



National Conference on Public  
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## The Advantages of Using Conventional Actuarial Approaches for Valuing Public Pension Plans

**F**inancial economics is a branch of economics that studies the capital markets, examining why people invest, how investments should be valued, and how investment risk and return should be measured. Over the past decade, adherents to these theories have successfully advocated applying the principles of financial economics to corporate pension plans through the calculation of a “market value liability” (MVL). Over the past year, they have begun advocating applying the same principles to public pension plans. This approach would be fundamentally different from the conventional approaches currently used to value the liabilities of public pension plans.

This position paper examines the MVL approach and compares it with conventional actuarial methods. It concludes that there are significant advantages to using conventional actuarial approaches for valuing public plans, including:

1. Conventional approaches better reflect the underlying nature of the governments that sponsor the plans, as well as the goals of governmental accounting.
2. Conventional approaches have succeeded in funding most public plans.
3. Conventional approaches better reflect the underlying dynamics of public pension plans.
4. Conventional approaches are more likely to provide for stable contribution rates.
5. Conventional approaches are more likely to allocate pension costs equitably across current and future taxpayers.
6. Conventional approaches are more likely to support better decisions related to public plan funding.

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## Overview of the MVL Approach

Largely originating in the 1950s, much of financial economics emerged as a result of efforts to measure the value of publicly-traded corporations. Over time, financial economics has developed a body of knowledge about how capital markets work and how they might work more efficiently. These theories have recently had a significant influence on the private-sector pension funding and accounting rules adopted by U.S. lawmakers and regulators. This is evidenced by the 2006 Pension Protection Act and the private-sector accounting standards developed by the Financial Accounting Standards Board (FASB) in Statement No. 158.

Proponents of financial economics argue that unless a corporation's pension plan assets and liabilities are measured at market value and presented on the corporation's balance sheet, the corporation's value is distorted in its financial statements. Consequently, investors may pay too much (or too little) for investments in the corporation, thereby making capital markets less efficient.<sup>1</sup>

For pension liabilities and other items that do not trade in open markets, financial economics holds that the best estimate of their market value is the price of similar, openly-traded items of the same amount, timing, probability of payment, etc. From the financial economics perspective, pension liabilities most closely resemble debt. Therefore, proponents of financial economics argue that the "market value of liabilities" (MVL) for pension benefits should be determined in the same way that bond prices are determined, i.e., by discounting the future cash flows using bond yields.<sup>2</sup>

Technically, the MVL is measured using the unit credit actuarial method and a discount rate based on risk-free (e.g., Treasury) bond yields (although discount rates based on investment grade corporate bonds have also been used). The unit credit method calculates a benefit obligation based on years of service and salary as of the valuation date, and excludes projected future service and salary from the calculation. Because the unit credit method only includes service and salary as of the valuation date, it is sometimes referred to as a "settlement" measure.

In contrast, most public pension plans are currently valued using the entry age actuarial cost method and a discount rate that reflects the expected long-term returns on plan investments.<sup>3</sup> The entry age method includes projected future service and salary in the cost calculations and is often used to determine contribution rates as a level percent of payroll. Using a discount rate based on expected long-term investment returns incorporates expected future investment earnings into the actuarial valuation.

1 Society of Actuaries and American Academy of Actuaries, *Pension Actuary's Guide to Financial Economics*, 2006.

2 Generally, current actuarial standards of practice require the discount rate to reflect the investment return assumption. However, for financial reporting and certain other purposes, the standards allow the discount rate to reflect "anticipated returns on a hypothetical asset portfolio." Actuarial Standards Board, ASOP No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, December 1996, page 6. This standard is currently under review by the Actuarial Standards Board.

3 For financial reporting purposes, the Governmental Accounting Standards Board (GASB) allows one of six actuarial cost methods to be used for the valuation of public pension benefits, including: entry age, projected unit credit, and the aggregated method. The (unprojected) unit credit method is not included, and is only accepted by the GASB in rare situations where accumulated benefits are not affected by future salary levels. According to the Public Pension Coordinating Council's 2000 Survey of *State and Local Government Employee Retirement Systems*, 62 percent of public plans use the entry age method, 10 percent use projected unit credit, and 10 percent use the aggregate method, with the remaining 18 percent scattered among the three other methods.



Generally, the MVL approach produces a measure of the pension liability that is often 15 percent (or more) higher than the liability produced under conventional approaches.<sup>4</sup> The difference results entirely from the use of the bond discount rate, which is lower than the expected return on plan assets.<sup>5</sup> Consequently, a plan that was 100 percent funded under the conventional approach would be about 87 percent (or less) funded under the MVL approach, even if the contributions under the conventional approach were sufficient to fund the plan over time.

If the MVL approach were used to determine plan contributions, the resulting contribution rates would be significantly higher than those determined using conventional actuarial methods. For example, a recent study for a statewide pension plan found that the total contribution rate increased 34 percent under the MVL approach as compared to the conventional approach, even though the MVL liability was only 13 percent higher than the actuarial accrued liability under the conventional approach.<sup>6</sup> The considerably higher contribution rate is due both to a higher normal cost under the MVL approach and a higher unfunded liability that would need to be amortized through contributions. Again, these differences are due to the use of the bond discount rate.

Until recently, proponents of financial economics had not suggested extending this approach to public pension plans. Now, however, several proponents advocate applying the MVL to measuring public plan liabilities. This change appears to result from concern over the stability of public pension plans, which they see as threatened by growing unfunded liabilities, unsustainable benefit promises, investment allocations containing excessive risk, and a propensity of governments to shift costs to future taxpayers.<sup>7</sup> According to the proponents:

1. The MVL approach would provide a standardized “market” measure of pension liabilities, which when compared with the market value of assets would provide a consistent measure of the plan’s “true” funded status.
2. Because the liability determined under the MVL approach would be higher than that determined under conventional approaches, it would reduce the temptation of government decision-makers to increase benefits based on plan “overfunding.”
3. Moreover, the higher employer contributions that may result from this approach would reduce the extent to which the contributions are deferred to future taxpayers.
4. As a result, this would help to stabilize the funding of public plans and promote their long-term sustainability.

However, while the purported goal of the MVL proponents is to support public plans, the more likely results of applying the MVL approach would be to (1) increase reported plan liabilities and required contributions; (2) increase the volatility of contributions; (3) confuse decision-makers, taxpayers, and the press; (4) shift costs to current taxpayers;

4 Richard Ennis, “What Ails Public Plans? And How Can They Become Strong Again?” Ennis Knupp & Associates, 2007. The article suggests the MVL approach would result in a liability that is 15 percent higher than under the current approach, using a 5.5 percent bond discount rate. If a lower discount rate were used, the MVL liability would be even higher.

5 If the unit credit actuarial method were used with a discount rate reflecting expected returns (rather than bond yields), the calculated liability would be lower than the liability determined under conventional approaches. However, because the MVL approach applies a discount rate that is significantly lower than expected investment returns, it produces a liability that is significantly higher than under current approaches.

6 The study compared results using the plan’s current actuarial method (entry age normal with an 8 percent discount rate) with the MVL approach (unit credit with a 5.5 percent discount rate).

7 Richard Ennis, “What Ails Public Plans? And How Can They Become Strong Again?” Ennis Knupp & Associates, 2007.



and (5) jeopardize the plan's sustainability. This could lead to the needless abandonment of public pension plans, which, for over a century, have proven to be effective and efficient vehicles for providing retirement income.

## Advantages of Conventional Approaches

### 1. Conventional approaches better reflect the underlying nature of the governments that sponsor the plans, as well as the goals of governmental accounting.

As discussed in the Governmental Accounting Standards Board's 2006 white paper, governments are fundamentally different from businesses and should be accounted for differently as a result.<sup>8</sup> A government's primary purpose is to maintain or enhance the well-being of its citizens by providing public services financed through taxes; whereas a business's primary purpose is to benefit shareholders by creating wealth through voluntary transactions. Moreover, governments generally exist much longer than businesses and are typically not subject to bankruptcy or dissolution.

Within this context, the GASB's white paper explains that governmental and business accounting standards are — and should be — different, including the standards related to pensions and other post-employment benefits. For such benefits, the governmental accounting approach supports allocating long-term benefit costs to periods of service as a level percent of payroll. This helps to smoothly spread the costs among different generations of taxpayers, thereby promoting intergenerational equity. Level contributions also help governments to better plan and budget their contributions. This is different from business accounting, which places greater emphasis on the measurement of plan liabilities, since these affect the value of the business if and when it is sold, or if the plan is terminated.

According to the GASB's white paper, governmental accounting “explicitly harmonizes accounting with the actuarial funding characteristics of public plans.” This approach makes it possible to “allocate expenses to periods in a way that charges each period with a level percentage of payroll for normal cost” and “equitably spreads the ongoing benefit program among different generations of taxpayers.”

Because the MVL does not include projected future salary and service in the liability calculation, it would not be able to allocate expenses to periods in a way that charges each period with a level percentage of payroll for normal cost. Consequently, it is unlikely to spread pension costs equitably among different generations of taxpayers.

### 2. Conventional approaches have succeeded in funding most public pension plans.

Proponents of the MVL approach claim that conventional actuarial methods calculate contribution rates that are too low to sustain public plans. However, many state and local government pension plans have existed for over 50 years and some have existed for over a century. Moreover, recently published independent studies of public plans have found them to be in good financial health, as indicated by the following findings:

<sup>8</sup> Governmental Accounting Standards Board, “Why Governmental Accounting and Financial Reporting Is — And Should Be — Different,” March 2006.



- State and local governmental pension plans are “reasonably well funded.”<sup>9</sup>
- To fully fund their plans, state and local governmental pension contributions would need to increase from the current average of 9.0 percent to 9.5 percent.<sup>10</sup>
- Many individual states are allocating funds to pay benefits and improving the governance and oversight of their retirement systems.<sup>11</sup>
- While funded ratios declined between 2000 and 2002, they have since leveled off and began to increase in 2006 and 2007.<sup>12</sup>

One recent academic study also found that the actuarial methods used for public plans have “contributed to the survivability of public plans” by smoothing short-term volatility in contribution rates.<sup>13</sup>

MVL proponents would likely counter that public plans only appear well funded because the liabilities calculated under conventional approaches do not include the cost of risk associated with equity investments. They argue that, because conventional approaches use a discount rate based on expected (rather than realized) long-term returns, they underestimate the risks of equity investments.

However, for the most part, the expected returns used by public plans accurately reflect the long-term historical rates of return earned by the plans. Many public plans use discount rates based on expected long-term returns of 8.0 percent. As reported in Callan’s *Capital Market Review*, for the 15 years ending March 31, 2008, state and local retirement plans in Callan Associates’ Public Database earned annual investment returns averaging 9.1 percent.<sup>14</sup> This period includes the significant domestic equity declines from 2000 – 2002, as well as declines in the last quarter of 2007 and the first quarter of 2008.

### **3. Conventional approaches better reflect the underlying nature and dynamics of public pension plans.**

The underlying theoretical basis of the MVL approach is that pension cash flows have the same structure as bond cash flows. However, pension plan cash flows typically depend on factors not included in bond cash flows, such as future service accruals and salary increases.<sup>15</sup>

As discussed earlier, the unit credit actuarial method used to determine the MVL does not incorporate projected salary and service increases after the valuation date in its measure of the plan’s liability. However, for the vast majority of public pension plans, benefits are based on participants’ final average earnings and years of service. In addition, the benefits are often protected from diminishment by state or local laws.

9 U.S. Government Accountability Office, *Current Funded Status of Pension and Health Benefits*, January 2008.

10 U.S. Government Accountability Office, *Current Status of Benefit Structures, Projections, and Outlook for Funding Future Costs*, September 2007.

11 Pew Center for the States, *Promises with a Price*, December 2007.

12 Wilshire Associates, *2008 Report on State Retirement Systems*, March 2008.

13 Alicia H. Munnell, et. al. “Why Have Defined Benefits Survived in the Public Sector?”, Center for Retirement Research at Boston College, December 2007.

14 Callan Investments Institute, *Capital Market Review*, First Quarter 2008. Used with permission.

15 David Kausch, “The Case for Stock in Pension Funds,” *Contingencies*, January/February 2008.

A valuation approach that ignores fundamental characteristics of the retirement benefit will not reflect the underlying dynamics of the plan and will not provide an accurate or useful measure of the plan's liabilities and related contributions. Moreover, because the MVL does not include projected future salary and service in the contribution rate, plan contributions under the MVL will likely increase as salary and service increase.

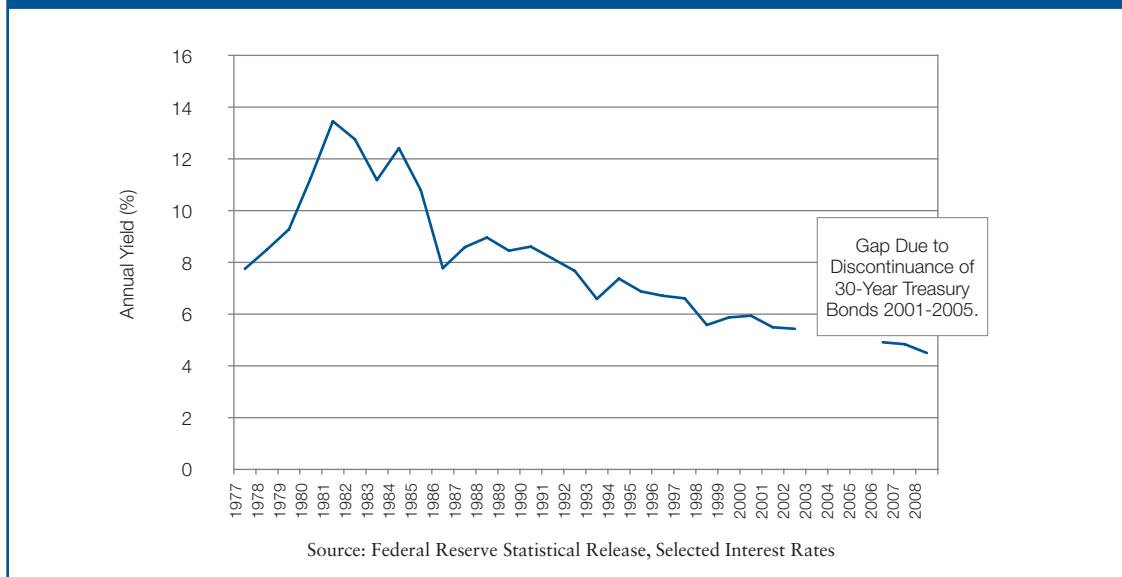
In addition, discounting pension cash flows using bond yields ties the measurement of plan liabilities to changes in the supply and demand for bonds, which are unrelated to the benefits promised by the plan. Consequently, small changes in the discount rate could result in large changes in plan liabilities, even though there were no changes in the benefits promised by the plan.

#### 4. Conventional approaches are more likely to provide for stable contribution rates.

To help stabilize their contribution rates and funding, public plans use a variety of techniques. As mentioned above, most plans use the entry age actuarial cost method to calculate contribution rates intended to remain a level percentage of payroll over time. In addition, most plans smooth investment gains and losses into the actuarial value of plan assets over a period of time, typically 3 to 5 years. Although these techniques do not guarantee that pension contributions and funding will remain level, they help mitigate short-term shocks and stabilize plan funding.

Using the MVL approach is likely to introduce more volatility into plan liabilities and contribution rates than under conventional approaches. While the discount rate used under conventional approaches does not vary much from year to year, the “risk-free” discount rates used under the MVL approach can vary widely. As shown in Exhibit 1, the annual yields on long-term U.S. government bonds have ranged from 13.34 percent in 1981 to 4.50 percent in 2008.

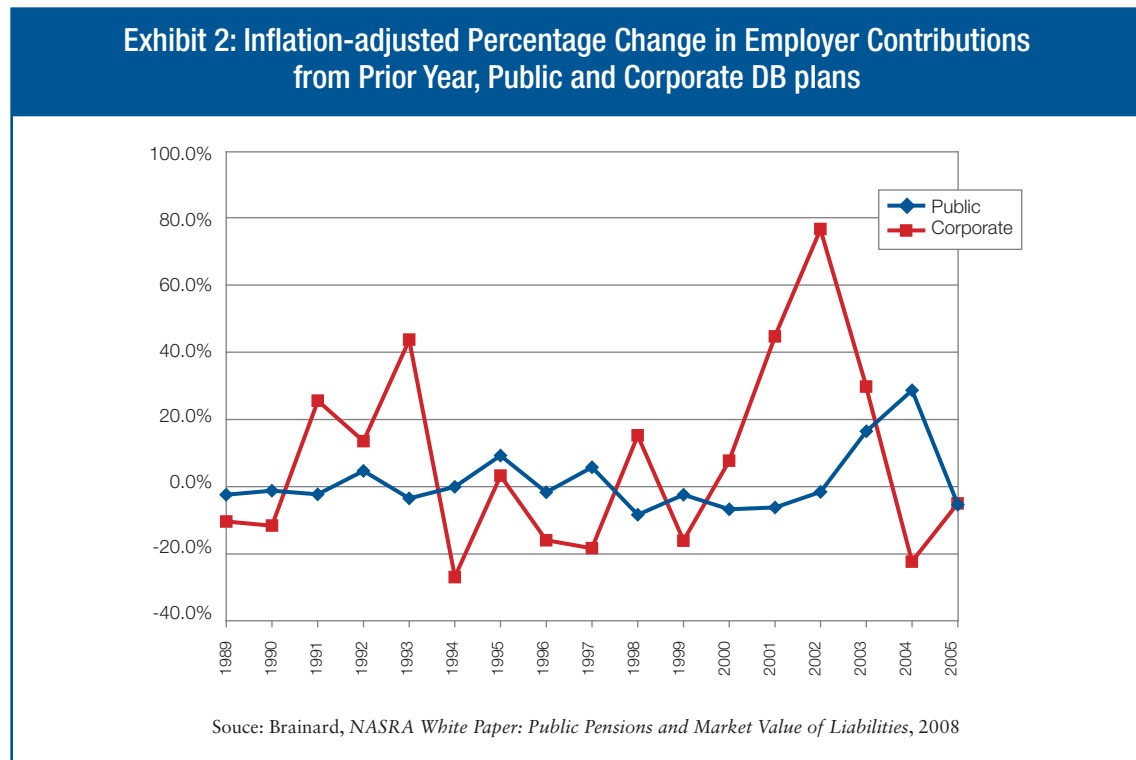
Exhibit 1: 30-Year Treasury Bond Yields, 1977–2008



Since pension liabilities are inversely proportional to the discount rate, a decline in long-term government bond yields increases plan liabilities and contributions under the MVL approach. This was a problem for private-sector pension plans in the early 2000s, when corporate plan liabilities grew rapidly as a result of discount rates pegged to declining bond yields.<sup>16</sup> Since public plan liabilities are not discounted in this manner, they are not subject to similar pressures.

Exhibit 2 shows the average change in employer contributions to public and corporate defined benefit plans from 1989 to 2005. Presented in a recent NASRA white paper, the exhibit clearly illustrates the additional volatility associated with corporate contributions.<sup>17</sup> As discussed by Keith Brainard, NASRA’s research director, public plan contributions changed by more than 15 percent in only three years during the period, while corporate contributions changed by more than 15 percent in nine years, including three years when the increases were greater than 50 percent.

Some proponents of the MVL approach argue that it can be used to significantly reduce volatility in the plan’s funded ratio. However, in order to stabilize plan funding under the MVL approach, the plan would have to “immunize” the liabilities using matching securities of the same amount and duration or apply a “liability driven investment” (LDI) strategy. Theoretically, if this were done, changes in the value of plan liabilities due to changes in discount rate yields would be offset by related changes in the prices of the matching securities, thus stabilizing the funded ratio.

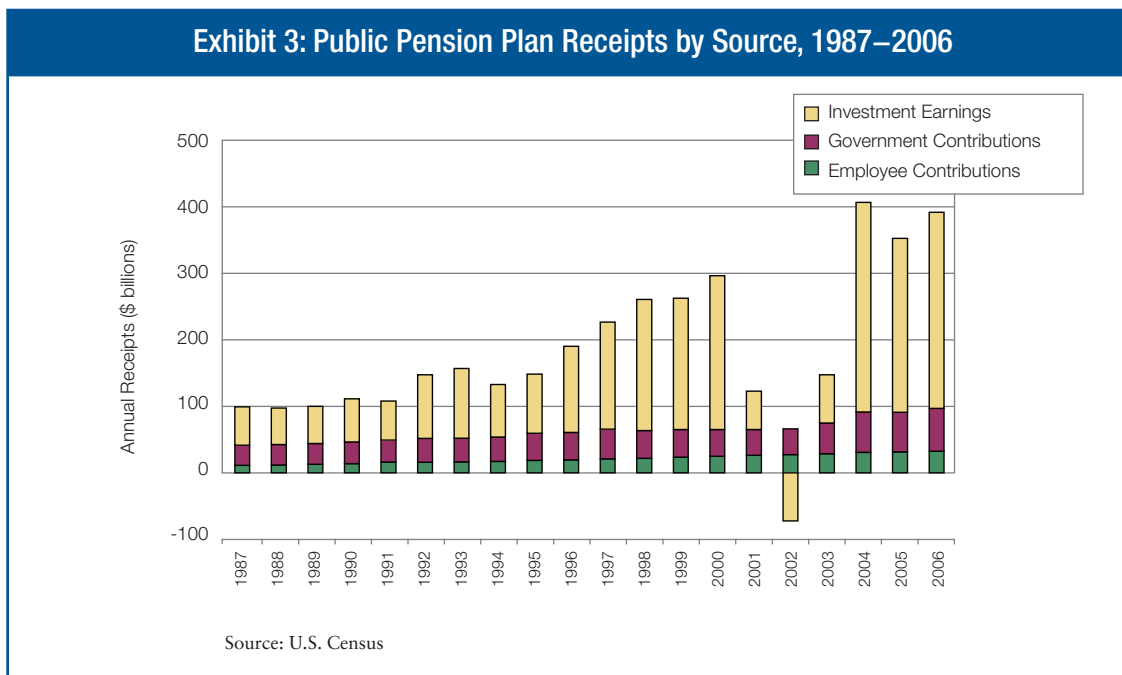


<sup>16</sup> The use of the long-term government bond rate subjects plan liabilities not only to economic risks but to federal policy risks as well. In 2001, the U.S. Treasury Department discontinued issuing 30-year bonds. As a result, the measure of long-term governmental bond yields fell from 5.75 percent in 2001 to 4.84 percent in 2002. To mitigate the effect of this change on private-plan funding and employer contributions, Congress enacted the use of a higher interest rate to determine private plan liabilities.

<sup>17</sup> Keith Brainard, “Public Pensions and Market Value of Liabilities,” National Association of State Retirement Administrators, July 21, 2008. Used with permission.

However, for this approach to work, the pension plan would have to be fully funded at the time the liabilities were immunized. If the plan was less than fully funded, this approach would lock-in the plan's underfunding or require even higher contributions. Moreover, it is not clear that matching securities could be found or synthesized to fully immunize the liabilities. The longest maturity for U.S. government securities is 30 years. By contrast, some pension plan payments will not come due for 70 years or more.

In addition, by investing largely in bonds, a pension plan would give up the potentially higher returns that are likely to be earned on equity investments. While higher equity returns are not guaranteed, there is substantial evidence to suggest that equity investments outperform bonds over the long term. Moreover, as shown in Exhibit 3, investment returns (including returns from equities) have played a significant role in funding public pension plans.



According to U.S. Census data, even with the 2002 investment losses, investment earnings added \$2.5 trillion to state and local pension plans from 1987 to 2006, or 67 percent of total public pension plan receipts over the period.<sup>18</sup>

### 5. Conventional approaches are more likely to allocate pension costs equitably across current and future taxpayers.

Proponents of the MVL approach argue that the current approach for funding public pension plans results in government (and therefore taxpayer) contributions that are lower than necessary to fund the plan. As a result, future taxpayers will likely pay higher contributions to make up the difference, violating the principle of intergenerational equity.

<sup>18</sup> U.S. Census Bureau, *State and Local Government Employee-Retirement Systems*, specified years.



However, as discussed above, if the MVL approach were used to determine plan contributions, the resulting contribution rates would immediately be significantly higher than those determined under conventional actuarial methods. Consequently, current taxpayers would pay significantly more to fund the plan than under conventional approaches. Moreover, if these contributions were invested in a diversified portfolio that earns significantly higher returns than the bond discount rate, the plan would become fully funded more rapidly than under current funding schedules. Therefore, at some point, future taxpayers would likely pay less than current taxpayers. This too would violate intergenerational equity.

Furthermore, suddenly higher contributions rates would not necessarily motivate governments to make the additional contributions. If the contributions were seen as artificially higher than the amount needed to fund the plan, there would be a disincentive to contribute the full amount.

### **6: Conventional approaches are more likely to support better decisions related to public plan funding.**

If the MVL were used to disclose public plan liabilities but not to establish contribution rates, it is likely that legislators, taxpayers, and members of the press would have difficulty distinguishing the different purposes behind reporting a “market liability” and a “funding liability.” Consequently, instead of making financial reporting more transparent, the MVL approach would likely lead to confusion about the costs and sustainability of the plans. This, in turn, could result in poor policy decisions and potentially lead to the needless abandonment of public pension plans.

This confusion is illustrated in the history of the GASB Statement No. 5.<sup>19</sup> Issued in 1986, the statement required two measures of a public pension plan’s liabilities to be disclosed in the plan’s financial reports (as well as the financial reports of the plan sponsors). One measure was determined by applying the actuarial method and assumptions used to fund the plan. The other was determined using the same assumptions, but applied the projected unit credit actuarial method. This second measure was intended to provide a standardized measure of the plan’s liability that could be compared across all public plans.

In 1994, however, the GASB eliminated the standardized measure. In explaining the reason for this change, the GASB noted that the presentation of two pension liabilities created significant confusion among readers of the financial reports. The Board concluded “the understandability and usefulness of financial reports are enhanced when the actuarially determined pension information is calculated ... consistent with the funding methodology.”<sup>20</sup>

## **A Better Approach**

Public pension plans have faced significant strains over the past decade. The downturn of the domestic equity markets from 2000 through 2002 resulted in plan funding ratios

<sup>19</sup> Governmental Accounting Standards Board, Statement No. 5, *Disclosure of Pension Information by Public Employee Retirement Systems and State and Local Governmental Employers*, November 1986.

<sup>20</sup> Governmental Accounting Standards Board, Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, November 1994, paragraph 131.



falling, on average, from a little over 100 percent to about 86 percent. The need to amortize this sudden increase in unfunded liabilities resulted in increased employer contribution rates during a time of fiscal stress for state and local governments. Moreover, some governments increased pension benefits in the late 1990s, believing that the high investment returns at the time would continue.

While it is important to address the issues associated with public plan funding, investment risks, sustainable benefits, and contribution volatility, a better approach would be to face them directly:

- To the extent there is too much risk in public pension portfolios, pension administrators and trustees should diversify their investment holdings in ways that better manage downside risk. If this results in lower expected returns over the long-term, these lower returns should be reflected in the actuarial assumptions used under conventional actuarial methods.
- To the extent governments have promised benefits based on plan “overfunding,” they should realize such promises will be difficult to sustain. Labor groups should recognize this as well and work to ensure that the benefits promised can be reasonably sustained over the long-term.
- To the extent governments are not making their full actuarially determined contributions to the plan, they should recognize that the shortfall will likely need to be paid in the future with interest. Taxpayers should understand this as well and monitor their governments to ensure that the necessary contributions are made in a timely manner.

All of these can be addressed using actuarial methods and assumption that reflect the fundamental dynamics of the plan, i.e., the conventional approaches.



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