015, have significantly changed the financial reporting requirements for U.S. public pension plans. Among other changes, 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) rather than the actuarial cost method the plan uses to determine contribution amounts, and it must be calculated using a discount rate that under certain circumstances may be lower than the investment return assumption used for funding purposes. Additionally, each plan is required to disclose how sensitive its Total Pension Liability is to changes in the discount rate. For some plans a different liability measurement is used as part of the process of determining amounts that should be contributed to fund the plan.

FIGURE 11: EFFECTS OF CHANGING THE INVESTMENT RETURN ASSUMPTION

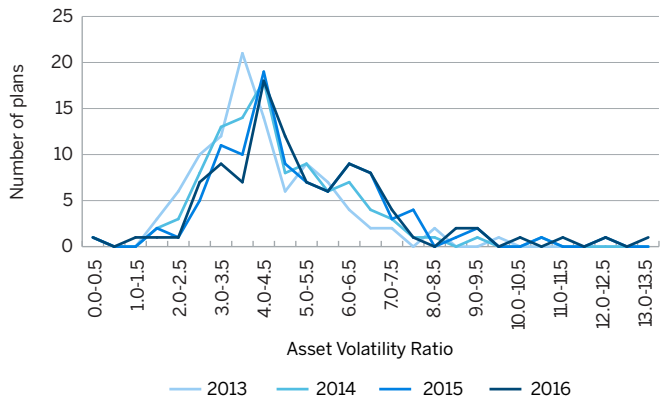
	RECALIBRATED LIABILITY ($ TRILLIONS)		
	- 100 BASIS POINTS	INDEPENDENTLY DETERMINED INVESTMENT RETURN	+ 100 BASIS POINTS
MOST MATURE 25 PLANS	$1.08 (+8.9%)	$0.99	$0.90 (-8.8%)
SECOND-MOST MATURE 25 PLANS	$1.23 (+10.2%)	$1.11	$1.01 (-9.6%)
SECOND-LEAST MATURE 25 PLANS	$1.66 (+11.3%)	$1.49	$1.34 (-10.6%)
LEAST MATURE 25 PLANS	$1.18 (+12.3%)	$1.05	$0.93 (-11.6%)
ALL 100 PLANS IN AGGREGATE	$5.14 (+10.7%)	$4.64	$4.17 (-10.2%)

FIGURE 12: ASSET VOLATILITY RATIO ILLUSTRATION FOR A HYPOTHETICAL PENSION PLAN

	1983	1993	2003	2013
MARKET VALUE OF ASSETS	$30,000	$110,000	$260,000	$390,000
COVERED PAYROLL	20,000	40,000	70,000	80,000
ASSET VOLATILITY RATIO = ASSETS ÷ PAYROLL	1.50	2.75	3.71	4.88
INCREASE IN CONTRIBUTION RATE RESULTING FROM A 10% ASSET LOSS (USING 15-YEAR LEVEL DOLLAR AMORTIZATION)	1.58%	2.90%	3.91%	5.14%

The median asset volatility ratio for the plans included in this study is 4.7, up slightly from 4.6 in the Milliman 2015 Public Pension Funding Study (see Figure 13). Thirty-six of the plans now have an asset volatility ratio of 5.5 or higher, indicating that their actuarially determined contributions will be more volatile in reaction to future market swings. Three years ago, just 18 of the plans exceeded the 5.5 mark, suggesting that for a significant number of plans the actuarially determined contribution levels are becoming more and more sensitive to market swings.

FIGURE 13: ASSET VOLATILITY RATIO



Methodology

This study is based on the most recently available Comprehensive Annual Financial Reports, which reflect measurement dates ranging from June 30, 2014, to December 31, 2015; 84 are from June 30, 2015, 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 sponsor-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 to reflect discounting at the 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.

We calculated the expected rate of return with a "building-block method," using a geometric averaging methodology. We used Milliman's December 31, 2015, capital market assumptions to calculate the 50th-percentile 30-year real rate of return, and then added 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).

METHODOLOGY: LIABILITY RECALIBRATION

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

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	09/30/2015	8.00%	15,962	10,552	5,410	66.1%	84,714	73,066
Alabama Teachers' Retirement System	09/30/2014	8.00%	31,338	22,254	9,085	71.0%	135,230	102,359
Alaska Public Employees' Retirement System	06/30/2015	8.00%	13,457	8,607	4,850	64.0%	19,297	37,266
Arizona Public Safety Personnel Retirement System*	06/30/2015							
Arizona State Retirement System	06/30/2015	8.00%	49,222	33,646	15,576	68.4%	211,300	367,377
Arkansas Public Employees Retirement System	06/30/2015	7.50%	9,392	7,550	1,842	80.4%	45,722	46,744
Arkansas Teacher's Retirement System	06/30/2015	8.00%	18,293	15,036	3,257	82.2%	72,919	53,127
California Public Employees' Retirement System*	06/30/2015							
California State Teachers' Retirement System	06/30/2015	7.60%	259,146	191,822	67,324	74.0%	429,460	466,496
Chicago Municipal Employees' Annuity and Benefit Fund	12/31/2014	7.50%	12,307	5,179	7,128	42.1%	30,160	40,350
Chicago Public Schools	06/30/2015	7.75%	20,713	10,690	10,023	51.6%	29,706	33,578
Colorado Public Employees' Retirement Association	12/31/2014	7.50%	68,848	44,229	24,619	64.2%	202,750	130,705
Connecticut State Employees Retirement System	06/30/2014	8.00%	26,487	10,473	16,014	39.5%	49,976	47,260
Connecticut State Teachers' Retirement System	06/30/2014	8.50%	26,349	16,208	10,141	61.5%	51,433	47,321
Cook County Employees' Annuity and Benefit Fund	12/31/2014	4.50%	21,946	9,068	12,878	41.3%	21,656	30,270
Delaware State Employees' Pension Plan	06/30/2015	7.20%	9,075	8,409	665	92.7%	35,998	28,859
Florida State Retirement System	06/30/2015	7.65%	161,371	148,454	12,916	92.0%	512,909	518,478
Georgia Employees' Retirement System	06/30/2015	7.50%	17,019	12,968	4,051	76.2%	60,416	52,913
Georgia Teachers' Retirement System	06/30/2015	7.50%	82,023	66,799	15,224	81.4%	214,015	206,299
Hawaii State Employees' Retirement System	06/30/2015	7.65%	23,238	14,505	8,733	62.4%	67,310	51,696
Idaho Public Employee Retirement System	06/30/2015	7.10%	15,274	13,957	1,317	91.4%	67,008	54,516
Illinois Municipal Retirement Fund*	12/31/2015							
Illinois State Employees' Retirement System	06/30/2015	7.02%	43,267	15,259	28,008	35.3%	63,273	55,034
Illinois State Teachers' Retirement System	06/30/2015	7.47%	111,917	46,407	65,510	41.5%	159,707	240,891
Illinois State Universities Retirement System	06/30/2015	7.12%	41,219	17,463	23,756	42.4%	69,381	138,004
Indiana Public Employees' Retirement Fund	06/30/2015	6.75%	17,981	13,908	4,073	77.3%	138,660	149,682
Indiana State Teachers' Retirement Fund	06/30/2015	6.75%	22,923	10,479	12,444	45.7%	68,734	63,027
Iowa Public Employees' Retirement System	06/30/2015	7.50%	33,370	28,430	4,940	85.2%	167,368	178,742
Kansas Public Employee Retirement System	06/30/2015	8.00%	25,614	16,636	8,979	64.9%	154,203	141,162
Kentucky County Employees Retirement System	06/30/2015	7.50%	14,354	8,519	5,835	59.4%	90,024	75,042
Kentucky Employees Retirement Systems	06/30/2015	7.50%	13,255	2,880	10,375	21.7%	33,942	56,293
Kentucky Teachers' Retirement System	06/30/2015	5.23%	42,477	18,049	24,428	42.5%	72,246	57,873
Los Angeles City Employees' Retirement System	06/30/2015	7.50%	16,910	11,921	4,989	70.5%	23,895	24,439
Los Angeles City Water and Power Employees' Retirement Plan	06/30/2015	7.50%	11,218	10,087	1,132	89.9%	9,205	10,371
Los Angeles County Employees Retirement Association	06/30/2015	7.63%	56,571	48,818	7,752	86.3%	92,466	71,900
Los Angeles Fire and Police Pension Plan	06/30/2015	7.50%	19,385	17,347	2,039	89.5%	13,068	12,705
Louisiana State Employees' Retirement System	06/30/2015	7.75%	18,217	11,415	6,802	62.7%	40,194	105,471
Louisiana Teachers' Retirement System	06/30/2015	7.75%	28,646	17,894	10,752	62.5%	83,602	103,153

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	06/30/2015	7.13%	12,616	10,242	2,374	81.2%	40,016	40,771
Maryland State Employees' Combined System	06/30/2015	7.55%	23,408	15,511	7,897	66.3%	83,794	99,877
Maryland Teachers	06/30/2015	7.55%	39,239	27,764	11,475	70.8%	105,526	95,717
Massachusetts State Board of Retirement System*	06/30/2015							
Massachusetts Teachers' Retirement System	06/30/2015	7.75%	44,729	25,429	19,300	56.9%	90,070	62,312
Michigan Municipal Employees' Retirement System*	12/31/2015							
Michigan Public School Employee's Retirement System	09/30/2015	8.00%	67,356	42,382	24,974	62.9%	210,974	225,096
Michigan State Employees Retirement System	09/30/2015	8.00%	16,234	10,735	5,500	66.1%	13,795	62,668
Minnesota Public Employees Retirement Association	06/30/2015	7.90%	23,764	18,582	5,183	78.2%	145,650	142,197
Minnesota State Retirement System	06/30/2015	7.90%	13,178	11,638	1,539	88.3%	49,037	53,263
Minnesota Teachers Retirement Association	06/30/2015	8.00%	26,632	20,446	6,186	76.8%	79,406	106,326
Mississippi Public Employees' Retirement System	06/30/2015	7.75%	40,365	24,907	15,458	61.7%	157,215	233,364
Missouri Public School Retirement System	06/30/2015	8.00%	40,611	34,838	5,773	85.8%	78,318	72,381
Missouri State Employees' Plan	06/30/2015	8.00%	11,728	8,517	3,211	72.6%	49,980	62,254
Nebraska Public Employees Retirement Systems School Retirement System*	06/30/2015							
Nevada State Public Employees' Retirement System	06/30/2015	8.00%	46,070	34,611	11,459	75.1%	103,108	73,191
New Hampshire Retirement System	06/30/2015	7.75%	11,471	7,510	3,962	65.5%	47,812	33,349
New Jersey Police and Firemen's Retirement System	06/30/2015	6.32%	47,518	25,107	22,411	52.8%	40,359	44,303
New Jersey Public Employees' Retirement System	06/30/2015	4.90%	74,724	28,554	46,170	38.2%	259,161	167,340
New Jersey Teachers' Pension and Annuity Fund	06/30/2015	4.13%	89,183	25,605	63,578	28.7%	153,335	95,098
New Mexico Educational Retirement Board	06/30/2015	7.75%	17,975	11,498	6,477	64.0%	61,173	78,835
New Mexico Public Employees Retirement Association	06/30/2015	7.75%	18,516	14,256	4,261	77.0%	49,173	40,688
New York City Employees' Retirement System	06/30/2015	7.00%	75,316	55,075	20,241	73.1%	185,971	149,485
New York City Police Pension Fund	06/30/2015	7.00%	47,858	35,345	12,513	73.9%	34,775	47,665
New York City Teachers' Retirement System	06/30/2015	7.00%	65,040	44,255	20,786	68.0%	112,481	89,044
New York State and Local Employees Retirement System	03/31/2015	7.50%	164,592	161,213	3,378	97.9%	491,558	513,860
New York State and Local Police & Fire	03/31/2015	7.50%	28,474	28,199	275	99.0%	31,372	36,696
New York State Teachers' Retirement System	06/30/2015	8.00%	99,332	109,719	(10,387)	110.5%	267,715	158,458
North Carolina Local Governmental Employees' Retirement System	06/30/2015	7.25%	23,496	23,047	449	98.1%	123,184	115,706
North Carolina Teachers and State Employees Retirement System	06/30/2015	7.25%	68,692	65,007	3,685	94.6%	307,313	329,478
Ohio Police and Fire Pension Fund	12/31/2014	8.25%	18,634	13,453	5,180	72.2%	27,602	31,317
Ohio Public Employees Retirement System	12/31/2014	8.00%	89,277	77,254	12,023	86.5%	335,754	697,311
Ohio Schools Employees' Retirement System	06/30/2015	7.75%	18,503	12,797	5,706	69.2%	122,855	81,235
Ohio State Teachers Retirement System	06/30/2015	7.75%	99,015	71,378	27,637	72.1%	164,925	175,569
Oklahoma Public Employees Retirement System	06/30/2015	7.50%	8,996	8,636	360	96.0%	43,843	38,617
Oklahoma Teachers' Retirement System	06/30/2015	8.00%	20,551	14,450	6,102	70.3%	90,388	69,386

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	12/31/2014	7.25%	16,619	11,536	5,082	69.4%	21,459	19,958
Oregon Public Employees Retirement System	06/30/2015	7.75%	70,665	64,924	5,742	91.9%	162,185	169,330
Pennsylvania Public School Employees' Retirement System	06/30/2015	7.50%	94,901	51,586	43,315	54.4%	259,868	356,961
Pennsylvania State Employees' Retirement System	12/31/2014	7.50%	42,195	27,338	14,857	64.8%	104,431	129,303
Puerto Rico Government Employees Retirement System	06/30/2014	4.29%	30,220	127	30,092	0.4%	125,671	124,497
Puerto Rico Teachers Retirement System	06/30/2014	4.33%	14,808	1,704	13,104	11.5%	39,343	41,290
Rhode Island Employees Retirement System	06/30/2014	7.50%	10,612	6,396	4,216	60.3%	24,567	27,879
Sacramento County Employees' Retirement System	06/30/2015	7.50%	9,029	7,879	1,150	87.3%	12,072	13,802
San Bernardino County Employees' Retirement Association	06/30/2015	7.50%	10,214	8,272	1,943	81.0%	19,938	15,932
San Diego County Employees Retirement Association	06/30/2015	7.50%	13,138	10,330	2,808	78.6%	17,656	22,460
San Francisco City and County Employees' Retirement System	06/30/2015	7.46%	22,724	20,428	2,296	89.9%	30,839	34,469
South Carolina Retirement System	06/30/2015	7.50%	44,097	25,132	18,965	57.0%	185,265	291,418
South Dakota Retirement System	06/30/2015	7.25%	10,352	10,777	(424)	104.1%	39,383	42,250
Tennessee Consolidated Retirement System	06/30/2015	7.50%	22,073	21,285	789	96.4%	69,140	55,292
Texas County & District Retirement System*	12/31/2015							
Texas Employees' Retirement System	08/31/2015	6.86%	37,265	23,998	13,266	64.4%	142,409	116,676
Texas Municipal Retirement System*	12/31/2015							
Texas Teacher Retirement System	08/31/2015	8.00%	163,887	128,539	35,349	78.4%	828,851	469,003
University of California Retirement Plan	06/30/2015	7.25%	65,705	55,055	10,650	83.8%	123,768	142,486
Utah Retirement Systems	12/31/2015	7.50%	31,150	26,687	4,463	85.7%	101,157	59,843
Virginia Employees Retirement System	06/30/2015	7.00%	85,387	64,026	21,361	75.0%	329,393	222,427
Washington Public Employees' Retirement System	06/30/2015	7.50%	45,874	37,076	8,798	80.8%	152,461	120,562
Washington State Law Enforcement Officer's and Fire Fighters' Plan 1 and 2	06/30/2015	7.50%	13,210	15,443	(2,233)	116.9%	16,893	11,591
Washington State Teachers' Retirement System	06/30/2015	7.50%	20,459	16,447	4,012	80.4%	67,293	55,962
West Virginia Teachers' Retirement System	06/30/2015	7.50%	10,269	6,803	3,466	66.3%	35,788	36,445
Wisconsin Retirement System	12/31/2014	7.20%	89,691	92,147	(2,456)	102.7%	256,100	386,233

* Full GASB 67/68 disclosures as of the measurement date were not available; for purposes of this study, available GASB 67/68 information was supplemented by other publicly available data.

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