The funding of state and local pensions: 2012-2016

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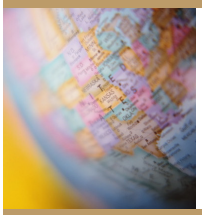

CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

STATE AND LOCAL PENSION PLANS NUMBER 32, JULY 2013

THE FUNDING OF STATE AND LOCAL PENSIONS: 2012-2016

*By Alicia H. Munnell, Jean-Pierre Aubry, Josh Hurwitz, and Madeline Medenica**

INTRODUCTION

This 2012 update on the funded status of state/local pensions will be one of the last two based on the Governmental Accounting Standards Board's (GASB) old provisions, under which assets are reported on an actuarially smoothed basis, the discount rate is the long-run expected rate of return, and the annual required contribution (ARC) serves as a well-defined metric against which to measure the extent to which plan sponsors are meeting their obligations. Under these standards, despite a rising stock market, the rebound in tax revenues, and increased employee contributions, the funded status in 2012 declined slightly. This result, which at first seems surprising, reflects the fact that liabilities continued to grow – albeit at a slower pace compared to the past – while the actuarial value of assets increased only modestly, reflecting asset smoothing procedures that continue to include losses from the 2008-09 market crash. In addition to providing a 2012 update, this *brief* offers a glimpse of the world when GASB's new proposals go into effect in 2014 and reports projections for the period 2013-2016 under both the old and new GASB standards.

The discussion is organized as follows. The first section reports that the ratio of assets to liabilities for our sample of 126 plans declined from 75 percent in 2011 to 73 percent in 2012. The second section shifts from a snapshot of funded status to sponsors' required payment. The update shows that the ARC – at 15.3 percent of payrolls – and the percent of ARC paid – at 80 percent – were virtually unchanged between 2011 and 2012. These funded ratios and ARCs, however, are based on promised benefits discounted by the expected long-term yield on plan assets, roughly 8 percent, so the third section revalues liabilities using the riskless rate, as advocated by most economists for reporting purposes. The fourth section provides a preview on funding under GASB's new provisions and compares the new GASB-funded

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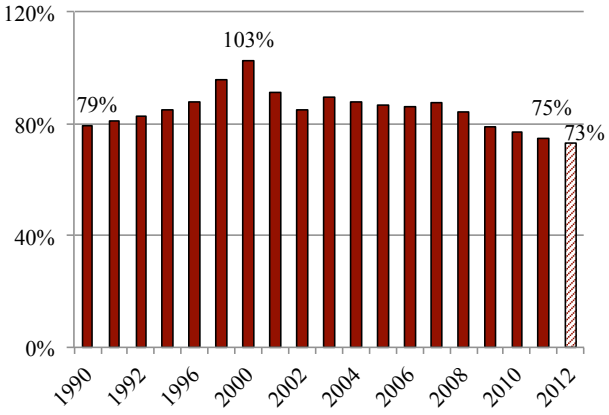
ratios with those produced by the current standards. The fifth section projects funded ratios for our sample plans for 2013-16 under three alternative economic scenarios and under both the old and new GASB standards. The final section concludes that while the shift in GASB standards will make monitoring funding more difficult, the public pension landscape should improve over the next few years if financial markets do not collapse again.

Funded Status in 2012

In 2012, the estimated aggregate ratio of assets to liabilities for our sample of 109 state-administered plans and 17 locally administered plans was 73 percent under GASB's old standards.[1] (The ratio for each individual plan appears in the Appendix). This ratio declined slightly from last year and is considerably below the levels of funding in the 1990s and early 2000s (see Figure 1).

Figure 1. State and Local Pension Funded Ratios, 1990-2012



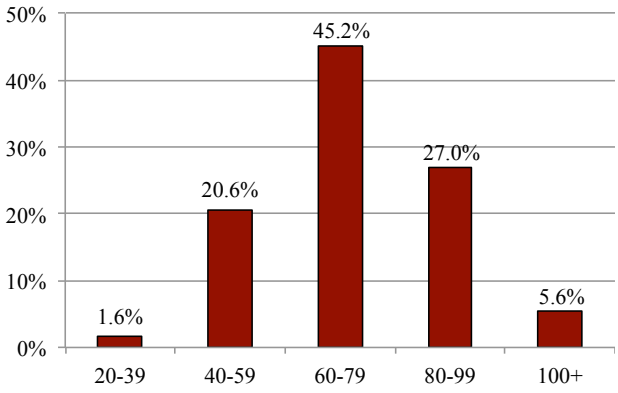
Note: 2012 is authors' estimate.
Sources: Various 2012 actuarial valuations; *Public Plans Database* (2001-2011); and Zorn (1990-2000).

Because only about 60 percent of our sample of 126 plans had reported their funded levels by mid-June 2013, the 2012 aggregate figure is an estimate. As in previous years, for those plans without 2012 valuations, assets are projected on a plan-by-plan basis using the detailed process described in the valuations.[2] This process resulted in a complete set of plan funded ratios for fiscal year 2012. In the aggregate, the actuarial value of assets amounted to $2.8 trillion and liabilities amounted to $3.8 trillion, producing a funded ratio of 73 percent.

The reason for the decline in funded levels from 2011 to 2012 is that liability growth outpaced asset growth. The growth in liabilities in 2012 was roughly 4.2 percent, considerably below the 6-percent growth in earlier years. Liability growth has slowed because states and localities have responded to the economic crisis by reducing their workforce, freezing salaries, and/or modifying the cost-of-living adjustments for current and future retirees. While the growth in liabilities slowed, the growth in the actuarial value of assets was even slower. The 2012 valuation for most plans pre-dated the 24 percent increase in the stock market that occurred between June 2012 and June 2013.

In 2012, as in earlier years, funded levels among plans varied substantially. Figure 2 shows the distribution of funding for our sample of plans. Although many of the poorly-funded plans are relatively small, several large plans, such as those in Illinois (SERS, Teachers, and Universities) and Connecticut (SERS), had funded levels below 50 percent.

Figure 2. Distribution of Funded Ratios for Public Plans, 2012



Sources: Authors' calculations and various 2012 actuarial valuations.

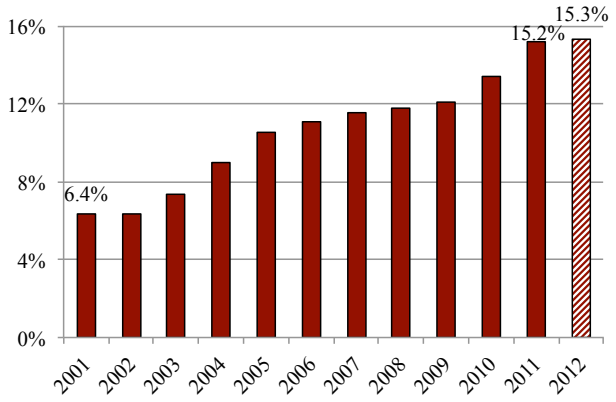
The ARC

The ARC, as defined by GASB, is the payment required to keep the plan on a steady path toward full funding. It equals normal cost – the present value of the benefits accrued in a given year – plus a payment to amortize the unfunded liability, generally over a

30-year period. Each year the plan sponsor reports the ratio of the employers' actual contribution to the ARC.

The ARC has increased significantly in the last three years, primarily because the financial crisis led to higher unfunded liabilities and thereby increased the amortization component of the ARC. In 2012, the ARC was 15.3 percent of payroll (see Figure 3).

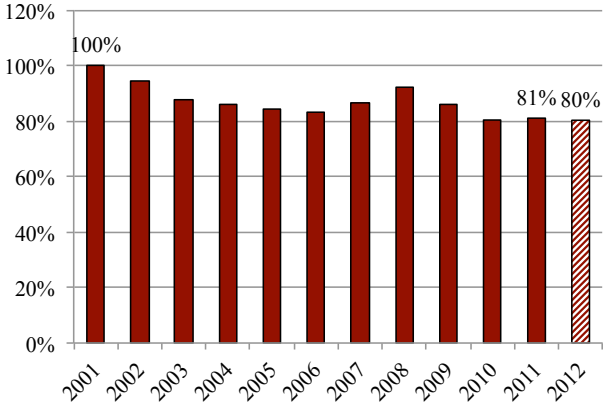
Figure 3. Annual Required Contribution as a Percent of Payroll, 2001-2012



Note: 2012 is authors' estimate.
Sources: Various 2012 actuarial valuations; and PPD (2001-2011).

The increase in the ARC has occurred during a period when states and localities have seen a dramatic decline in their revenues. As a result, sponsors have paid less than the full ARC (see Figure 4). In 2012, employer contributions equaled 80 percent of the required payments. This decline resembles the pattern in the wake of the bursting of the dot.com bubble in 2000-2001, in which the percent of ARC paid fell from 100 percent in 2001 to 83 percent in 2006. Thereafter, the percent paid increased until the financial crisis of 2009. As budgets recover and the unfunded liability stabilizes as a result of stock market gains, hopefully the ARC will stop rising and the percent of ARC paid will once again increase.

Figure 4. Percent of Annual Required Contribution Paid, 2001-2012



Note: 2012 is authors' estimate.
Sources: Various 2012 actuarial valuations; and PPD (2001-2011).

Liabilities Valued at the Riskless Rate

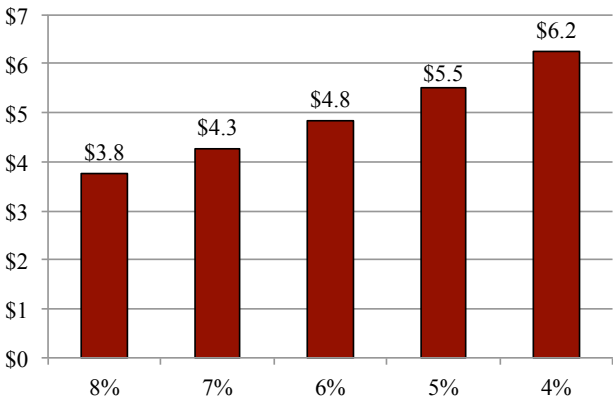
The funded ratios presented above follow GASB's existing standards under which assets are reported on an actuarially smoothed basis and the discount rate is the long-run expected rate of return, which has been around 8 percent (although many plans have recently lowered their assumptions). Most economists contend that using the return on the plan's assets produces misleading results. The returns on the bonds and stocks in the pension fund include premiums to cover the risk of holding these assets. Discounting pension benefits using the expected yield on these securities implies that the entire yield is available to help pay future benefits, making no allowance for the cost of expected losses, which is represented by the risk premium.

Standard financial theory suggests that future streams of payment should be discounted at a rate that reflects their risk.[3] In the case of state and local pension plans, the risk is the uncertainty about whether payments will need to be made. Since these benefits are protected under most state laws, the payments are, as a practical matter, guaranteed. Consequently, to assess accurately the status of a plan warrants discounting its stream of future benefits by the risk-free interest rate.

As events have unfolded in the wake of the economic crisis, though, benefits have proved themselves not to be riskless; the benefits for current workers and retirees have been reduced in several states by suspending the cost-of-living adjustment. Nevertheless, core benefits will almost certainly be paid, so benefits – for reporting purposes – should be discounted by something closer to the risk-free interest rate.[4]

Figure 5 shows the value of liabilities for our sample of 126 plans under different interest rates. In 2012, the aggregate liability was $3.8 trillion, calculated under a typical discount rate of 8 percent. A discount rate of 5 percent raises public sector liabilities to $5.5 trillion.

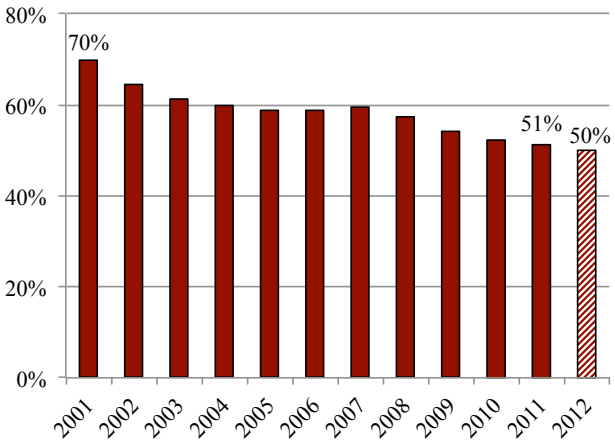
Figure 5. Aggregate State and Local Pension Liability under Alternative Discount Rates, 2012, Trillions



Note: The $3.8 trillion figure is the value for the liabilities of plans in our sample, which – on average – are calculated using a discount rate of about 8 percent.
Source: Authors' calculations and various 2012 actuarial valuations.

Recalculating the liabilities for each plan at 5 percent in 2012 produces a funded ratio of 50 percent, $2.8 trillion in actuarial assets (the same value used earlier) compared to $5.5 trillion in liabilities. The 2012 ratio of 8-percent liability to 5-percent liability was applied retroactively to derive funded ratios for earlier years (see Figure 6).

Figure 6. State and Local Funded Ratios with Liabilities Using a Riskless Rate, 2001-2012



Note: Authors' estimates.
Sources: Authors' calculations using various 2012 actuarial valuations and PPD (2001-2011).

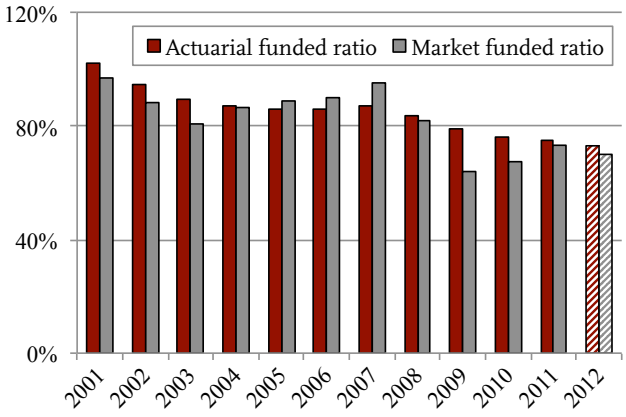
A Preview of GASB's New Standards

Perhaps in response to pressure for a more market-based valuation of both liabilities and assets, GASB in 2006 embarked on a project to review its accounting standards for pensions and in 2012 announced wide-ranging recommendations. GASB itself emphasizes that these recommendations relate to accounting and reporting only and have nothing to do with how governments should address funding. Three of the main proposals pertain to the valuation of assets and liabilities used to measure reported funded ratios. First, assets will be reported at market value rather than actuarially smoothed. Second, projected benefit payments will be discounted by a combined rate that reflects: 1) the expected return for the portion of liabilities that are projected to be covered by plan assets; and 2) the return on high-grade municipal bonds for the portion that are to be covered by other resources. Third, the entry age normal/level percentage of payroll will be the sole allocation method used for reporting purposes (roughly three quarters of plans already use this method).

Implications for Funded Ratios

To see the implications of GASB's new reporting standards, it is useful to proceed in two steps. The first step is to estimate the change in reported funded ratios by switching from actuarial to market assets. As Figure 7 reveals, actuarial funded ratios lag market ratios. Smoothing mitigated the full impact of the financial crisis but also lengthened the period of recovery. If no changes are made to the interest rate assumptions, then funded levels under the new GASB provisions will look like those in Figure 7.

Figure 7. Aggregate Funded Ratios for State and Local Plans Using Actuarial and Market Assets, 2001-2012



Note: 2012 is authors' estimate.
Source: Various 2012 actuarial valuations; and *Public Plans Database* (2001-2011).

The second step is to calculate how funded ratios would change if liabilities were calculated using a combined rate of return. GASB's rationale for the combined rate is that, while the expected rate of return is appropriate for discounting benefits backed by assets, benefits not covered by assets fall to the sponsoring government and therefore should be discounted by the interest rate for high-yield, tax-exempt, 20-year general obligation bonds. The argument, of course, is at odds with the economist's view that the discount rate should reflect the riskiness of the benefits, irrespective of how the benefits are funded.

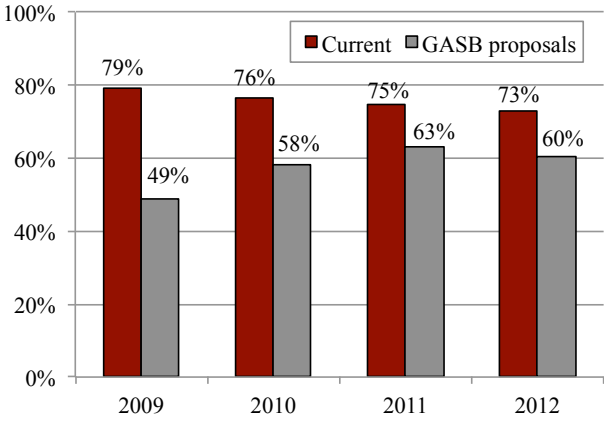
Calculating whether plans will be forced to use a combined rate requires knowing the underlying stream of benefit payments owed by the plan in future years. Public pensions typically do not disclose this information, so the benefit stream must be re-engineered based on data from actuarial reports on the age, salary, and tenure of the workforce, as well as assumptions regarding retirement, separation, and mortality.[5]

With the stream of projected benefits in hand, the task is to project the portion of that stream that will be covered by plan assets and the portion that will be covered by other resources. Projected assets depend on three factors – current asset levels, future contributions, and investment returns. In determining how much sponsors will contribute in the future, GASB recommends looking at the percent of ARC paid in the last five years. In terms of investment returns, GASB proposes to use the plan's long-run expected return.

With current assets, flows of projected benefits, government and employee contributions, and investment returns, it is possible to calculate the date when assets will not be sufficient to cover annual benefit payments. All benefits payable in years prior to the crossover point are discounted using the average assumption regarding the expected return on assets. Benefits payable after the run-out date are discounted by 3.7 percent – the current yield on high-grade municipal bonds.

Figure 8 compares the funded ratios currently reported with our estimates of what these ratios would have looked like under GASB's current proposals for 2009-12. The bottom line is that this headline number would have been 60 percent instead of 73 percent.

Figure 8. Aggregate Funded Ratios for State and Local Plans: Currently Reported versus GASB Proposals, 2009-2012



Source: Authors' calculations from various actuarial valuation reports (2012) and the PPD (2009-11).

The key issue is whether discount rates will really change. GASB's proposed combined rate requires a complicated calculation based on a number of assumptions. The determination of the portion of benefits funded requires assumptions not only about plan returns but also about future contributions from the government and from employees. Plan sponsors can easily assert that adequate contributions will be made and, therefore, assets will always be available to cover projected benefits. In this case, the relevant discount rate reverts to the plan's expected long-run rate of return.

Implications for the ARC

GASB's proposals will remove the ARC – the percent of payroll required to cover current service costs and amortize the unfunded liability over a maximum of thirty years – from the measurement of pension obligations and costs. In its place, plans will either report an actuarially determined contribution or a statutory contribution. Those that report an actuarially determined contribution will provide information on the underlying actuarial assumptions and methods used. However, GASB will no longer provide guidelines regarding acceptable parameters, which will make comparisons between plans difficult. Plans with a statutory rate will not be required to report an actuarially determined contribution. This change not only results in a loss in analysts' ability to assess how close plan contributions are to those required to keep the system on track, but also creates a tempting escape valve that states could use as ARCs rise beyond reach: introduce a statutory rate and dispense with reporting actuarial calculations. Such a development would be harmful to efforts to improve plan funding.

Projections for 2013-2016

The question is how the shift to the new GASB standards will affect the trajectory of funded ratios over the next few years. The pattern of future funding under either GASB guideline depends on three factors: the performance of the stock market, the growth in contributions and benefits, and the growth in liabilities.

- To address uncertainty about future stock market outcomes, projections are made using three assumptions for the average nominal return for the Dow Jones Wilshire 5000 Index: 7.75 percent (baseline), 11.0 percent (optimistic), and zero percent (pessimistic).[6]
- Both contributions and benefits rise slowly over time, so their average growth for the period 2013-2016 was assumed to equal their average growth over 2001-12.[7]
- Growth in liabilities holds steady at the 2012 level of 4.2 percent under both GASB's old and new standards.[8]

The projected funded ratios are shown in Table 1 for three scenarios. Under the baseline assumption, without any adjustment on the liability side, the 2013 actuarial reports will show funded ratios higher than 2012, given the increase in stock prices that has already occurred. Then funded ratios continue to climb as asset growth under either actuarial or market value continues to exceed assumed liability growth. The funded numbers are much lower if many plans adopt a combined rate, which would produce a one-shot increase in liabilities and lower funded ratios thereafter.

Looking further out, liability growth will likely be restrained somewhat by the long-term benefit cutbacks enacted in recent years. These cutbacks were detailed in a study that we published earlier this year.[9]

Table 1. Projected Funded Ratios for Fiscal Years 2013-16 under GASB's Old and New Standards

Scenario and year	GASB old	GASB new	
		Market assets	Market assets/ Combined rate
Baseline			
2013	74.6 %	78.8 %	N/A
2014	76.9	80.6	69.5 %
2015	79.1	82.1	70.8
2016	81.2	83.4	71.9
Optimistic			
2013	74.7	79.2	N/A
2014	77.7	83.7	72.1
2015	81.1	87.7	75.6
2016	84.7	91.2	78.6
Pessimistic			
2013	74.4	78.3	N/A
2014	75.6	75.1	64.8
2015	75.7	72.1	62.1
2016	74.9	69.2	59.6

Source: Authors' projections.

Conclusion

The funded status of state and local pensions has been front-page news since the collapse of financial markets in 2008. At the time, it was clear that the funded ratios of public plans would continue to decline as actuaries gradually averaged in the losses. Indeed, the funded status of public plans has declined steadily as the losses work their way through the averaging process, with the 2012 level slightly below that of the previous year.

The measure of funded ratios will change in 2014 as GASB's new guidelines take effect. At a minimum, market assets will replace actuarially smoothed assets in the calculation. Funded ratios may also change to the extent that sponsors with significantly underfunded plans will be forced to use a combined rate, which will be lower than the long-run expected return on assets. Measuring the funded status of plans has always been fraught with difficulty. Unfortunately, the future will be more confusing than the past.

Regardless of measurement problems, a healthy stock market will improve the funding picture in 2013. What happens thereafter depends very much on the performance of the stock market and the extent to which plans adjust their interest rate assumptions. In 2016, assuming a healthy stock market, plans should be slightly more than 80 percent funded using either the market or actuarial value of assets. The ratio will be lower if public plans widely adopt a combined rate to discount their benefit promises.

Endnotes

1 The sample represents about 90 percent of the assets in state-administered plans and 30 percent of assets in plans administered at the local level.

2 For plans without published 2012 actuarial valuations, we estimated the percent change in actuarial assets between 2011 and 2012, calculated according to the plan's own methodology, and applied that change to its published 2011 GASB level of actuarial assets. Applying our methodology retrospectively for each plan produced numbers for previous years that perfectly matched published asset values in half the cases and that came within 1 percent in the other half. Liabilities are projected based on the average rate of growth for plans already reporting. The initial estimates of assets and liabilities were then sent to the plan administrators and any suggested alterations were incorporated.

3 The analysis of choice under uncertainty in economics and finance identifies the discount rate for riskless payoffs with the riskless rate of interest. See Gollier (2001) and Luenberger (1997). This correspondence underlies much of the current theory and practice for the pricing of risky assets and the setting of risk premiums. See Sharpe, Alexander, and Bailey (2003); Bodie, Merton, and Cheeton (2008); and Benninga (2008).

4 Such an approach has been adopted by other public or semi-public plans, such as the Ontario Teachers' Pension Plan (2011) and the quasi-public defined benefit plans in the Netherlands (Ponds and van Riel, 2007). For a more detailed discussion of valuing liabilities *for reporting purposes* and the implications for funding and investments, see Munnell et al. (2010).

5 For a detailed description of the methodology, see Munnell et al. (2012).

6 The detailed assumptions for each scenario are as follows.

Baseline: Output grows 5.75 percent per year (3.5 percent real, 2.25 percent inflation), profits rise on average 5.75 percent annually, the price/earnings (p/e) ratio is 17 at the end of 2016, and the dividend yield remains at 2 percent. Stock prices rise, on average, 5.75 percent annually, producing an average nominal return of 7.75 percent.

Optimistic: Output grows 6.5 percent per year (4 percent real, 2.5 percent inflation), profits rise on average 8 percent annually, the p/e ratio is 18 at the end of 2016, and the dividend yield averages 1.5 percent over the four years. Stock prices rise, on average, 9.5 percent annually, producing an average nominal return of 11 percent.

Pessimistic: Output grows 3.5 percent per year (2 percent real, 1.5 percent inflation), profits rise on average 2 percent annually, the p/e ratio is 14 at the end of 2016, and the dividend yield averages 2.5 percent. Stock prices fall, on average, 2.5 percent annually, producing a zero average return over the four years.

7 The focus here is on contributions, where growth remains fairly steady, rather than on the percent of ARC paid which is more variable.

8 Liabilities increased at an average rate of about 6 percent over the period 2001-09. The rate then declined to about 4.0 percent in 2010 and to 4.2 percent in 2011 and 2012.

9 Munnell et al. (2013).

References

Benninga, Simon. 2008. *Financial Modeling*. Cambridge, MA: MIT Press.

Bodie, Zvi, Robert Merton, and David Cheeton. 2008. *Financial Economics*. Upper Saddle River, NJ: Prentice Hall, Inc.

Gollier, Christian. 2001. *The Economics of Risk and Time*. Cambridge, MA: MIT Press.

Luenberger, David G. 1997. *Investment Science*. Oxford: Oxford University Press.

Munnell, Alicia H., Jean-Pierre Aubry, Anek Belbase, and Josh Hurwitz. 2013. "State and Local Pension Costs: Pre-Crisis, Post-Crisis, and Post-Reform." *State and Local Plans Issue in Brief* 30. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Munnell, Alicia H., Jean-Pierre Aubry, Josh Hurwitz, and Laura Quinby. 2012. "How Would GASB Proposals Affect State and Local Pension Reporting?" *State and Local Plans Issue in Brief* 23. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Munnell, Alicia H., Richard W. Kopcke, Jean-Pierre Aubry, and Laura Quinby. 2010. "Valuing Liabilities in State and Local Plans." *State and Local Plans Issue in Brief* 11. Chestnut Hill, MA: Center for Retirement Research at Boston College. Jointly published by the Center for State and Local Government Excellence.

Ontario Teachers' Pension Plan. 2011. *2011 Annual Report*. Toronto, Ontario.

Ponds, Eduard H. M. and Bart van Riel. 2007. "The Recent Evolution of Pension Funds in the Netherlands: The Trend to Hybrid DB-DC Plans and Beyond." Working Paper 2007-9. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Public Plans Database. 2001-2011. Center for Retirement Research at Boston College and Center for State and Local Government Excellence.

Sharpe, William, Gordon J. Alexander, and Jeffrey W. Bailey. 2003. *Investments*. Upper Saddle River, NJ: Prentice Hall, Inc.

Wilshire Associates. 2012. "Dow Jones Wilshire 5000 (Full Cap) Price Levels Since Inception." Available at: http://www.wilshire.com/Indexes/calculator/csv/w5kppidd.csv.

Zorn, Paul. 1994-2000. *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. Ratio of Assets to Liabilities for State and Local Plans 2001-2011 and 2012 Projections[a]

Plan name	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Total	91.4	84.9	89.7	87.8	86.6	86.4	87.6	84.3	79.0	77.1	74.9	73.1	
Alabama ERS	100.2	95.4	91.1	89.7	84.0	81.1	79.0	75.7	72.2	68.2	65.8	62.9	*
Alabama Teachers	101.4	97.4	93.6	89.6	83.6	82.8	79.5	77.6	74.7	71.1	67.5	63.8	*
Alaska PERS	100.9	75.2	72.8	70.2	65.7	78.2	77.8	78.8	63.0	62.4	61.9	57.4	*
Alaska Teachers	95.0	68.2	64.3	62.8	60.9	67.8	68.2	70.2	57.0	54.3	54.0	49.4	*
Arizona Public Safety Personnel	126.9	113.0	100.9	92.4	81.3	76.7	65.2	68.8	70.0	67.7	63.7	60.2	
Arizona SRS	115.1	106.4	98.4	92.5	86.1	84.3	83.2	82.1	79.0	76.4	75.5	75.3	
Arkansas PERS	106.0	100.0	95.0	89.0	86.0	83.0	89.0	90.0	78.0	74.1	70.7	68.9	
Arkansas Teachers	95.4	91.9	85.9	83.8	80.4	80.3	85.3	84.9	75.7	73.8	72.0	72.3	*
California PERF	111.9	95.2	87.7	87.3	87.3	87.2	87.2	86.9	83.3	83.4	82.6	83.9	*
California Teachers	98.0		85.0	85.0	86.0	87.0	89.0	87.0	78.0	71.0	69.0	68.1	*
Chicago Teachers	100.0	96.3	92.0	85.9	79.0	78.0	80.1	79.4	73.3	66.9	59.7	54.7	*
City of Austin ERS	96.4	86.9	86.9	80.8	78.0	75.9	78.3	65.9	71.8	69.6	65.7	63.9	**
Colorado Municipal	104.3	93.6	80.2	77.2	78.0	79.5	81.2	76.4	76.2	73.0	69.3	73.4	*
Colorado School	98.2	87.9	75.2	70.1	73.9	74.1	75.5	70.1	69.2	64.8	60.2	61.9	*
Colorado State	98.2	87.9	75.2	70.1	71.5	73.0	73.3	67.9	67.0	62.8	57.7	58.7	*
Connecticut SERS	63.1	61.6	56.7	54.5	53.3	53.2	53.6	51.9		44.4	47.9	42.3	
Connecticut Teachers		75.9		65.3		59.5		70.0		61.4		55.2	
Contra Costa County	87.6	89.6	85.4	82.0	84.8	84.3	89.9	88.5	83.8	80.3	78.5	76.2	*
DC Police & Fire	81.1	76.6	78.3	81.9	85.1	91.6	101.0	99.8	100.7	100.7	108.6	110.1	
DC Teachers	107.4	107.0	103.8	101.9	102.1	111.2	111.6	108.2	110.8	118.3	101.9	94.4	
Delaware State Employees	112.4	109.6	106.9	103.0	101.6	101.7	103.7	103.1	98.8	96.0	94.0	91.5	
Denver Employees	99.5	101.7	98.0	99.1	97.4	98.6	98.2	91.9	88.4	85.0	81.6	80.0	*
Denver Schools	97.0	91.0	90.6	88.2	87.9	88.3	87.7	84.3	88.3	88.9	81.5	82.9	*
Duluth Teachers	107.6	100.4	95.7	91.8	86.4	84.1	86.8	82.1	76.6	81.7	73.2	63.4	
Fairfax County Schools	103.0	95.6	90.1	84.9	84.9	86.4	88.0	76.9	76.5	76.5	75.6	75.4	**
Florida RS	117.9	115.0	114.2	112.1	107.3	105.6	105.7	105.4	87.1	86.6	86.9	86.4	
Georgia ERS	101.7	101.1	100.5	97.6	97.2	94.5	93.0	89.4	85.7	80.1	76.0	73.1	
Georgia Teachers	103.9	102.0	101.1	100.9	98.0	96.5	94.7	91.9	87.2	85.7	84.0	82.3	
Hawaii ERS	90.6	84.0	75.9	71.7	68.6	65.0	67.5	68.8	64.6	61.4	59.4	59.2	
Houston Firefighters	113.0	98.0		88.0	86.0	87.0	91.0	96.0	95.4	93.4	90.6	89.3	*
Idaho PERS	97.2	84.9	83.8	91.7	94.2	95.2	105.5	93.3	74.1	78.9	90.2	84.7	
Illinois Municipal	106.4	101.5	97.6	94.3	94.6	95.3	96.1	84.3	83.2	83.3	83.0	84.3	
Illinois SERS	65.8	53.7	42.6	54.2	54.4	52.2	54.2	46.1	43.5	37.4	35.6	34.7	
Illinois Teachers[b]	59.5	52.0	49.3	61.9	60.8	62.0	63.8	56.0	52.1	48.4	46.5	42.1	
Illinois Universities	72.1	58.9	53.9	66.0	65.6	65.4	68.4	58.5	54.3	46.4	44.3	42.1	
Indiana PERF	105.0	99.2	102.9	100.1	96.4	97.6	98.2	97.5	93.1	85.2	80.5	76.6	
Indiana Teachers[c]	43.0	42.1	44.4	44.8	43.4	44.3	45.1	48.2	41.9	44.3	43.8	42.7	

Plan name	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Iowa PERS	97.2	92.6	89.6	88.6	88.7	88.4	90.2	89.1	81.2	81.4	79.9	79.9	
Kansas PERS	85.0	78.0	75.0	70.0	69.0	69.0	71.0	59.0	64.0	62.0	59.0	56.7	*
Kentucky County	141.0	125.3	114.1	101.0	90.7	81.4	80.1	77.1	70.6	65.5	62.9	60.0	
Kentucky ERS	125.8	110.7	98.0	85.8	74.6	61.3	58.4	54.2	46.7	40.3	35.6	29.7	
Kentucky Teachers	90.8	86.6	83.5	80.9	76.3	73.1	71.9	68.2	63.6	61.0	57.4	54.5	
LA County ERS	100.0	99.4	87.2	82.8	85.8	90.5	93.8	94.5	88.9	83.3	80.6	76.8	
Louisiana SERS	74.2	70.2	66.2	59.6	61.5	64.3	67.2	67.6	60.8	57.7	57.6	55.9	
Louisiana Teachers	78.4	73.9	68.8	63.1	64.6	67.5	71.3	70.2	59.1	54.4	55.1	55.4	
Maine Local	108.2	122.8	116.3	112.1	114.2	112.2	113.6	112.7	102.5	96.3	93.5	93.2	*
Maine State and Teacher	73.1	69.6	67.6	68.5	69.8	71.3	74.1	74.1	67.7	66.0	80.2	80.0	*
Maryland PERS	102.2	98.0	93.1	91.2	86.7	80.4	79.5	77.2	63.9	62.8	62.8	62.5	
Maryland Teachers	95.3	92.0	92.8	92.8	89.3	84.2	81.1	79.6	66.1	65.4	66.3	65.8	
Massachusetts SERS	94.0	79.5	83.9	82.8	81.5	85.1	89.4	71.6	76.5	81.0	73.8	69.1	
Massachusetts Teachers	76.2	64.5	69.6	67.6	67.2	71.0	73.9	58.2	63.0	66.3	60.7	57.7	*
Michigan Municipal	84.3	79.8	78.7	76.7	76.1	76.4	77.3	75.0	75.5	74.5	73.0	73.2	*
Michigan Public Schools	96.5	91.5	86.5	83.7	79.3	87.5	88.7	83.6	78.9	71.1	64.7	61.3	
Michigan SERS	107.6	98.7	88.8	84.5	79.8	85.1	86.2	82.8	78.0	72.6	65.5	60.3	**
Minneapolis ERF	93.3	92.4	92.3	92.1	91.7	92.1	85.9	76.4	55.9	65.6	72.5	69.1	
Minnesota PERF	87.0	85.0	81.3	76.7	74.5	74.7	73.3	73.6	70.0	76.4	75.2	73.5	
Minnesota State Employees	112.1	104.5	99.1	100.1	95.6	96.2	92.5	90.2	85.9	87.3	86.3	82.7	
Minnesota Teachers	105.9	105.3	103.1	100.0	98.5	92.1	87.5	82.0	77.4	78.5	77.3	73.0	
Mississippi PERS	87.5	83.4	79.0	74.9	72.4	73.5	73.7	72.9	67.3	64.2	62.2	58.0	
Missouri DOT and Highway Patrol	66.1	61.5	56.2	53.4	53.9	55.5	58.2	59.1	47.3	42.2	43.3	46.3	
Missouri Local	104.0	100.4	96.4	95.9	95.1	95.3	96.1	97.5	80.0	81.0	81.6	83.5	
Missouri PEERS	103.1	97.6	81.9	82.7	83.3	80.5	83.2	82.5	80.7	79.1	85.3	82.5	
Missouri State Employees	97.0	95.9	90.9	84.6	84.9	85.3	86.8	85.9	83.0	80.4	79.2	73.2	
Missouri Teachers	99.4	95.3	81.1	82.0	82.7	82.6	83.5	83.4	79.9	77.7	85.5	81.5	
Montana PERS		100.0		86.7	85.5	88.3	91.1	90.3	84.0	74.2	70.0	67.0	
Montana Teachers		86.6		76.6	73.4	76.1	79.6	79.9	66.2	65.4	61.5	59.2	
Nebraska Schools	87.2	94.9	90.6	87.2	85.6	87.2	90.5	90.6	86.6	82.4	80.4	76.6	
Nevada Police Officer and Firefighter	78.9	78.1	73.9	71.7	69.8	68.9	71.1	70.8	68.9	67.8	68.4	70.1	
Nevada Regular Employees	85.5	83.5	83.2	80.5	77.3	76.5	78.8	77.7	73.4	71.2	70.6	71.2	
New Hampshire Retirement System[d]	85.0	82.1	75.0	71.1	60.3	61.4	67.0	67.8	58.3	58.5	57.4	56.1	
New Jersey PERS	117.1	107.3	97.9	91.3	85.3	78.0	76.0	73.1	64.9	69.5	66.8	63.6	
New Jersey Police & Fire	100.8	95.8	88.4	84.0	80.1	78.4	77.6	74.3	70.8	77.1	74.9	74.3	
New Jersey Teachers	108.0	100.0	92.7	85.6	79.1	76.3	74.7	70.8	63.8	67.1	63.2	59.3	
New Mexico PERF	105.4	103.1	97.3	93.0	91.6	92.1	92.8	93.3	84.2	78.5	70.5	65.3	

Plan name	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
New Mexico Teachers	91.9	86.8	81.1	75.4	70.4	68.3	70.5	71.5	67.5	65.7	63.0	60.7	
New York City ERS	117.4	112.0	104.0	94.5	88.4	82.3	79.0	79.7	78.6	77.2	73.8	71.6	*
New York City Teachers	98.0	93.6	88.2	81.1	77.1	71.8	69.6	65.2	64.1	62.9	62.2	58.7	*
New York State Teachers	125.0	99.6	99.4	99.2	98.8	102.6	104.2	106.6	103.2	100.3	96.7	89.7	*
North Carolina Local Government	99.3	99.4	99.3	99.3	99.4	99.5	99.5	99.6	99.5	99.6	99.8	101.7	*
North Carolina Teachers and State Employees	111.6	108.4	108.1	108.1	106.5	106.1	104.7	99.3	95.9	95.4	94.0	93.6	*
North Dakota PERS	110.6	104.2	98.1	94.0	90.8	86.8	93.4	92.6	85.1	73.4	70.5	65.1	
North Dakota Teachers	96.4	91.6	85.1	80.3	74.8	75.4	79.2	81.9	77.7	69.8	66.3	60.9	
NY State & Local ERS	119.3	118.5	98.9	101.6	102.8	104.1	105.8	107.3	101.0	93.9	90.2	87.2	**
NY State & Local Police & Fire	132.1	128.6	103.4	105.0	104.8	105.2	106.5	108.0	103.8	96.7	91.9	87.9	**
Ohio PERS	103.0	86.0	85.0	88.0	89.0	93.0	96.0	75.0	75.0	76.1	77.4	78.3	*
Ohio Police & Fire	92.8	82.6	86.5	80.9	78.4	78.2	81.7	65.1	72.8	69.4	63.1	67.4	*
Ohio School Employees	95.0	90.2	83.6	78.1	75.3	76.4	80.8	82.0	68.4	72.6	65.2	62.8	
Ohio Teachers	91.2	77.4	74.2	74.8	72.8	75.0	82.2	79.1	60.0	59.1	58.8	56.0	
Oklahoma PERS	82.6	79.8	76.8	76.0	72.0	71.4	72.6	73.0	66.8	66.0	80.7	80.2	
Oklahoma Teachers	51.4	51.4	54.0	47.3	49.5	49.3	52.6	50.5	49.8	47.9	56.7	54.8	
Oregon PERS	106.7	91.0	97.0	96.2	104.2	110.5	112.2	80.2	85.8	86.9	82.0	88.0	*
Pennsylvania School Employees	114.4	104.8	97.2	91.2	83.6	81.2	85.8	86.0	79.2	75.1	69.1	66.3	
Pennsylvania State ERS	116.3	107.2	104.9	96.1	92.9	92.7	97.1	89.0	84.4	75.2	65.3	57.9	*
Phoenix ERS	102.5	91.6	88.5	84.2	84.2	81.3	83.9	79.1	75.3	69.3	66.7	62.2	
Rhode Island ERS	77.6	72.6	64.3	59.4	55.8	53.4	56.2	61.5	58.5	48.4	58.8	57.8	
Rhode Island Municipal	118.1	111.3	100.7	93.2	87.2	87.1	90.3	92.8	88.3	73.6	84.3	82.5	
San Diego County	106.8	75.4	75.5	81.1	80.3	83.6	89.7	94.4	91.5	84.3	81.5	78.7	
San Francisco City & County	129.0	117.9	109.0	103.8	107.6	108.7	110.3	103.8	97.0	91.1	88.0	82.6	
South Carolina Police[e]	94.6	93.0	91.5	87.7	87.4	84.7	84.7	77.9	76.3	74.5	77.3	71.1	
South Carolina RS[e]	87.4	86.0	82.8	80.3	71.6	69.6	69.7	69.3	67.8	65.5	64.0	64.7	
South Dakota PERS	96.4	96.7	97.2	97.7	96.6	96.7	97.1	97.2	91.8	96.3	96.4	92.6	
St. Louis School Employees	80.5	82.1	84.0	86.3	87.6	87.2	87.6	87.6	88.4	88.6	84.9	80.9	*
St. Paul Teachers	81.9	78.8	75.6	71.8	69.7	69.1	73.0	75.1	72.2	68.1	70.0	62.0	
Texas County & District	89.3	88.7	90.5	91.0	91.4	94.3	94.3	88.6	89.8	89.4	88.8	88.9	**
Texas ERS	104.9	102.5	97.6	97.3	94.8	95.2	95.6	92.6	89.8	85.4	84.5	82.6	
Texas LECOS	131.6	124.7	111.5	109.3	103.1	101.7	98.0	92.0	89.7	86.3	86.4	82.0	
Texas Municipal	85.0	84.2	82.6	82.8	82.7	82.1	73.7	74.4	75.8	82.9	85.1	87.2	
Texas Teachers	102.5	96.3	94.5	91.8	87.1	87.3	89.2	90.5	83.1	82.9	82.7	81.9	
TN Political Subdivisions	90.4		91.9		92.7		89.5		86.3		89.2	88.4	*
TN State and Teachers	99.6		99.8		99.8		96.2		90.6		92.1	91.5	*
University of California	147.7	138.4	125.7	117.9	110.3	104.1	104.8	103.0	94.8	86.7	82.5	78.7	

Plan name	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Utah Noncontributory	102.8	92.2	94.4	92.3	93.2	95.8	95.1	86.5	85.7	82.2	78.4	76.8	*
Vermont State Employees	93.0	97.4	97.5	97.6	97.8	99.3	100.8	94.1	78.9	81.2	79.6	77.7	
Vermont Teachers	89.0	89.5	89.6	90.2	90.7	84.6	84.9	80.9	65.4	66.5	63.8	61.6	
Virginia Retirement System[f]	107.3	101.8	96.4	90.3	81.3	80.8	82.3	84.0	80.2	72.4	69.9	65.8	**
Washington LEOFF Plan 1	129.0	120.0	112.0	109.0	113.0	116.0	122.0	128.0	125.0	127.0	134.0	135.0	**
Washington LEOFF Plan 2	119.5	111.0	211.7	198.2	103.3	108.5	120.2	126.4	119.9	117.0	111.4	110.0	**
Washington PERS 1	91.0	86.0	81.0	77.0	71.0	73.0	71.0	71.0	70.0	74.0	71.0	69.1	**
Washington PERS 2/3	125.0	115.1	107.9	105.4	101.7	100.8	101.5	101.1	99.3	97.2	97.1	96.0	**
Washington School Employees Plan 2/3	123.5	113.8	105.6	103.6	95.5	103.8	106.8	104.3	100.4	98.5	97.2	95.7	**
Washington Teachers Plan 1	94.0	92.0	88.0	84.0	78.0	80.0	77.0	77.0	75.0	85.0	81.0	78.7	**
Washington Teachers Plan 2/3	133.6	130.2	122.7	119.3	106.1	110.5	112.7	107.9	101.8	100.5	99.3	97.7	**
West Virginia PERS	84.4	75.4	73.1	80.0	83.6	86.8	97.0	84.2	65.9	74.6	78.4	77.6	
West Virginia Teachers	21.0	19.2	19.1	22.2	24.6	31.6	51.3	50.0	41.3	46.5	53.7	53.0	
Wisconsin Retirement System	96.5	97.1	99.2	99.4	99.5	99.6	99.6	99.7	99.8	99.8	99.9	99.8	**
Wyoming Public Employees	103.0	92.2	91.7	96.0	95.1	94.4	94.0	78.6	87.5	84.6	81.9	89.7	*

* Numbers are authors' estimates.
** Received from plan administrator.
[a] Funded ratios may vary across plans because of the discount rate used to value liabilities. While the median discount rate is 8.0 percent, the rates range from 8.5 percent in Minnesota and 8.25 percent in New Jersey to 7.0 percent in Virginia, 6.75 percent in Indiana, and 6.25 percent in Vermont.
[b] Through 2008, the Illinois TRS funded ratio was based on the market value of assets. Beginning in 2009, the funded ratio was calculated using five-year smoothed actuarial assets.
[c] The reported funded ratios of the Indiana TRF are made up of two separately funded accounts: the pre-1996 account and the 1996 account. The pre-1996 account is for employees hired prior to 1996 and is funded under a pay-go schedule. The 1996 account is for employees hired afterwards and is pre-funded. The funded ratio for the pre-funded account is currently 90.7 percent. As expected, the pay-go account has a much lower funded ratio of 30.1 percent.
[d] Prior to 2007, the New Hampshire Retirement System used the Open Group Aggregate method to calculate its funded ratio. Beginning in 2007, the entry age normal (EAN) method was used.
[e] The 2011 funded ratios for South Carolina RS and Police are calculated based on the plan design features and actuarial methods in place prior to the passing of Act 278.
[f] The funded ratios presented represent the VRS plan only for the state employees, teachers and political subdivisions. They do not reflect the information in the other plans – SPORS, JRS and VaLORS.
Sources: Various 2012 actuarial valuations; and PPD (2001-2011).

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