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The Underfunding of State and Local Pension Plans

The recent financial crisis and economic recession have left many states and localities with extraordinary budgetary difficulties for the next few years, but structural shortfalls in their pension plans pose a problem that is likely to endure for much longer. This issue brief discusses alternative approaches to assessing the size of those shortfalls and the implications of those approaches for funding decisions:

- By any measure, nearly all state and local pension plans are underfunded, which means that the value of the plans' assets is less than their accrued pension liabilities for current workers and retirees.
- There are two leading approaches for valuing assets and liabilities, and the reported amount of underfunding varies significantly depending on which one is used.
- Decisions about how to address the underfunding can be informed by the choice between those two measurement approaches, but there is no necessary connection between the information provided by the two approaches and decisions about how much a plan's sponsor should contribute each year.

According to the Public Fund Survey of 126 state and local pension plans, which account for about 85 percent of pension assets and participants in state and local pension plans in the United States, those plans held roughly $2.6 trillion in financial assets in 2009 but had about $3.3 trillion in liabilities for future pension payments.[1] Thus, those assets covered less than 80 percent of liabilities, and unfunded liabilities (the amount by which liabilities exceed assets) amounted to roughly $0.7 trillion.[2] That share of liabilities covered by assets in 2009 was the lowest percentage in the past 20 years (see Figure 1). By comparison, the amount of state and local governments' debt that was outstanding at the end of 2009 was $2.4 trillion.

That estimate of unfunded liabilities is calculated on the basis of actuarial guidelines currently followed by state and local governments. Another approach for measuring pension assets and liabilities, which more fully accounts for the costs that pension obligations pose for taxpayers, yields a much larger estimate of unfunded liabilities for those plans in 2009—between $2 trillion and $3 trillion.[3]

In any event, most state and local pension plans probably will have sufficient assets, earnings, and contributions to pay scheduled benefits for a number of years and thus will not need to address their funding shortfalls immediately. But they will probably have to do so eventually, and the longer they wait, the larger those shortfalls could become.[4] Most of the additional funding needed to cover pension liabilities is likely to take the form of higher government contributions and therefore will require higher taxes or reduced government services for residents. Additional funding for pension benefits already accrued is unlikely to come from current workers; state laws and court opinions indicate that efforts toward that

1. Liabilities are measured as the present value of promised benefits. Present value is the value today of a series of payments made in the future, calculated by applying a discount rate to those payments. The lower the rate of discount, the higher the present value.

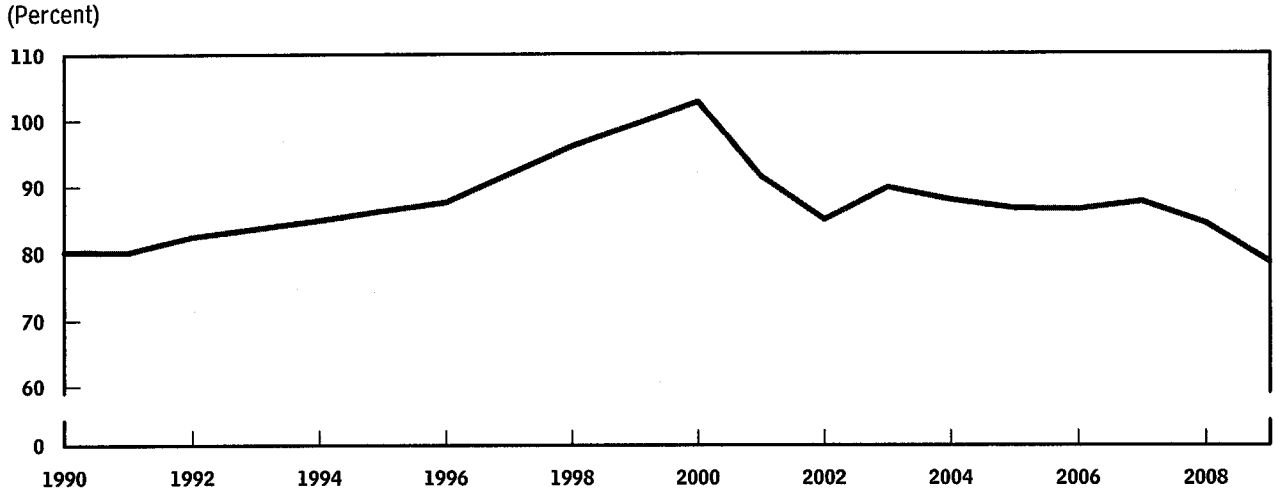
2. See National Association of State Retirement Administrators, *Public Fund Scorecard,* available at www.publicfundsurvey.org/publicfundsurvey/scorecard.asp (accessed March 22, 2011). The data do not include costs for retirees' health care.

3. See Alicia H. Munnell and others, *Valuing Liabilities in State and Local Plans,* Issue Brief 11 (Boston: Center for Retirement Research at Boston College, June 2010). For earlier estimates, see Robert Novy-Marx and Joshua D. Rauh, "The Liabilities and Risks of State-Sponsored Pension Plans," *Journal of Economic Perspectives,* vol. 23, no. 4 (Fall 2009), pp. 191–210.

4. For a listing of actions taken in 2010, see Ronald K. Snell, *Pensions and Retirement Plan Enactments in 2010 State Legislatures* (National Conference of State Legislatures, November 23, 2010), available at www.ncsl.org/?TabId=20836.

Figure 1.

State and Local Governments' Pension Assets as a Percentage of Liabilites, Calculated Using Guidelines Issued by GASB, 1990 to 2009



Source: Congressional Budget Office based on Alicia H. Munnell, Jean-Pierre Aubry, and Laura Quinby, The Funding of State and Local Pensions: 2009-2013, Issue Brief 10 (Boston: Center for Retirement Research at Boston College, April 2010).

Notes: Liabilities include pension benefits paid to retired employees, benefits earned by active employees on the basis of their current salaries and years of service, and the effect of future salary increases on the value of pension benefits already earned by current workers.

The data are for fiscal years, plotted biannually for 1990 to 2000 and annually after that.

GASB = Government Accounting Standards Board.

end could be successfully challenged in court in the majority of states.[5]

Decisions about the amount and timing of the additional funding for underfunded plans will depend on many factors, including competing budgetary priorities, views on intergenerational fairness, and the amount of risk that plans' sponsors are prepared to take. If the financial condition of state and local pension plans worsened, the federal government might be asked to assist in the funding of such plans. If granted, such assistance would raise the federal deficit and debt, unless offset by higher taxes or lower spending in other areas.

State and Local Pension Plans

States and localities play a significant role in the nation's retirement system, representing 19 percent of all contributions by employers for employee retirement plans and 28 percent of total pension assets. According to the most recent data from the Census Bureau, in fiscal year 2008 there were 2,550 state and local retirement systems, and about 90 percent of the participants in those plans were covered by 218 state-administered plans. State plans include many local government employees (primarily teachers). Local plans generally cover police personnel and firefighters as well as general municipal employees. About 70 percent of state and local employees are also covered by Social Security.

Pension plans of state and local governments generally are defined-benefit plans, in which retirement benefits are determined by formula on the basis of factors such as the employee's recent salary and total years of service.[6] For example, a plan might offer a pension benefit equal to

5. See Amy B. Monahan, "Public Pension Plan Reform: The Legal Framework," *Education Finance and Policy*, vol. 5, no.4 (March 2010), pp. 617–646.

6. Most pension plans in the private sector are defined-contribution plans, in which employers commit to annual payments toward employees' retirement savings but not to a particular amount of benefits.

1 percent of a worker's recent salary for each year of service. In that case, an employee retiring after 40 years of work with recent earnings averaging $50,000 would get an annual pension of $20,000. For most employees, benefit payments increase over time with inflation because of cost-of-living adjustments.

Retirement benefits paid by state and local pension plans are financed by contributions from governments and employees and by income from plans' assets. Contribution rates for employers and employees are usually set as a percentage of salaries. During 2010, the 100 largest state and local pension plans, which account for almost 90 percent of the assets of all state and local plans, collected about $117 billion in contributions ($81 billion from governments, or about 4 percent of total state and local spending, and $35 billion from employees) and paid out $183 billion in benefits.[7] Investment earnings amounted to $267 billion.

At the end of 2010, the largest 100 plans held assets of roughly $2.6 trillion (or 14 times the benefit payments made in that year); corporate stocks and international securities accounted for about half of the investments.[8] Recent data indicate that the median annualized return on public pension plans with assets of more than $1 billion averaged 9 percent (roughly 6 percent after subtracting inflation) for the 25-year period extending through 2010. In 2010, the median return for those plans was 13 percent, compared with losses of 26 percent in 2008 and gains of 20 percent in 2009.[9]

Most jurisdictions have guidelines or laws that call for additional contributions to their pension plans when assets are less than liabilities, but no federal laws or regulations govern how states and localities are to respond when plans are underfunded. Actuaries for the plans determine each year how much contributions would need to rise (above contributions for "normal costs"—those resulting from benefits accrued during the current year) in order to eliminate (amortize) the shortfall of assets relative to liabilities steadily over a period of time, generally 15 to 30 years. However, payments by many states and localities have been lower than called for by their guidelines—especially in times of budgetary stress.[10]

Two Approaches to Measuring the Underfunding of Pension Plans

The approach used to measure pension plans' liabilities and assets can significantly affect assessments of the adequacy of funding. Future obligations can be measured more or less broadly, and their current value is very sensitive to the discount rate that is used to cumulate the obligations.[11] The two leading approaches—guidelines issued by the Government Accounting Standards Board (GASB), which is the organization that specifies the accounting practices generally followed by states and localities, and the fair-value method, which generates estimates of funding that are more comparable to those reported by the corporate sector—often give very different pictures of funding status, primarily because they use different discount rates. The GASB and fair-value approaches also differ in their treatment of assets, but that difference does not have a systematic effect on estimates of underfunding.

GASB Guidelines

Under the guidelines provided by GASB, actuaries compute liabilities by discounting future benefit payments using a discount rate based on the expected rate of return on the plans' assets. (Currently, the median of pension plans' assumptions for future returns on state and local pension assets is about 8.0 percent, or 4.5 percent after

7. Census Bureau, *Finances of Selected State and Local Government Employee Retirement Systems,* Table 2, "Receipts, Benefits, and Withdrawal Payments of Major Public Employee Retirement Systems," available at www.census.gov/govs/qpr/.

8. Census Bureau, *Finances of Selected State and Local Government Employee Retirement Systems,* Table 1, "Cash and Security Holdings of Major Public Employee Retirement Systems, by Type," available at www.census.gov/govs/qpr/.

9. National Association of State Retirement Administrators and the National Council on Teacher Retirement, *Strong Investment Gains and Legislative Changes Speeding Public Pension Recovery,* NASRA/NCTR Issue Brief (April 2011).

10. Most of the shortfalls result from limits placed by state and local governments on the amount of such contributions. See Alicia H. Munnell and others, *Why Don't Some States and Localities Pay Their Required Pension Contributions?* Issue Brief 7 (Boston: Center for Retirement Research at Boston College, May 2008).

11. Estimates of liabilities also depend to some extent on the factors that are included in calculating future benefits. In broad terms, actuarial methods differ in whether or not they take into account projected salary increases for current workers and their future years of service.

removing the effect of the median assumed rate of inflation.)[12] That approach provides a measure of the amount that must be invested in assets earning the expected rate of return, on average, in order to cover future payments. The guidelines also allow the reported value of assets to be an average of the market value of assets over several years, so as to blunt the impact of a large swing in the value of equity holdings in a single year.[13]

According to the Public Fund Survey, the average funded ratio (that is, assets as a percentage of liabilities, or the percentage of liabilities that is funded by those assets) for the sample of 126 large plans was 78 percent in 2009; the value of the assets was about $0.7 trillion less than the value of the liabilities.[14] Of those plans, 21 had funded ratios above 90 percent, and 26 were between 80 percent and 90 percent.[15] At the other end of the spectrum, 8 plans had funded ratios below 50 percent: the Illinois State Employees Retirement System (at 43 percent), the Connecticut State Employees Retirement System (at 44 percent), the Illinois State Universities Retirement System (at 46 percent), the West Virginia Teachers Retirement System (at 47 percent), the Kentucky Employees' Retirement System (at 47 percent), the Missouri Department of Transportation and Highway Patrol Employees Retirement System (at 47 percent), the Indiana State Teachers Retirement Fund (at 48 percent), and the Illinois Teachers Retirement System (at 48 percent).

Fair-Value Approach

The fair-value approach aims to measure the market value of an asset or liability:[16]

- For assets, the fair value is what an investor would be willing to pay for them—that is, the current market value (or an estimate when market values are unavailable); it is not the averaged, or smoothed, market values that are reported under GASB guidelines.
- For pension liabilities, the fair value can be thought of as what a private insurance company operating in a competitive market would charge to assume responsibility for those obligations.

In the case of state and local pension plans, the discount rate for future benefit payments using the fair-value approach is lower—and, therefore, the estimated present value of those payments is higher—than under the GASB approach. Under the fair-value approach, future cash flows are discounted at a rate that reflects their risk characteristics. Hence, for pension liabilities, the discount rate reflects the fact that the cash flows associated with accrued liabilities are fixed and carry little risk; it is very unlikely that the liabilities will not be honored.[17] (By contrast, under the GASB approach, the discount rate used for liabilities reflects the greater risk associated with pension funds' assets.) Under the fair-value approach, one way to approximate the discount rate applied to future

12. An assumed rate of inflation lower than the median assumption of 3.5 percent reported in the Public Fund Survey would tend to lower the expected nominal rate of return on assets and thus increase the present discounted value of pension obligations. However, it would also reduce the nominal growth of wages and benefit accruals and would result in lower projected cost-of-living adjustments to benefit payments.

13. In June 2010, GASB expressed preliminary views on potential changes to its guidelines for accounting and reporting issues. For assets, reported values would be current market values; assets would no longer be valued using prices that are averaged over several years. For liabilities, the discount rate would be a weighted average of expected returns on a portfolio and the rate of an index for high-quality municipal bonds, with the weights determined by how many years of benefits were funded and unfunded. The municipal bond rate would get more weight when there were relatively more unfunded years. The approach is roughly equivalent to using expected returns on assets to discount liabilities covered by those assets and using a municipal bond rate to discount liabilities that would be paid after the assets were exhausted.

14. See National Association of State Retirement Administrators, *Public Fund Survey*, www.publicfundsurvey.org/publicfundsurvey/memberslogin.asp. Updated data are available upon registering at this Web site. For 74 of the plans, the data are for fiscal year 2009; for 51 of the plans, for fiscal year 2010; and for one of the plans, for fiscal year 2008.

15. The tally does not include six plans that use accounting methods that do not produce measures of unfunded liabilities and, by definition, imply funding ratios of 100 percent.

16. See Financial Accounting Standards Board, *Fair Value Measurement*, Statement No. 157 (September 2006), p. 2.

17. See Jeffrey R. Brown and David W. Wilcox, "Discounting State and Local Pension Liabilities," *American Economic Review*, vol. 99, no. 2 (May 2009), pp, 538–542.

Table 1.

State and Local Governments' Unfunded Pension Liabilities Under Alternative Discount Rates, 2009

(Trillions of dollars)

Discount Rate	Amount Unfunded
4 Percent	2.9
5 Percent	2.2
6 Percent	1.6
8 Percent	0.7

Source: Congressional Budget Office based on Alicia H. Munnell and others, Valuing Liabilities in State and Local Plans, Issue Brief 11 (Boston: Center for Retirement Research at Boston College, June 2010).

Note: Unfunded liabilities are the current value of promised benefits minus assets in 2009. Liabilities include pension benefits paid to retired employees, benefits earned by active employees on the basis of their current salaries and years of service, and the effect of future salary increases on the value of pension benefits already earned by current workers.

benefit payments is by using the interest rate on municipal securities (adjusted to remove the effect of tax deductibility): In 2010, the discount rate would have been about half as large as the median discount rate of 8 percent under the GASB guidelines. (For additional discussion of discount rates, see Box 1 on page 6.)

A study published last year that examined the sensitivity of estimates of underfunding to discount rates for pension plans in the Public Fund Survey illustrates the large difference between the GASB and fair-value approaches.[18] Unfunded liabilities in 2009 amount to about $0.7 trillion when liabilities are discounted at 8 percent but total $2.2 trillion when liabilities are discounted at 5 percent and $2.9 trillion when they are discounted at 4 percent (see Table 1). Those unfunded liabilities, as calculated on a fair-value basis, indicate funded ratios of roughly 55 percent and less than 50 percent, respectively.

18. See Alicia H. Munnell and others, *Valuing Liabilities in State and Local Plans*. Those estimates incorporate projected increases in salaries but not projected increases in years of service. The sensitivity of the size of unfunded liabilities to alternative discount rates also is shown in Robert Novy-Marx and Joshua D. Rauh, "The Liabilities and Risks of State-Sponsored Pension Plans."

The Visibility of Costs

The GASB and fair-value approaches differ in what they tell a plan's managers, its participants, and the public about the costs of a pension system, including the cost of the risk to taxpayers that the rate of return on risky pension assets may not meet expectations. By using the expected rate of return on assets as the discount rate for converting future benefit payments into today's dollars, the GASB approach essentially assumes that those returns are as certain as benefit payments, at least in the long run. By contrast, the fair-value approach views the returns on assets as more uncertain than the benefit payments, even in the long run; under that approach, the rate of return on assets is not suitable for discounting pension benefits. By accounting for the different risks associated with investment returns and benefit payments, the fair-value approach provides a more complete and transparent measure of the costs of pension obligations.[19]

Some proponents of the GASB approach argue that, although rates of return on assets in some periods may be lower than those necessary to cover future obligations, those periods will tend to be offset by others in which the returns will be higher, so the historical average return is fairly certain. They believe that sponsors of plans can wait out the periods of losses or low returns and still pay full benefits by allowing the fund balances to temporarily decline because governments do not have the finite planning horizons that individuals do. Consequently, under this view, it is appropriate to use an average expected return when informing the public about the financial condition of public-sector pension funds.[20]

However, even over very long periods, higher returns on risky investments are not a sure thing.[21] Although a strategy of investing in relatively risky assets produces

19. The fair-value approach also gives a more complete picture of the costs of changes in policy, to the extent that such changes would affect pension benefits (and possibly wages) for current employees. See Joshua Rauh and Robert Novy-Marx, "Policy Options for State Pension Systems and Their Impact on Plan Liabilities," Working Paper No. 16453 (Cambridge, Mass.: National Bureau of Economic Research, October 2010).

20. For example, see Dean Baker, *The Origins and Severity of the Public Pension Crisis* (Washington, D.C.: Center for Economic and Policy Research, February 2011).

21. See Lubos Pastor and Robert F. Stambaugh, *Are Stocks Really Less Volatile in the Long Run?* Working Paper No. 14757 (Cambridge, Mass.: National Bureau of Economic Research, February 2009).

Box 1.

Selecting Discount Rates for Measuring Pension Plans' Liabilities

A market valuation of any future cash flows, which is the basis of the notion of fair value, depends on the risks associated with those cash flows. For example, the market value of a corporate bond is the present discounted value of the bond's expected principal and interest payments. The discount rate for those expected flows is the bond's expected rate of return, which reflects the time value of money and the market's assessment of the various risks of owning that bond, including the risk that the company will fail to make all of the payments on the bond.[1] By using the expected return on a pension plan's assets to discount future payments to beneficiaries, the guidelines issued by the Government Accounting Standards Board (GASB) implicitly reflect an assumption that the risk to workers that states and localities will fail to pay future retirement benefits is the same as the risk that expected returns on the plan's assets will not be realized.

In fact, because the risk to future payments to beneficiaries is generally much less than the risk to the returns on typical assets held by pension plans, standard financial principles of valuation suggest that future benefit payments be discounted at a lower rate than under GASB's guidelines. Under the legal framework in most jurisdictions, the accrued benefits of current workers and retirees are obligations of the government and, therefore, like most municipal bonds, have a low likelihood of not being paid. Moreover, because state and local pension payments are based on wages, they are less risky than would be the case if they were based on measures more closely related to the stock market, for example. Under an assumption that the risk of a state or local government's defaulting on its obligations to pensioners is the same as the risk of its defaulting on its debt, the appropriate discount rate for obligations already accrued would be approximately the interest rate on state and local debt, adjusted for the fact that it is tax-exempt and pension benefits are not.[2] With that

1. In addition to the risk of default, risks posed by inflation and a lack of liquidity should be taken into account when selecting an appropriate discount rate. So should "market risk," which is the risk that losses will be greatest during times of economic stress (when such losses are more burdensome). Creditors require a risk premium—an expected return in excess of a risk-free rate—as compensation for assuming such risks.

2. However, a factor that tends to lower the risk of default on pension plans' obligations relative to that risk for general obligation bonds is that the pension plans' obligations have more collateral backing them than do state and municipal bonds. (In 1975, for example, New York City defaulted on its debt but continued to make its pension payments.) For jurisdictions with relatively poor credit ratings, the interest rates on municipal bonds would be relatively high, and relatively high discount rates would be appropriate; however, applying higher rates would lower the discounted value of liabilities, thus effectively rewarding those jurisdictions for having bad credit ratings.

Continued

higher returns on average, compared with a strategy of investing in relatively safe assets, there is no certainty of obtaining higher returns for a particular portfolio or over any given period of time. Those potential higher returns would be obtained by imposing added risk on taxpayers—particularly the risk of experiencing severe losses during protracted economic downturns—which represents an equal and offsetting cost.[22] Such long-run risk, which investors view as costly, is reflected in the premium that investors require to bear it.[23] Fair-value measures account for that cost.

22. Even if those losses would not immediately result in higher taxes or reduced government services, the losses from a reduction in the market value of assets are equivalent to borrowing from the pension plan, and that debt eventually would need to be repaid.

23. See Zvi Bodie, *On the Risk of Stocks in the Long Run.* Working Paper No. 95-013 (Cambridge, Mass.: Harvard Business School, December 1994), available at the Social Science Research Network, http://ssrn.com/abstract=5771.

Box 1. Continued

Selecting Discount Rates for Measuring Pension Plans' Liabilities

adjustment, the appropriate nominal discount rate in 2010 would have been about 4 percent, or approximately half the discount rate used by most state and local pension plans.[3] Four years earlier, in 2006, that rate would have been higher (about 5 percent).

The appropriate discount rate for future benefit payments can be affected by the way that pension systems project future obligations for benefits because different projection methods can indicate differences about the risk to those payments. Most systems use a broader measure than current accruals as the basis for obligations—one that includes employees' future years of service and sometimes includes projected salary increases. One consideration is that the future benefits not yet accrued by current employees are less certain than those already accrued. Recently, in some states, the formulas determining future benefits for current employees have been modified (for instance, in Colorado, Minnesota, and South Dakota). Whether those actions will stand depends on the outcomes of current challenges in the courts.[4] Also, uncertainty about the legislated growth of future salaries introduces risk about the level of benefits tied to those salaries, especially for younger workers, whose benefits are mostly not yet accrued. For measures of future benefit payments that involve such uncertainties, the principle of using a discount rate that reflects the risk to the payments suggests using a slightly higher discount rate than the rate on tax-adjusted municipal bonds but still one that is considerably less than the expected returns on pension plans' assets.

3. On average in 2010, the interest rate on a tax-exempt 10-year AAA-rated municipal bond was roughly 3.0 percent, down from 3.9 percent four years earlier. For additional discussion of using taxable rather than tax-exempt municipal bond rates, see Robert Novy-Marx and Joshua D. Rauh, "The Liabilities and Risks of State-Sponsored Pension Plans," *Journal of Economic Perspectives*, vol. 23, no. 4 (Fall 2009), pp. 191–210.

4. *Justus v. Colorado*, 2010-CV-1598 (Colo. Dist. Ct. February 26, 2010); *Swanson v. Minnesota*, 62-CV-10-05285 (Minn. Dist. Ct. May 17, 2010); and *Tice et al. v. South Dakota et al.*, Civ. No. 10-225 (6th Cir. S.D. June 15, 2010).

In addition, by not smoothing asset values over time, the fair-value approach provides a clearer view of the fluctuations that can occur in long-term funding needs when risky assets are used to finance fixed pension obligations. By making the mismatch in risk between assets and liabilities more transparent, the fair-value approach also may discourage risk taking on the part of fund managers.

Implications for Funding Pension Plans

State and local governments are experiencing extraordinary budgetary pressures as the result of the recent financial crisis and economic recession, and for some jurisdictions the need to address the underfunding of their pension plans adds to those pressures. By indicating a larger amount of underfunding, adopting a fair-value approach in reporting pension plans' finances could indicate a need for a significant increase in funding, which would further strain government budgets—despite the fact that, on average, a much smaller increase in funding might turn out to be sufficient to cover pension plans' liabilities. Moving to a fair-value approach could also increase the volatility in reported underfunding and, therefore, in funding requirements, making budgeting for the required contributions more difficult.[24]

24. Such volatility, it has been argued, could lead to fewer and fewer defined-benefit pension plans. See Norman L. Jones, Brian B. Murphy, and Paul Zorn, "Actuarial Methods and Public Pension Funding Objectives: An Empirical Examination" (paper presented at the Public Pension Finance Symposium, Chicago, Illinois, May 18–19, 2009).

However, there is no necessary connection between the information provided by the fair-value approach and the determination of a sponsor's annual contributions to the plan, which could be calculated on a different basis. For instance, to take into account the higher expected returns on riskier portfolios, annual contributions could continue to be based on the GASB guidelines for measuring liabilities, and volatility in annual contributions could be reduced by basing contributions on shortfalls averaged over several years.[25] If adequately funded, such a strategy would offer a significant likelihood that a plan's assets would be sufficient to cover its liabilities, but that strategy would be accompanied by the risk of a significant shortfall that could burden future taxpayers.

Reducing Underfunding

Underfunding can be reduced either by decreasing pension plans' liabilities or by increasing their assets. Reducing liabilities essentially means lowering the present value of lifetime benefits (though not by just raising the discount rate). Some states have begun to offer less generous packages to new employees. In some cases, new employees will be required to make larger contributions, accept less favorable benefit formulas (possibly supplemented by moving to coverage under the Social Security system), shift partly to defined-contribution plans, or work more years before becoming vested.[26] Those changes, however, will not reduce the underfunding that currently exists because it derives from promises to current and former employees, not from potential promises to future employees. A few states have proposed or taken actions that would affect current workers (and possibly retirees) as well as prospective employees; for instance, Colorado, Minnesota, and South Dakota have changed formulas for cost-of-living adjustments. Those actions are being challenged in court.

Increasing plans' assets requires raising contributions from current workers, raising government contributions, or earning more on investments. The legal framework that governs state pension plans—the constitutional and statutory provisions and the legal precedents that are applicable—suggests that, in most states, increases in contributions to address underfunding will probably be borne by employers, not employees.[27] Larger government contributions, in turn, will need to be financed either by raising taxes or by reducing other spending by state and local governments (including employees' salaries). Alternatively, managers of pension plans can seek faster growth in their assets through higher expected returns by increasing the share of risky assets in their portfolios. Whether that strategy is good public policy has been the subject of debate.[28]

Some jurisdictions have sought to raise pension plans' revenues by borrowing to invest in equities. For instance, some jurisdictions have sold pension obligation bonds and invested the proceeds in equities and other risky securities. Such a transaction is expected to generate future income, because it involves investing in assets that have expected returns in excess of the interest rate paid on the bonds underlying pension plans' obligations.[29] However, the transaction does not alter the value of pension plans' assets, because it simply exchanges safe claims (the bonds) for risky ones (equities and other securities) of

25. Volatility also could be reduced by shifting assets away from risky equities and toward bonds that posed low risk and that had promised cash flows similar to those of the projected obligations.

26. Often workers have to remain employed for some minimum number of years before they become vested, which means that they have a right to receive benefits under the plan.

27. Nevertheless, some states and localities with relatively weak protections for pensions may be able to raise contribution rates for current employees for future benefits not yet earned. Another possibility would be to slow the growth of employees' pay, but that step would not affect estimates of state and local pension plans' liabilities unless actuarial assumptions about the projected growth in salaries were also adjusted downward. Moreover, benefits paid to people who have already retired would not be altered as a result.

28. See Lawrence N. Bader and Jeremy Gold, "The Case Against Stock in Public Pension Funds," *Financial Analysts Journal*, vol. 63, no. 1 (January/February 2007), pp. 55–62. See also Deborah J. Lucas and Stephen P. Zeldes, "How Should Public Pension Plans Invest?" *American Economic Review Papers and Proceedings*, vol. 99, no. 2 (May 2009), pp. 527–532.

29. Another rationale for using pension obligation bonds is to postpone raising taxes or cutting services—to avoid such actions during a recession, for instance. That step also has the effect of shifting some of the burden of paying for pensions onto later generations.

equal market value.[30] Although the average return is higher on the risky investments, there is a significant risk that returns could fall below the cost of servicing the additional debt from the bonds. Because those bonds are ultimately backed by tax revenues, future taxpayers bear the risk of losses.

Although the amount of underfunding of state and local pensions is substantial, it is not necessarily in the best interests of taxpayers for states and localities to completely prefund their pension liabilities. Ultimately, judgments about the amount and timing of additional funding that should be provided for underfunded plans depend on many factors, including competing budget priorities, views about intergenerational fairness, and the amount of risk the sponsors are prepared to take that they (and their taxpayers) might have to bear substantial costs at some point in the future in order to pay promised benefits.[31] It is generally agreed that the costs—including pension costs—of current services provided by state and local governments should be borne by those who benefit from those services and not shifted to future generations of taxpayers, as has already occurred because of underfunding by previous taxpayers.[32] However, the services provided by school teachers, for example, might be justifiably financed, at least in part, by future taxes on people who are now students.[33] Despite those considerations, employee compensation packages currently may be substantially distorted by political pressures to favor deferred compensation—to raise pension benefits and postpone the associated costs to taxpayers until some future time.[34]

30. Because of federal restrictions to prevent tax arbitrage (that is, investment strategies that attempt to profit by exploiting the price differences between tax-free and taxable bonds), pension obligation bonds are not exempt from federal taxes.

31. For contrasting views emphasizing lower and higher funding levels, respectively, see Henning Bohn, *Should Public Retirement Plans be Fully Funded?* Working Paper No. 16409 (Cambridge, Mass.: National Bureau of Economic Research, September 2010) and Stephen P. C'Arcy, James H. Dulebohn, and Pyungsuk Oh, "Optimal Funding of State Employee Pension Systems," *Journal of Risk and Insurance,* vol. 66, no. 3 (September 1999), pp. 345–380.

32. An important issue is how costs shifted by previous taxpayers should be distributed between current and future taxpayers. The shifting of costs from one generation to another is mitigated to the extent that underfunding pension plans lowers current property values, as residents move to other places to avoid anticipated increases in taxes or reductions in public services.

33. However, in a mobile society, the people paying future taxes in a particular state may not be the students there today.

34. The optimal level of funding also may change over the course of the business cycle. In particular, because a stable tax rate is considered less distortionary than one that frequently changes, underfunding may be preferable to full funding in times of economic downturns because the underfunding would avoid the need to raise tax rates in bad times.

This brief was prepared by Frank Russek. It and other CBO publications are available at the agency's Web site (www.cbo.gov).

Douglas W. Elmendorf

Douglas W. Elmendorf
Director