

Stability in overall pension plan funding masks a growing divide

Authors: Jean-Pierre Aubry, Caroline V. Crawford, Kevin Wandrei

Persistent link: <http://hdl.handle.net/2345/bc-ir:108196>

This work is posted on [eScholarship@BC](#),
Boston College University Libraries.

Chestnut Hill, Mass.: Center for Retirement Research at Boston College, October 2018

These materials are made available for use in research, teaching and private study, pursuant to U.S. Copyright Law. The user must assume full responsibility for any use of the materials, including but not limited to, infringement of copyright and publication rights of reproduced materials. Any materials used for academic research or otherwise should be fully credited with the source. The publisher or original authors may retain copyright to the materials.



STABILITY IN OVERALL PENSION PLAN FUNDING MASKS A GROWING DIVIDE

*By Jean-Pierre Aubry, Caroline V. Crawford, and Kevin Wandrei**

INTRODUCTION

In fiscal year 2017, the aggregate funded ratio for state and local pension plans under traditional government accounting rules was 72 percent, largely unchanged from the past several years. However, this stability belies growing disparities in individual plan funding. While plans with extremely low funded ratios garner most of the public spotlight, a sizable share of plans are well-funded and financially stable. As such, much can be learned from analyzing trends for specific groups of plans that underlie the aggregate story.

The discussion proceeds as follows. The first section provides an update of the aggregate funded level for 2017 based on the most recent reports from the 180 plans in the *Public Plans Database*.¹ The second section divides the sample of plans into thirds based

on their 2017 funded ratio, and traces the history of funding for each group. The data show that the average funded ratios for each third were relatively similar in 2001, but have diverged since. The third section investigates potential reasons for this divergence by reviewing each group's benefit levels, funding discipline, and investment returns from 2001-2017. The fourth section projects future funded levels in aggregate. The final section concludes that the top third of plans should remain on track if they maintain their current course while the bottom third will likely need to make major changes. One concern that all plans share is the possibility of a market downturn, which could set back funding for several years.

**Jean-Pierre Aubry is associate director of state and local research at the Center for Retirement Research at Boston College (CRR). Caroline V. Crawford is assistant director of state and local research at the CRR. Kevin Wandrei is a research associate at the CRR. The authors thank David Blitzstein, Keith Brainard, and Joshua Franzel for helpful comments.*

LEARN MORE →

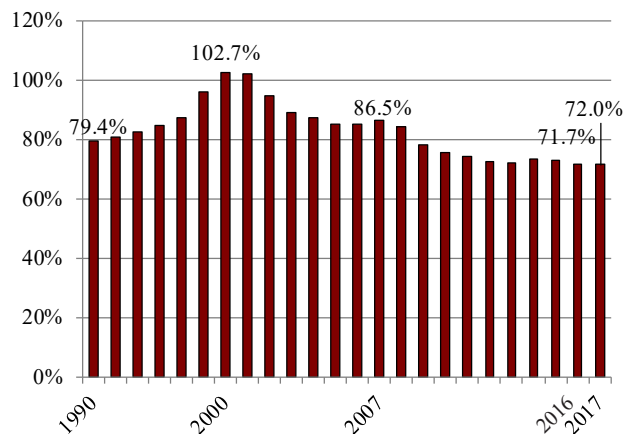
Search for other publications on this topic at:
crr.bc.edu

FUNDED STATUS IN 2017

Prior to 2014, most public pension plans used the traditional Governmental Accounting Standards Board rules (GASB 25) to report assets and liabilities both for accounting and funding purposes. New GASB rules introduced in 2014 (GASB 67) included significant changes to the measures of assets and liabilities for accounting purposes only. This *brief* focuses on the traditional GASB 25 standards because plans still use them for funding, and they allow for continuity with historical trends.²

As of 2017, state and local plans were 72 percent funded in aggregate – virtually unchanged since 2016 (see Figure 1).³ This lack of improvement in funded levels is a result of similar growth in both assets and liabilities. Between 2016 and 2017, actuarial assets grew by 5.1 percent – from \$3.46 trillion to \$3.64 trillion – while actuarial liabilities grew by 4.8 percent – from \$4.83 trillion to \$5.07 trillion.

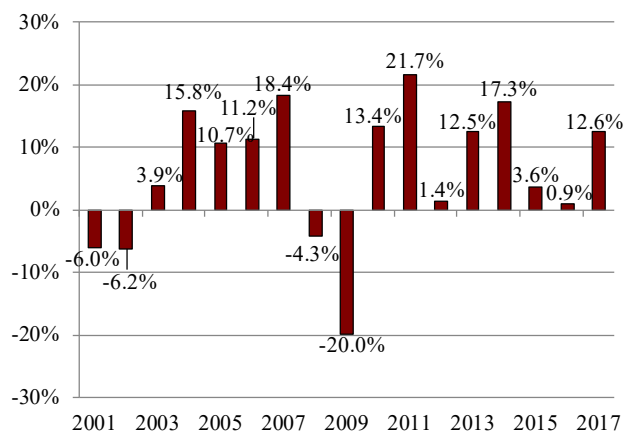
FIGURE 1. STATE AND LOCAL PENSION FUNDED RATIOS, FY 1990-2017



Note: The 2017 funded ratio involves projections for 18 percent of PPD plans, representing 26 percent of liabilities. Sources: 2017 actuarial valuations (AVs); *Public Plans Database* (PPD) (2001-2017); and Zorn (1990-2000).

The relatively slow growth in assets in 2017 is due to the impact of actuarial smoothing, which typically averages market performance over a 5-year period. So, while investment returns were strong in 2017 (12.6 percent), the smoothing method reflects a combination of three very strong years and two weak years (see Figure 2). In contrast, the growth in liability values is based on the discount rate used by plans, which generally changes little from year to year.⁴

FIGURE 2. RETURNS FOR STATE AND LOCAL PLANS, FY 2001-2017

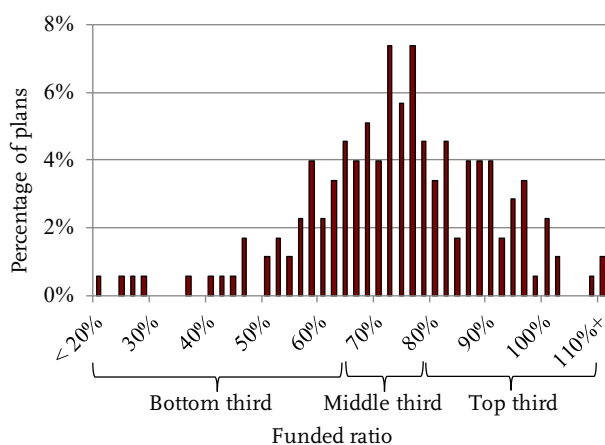


Source: PPD (2001-2017).

HOW DO FUNDED RATIOS VARY AMONG PLANS?

While the aggregate funded ratio provides a useful measure of the public pension landscape at large, it can obscure variations in funding at the plan level. Figure 3 (on the next page) shows the distribution of 2017 funded ratios for the 180 plans in the PPD. To better assess any underlying trends, this analysis divides the universe of PPD plans into three equal groups based on their 2017 funded status. The funded-ratio boundaries for the three groups were 16 to 67 percent for the bottom third, 68 to 80 percent for the middle third, and 81 to 111 percent for the top third. The average 2017 funded ratio for each group was 55 percent for the bottom third, 73 percent for the middle third, and 90 percent for the top third.

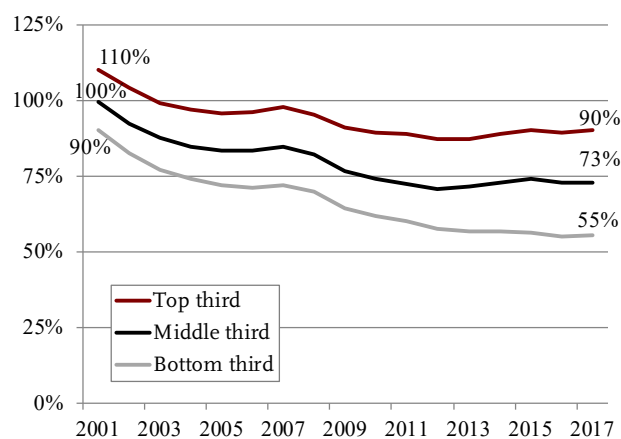
FIGURE 3. DISTRIBUTION OF 2017 FUNDED STATUS



Source: PPD (2001-2017).

The analysis begins by tracking the average funded ratio for each group back to 2001 (see Figure 4). While the bottom third has been consistently less funded throughout the period, all three groups were at or above 90 percent in 2001. However, over time, the funded status of the three groups has grown apart. Much of this divergence has occurred since the financial crisis as the worst-funded group has continued to deteriorate while the other two groups have stabilized. As a result, the gap between the top and bottom group in 2017 was 35 percentage points.

FIGURE 4. AVERAGE FUNDED RATIOS BY 2017 FUNDED STATUS, 2001-2017



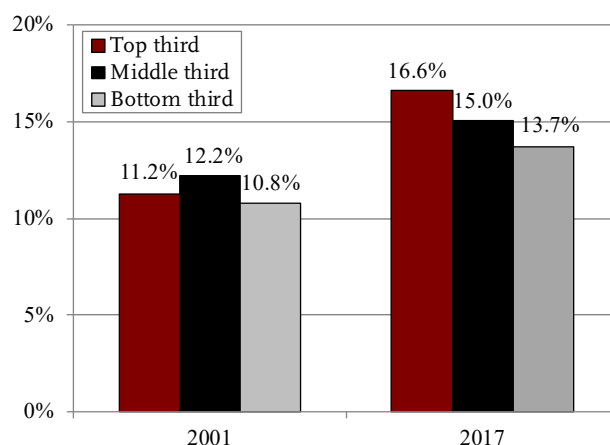
Source: PPD (2001-2017).

WHAT EXPLAINS THE WIDENING GAP?

To better understand what factors underlie the divergence in funded status, we look at three key elements: benefit levels, funding discipline, and investment returns.

To assess retirement benefits, the analysis examines the average normal cost as a percentage of payroll for each group. The normal cost measures the present value of retirement benefits earned by active workers in a given year, and is often used as a single measure to compare the complicated benefit provisions offered by plans. Figure 5 shows that the normal costs for the three groups are relatively similar and that the worst-funded plans generally had the lowest normal cost. These results suggest that differences in benefit levels are not driving the widening gap in funded status among the three groups.

FIGURE 5. AVERAGE TOTAL NORMAL COST AS A PERCENTAGE OF PAYROLL BY 2017 FUNDED STATUS, 2001 AND 2017



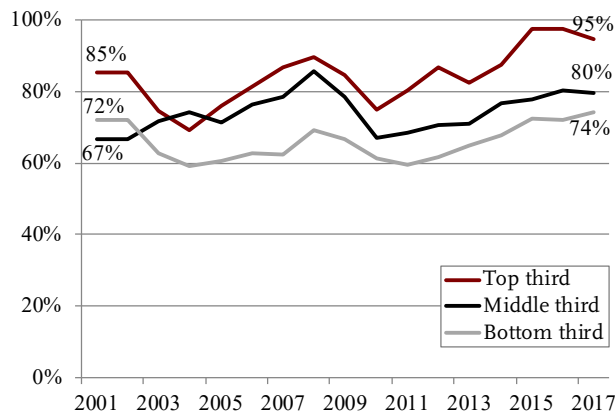
Note: To standardize across the varying discount rates, reported normal costs were revalued at a 7.5-percent discount rate based on an actuarial rule-of-thumb that assumes a 1-percentage point change in the discount rate equates to a 22-percent change in normal costs.

Source: PPD (2001-2017).

Past research by the Center has demonstrated that both inadequate contributions by government sponsors and poor investment performance of plans have contributed significantly to unfunded liability growth for public plans.⁵ To investigate the adequacy

of contributions made to plans, the analysis compares annual government contributions with the amount needed to both fund accruing benefits and pay off the existing unfunded liability within 30 years in level dollar payments.⁶ From 2001-2017, the average contribution for all three groups was less than this funding benchmark, with the best-funded group receiving 80-90 percent of the benchmark in most years, and the worst-funded receiving 60-70 percent in most years (see Figure 6).⁷

FIGURE 6. PERCENTAGE OF REQUIRED CONTRIBUTION RECEIVED* BY 2017 FUNDED STATUS, 2001-2017



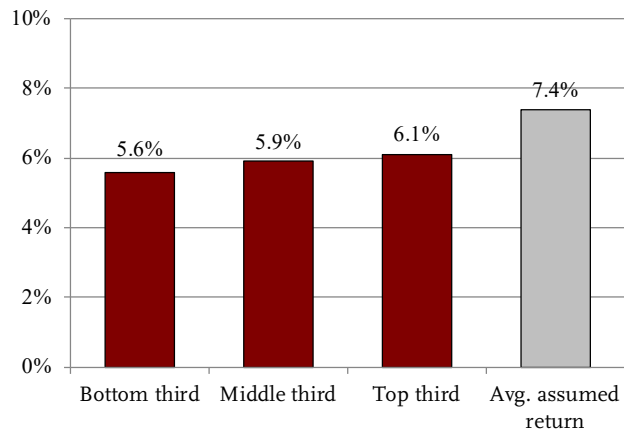
*The required contribution used here recalculates each plan's reported required contribution using a level-dollar amortization method over a 30-year period, holding all other factors constant.

Sources: 2017 AVs; and PPD (2001-2017).

The analysis next turns to a comparison of investment returns. Figure 7 shows the average annualized return from 2001-2017 for each group compared to the average assumed investment return. Two key takeaways emerge. First, all groups underperformed the assumed return.⁸ As a result, because contributions are based on the assumption that plans realize their assumed return, even plans that have been dutiful in paying down unfunded liabilities have seen a drop in funded status. Second, the worst-funded plans fell short of the assumed return by more than the best-funded plans. Based on simple projections, if the worst funded plans had achieved returns similar to the best-funded group, their funded ratio would

be about 11 percentage points higher – eliminating about one-third of the gap in funding between the two groups.⁹

FIGURE 7. AVERAGE ANNUALIZED RETURN BY 2017 FUNDED STATUS, AND ASSUMED RETURN, 2001-2017



Source: PPD (2001-2017).

In summary, the data show that the worst-funded plans have not provided higher levels of benefits over the past 17 years. However, contributions to the worst-funded plans have fallen well short of what is required to maintain reasonable funded levels. And average investment returns for the worst-funded plans lag behind the other groups.

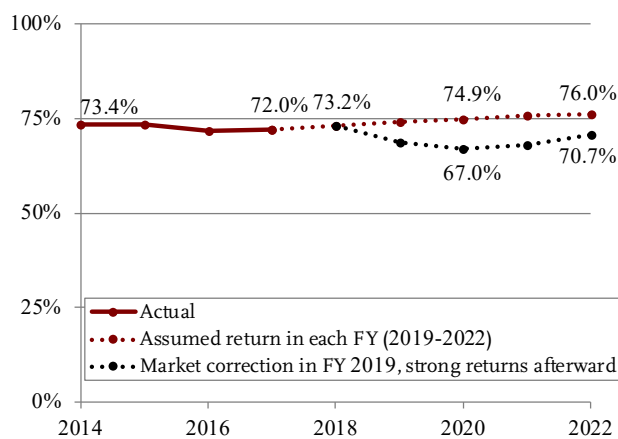
LOOKING FORWARD

The performance of the stock market in 2018 has likely improved the funded status for most plans relative to their reported levels in 2017. A projection of plan funded status, incorporating realized stock market returns, shows a one-percentage-point increase in the funded levels from 2017 to 2018 – from 72 percent to 73 percent.¹⁰

However, the extended period of relatively strong market performance has some experts worried about a market correction in the near future – the stock market is near historic highs with a price-to-earnings ratio of about 1.5 times the historic average, and the yield curve continues to flatten as short-term rates

increase.¹¹ To better understand how a significant market correction might impact plan funding, funded ratios from 2019 to 2022 are projected under two scenarios: 1) plans earn exactly their assumed return in each year; and 2) plans experience a negative return of 15 percent in 2019 and then relatively strong returns in the following years to ensure that the annualized return from 2019-2022 is equal to the assumed return (see Figure 8).¹²

FIGURE 8. STATE AND LOCAL PENSION FUNDED RATIOS, ACTUAL AND PROJECTED, 2014-2022



Note: FY 2018 funded ratios are estimated based on the actual performance of the Wilshire 5000.

Sources: PPD (2014-2017); and authors' calculations (2018-2022).

If plans earn their assumed return in each of the next four years, the funded ratio will climb slowly to 76 percent by 2022. However, if a downturn results in a negative 15-percent return in 2019, the aggregate funded ratio will be only 71 percent in 2022 – even

with strong returns from 2020 to 2022. Two factors exacerbate the impact that negative returns have on the funded ratio. First, the initial impact of a market loss is felt twofold because the actuarial assets drop *and* liabilities continue to grow. Second, because of actuarial smoothing of market gains and losses, a loss in 2019 is incrementally recognized in the actuarial assets over several years (typically five). The incremental recognition of losses limits improvement in the funded ratio in spite of strong returns afterward. In that way, a one-time market downturn has lingering impacts on plan funding.

CONCLUSION

The 2017 funded ratios reported by public pension plans resulted in little change in their average funded status under the traditional GASB standards. However, separating the public pension universe into three groups by their 2017 funded status makes clear that underlying trends for each group have not been uniform. The top third of plans now has an average funded ratio of 90 percent and should remain on track with continued maintenance. The average funded ratio for the middle third of plans has remained relatively steady around 70 percent since the crisis, and these plans can improve by adopting more stringent funding methods. However, the average funded ratio for the bottom third of plans is currently 55 percent and has continued to decline in the wake of the crisis. These worst-off plans will likely require intervention beyond traditional reforms to change the trajectory of their funded status.

Looking forward, the 2018 funded levels for plans will likely increase from 2017 levels due to the relatively strong market performance from July 2017 to June 2018. However, if a market downturn occurs, it could set back plan funding for several years.

ENDNOTES

1 This sample covers approximately 95 percent of public pension membership and assets nationwide. The sample of plans is a carry-over from the Public Fund Survey (PFS), which was constructed with an eye toward the largest state-administered plans in each state, but also includes some large local plans such as New York City ERS and Chicago Teachers.

2 For an update of the funded status based on the new GASB standards, see Appendix A.

3 For the funded ratios of individual plans, access the PPD's [Interactive Data Browser](http://publicplansdata.org/public-plans-database/browse-data), available at: <http://publicplansdata.org/public-plans-database/browse-data>

4 The annual growth in actuarially accrued liabilities is roughly equal to the interest on last year's liability + normal cost (the present value of newly accrued benefits) – benefits paid (accrued benefits that are no longer due). Because benefit payments are generally larger than normal costs, the annual growth in liabilities is usually lower than the discount rate. Rather than use market interest rates that may fluctuate significantly, public plans use their assumed long-term investment return as the interest rate to value their liabilities.

5 See Munnell, Aubry, and Cafarelli (2015).

6 See Aubry, Crawford, and Munnell (2018). Most plans use a “level-percentage-of-pay” method for amortizing their unfunded liabilities in order to keep contributions at a set percentage of government payroll – which is consistent with public sector budgeting objectives. However, this method generally results in a schedule of smaller amortization payments in earlier years and larger payments later. For long amortization periods (20-30 years), the backloaded payment schedule allows the UAAL to grow in the early years. An alternative approach is a “level-dollar” amortization method that schedules equal dollar payments, which are designed to reduce the unfunded liability each year. For any amortization period, the level-dollar approach will reduce the UAAL more quickly than the “level-percentage-of-pay” approach.

7 For many state and local plans, government pension contributions are made according to a fixed statutory contribution rate (or dollar level) rather than the actuarially determined contribution. For others, statutory caps limit the allowable increase in the employer contribution from year to year. These statutory limitations are often why governments contribute less than the required contribution to their pension plan. For example, in 2006, 71 percent of plans with a statutory limitation did not pay their full required contribution compared to only 26 percent of plans without a statutory limitation.

8 The average assumed return for each group differed by less than one-tenth of a percentage point.

9 The projection assumes that plans in the worst-funded group achieve the average returns of plans in the best-funded group while leaving the cash flows and liabilities of the worst-funded group unchanged. This simplified projection does not account for the impact of actuarial asset smoothing (delayed accounting of annual investment gains and losses) or the likelihood that a plan's contributions would decrease in response to better returns.

10 The projection begins with the assets, liabilities, and cash flows reported in the 2017 PPD data. The investment return for public plans in 2018 is based on the actual performance of the Wilshire 5000 Index and a historical market beta of 0.75 for public plan portfolios. Liabilities are assumed to grow at a 5-percent rate annually. Cash flows (the difference between contributions and benefits) are assumed to grow at an annual rate of 2.7 percent, based on the five-year geometric mean of aggregate cash flow growth between 2012 and 2017 (U.S. Census Bureau, 2012 and 2017).

11 Leinz (2018). At the end of 2017, when market indicators were similar to today, Vanguard predicted a 70-percent likelihood of a market correction in 2018.

12 The negative 15-percent return for public plans in 2019 is based on a 20-percent decline in the Wilshire 5000 – halfway between a standard 10-percent correction and the roughly 30-percent drop during the financial crisis – and a historical market beta of about 0.75 for public pension portfolios. For a discussion of the exact definitions of market corrections, market reversals, and bear markets, see Constable (2016).

12 Given the assumed negative 15-percent portfolio return in 2019, the annualized portfolio return from 2020 to 2022 would equal about 16 percent to achieve a 7.5-percent return from 2019 to 2022.

13 For multiple employer agency plans that do not report a funded ratio under the new rules, the funded ratio is calculated by dividing the net market assets reported on the pension fund's balance sheet by the plan's actuarially accrued liability.

REFERENCES

- Aubry, Jean-Pierre, Caroline V. Crawford, and Alicia H. Munnell. 2018. "The Funded Status of Local Pensions Inches Closer to States." *Issue in Brief*. Jointly published by the Center for Retirement Research at Boston College and the Center for State and Local Government Excellence.
- Constable, Simon. 2016. "What Is a Reversal vs. Correction?" (January 12). New York, NY: *The Wall Street Journal*.
- Leinz, Kailey. 2018. "End of a Bull Market, or Nowhere Near? Making the Case for Both." (February 7). New York, NY: *Bloomberg*.
- Munnell, Alicia H., Jean-Pierre Aubry, and Mark Cafarelli. 2015. "How Did State/Local Plans Become Underfunded?" *State and Local Plans Issue in Brief* 42. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Public Plans Database*. 2001-2017. Center for Retirement Research at Boston College, Center for State and Local Government Excellence, and National Association of State Retirement Administrators.
- U.S. Census Bureau. *Survey of Public Pensions: State & Local Data*, 2012 and 2017. Washington, DC.
- Wilshire Associates. 2018. "Dow Jones Wilshire 5000 (Full Cap) Price Levels Since Inception." Santa Monica, CA.
- Zorn, Paul. 1990-2000. *Survey of State and Local Government Retirement Systems: Survey Report for Members of the Public Pension Coordinating Council*. Chicago, IL: Government Finance Officers Association.

APPENDIX

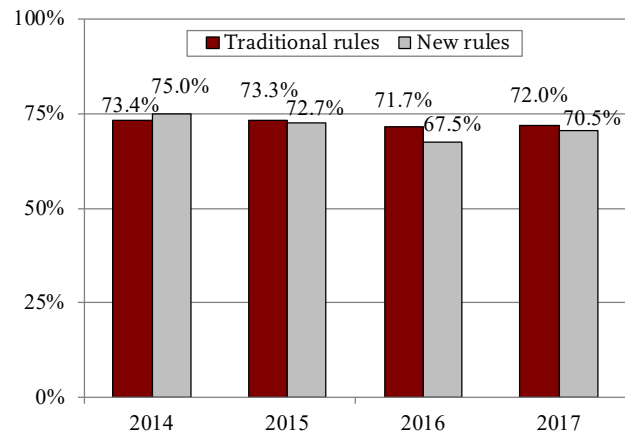
APPENDIX. AGGREGATE FUNDED STATUS UNDER NEW GASB STANDARDS

The new GASB 67 standards introduced two significant changes to the reporting of pension assets and liabilities. First, they require plans to report assets at market value rather than actuarially smoothed. Second, they require plans to value liabilities using a blended rate that reflects: 1) the plan's assumed return for the portion of benefits projected to be covered by plan assets and contributions; and 2) the yield on high-grade municipal bonds for any portion of benefits that is to be covered by other resources.

The majority of plans use their assumed return for valuing all liabilities, as they anticipate having sufficient assets and contributions to cover benefits. Table A1 lists the plans that currently use a blended discount rate that is more than 1 percentage point below their assumed return.

Figure A1 shows the funded status under both traditional and new GASB standards from 2014 to 2018. While the funded status under both methods is relatively similar, the ratio under the new rules is slightly more volatile due to fluctuations in market assets.¹³

FIGURE A1. FUNDED RATIOS UNDER TRADITIONAL AND NEW GASB RULES, FY 2014-2018



Sources: 2017 AVs; and PPD (2017).

TABLE A1. PLANS ADOPTING A SIGNIFICANTLY LOWER GASB 67 BLENDED DISCOUNT RATE, FY 2017

Plan	Actuarial assets (\$000s)	Discount Rate		Funded status	
		Traditional (GASB 25)	New (GASB 67)	Traditional (GASB 25)	New (GASB 67)
New Jersey PERS	\$33,401,414	7.0%	5.0%	57.3%	36.8%
New Jersey Teachers	26,549,410	7.0	4.3	42.1	25.4
Texas ERS	26,371,827	8.0	5.4	70.1	54.7
Colorado School	23,263,344	7.3	5.3	56.3	43.1
Minnesota Teachers	21,062,789	8.5	5.1	76.8	51.6
Kentucky Teachers	18,514,638	7.5	4.5	56.4	39.8
Colorado State	14,026,332	7.3	5.3	54.6	42.6
New Mexico Educational	12,507,831	7.3	5.9	62.9	53.0
Minnesota State Employees	12,364,957	8.0	5.4	85.2	62.7
Cook County ERS	9,488,223	7.5	4.6	56.7	39.2
North Dakota PERS	2,633,199	7.8	6.4	70.7	62.6
Dallas Police and Fire	2,157,800	7.3	4.1	49.4	25.5
Birmingham RRS	1,016,438	7.5	4.1	75.5	48.5
Texas LECOS	923,990	8.0	3.5	66.0	42.7
Charlotte Firefighters' RS	520,579	7.5	5.2	86.2	71.2

Sources: 2017 AVs; and PPD (2017).

ABOUT THE CENTER

The mission of the Center for Retirement Research at Boston College is to produce first-class research and educational tools and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception in 1998, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

AFFILIATED INSTITUTIONS

The Brookings Institution
Syracuse University
Urban Institute

CONTACT INFORMATION

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: <http://crr.bc.edu>

Visit the:

 PUBLIC PLANS DATA WEBSITE
 publicplansdata.org

© 2018, by Trustees of Boston College, Center for Retirement Research. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that the authors are identified and full credit, including copyright notice, is given to Trustees of Boston College, Center for Retirement Research.

The CRR gratefully acknowledges the Center for State and Local Government Excellence for its support of this research. The Center for State and Local Government Excellence (<http://www.slge.org>) is a proud partner in seeking retirement security for public sector employees, part of its mission to attract and retain talented individuals to public service. The opinions and conclusions expressed in this *brief* are solely those of the authors and do not represent the opinions or policy of Boston College, the CRR, or the Center for State and Local Government Excellence.