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## GETTING AN ACCURATE PICTURE OF STATE PENSION LIABILITIES

By Eileen Norcross

MERCATUS CENTER  
George Mason University

**S**TATE GOVERNMENTS HAVE reported unfunded pension liabilities—the difference between what plans have promised to pay public workers and the assets set aside to pay out these benefits—of \$452 billion as of June 2009.<sup>1</sup> Estimates place the shortfall in local plans at an additional \$190 billion.<sup>2</sup> These reported figures, however, severely underestimate the pension obligations governments owe to public workers. To measure pension obligations accurately, state and local governments must institutionalize the correct measurement of pension liabilities: the market value of liabilities (MVL), which properly accounts for the guaranteed nature of public pension benefits.

Recognizing the unsustainable future of current public pension plans, many state legislatures are considering pension reform. Unfortunately, most proposed reforms are insufficient to fill the funding gap because government accounting standards continue to underestimate the true debt.

### CALCULATING PENSION LIABILITIES

Governments hire actuarial firms to perform annual valuations of their pension plans. These Comprehensive Annual Financial Reports (CAFRs) include information about plan assets, plan liabilities, and the level of plan funding.

Employee and employer contributions and the return on those contributions when invested, together finance plan benefits.<sup>3</sup> To assess the funded status of the plan, a process known as discounting makes plan liabilities that occur years or even decades in the future comparable to the assets held by the plan today. Discounting takes a future dollar value and backs out the interest to generate a “present value.” The present value of plan liabilities can then be compared to the current value of plan assets to determine the overall funding health of the program.

In determining what interest (or discount) rate to use, actuaries rely on the Government Accounting Standards Board (GASB) Ruling 25<sup>4</sup> and Actuarial Standards of Practice (ASOP) 27.<sup>5</sup> These rules state that a pension liability may be discounted using the annual interest rate the plan's assets are expected to return. On average, state governments have assumed an annual rate of return of 7.97 percent on plan assets, with individual plan returns varying from a low of around 7 percent to a high of around 8.5 percent.

Current pension reporting calculates the value of pension liabilities based on what the assets are expected to return when invested. This approach sounds reasonable, but in fact it runs contrary to economic theory and the practice of financial markets.

The problem is that public pension liabilities are practically riskless, guaranteed by legal precedents and state constitutions, yet the assets held by pension plans are highly risky. This mismatch systematically understates the value of pension liabilities and overstates plans' funding levels.

The valuation that does not understate the value of pension liabilities is the standard used by private pension plans, the market value of the liabilities (MVL). The MVL discounts future liabilities at an interest rate that matches their risks and represents the amount a private insurance company would demand to issue annuities to cover all the benefits owed by a plan. Market valuation reveals the shortfall in state plans is over \$3 trillion and the shortfall in local plans is \$574 billion.<sup>6</sup>

## PENSION MISMANAGEMENT

This approach implies that a public pension benefit—a government debt that represents a guaranteed payment to a worker—can be secured by investing in risky assets without any accounting for the cost of investment risk. As a result, the pension liabilities reported in government accounts appear smaller than they actually are. This has led to at least three consequent mistakes in how plans have been managed by governments.

**Governments set too little aside to fund future benefits.** Because they systematically underestimate the liability, governments have also underestimated the Annual Required Contribution (ARC), or the amount set aside today by employees and the employer to fund the liability in the future.

**Pension portfolios have shifted toward riskier assets in order to discount their liabilities at higher interest rates.** In the 1980s, equities constituted 40 percent of public pension fund investments; by 2007, they comprised 70 percent.<sup>7</sup> In addition, rising shares of pension assets are now dedicated to even riskier “alternative investments” such as private equity and hedge funds. As a result of the market decline of 2008, pension plan portfolios lost an estimated \$1 trillion.<sup>8</sup>

### FINDING THE MARKET VALUE OF THE LIABILITY BASED ON THE REPORTED ACTUARIAL VALUE OF THE ASSETS, LIABILITIES, AND ASSUMED INTEREST RATE FOUND IN THE PENSION PLAN'S CAFR

*Example: New Jersey Teachers Pension Annuity Fund (TPAF) (Data taken from the Comprehensive Audited Financial Statement Report for FY 2010.)<sup>1</sup>*

As Reported:

Actuarial Value of Assets (AVA): \$34,838,211,259

Actuarial Accrued Liabilities (AAL): \$54,576,061,024

Unfunded Accrued Liability = (AVA – AAL) = \$19,737,849,765

Funding Ratio = (AVA ÷ AAL) = 63%

Actuarial Assumption: Interest Rate = 8.25%

To arrive at the Market Value of the Liability based on the information provided, first calculate the Future Value of the Liability by compounding the AAL 15 years forward based on the plan's assumed interest rate ( $r = 8.25\%$ ). Fifteen years represents the approximate midpoint of pension plans' future benefit obligations. Then discount this Future Value back to the Present Value based on the risk-free rate ( $r = 3.5\%$ ). We choose the yield on 15-year Treasury bonds.<sup>2</sup>

Formula to find the Future Value:

$$\begin{aligned} FV &= AAL \times (1 + r)^{15} \\ &= \$53,418,328,576 \times (1 + 0.0825)^{15} = \$179,234,151,014 \end{aligned}$$

Formula to Discount the Future Value of the reported liability back to the Present Value is based on the risk-free discount rate.

Formula to find the Present Value of the MVL:

$$\begin{aligned} PV &= FV \div (1 + r)^{15} \\ MVL &= \$179,234,151,014 \div (1 + 0.035)^{15} = \$106,983,183,277 \end{aligned}$$

Market Value Unfunded Liability = AAL – MVL = \$72,144,972,018

Funded Ratio based on the Market Value = AVA ÷ MVL = 33%

1. See State of New Jersey Division of Pensions and Benefits, Financial Statements and Schedules (June 30, 2010), 25, <http://www.state.nj.us/treasury/pensions/pdf/financial/2010divisioncombined.pdf>.

2. See Eileen Norcross and Andrew Biggs, “The Crisis in Public Sector Pension Plans: A Blueprint for Reform in New Jersey,” (working paper, Mercatus Center at George Mason University, July 2010). We choose the 15-year yield on Treasury bonds because it has been shown that the mid-point of a public pension's stream of future benefit payments is approximately 15 years in the future. In other words, a lump-sum payment 15 years hence can be treated as an approximation of the annual benefit liability owed by the plan. See M. Barton Waring, “Liability-relative investing,” *Journal of Portfolio Management* 30, no. 4 (2008).

**Basing the discount rate on expected asset returns gives plans the illusory appearance of full funding in years when investment returns are robust.**<sup>9</sup> Operating under this false assumption has led some governments to adjust their budget-

ing behavior, deferring contributions to pension systems and granting generous benefit enhancements.

### POLICY RECOMMENDATION: INSTITUTIONALIZE ACCURATE PENSION ACCOUNTING

As a result of this mismanagement and underfunding, many plans are due to run out of assets to pay beneficiaries in the next 15 to 20 years.<sup>10</sup> Realizing this and recognizing the recent downturn in the market, several states have started to reform their pension plans by adjusting their discount rates downward from the 8-percent to the 7-percent range. However, this downward adjustment is still based on the same incorrect logic—anticipated returns for assets—and sidesteps the fundamental measurement error used to value pension liabilities.<sup>11</sup>

To fix the systematic underestimation of pension liabilities, governments should legally require that actuarial firms hired to value state and local pension plans calculate the MVL based on the return on U.S. Treasury securities and use this to determine what the plan owes to retirees over the 30-year time horizon (which includes calculating what this requires annually in their CAFR reports).<sup>12</sup> Only when states have an accurate accounting of what they owe their workers over a 30-year period can pension reforms be fully successful in stabilizing pension systems, government budgets, and protecting taxpayers.

### ENDNOTES

1. "The The Trillion Dollar Gap: Underfunded state retirement systems and the roads to reform," The Pew Center on the States, February 2010, 2–3.
2. Robert Novy-Marx and Joshua Rauh, "The Crisis in Local Government Pensions in the United States" (working paper, Northwestern University, 2010).
3. The actuarial valuation of assets is based on a process called "smoothing" which averages returns, typically over a five-year period. This means that a downturn in returns is not fully recognized at once, but incorporated over the period. Andrew Biggs notes, "while the market value of assets (the amount for which the plan's assets could be sold at the time the valuation is made) is a preferable figure, in most cases actuarial assets are at least an unbiased measure: it is as likely to understate the market value of the plan assets as it is to overstate it." See *The Market Value of Public-Sector Pension Deficits*, Retirement Policy Outlook no. 1 (Washington, DC: American Enterprise Institute for Public Policy Research, April 2010), 2.
4. Government Accounting Standards Board, "Summaries and Status—Summary of Statement no. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*," November 1994, [http://www.gasb.org/cs/ContentServer?c=Pronouncement\\_C&pagename=GASB%2FPronouncement\\_C%2FGASBSummaryPage&cid=1176156677465](http://www.gasb.org/cs/ContentServer?c=Pronouncement_C&pagename=GASB%2FPronouncement_C%2FGASBSummaryPage&cid=1176156677465).
5. Actuarial Standards Board, *Selection of Economic Assumptions for Measuring Pension Obligations*, Actuarial Standard of Practice no. 27,

September 2007, [http://www.actuarialstandardsboard.org/pdf/asops/asop027\\_109.pdf](http://www.actuarialstandardsboard.org/pdf/asops/asop027_109.pdf).

6. Alicia Munnell and Mauricio Soto, *State and Local Pensions are Different from Private Plans*, State and Local Pension Plans no. 1 (Chestnut Hill, MA: Center for Retirement Research at Boston College, 2007).

To fix the systematic underestimation of pension liabilities, governments should legally require that actuarial firms hired to value state and local pension plans calculate the MVL based on the return of U.S. Treasury securities.

7. Alicia Munnell, Kelly Haverstick, and Jean-Pierre Aubry, *Why Does Funding Status Vary Among State and Local Plans?* State and Local Pension Plans no. 6 (Chestnut Hill, MA: Center for Retirement Research at Boston College, 2008).
8. Andrew Biggs, *The Market Value of Public-Sector Pension Deficits*.
9. Joshua Rauh, *Are State Public Pensions Sustainable? Why the Federal Government Should Worry About State Pension Liabilities* (Evanston, IL: Northwestern University Department of Finance, 2010), 26.
10. Economists agree on a precept called "the law of one price," which holds that two assets that produce the same stream of payments should sell for the same price. The discount rate chosen should match as closely as possible the timing, amount and probability of payment of the liability being valued. While no market assets match pension liabilities perfectly, many analysts have concluded that the probability of default on accrued pension liabilities is roughly equivalent to that on U.S. Treasury securities. Thus the yield on Treasury bonds is likely the most appropriate discount rate to apply in calculating the size of pension liabilities.
11. There is precedent for this practice. In 2007, New York City's actuary, Robert North, performed a market valuation of the New York City's Employees' Retirement System (NYCERS) and calculated the MVL based on Treasury securities. Jeremy Gold and Gordon Latter, "Making the Case for the Marking Public Plan Liabilities to Market" (working paper, Pension Finance Institute, 2008), 63.



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**Eileen Norcross** is a senior research fellow with the Social Change Project and the lead researcher on the State and Local Policy Project. Her work focuses on the question of how societies sustain prosperity and the role civil society plays in supporting economic resiliency. Her areas of research include fiscal federalism and institutions, state and local governments, and economic development.