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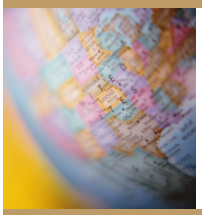

CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

STATE AND LOCAL PENSION PLANS NUMBER 56, JULY 2017

STATE AND LOCAL PENSION PLAN FUNDING SPUTTERS IN FY 2016

*By Jean-Pierre Aubry, Caroline V. Crawford, and Alicia H. Munnell**

Introduction

The aggregate funded status of state and local pension plans declined in fiscal year (FY) 2016, because liabilities continued to grow steadily while poor stock market performance led to slow asset growth. Thus, the ratio of assets to liabilities fell whether measured by the old Governmental Accounting Standards Board standard (GASB 25), which uses a smoothed value of assets, or by the new standard (GASB 67), which values assets at market. While the new standard has been in effect since 2014, most plans also still report numbers under the traditional rules. As such, this *brief* provides a multi-year comparison of the two approaches.

The discussion is organized as follows. The first section reports that the ratio of assets to liabilities for the 170 plans in the *Public Plans Database* decreased from 73 percent in 2015 to 72 percent in 2016, as measured by the traditional GASB standard; and from 73 percent to 68 percent, as measured by the new standard. The second and third sections separately evaluate the changes in assets and liabilities, respectively. The fourth section shows that, for the sample as a whole, both the required contribution and the percentage of required contribution paid have remained relatively constant since 2015. The fifth section projects funded ratios for our sample for 2017-2021 under two scenarios of investment performance. Even though 2017 has been a very good year in terms of market returns, plan funded ratios are projected to grow only modestly by 2021 even if plans achieve their assumed returns (currently 7.6 percent on average). The final section concludes that, in order to see more meaningful improvement in funded levels going forward, plans need to set and pay a more sufficient actuarially determined employer contribution, in addition to achieving their assumed returns.

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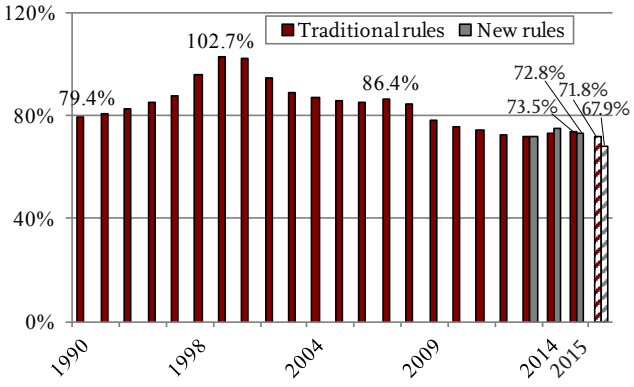
Funded Status in 2016

This section reports funded ratios under both the traditional and new GASB standards. The new GASB rules introduced in 2014 include significant changes to the measures of assets and liabilities used to calculate the funded status for accounting purposes.[1] First, assets are reported at market value rather than actuarially smoothed. Second, liabilities are valued using a discount rate that combines: 1) the expected return for the portion of liabilities that is projected to be covered by plan assets; and 2) the return on high-grade municipal bonds for any portion that is to be covered by other resources.[2] This rate is referred to as the blended discount rate.

In 2016, the estimated aggregate ratio of assets to liabilities for our sample of 170 state and local pension plans was 72 percent under the traditional rules and 68 percent under the new rules (see Figure 1). (All data throughout this study are presented on a fiscal-year basis.)[3] Both measures of funding have decreased since 2015. The funded ratio for each individual plan under the traditional rules appears in the Appendix.

Figure 1. State and Local Pension Funded Ratios, FY 1990-2016



Note: See endnote 4.
Sources: 2016 actuarial valuations; *Public Plans Database* (PPD) (2001-2016); and Zorn (1990-2000).

Table 1 presents the assets and liabilities underlying each funded ratio. The 72-percent funded level in 2016 reflects smoothed asset values of $3.5 trillion and liabilities of $4.8 trillion; the 68-percent funded level reflects market assets of $3.4 trillion and liabilities of $5.0 trillion. The following two sections take a closer look at the asset and liability components.

Table 1. Breakdown of Funded Ratios under Traditional and New GASB Standards, in Trillions of Dollars, FY 2015-2016

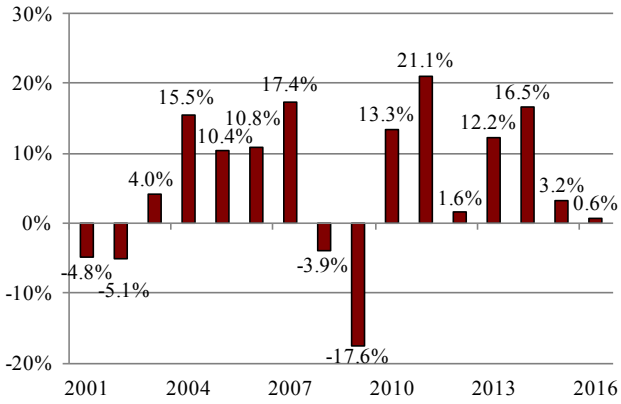
	FY 2015	FY 2016
Traditional standards		
Actuarial assets	$3.4	$3.5
Actuarial liability	4.6	4.8
Funded ratio	73.5%	71.8%
New standards		
Market assets	$3.4	$3.4
Total pension liability	4.7	5.0
Funded ratio	72.8%	67.9%

Sources: 2016 actuarial valuations; PPD (2001-2016).

Assets under Traditional and New GASB Standards

In 2016, market assets remained relatively flat while actuarial assets grew modestly. The change in assets is made up of two main components: 1) investment returns; and 2) cash flows (contributions minus benefits). In terms of investment returns, the 2016 stock market continued the poor performance of 2015. As a result, public plans, on average, reported only a 0.6-percent return in 2016 (see Figure 2) compared to their assumed return of 7.6 percent.

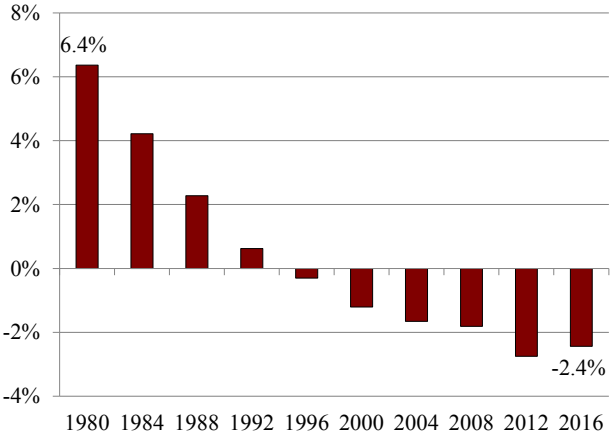
Figure 2. Returns for State and Local Plans, FY 2001-2016



Source: PPD (2001-2016).

In terms of cash flow, as state and local plans have matured over the past several decades, net flows have become increasingly negative as benefits continue to exceed contributions (see Figure 3). In 2016, these negative cash flows, combined with the low returns, kept the market value of pension assets relatively flat.[5]

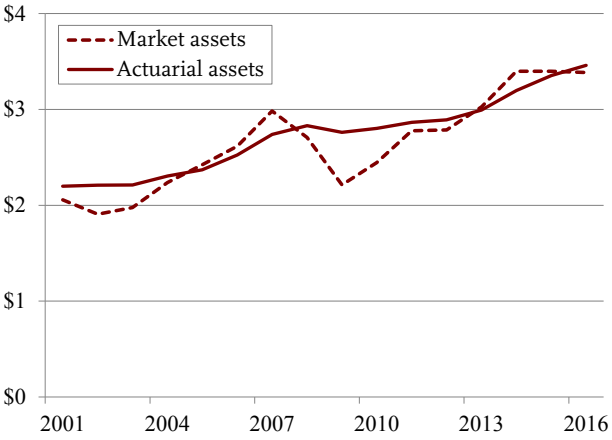
Figure 3. Cash Flows as a Percentage of Market Assets for State and Local Plans, FY 1980-2016



Source: U.S. Census Bureau (1980-2016).

Actuarial assets, which are generally based on a five-year smoothing of market performance, showed some growth due to the strong performance in 2013 and 2014. This modest growth in actuarial assets and the lack of growth in market assets resulted in the two asset levels being relatively similar in 2016 (see Figure 4).

Figure 4. Market Assets vs. Actuarial Assets, FY 2001-2016, in Trillions of Dollars



Note: For agency plans, the net position is assumed to equal market assets reported in each plan's income statement.
Sources: 2016 actuarial valuations; and PPD (2016).

Liability under Traditional and New GASB Standards

The other factor in the change in the funded ratio is the growth in liabilities from year to year.[6] In 2016, liabilities valued under the old and new standards grew by 5.6 percent and 6.3 percent, respectively. Under both standards, these growth rates exceeded asset growth, causing the funded ratios to drop.

The value of liabilities depends on the rate used to discount promised benefits. The traditional discount rate averaged 7.6 percent across public plans in 2016, while the blended discount rate used for the new GASB standard averaged 7.3 percent.[7] As a result, the liabilities measured under the new GASB standard were about $160 billion (or 3.3 percent) greater than those measured under the traditional method.

Although the aggregate discount rate under the two standards did not differ much, the blended rate was significantly lower than the traditional rate for 14 plans (about 5 percent of the sample) (see Table 2).[8] These 14 plans include those reported in last year's *brief*, with the addition of the Birmingham Retirement and Relief System, Chicago Municipal Employees, Minnesota State Employees, Minnesota Teachers,

Table 2. Plans Adopting a Significantly Lower GASB 67 Blended Rate, FY 2016

Plan	Rate		Funded status	
	Actuarial	GASB 67	Actuarial	GASB 67
Birmingham Retirement	7.5%	4.1%	75.5%	48.5%
Chicago Municipal Employees	7.5	3.7	30.5	19.0
Cincinnati ERS	7.5	5.6	76.9	74.5
Cook Co. Employees	7.5	4.2	58.9	35.6
Dallas Police/Fire	7.2	4.0	53.1	27.6
Kentucky Teachers	7.5	4.9	54.6	35.2
Minnesota State Employees	8.0	4.2	81.6	47.5
Minnesota Teachers	8.0	4.7	75.6	44.9
New Jersey PERS	7.6	4.0	57.2	31.2
New Jersey Police/Fire	7.6	5.6	70.3	48.5
New Jersey Teachers	7.6	3.2	47.0	22.3
Portland Fire/Police[a]	7.5	2.8	0.5	0.5
Texas ERS	8.0	5.7	75.2	55.3
Texas LECOS	8.0	3.7	71.1	38.8

[a] Portland Fire/Police is funded on a pay-go basis.
Sources: 2016 actuarial valuations; PPD (2016).

and Portland Police and Fire.[9] Some plans, such as New Jersey's PERS, Police & Fire, and Teachers, have further decreased their blended discount rate since the 2015 *brief*. The lower blended rate dramatically increases the value of liabilities, which reduces the funded status of each individual plan.

While some plans used lower blended rates in 2016, the vast majority maintained rates above 7 percent. Table 3 displays the hypothetical impact of applying lower rates to the liabilities of all plans in our sample, compared to the current average of 7.6 percent. Under the traditional GASB standard, applying a 6-percent discount rate drops the aggregate percent funded to 56 percent. Further reducing the discount rate to 4 percent results in a 43-percent funded status.

Table 3. Aggregate Pension Measures under Traditional GASB Standards Using Alternative Discount Rates, FY 2016, in Trillions of Dollars

Measure	Discount rate				
	7.6%	7.0%	6.0%	5.0%	4.0%
Actuarial liability	$4.8	$5.5	$6.2	$7.0	$8.0
Actuarial assets	3.5	3.5	3.5	3.5	3.5
Unfunded liability	1.4	2.0	2.8	3.6	4.5
Percent funded	72%	63%	56%	49%	43%

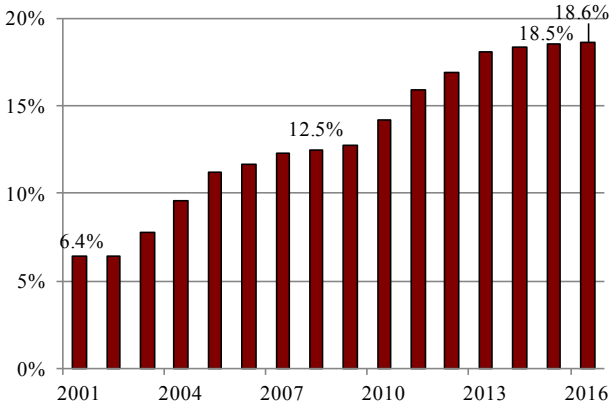
Sources: 2016 actuarial valuations; PPD (2016).

The ADEC (Formerly the ARC)

In 2014, the new GASB standard replaced the Annual Required Contribution (ARC) with the Actuarially Determined Employer Contribution (ADEC). Unlike assets and liabilities, plans do not seem to be maintaining two sets of required contribution numbers, but have instead shifted to using the ADEC for both funding and reporting purposes. While the two measures have minor conceptual discrepancies, generally these differences do not seem to be consequential. Required contributions, whether measured by the ARC or ADEC, are based on the assets and liabilities using the old GASB standard. Thus, no required contribution concept is linked to the new GASB assets and liabilities. For these reasons, our analysis extends the prior ARC data using the ADEC.

The ADEC includes the normal cost – the present value of the benefits accrued in a given year – plus a payment to amortize the unfunded liability (under the old GASB standard) over a specified timeframe, generally 20-30 years. As can be seen in Figure 5, for our sample of 170 state and local pension plans, required contributions as a percentage of payroll remained constant between 2015 and 2016.[10]

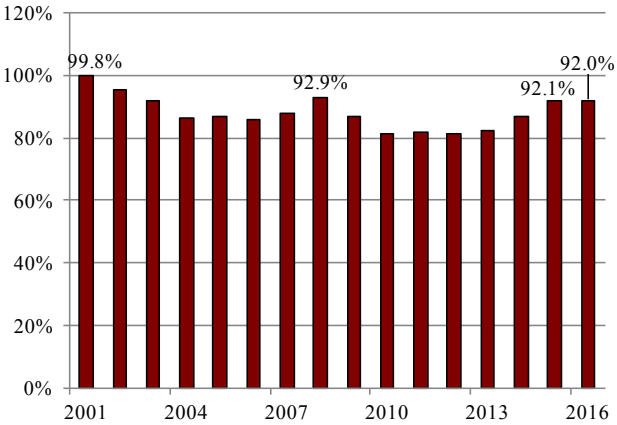
Figure 5. Aggregate Required Contribution as a Percentage of Payroll, FY 2001-2016



Notes: The 2001-2013 measure is the ARC; the 2014-2016 measure is the ADEC. The 2016 value involves projections for about 20 percent of plans.
Sources: 2016 actuarial valuations; and PPD (2016).

Similarly, the percentage of required contribution paid has remained stable since 2015 (see Figure 6). Sponsors have steadily increased the percentage of required contributions paid since the financial crisis and, today, pay above 90 percent.[11]

Figure 6. Percentage of Aggregate Required Contribution Paid, FY 2001-2016



Notes: The 2001-2013 measure is the ARC; the 2014-2016 measure is the ADEC. The 2016 value involves projections for about 20 percent of plans.
Sources: 2016 actuarial valuations; and PPD (2016).

In practice, paying the calculated ADEC is often not enough to meaningfully improve funding under the old GASB rules. For many plans, the amortization payments for the ADEC are back-loaded so that smaller payments are scheduled in the initial years and larger payments later.[12] Yet because most plans regularly reset the funding period, scheduled payments often remain at the low levels indefinitely.[13] In these cases, paying the calculated ADEC results in contributions that are often insufficient to improve the old GASB funded ratio.[14] Another issue arises when considering the impact of ADEC payments and the funded status under new GASB rules. Since the amortization payment for the ADEC is based on the unfunded liability measured under the *old* standard, this payment will not be sufficient to improve funding when the new GASB unfunded liability exceeds the old one; conversely, the payment will be more than needed when the situation is reversed.

Looking Beyond 2016

Table 4 displays the aggregate projected funded ratio for state and local plans under the old and new GASB standards from 2017 to 2021.[15] Importantly, the projections are made under two return scenarios. The baseline scenario assumes that each plan achieves its expected return (about 7.6 percent on average) from 2018 forward. The alternative assumes that each plan underperforms its expected return by about 2 percentage points for an average return of 5.5 percent across all plans – a return consistent with the forecasts of many investment firms.[16]

Table 4. Projected Funded Ratios under Traditional and New GASB Standards for Two Scenarios of Asset Returns, FY 2017-2021

Year	Old GASB		New GASB	
	Baseline	Lower	Baseline	Lower
2016 (actual)	71.8%	71.8%	67.9%	67.9%
2017	72.2	72.1	71.1	70.8
2018	72.4	71.8	71.1	69.3
2019	72.3	71.0	70.9	67.7
2020	72.5	70.2	70.8	66.2
2021	72.9	69.5	70.6	64.6

Note: The baseline projections assume a 7.6-percent average return, and the lower projections assume a 5.5-percent average return.
Source: Authors' projections.

The outlook for 2017 is more certain than for later years since the stock market performance is already known; the Wilshire 5000 Index grew by 16 percent. This positive return has helped offset the weak performance in 2015 and 2016, so that the projected 2017 funded status under the old GASB standard is modestly higher than 2016. Meanwhile, the funded status under the new GASB standard, which is based on market assets, is projected to increase by 3.2 percentage points in 2017.

Surprisingly, the projections for later years under the old GASB show that funded ratios remain essentially flat under the baseline, even though plans pay most of their ADEC and achieve their assumed return. The reason, as noted above, is that the ADEC used by plans is often inadequate to substantially improve funding because amortization payments are back-loaded and plans regularly push out their full funding dates. In 2016, the aggregate ADEC for the 170 PPD plans was $129.9 billion, and employers contributed 92 percent of this amount. However, if the amortization schedule were based on a more stringent "level-dollar" method, which does not back-load costs, the ADEC would have been about $154.7 billion. So, in the aggregate under the old GASB, state and local plans are falling short in two ways – not setting adequate contribution amounts and not paying the full amount that they do set.

The impact of the inadequate ADEC is exacerbated in the projections of the new GASB funded ratio, because the new GASB unfunded liability currently exceeds the old GASB unfunded liability. This difference means that an ADEC calculated under the old GASB – even on a "level-dollar" basis – will be inadequate to decrease the unfunded liability measured under the new GASB standard. As a result, the funded levels under the new GASB decline even if plans hit their investment return target. In other words, plans do not have a clear contribution benchmark for improving the funded ratio under this new standard.

Conclusion

The stock market in 2016 continued the poor performance of 2015, decreasing the funded status of state and local pension plans. Based on the traditional GASB standard, which smooths market gains and losses over time, funding dropped from 74 percent in 2015 to 72 percent in 2016. Under the new GASB standard, which values assets at market, funding declined more dramatically from 73 percent to 68 percent. 2016 was the third year that the new GASB standard was in effect for financial reporting. However, only 14 plans calculated a blended rate that was significantly lower than their traditional discount rate to value liabilities.

The revival of markets in 2017 has helped pension plan assets recover. But looking forward, the funded status of plans will depend heavily on both future investment performance and adequate contributions. In 2021, assuming plans achieve their expected returns, they are projected to be 72.9 percent funded under the old GASB standard compared to 71.8 percent today, and 70.6 percent funded under the new GASB standard compared to 67.9 percent today. To achieve more meaningful progress in funded levels going forward, plans need to re-evaluate the way their required contributions are calculated.

Endnotes

1 The new GASB 67 rules are for reporting purposes only and are not meant to determine funding. As such, funding measures under the GASB 25 and GASB 67 rules are not entirely comparable.

2 Under the new GASB standards, assets and liabilities are referred to as the net fiduciary position and the total pension liability, respectively. The difference between the two is known as the net pension liability.

3 About three quarters of the plans in the PPD report on a June 30 basis. Most of the remaining plans report on a calendar-year basis.

4 2016 involves projections for about 30 percent of the plans in our sample. Because agency plans do not report a plan-level funded status under the new rules, the net position for the plan as a whole is assumed to equal market assets reported in the plan's income statement, and the total pension liability is assumed to equal the actuarial accrued liability for the plan as a whole.

5 The change in market assets is estimated using the simplified formula: Asset(t+1) = (Asset(t)*investment return) + (½*cash flows* investment return)+ (½*cash flows).

6 Liability growth is generally due to a combination of normal benefit accruals and growth in the workforce rather than outright benefit increases.

7 The traditional discount rate is based on the assumed long-term investment return for the plan. The blended rate is the result of a cash flow projection to determine if the plan will deplete its assets before all benefits are paid. If the projection shows that the plan will not exhaust its assets before all benefits are paid, the plan continues to use the assumed return as the discount rate for liabilities. If the projection results in an asset depletion date, all benefit payments projected to occur before that date are discounted using the assumed return, and all payments projected to occur after that date are discounted using an investment grade municipal bond rate.

8 As of 2016, 22 percent of plans in the sample calculated a blended discount rate that was lower than their traditional discount rate. The 14 plans listed in Table 2 have lowered their discount rate by more than 1 percentage point.

9 Duluth Teachers is excluded from this list as it closed its plan to new members in 2014.

10 Compared to an aggregate ADEC of about 18-19 percent of payroll, the average ADEC reported by plans in 2015 – the last year of complete plan data – was 23 percent. This difference suggests that smaller plans have a higher ADEC as a percentage of payroll than larger ones.

11 In aggregate, the percentage of ADEC paid in both 2015 and 2016 was 92 percent. In comparison, the average percentage paid at the plan level in 2015 – the last year of complete data – was 98 percent, with about two-thirds of plans paying 100 percent. This difference suggests that larger plans pay less of the ADEC than smaller ones.

12 The backloading of payments is often because plans use a "level-percentage-of-payroll" amortization method that sets payments as a constant percentage of future payroll (which is assumed to grow). The alternative is a "level-dollar" amortization that schedules equal dollar payments each year to amortize the unfunded liability.

13 Resetting the funding period each year is known as the open amortization method. The alternative is a closed method that sets a fixed date for full funding. Approximately two-thirds of PPD plans reset the amortization period in 2015.

14 See Munnell, Aubry, and Hurwitz (2013) for a more complete discussion of the amortization methods of state and local plans and their potential impact on funded levels.

15 Starting assets, liabilities, and cash flows are based on 2015 and 2016 PPD data. Investment returns for 2016 and 2017 projections are based on the performance of the Wilshire 5000 Index. The prior year's analysis assumed that plans would receive a 7.6-percent return over the 5-year period; the methods used in this *brief* more closely align with current actuarial practice. Liabilities are assumed to grow at a 5-percent rate. Cash flows are assumed to grow at an annual rate of 2.7 percent, based on the 5-year geometric mean of aggregate cash flow growth between 2011 and 2016 (U.S. Census Bureau).

16 Bogle and Nolan (2015); GMO (2016); Goldman Sachs (2016); JP Morgan (2015); McKinsey Global Institute (2016); Morningstar (2015); and Research Affiliates (2016).

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APPENDIX

Appendix. Funded Ratio under Traditional Rules for State and Local Plans, 2001, 2004, 2007, 2010, and 2013-2016

Plan name	2001	2004	2007	2010	2013	2014	2015	2016
Alabama ERS	100.2	89.7	79.0	68.2	65.7	66.9	67.3	69.7*
Alabama Teachers	101.4	89.6	79.5	71.1	66.2	67.5	68.3	70.7*
Alameda County Employee's Retirement Association	105.8	82.1	89.2	77.5	75.9	74.8	77.3	78.1
Alaska PERS	100.9	70.2	77.8	62.4	54.5	59.7	67.0	68.3*
Alaska Teachers	95.0	62.8	68.2	54.3	48.1	54.5	76.9	93.2*
Arizona Public Safety Personnel	126.9	92.4	66.4	67.7	58.7	49.2	49.0	46.0
Arizona SRS	115.1	92.5	83.3	76.4	75.4	76.3	77.1	77.6
Arizona State Corrections Officers	140.0	104.8	84.6	83.8	66.9	57.3	57.3	57.3
Arkansas PERS	105.6	88.7	89.1	74.1	74.3	77.8	79.1	80.4
Arkansas Teachers	95.4	83.8	85.3	73.8	73.3	77.3	79.6	81.0
Atlanta General Employees Pension Fund		61.3	52.2	53.7	51.2	55.5	57.8	60.4
Atlanta Police Fund	82.9	67.5	65.6	66.1	70.8	80.7	78.8	73.1
Baltimore Fire and Police Employees Retirement System	100.1	96.8	91.9	83.2	76.6	74.2	72.8	71.5
Baton Rouge City Parish Retirement System	90.2	83.6	84.6	73.9	73.0	71.0	69.3	67.4*
Birmingham Retirement & Relief System	106.3	95.6	94.3	82.0	73.0	74.8	75.3	75.5
Boston Retirement Board	70.3	63.3	67.6	63.1	59.5		61.6	62.6*
California PERF[a]	111.9	87.3	87.2	83.4	75.2	76.3	73.1	69.0**
California Teachers	98.0	82.5	88.8	71.5	66.9	68.5	68.5	63.7
Chicago Municipal Employees	93.3	72.0	69.1	50.8	37.0	40.9	32.9	30.5
Chicago Police	70.5	55.9	51.5	40.4	29.7	26.1	28.2	29.1*
Chicago Teachers	100.0	85.8	80.1	66.9	49.5	51.5	51.8	52.4
Cincinnati Employees Retirement System	115.4	94.7	86.2	75.1	63.2	64.3	77.1	76.9
City of Austin ERS	96.4	80.8	78.3	69.6	70.4	70.9	68.0	67.5
Colorado Municipal	104.3	77.2	81.2	73.0	73.1	78.7	79.0	80.6*
Colorado School	98.2	70.1	75.5	64.8	60.3	60.9	60.7	62.0*
Colorado State	98.2	70.1	73.3	62.8	57.5	57.8	57.6	58.8*
Connecticut Municipal	109.3	102.9	103.7	88.4	87.5	87.8	87.8	86.1
Connecticut SERS	63.1	54.5	53.6	44.4	41.2	41.5	43.3	35.5
Connecticut Teachers		65.3		61.4		59.0		56.0
Contra Costa County	87.6	82.0	89.9	80.3	76.4	81.7	84.5	86.1*
Cook County Employees	88.9	70.9	85.9	66.4	61.5	62.3	60.2	59.1*
Dallas Police and Fire	84.5	80.8	89.4	79.5	75.6	63.8	45.1	53.2*
DC Police & Fire			101.0	108.0	110.1	107.3	107.6	110.8
DC Teachers			111.6	118.3	90.1	88.6	88.7	90.9
Delaware State Employees	112.4	103.0	103.7	96.0	91.1	92.3	91.6	89.0
Denver Employees	99.5	99.1	98.2	85.0	76.4	73.7	72.2	70.4*
Denver Schools	96.5	88.2	87.7	88.9	81.2	82.6	82.1	83.8*

Plan name	2001	2004	2007	2010	2013	2014	2015	2016
Detroit General Employees	91.6	73.0	98.8	87.1	70.0	62.5	50.4	36.7
Detroit Police and Fire Retirement System	112.6	79.7	110.5	102.3	89.3	81.0	91.3	78.9*
Duluth Teachers	107.6	91.8	86.8	81.7	54.0	56.9	N/A	N/A
Fairfax County Employees	97.3	84.2	82.7	69.9	72.9	75.3	76.6	74.9
Fairfax County Schools	103.0		86.4	75.6	75.4	76.7	77.7	76.0
Florida RS	117.9	112.1	105.6	88.0	85.4	86.6	86.5	85.4
Georgia ERS	101.7	97.6	93.0	80.1	71.4	72.8	74.1	74.7
Georgia Teachers	103.9	100.9	94.7	85.7	81.1	81.9	79.1	74.3
Hartford Municipal Employee	113.1	99.6	100.1	88.6	74.7	76.9	77.6	74.8
Hawaii ERS	90.6	71.7	67.5	61.4	60.0	61.4	62.2	54.7
Houston Firefighters	112.9	88.2	91.1	93.4	86.6		89.4	86.4*
Idaho PERS	97.2	91.7	105.5	78.9	85.3	93.9	90.4	86.3
Illinois Municipal	106.4	94.3	96.1	83.3	87.6	87.3	88.4	88.9
Illinois SERS	65.8	54.2	54.2	37.4	34.2	33.7	36.2	34.3
Illinois Teachers	59.5	61.9	63.8	48.4	40.6	40.6	42.0	39.8
Illinois Universities	72.1	66.0	68.4	46.4	41.5	42.3	43.3	43.3
Indiana PERF	105.0	100.1	98.2	85.2	80.2	82.4	78.6	79.1
Indiana Teachers	43.0	44.8	45.1	44.3	45.7	48.1	46.4	46.8
Iowa Municipal Fire and Police	99.1	84.2	87.2	81.1	73.9	77.8	80.8	81.4
Iowa PERS	97.2	88.6	90.2	81.4	81.0	82.7	83.7	83.9
Jacksonville General Employee Pension Plan	96.5	82.6	89.9	75.9	62.3	65.8	66.8	65.2*
Kansas PERS	88.3	75.2	69.4	63.7	59.9	62.3	67.1	72.2*
Kentucky County	141.0	101.0	80.1	65.5	59.5	61.9	59.7	58.7
Kentucky ERS	125.8	85.8	58.4	40.3	25.8	23.9	21.9	18.9
Kentucky Teachers	90.8	80.9	71.9	61.0	51.9	53.6	55.3	54.6
Kern County Employees Retirement Association	103.3	93.6	75.7	62.7	61.1	60.8	62.4	63.4
LA County ERS	100.0	82.8	93.8	83.3	75.0	79.5	83.3	79.4
Los Angeles City Employees' Retirement System	108.1	82.5	81.7	75.9	68.7	67.4	69.4	71.4
Los Angeles Fire and Police	118.9	103.0	99.2	91.6	83.1	86.6	91.5	93.9
Los Angeles Water and Power	109.9	97.3	91.9	81.5	78.8	80.9	86.9	84.2
Louisiana Municipal Police	101.1	72.9	89.1	59.9	64.2	68.1	69.9	70.6
Louisiana Schools	103.0	75.8	80.0	61.0	62.1	66.9	70.7	72.5
Louisiana SERS	74.2	59.6	67.2	57.7	60.2	59.3	62.1	62.6
Louisiana State Parochial Employees	92.3	93.5	96.9	97.2	92.5	96.9	97.2	93.7*
Louisiana Teachers	78.4	63.1	71.3	54.4	56.4	57.4	60.9	62.4
Maine Local	108.2	112.1	113.6	96.3	88.4	91.2	89.4	86.1
Maine State and Teacher	73.1	68.5	74.1	66.0	77.7	81.4	82.2	80.4
Maryland PERS	102.2	91.2	79.5	62.8	63.3	65.9	66.7	67.7
Maryland Teachers	95.3	92.8	81.1	65.4	67.1	70.7	71.9	72.7
Massachusetts SRS	91.8	83.9	85.1	76.5	69.1	70.3	67.5	63.5
Massachusetts Teachers	79.2	69.6	71.0	63.0	55.7	56.3	54.3	52.8

Plan name	2001	2004	2007	2010	2013	2014	2015	2016
Miami City Firefighters and Police	93.7	85.1	96.2	65.5	72.5	72.0	71.0	69.6
Michigan Municipal	84.3	76.7	77.3	74.5	71.7	70.6	66.5	66.2*
Michigan Public Schools	96.5	83.7	88.7	71.1	59.6	59.9	60.5	59.7**
Michigan SERS	107.6	84.5	86.2	72.6	60.3	61.6	64.2	64.3**
Milwaukee City ERS	137.2	116.7	131.2	104.4	94.8	97.2	96.7	94.6**
Milwaukee County ERS	108.6	79.9	80.4	92.2	85.7	79.8	75.8	71.6*
Minneapolis ERF	93.3	92.1	85.9	65.6	74.4	82.0	N/A	N/A
Minnesota GERF	87.0	76.7	73.3	76.4	72.8	73.5	76.3	75.5
Minnesota Police and Fire Retirement Fund	120.5	101.2	91.7	87.0	81.2	80.0	83.6	87.7
Minnesota State Employees	112.1	100.1	92.5	87.3	82.0	83.0	85.7	81.6
Minnesota Teachers	105.8	100.0	87.5	78.5	71.6	74.1	77.1	75.6
Mississippi PERS	87.5	74.9	73.7	64.2	57.7	61.0	60.4	60.0
Missouri DOT and Highway Patrol	66.1	53.4	58.2	42.2	46.2	49.2	52.9	55.5
Missouri Local	104.0	95.9	96.1	81.0	86.5	91.7	94.4	94.7
Missouri PEERS	103.1	82.7	83.2	79.1	81.6	85.1	86.8	86.4
Missouri State Employees	97.0	84.6	86.8	80.4	72.7	75.1	75.0	69.6
Missouri Teachers	99.4	82.0	83.5	77.7	80.1	82.8	83.9	84.8
Montana PERS		86.7	91.0	74.2	80.2	74.4	76.1	77.3
Montana Teachers		77.4	80.4	65.4	66.8	65.4	67.5	69.3
Montgomery County Employees	94.3	79.8	79.7	76.6	78.8	84.2	89.6	91.7
Nashville-Davidson Metro Employees Benefit Trust Fund	94.1	93.2	89.6	90.8	82.6	89.7	95.1	97.1*
Nebraska Schools	87.2	87.2	90.5	82.4	77.1	82.7	88.0	89.6
Nevada Police Officer and Firefighter	78.9	71.7	71.1	67.8	71.1	74.3	76.3	77.1
Nevada Regular Employees	85.5	80.5	78.8	71.2	68.9	70.8	72.4	73.2
New Hampshire Retirement System[b]	85.0	71.1	67.0	58.5	56.7	60.7	59.2	60.0
New Jersey PERS	117.1	91.3	76.0	69.5	62.1	60.9	59.5	57.2
New Jersey Police & Fire	100.8	84.0	77.6	77.1	73.1	72.6	72.6	70.3
New Jersey Teachers	108.0	85.6	74.7	67.1	57.1	54.0	51.1	47.0
New Mexico Educational	91.9	75.4	70.5	65.7	60.1	63.1	63.7	64.2
New Mexico PERA	105.4	93.1	92.8	78.5	72.9	75.8	74.9	75.3
New York City ERS	117.4	94.5	79.0	64.2	68.4	70.3	77.2	75.7*
New York City Fire	84.7	63.9	55.1	48.2	54.3	55.4	60.8	59.5*
New York City Police	104.5	80.1	68.9	60.1	66.8	66.9	78.4	70.9*
New York City Teachers	98.0	81.1	69.6	58.9	57.7	57.7	56.4	58.6**
New York State Teachers	125.0	99.2	104.2	100.3	87.5	92.9	94.2	87.2*
North Carolina Local Government	99.3	99.3	99.5	99.6	99.8	99.8	97.1	95.4**
North Carolina Teachers and State Employees	111.6	108.1	104.7	95.4	94.8	95.6	92.5	91.1**
North Dakota PERS	110.6	94.0	93.3	73.4	62.0	64.5	68.6	66.7
North Dakota Teachers	96.4	80.3	79.2	69.8	58.8	61.8	61.6	62.1
NY State & Local ERS	120.1	100.5	105.8	93.9	88.5	92.0	93.8	94.1**
NY State & Local Police & Fire	132.6	104.1	106.5	96.7	89.5	93.1	93.2	92.6**

Plan name	2001	2004	2007	2010	2013	2014	2015	2016
Ohio PERS[c]	102.6	87.6	96.3	79.1	82.4	83.8	85.0	80.1**
Ohio Police & Fire	92.7	80.9	81.7	69.4	66.7	70.8	71.3	69.2*
Ohio School Employees	95.0	78.1	80.8	72.6	65.3	68.1	68.8	67.3
Ohio Teachers	91.2	74.8	82.2	59.1	66.3	69.3	69.3	69.6
Oklahoma PERS	82.6	76.1	72.6	66.0	81.6	88.6	93.6	93.2
Oklahoma Police Pension and Retirement System	91.4	81.1	79.9	74.9	89.3	94.6	98.2	98.7
Oklahoma Teachers	51.4	47.3	52.6	47.9	57.2	63.2	66.6	65.7
Omaha Police and Fire Pension	77.5	77.3	60.1	41.4	46.8	49.6	50.8	*
Omaha School Employee Retirement System	89.2	83.8	89.0	73.5	72.6	74.1	73.0	65.2
Orange County ERS	94.7	70.9	74.1	69.8	66.0	69.8	71.7	73.7*
Oregon PERS	96.4	97.0	110.5	85.8	90.7	95.9	83.6	78.7
Pennsylvania Municipal Retirement System		105.6	105.9	102.4	98.4	100.7	101.0	99.9*
Pennsylvania School Employees	114.4	91.2	85.8	75.1	63.8	62.0	60.5	57.3
Pennsylvania State ERS	116.3	96.1	97.1	75.2	59.2	59.4	58.0	58.1**
Philadelphia Municipal Retirement System	77.5	59.8	53.9	45.4	47.4	45.8	45.0	44.8
Phoenix ERS	102.5	84.2	83.9	69.3	64.2	58.7	55.4	57.3
Portland Fire and Police Disability Retirement Fund	1.3	1.1	0.5	0.6	0.6	0.7		0.5
Providence ERS	41.6	36.3	39.5	34.1	31.4	25.6	27.1	24.7*
Rhode Island ERS	77.6	59.4	56.2	48.4	57.3	58.7	57.9	57.4
Rhode Island Municipal	118.1	93.2	90.3	73.6	82.1	84.1	83.8	83.0
Sacramento County ERS	107.7	93.3	93.4	87.7	82.8	85.2	86.8	87.3
San Diego City ERS	89.9	65.8	78.8	67.1	70.4	74.2	75.6	71.6
San Diego County	106.8	81.1	89.7	84.3	79.0	80.9	80.5	76.9
San Francisco City & County	129.0	103.8	110.2	91.1	80.6	85.3	85.6	84.6
Seattle Employees Retirement System		85.9		62.0	63.5	64.2	66.0	66.5
South Carolina Police	94.6	87.7	84.7	74.5	69.2	69.5	69.2	66.3
South Carolina RS	87.4	80.3	69.7	65.5	62.5	62.7	62.0	59.5
South Dakota RS	96.4	97.7	97.1	96.3	100.0	100.0	100.0	100.0
St. Louis School Employees	80.5	86.3	87.6	88.6	84.4	84.8	78.5	74.6*
St. Paul Teachers	81.9	71.8	73.0	68.0	60.4	61.8	62.6	63.3
Texas County & District	89.3	91.0	94.3	89.4	89.4	90.5	88.7	88.4**
Texas ERS	104.9	97.3	95.6	85.4	79.6	77.2	76.3	75.2
Texas LECOS	131.6	109.3	98.0	86.3	73.3	73.2	72.0	71.1
Texas Municipal	85.0	82.8	73.7	82.9	84.1	85.8	85.8	86.3
Texas Teachers	102.5	91.8	89.2	82.9	80.8	80.2	80.2	79.7
TN Political Subdivisions	90.4		89.5		95.0		98.8	97.2*
TN State and Teachers	99.6		96.2		93.3		95.2	93.7*
University of California	147.7	117.9	104.8	86.7	75.9	80.0	81.7	82.6
Utah Noncontributory	102.8	92.3	95.1	83.8	82.0	84.1	86.5	83.7*
Utah Public Safety	100.8	88.3	90.7	77.1	79.3	82.8	85.1	82.3*
Vermont State Employees	93.0	97.6	100.8	81.2	76.7	77.9	75.1	74.6

Plan name	2001	2004	2007	2010	2013	2014	2015	2016
Vermont Teachers	89.0	90.2	84.9	66.5	60.5	59.9	58.6	58.3
Virginia Retirement System	107.3	90.3	82.3	72.4	65.9	69.6	73.3	74.8
Washington LEOFF Plan 2	154.4	116.9	128.8	119.0	114.6	107.1	105.5	105.4*
Washington PERS 2/3	179.1	134.4	119.9	112.7	102.3	90.0	88.4	88.7*
Washington School Employees Plan 2/3	197.0	136.9	126.1	112.5	101.9	91.4	89.0	88.4*
Washington Teachers Plan 2/3	197.4	152.6	130.4	115.5	104.9	93.6	91.9	92.1*
West Virginia PERS	84.4	80.0	97.0	74.6	79.7	83.1	86.8	89.0
West Virginia Teachers	21.0	22.2	51.3	46.5	57.9	66.2	66.0	65.4
Wisconsin Retirement System	96.5	99.4	99.6	99.8	99.9	100.0	100.0	100.0
Wyoming Public Employees	103.2	96.0	94.0	84.6	77.6	79.0	78.2	78.1

Notes: The years reported for this table reflect the fiscal-year end of the annual financial reports for the plans, not the actuarial valuation dates. For plans with valuation dates that are different from the fiscal year end dates of the annual financial reports, data are for the most recent valuation as of the fiscal year end date. Municipal agency plans such as Michigan Municipal and Illinois Municipal do not have a single funded ratio, as they are made up of individual retirement systems that each maintain their own liabilities and funded ratios. For these types of plans, the funded ratios reported above represent an aggregate of assets and liabilities of the individual systems.

* Numbers are authors' estimates. ** Received from plan administrator.

[a] The reported 2016 California PERF funded ratio is based on actuarial assets and liabilities provided by the plan administrator, estimated using actuarial roll-forward techniques and a 7.5-percent discount rate. The Board is reducing the discount rate for most of its plans to 7.375 percent (FY 2016), 7.25 percent (FY 2017), and 7.0 percent (FY 2018). The table reports the system's funded ratio using the 7.5-percent rate because not all plans have been processed at the new rate.

[b] Prior to 2007, the New Hampshire Retirement System used the Open Group Aggregate to calculate its funded ratio. Beginning in 2007, the entry age normal (EAN) was used.

[c] The 2015 funded ratio for Ohio PERS represents the plan's 2015 funded ratio pre-experience study.

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