

RE: **Methods for Stabilizing Public Retirement Plan Contribution Rates**
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A major goal in actuarially funding a retirement plan is to accumulate monies in a systematic manner so that contribution rates remain reasonably stable and the funds can earn long-term investment returns. Stable contribution rates are an important component in funding retirement plans, since they help governments budget effectively for plan contributions.

BACKGROUND

In the early years of state and local retirement plan development, asset levels were very low, and investment volatility did not affect contribution rates to any great extent. During those years, it was common for plans to invest funds very conservatively, principally in government bonds or other high quality fixed income instruments. Investment return assumptions were low, perhaps in the 2% to 4% range, and contribution rates were high, but relatively stable.

As time passed, asset levels grew and investment practices changed with a higher portion of assets being placed in common stocks. Accordingly, asset allocations became more aggressive and investment return assumptions rose to the 7% to 9% range. Contribution rates dropped remarkably but, as asset levels grew, the rates became more volatile. During the 1980s and 1990s, contribution rate volatility was not seen as a problem since strong investment returns meant contribution rates were falling. Serious up-side volatility in contribution rates became an issue following the poor equity returns that affected most investors from 2000 through 2002.

When plan sponsors moved heavily into common stock investments and increased assumed rates of return, they were making a fundamental trade-off: low but stable investment returns were exchanged for higher but more volatile returns. Unfortunately, because the tradeoff was made gradually over time, the volatility effect was not immediately apparent. It now seems unlikely that many pension plan sponsors will want to reverse the trade by moving away from common stocks and lowering the assumed investment return rate to 4% or 5%. Doing so would help stabilize employer contribution rates, but would require a major contribution rate increase or a major decrease in retirement system benefits, or both. Moreover, it would also sacrifice some of the higher returns that are believed to be available in the equity markets, even when measured on a risk-adjusted basis.

Given that the tradeoff is not likely to be reversed, what can be done to stabilize contribution rates? To mitigate the effects of short-term investment fluctuations on contribution rates, actuaries currently use a number of techniques, such as asset smoothing and amortizing unfunded actuarial gains and losses over long periods. These methods have worked well for most of the past 25 years when significant declines in investment returns have been relatively short-lived. For most of those years, investment volatility was largely on the up side, and was viewed as good news.¹ Pension contributions could be reduced or benefits increased, or (in some cases) both. Some employer contribution rates went to unnaturally low levels, below the plan's

¹ During the 1980s and 1990s, state and local governments benefited substantially from funding their retirement plans. According to the U.S. Census Bureau, public-sector retirement plan investment earnings totaled \$1.65 trillion from 1981 to 1999, or approximately two-thirds of all plan receipts. As a result, the funded ratios of public plans grew from an average of 81% in 1990 to 104% in 2000, and employer contributions rates declined from an average of 14.4% of payroll to 10.6%, as shown in Public Pension Coordinating Council surveys.

“normal cost” rate.² As a somewhat extreme example, in one plan with a normal cost rate of 25% of payroll, a high funded ratio permitted the employer contribution rate to be reduced to 2% of payroll.

The stock market decline from 2000 through 2002 was a shock to financial markets and an unusual event in U.S. history. Over those three years, the value of U.S. large company stocks fell approximately 43%, the largest and most sustained decline since the Great Depression. Because of the investment losses, higher employer contributions were required to fund retirement plans. In particular, asset surpluses that were built up in the 1980s and 1990s evaporated almost overnight. As a result, pension plans that had taken contribution holidays or had allowed the contribution rate to drop to very low levels were faced with large percentage increases in contribution rates.

Under these circumstances, the plan mentioned earlier with a contribution rate of 2% of payroll now requires an employer contribution rate of 40% per year. While a 40% contribution is not necessarily unreasonable for a plan whose normal cost is 25% of payroll (especially given the investment declines from 2000 through 2002), it is an increase by a factor of 20 in the plan’s actuarially determined Annual Required Contribution (ARC). Unfortunately, the same economic forces that lead to poor investment results and the need for higher pension contributions also tend to reduce tax revenues for state and local governments, making it difficult to come up with the higher contributions.

When a significant and prolonged investment decline occurs, traditional actuarial smoothing methods may not, by themselves, be sufficient to stabilize contribution rates – particularly if a plan is moving from being “overfunded” to being “underfunded.”³ In order to help governments stabilize contribution rates, actuaries and other retirement plan professionals are studying additional stabilization methods, as discussed in this memorandum. While it is unlikely that any smoothing technique would be able to fully mitigate the large investment losses that occurred at the beginning of this decade (and simultaneously meet the GASB’s related accounting standards⁴), there are several methods that can help.

CRITERIA FOR EVALUATING CONTRIBUTION STABILIZATION METHODS

Different contribution stabilization methods have varying advantages and disadvantages. In order to make an informed decision, it is important to compare the particular methods against relevant criteria. These include:

- **Stability:** Does the method produce contribution rates that are predictable and stable from year to year?
- **Sufficiency:** Does the method allow for contribution rates that are sufficient to fund the promised benefits?
- **GASB Compliance:** Will the resulting contribution rates amortize the unfunded actuarial liabilities within the period allowed under the accounting standards for governmental plans?
- **Optimum Rates:** Does the method produce contribution rates that are neither higher nor lower than necessary over a long-term period?
- **Reasonable Results:** Does the method produce contribution rates and other underlying financial measures that appear reasonable to objective observers?

² A pension plan’s “normal cost” is the cost of benefits earned by plan members as a result of members’ service to the employer during the current year.

³ Throughout this paper, the terms “overfunded” and “underfunded” are used for stylistic convenience to indicate plan assets that are greater than or less than plan liabilities, respectively. As the recent investment decline illustrates, it is inaccurate to consider retirement plans with assets that are greater than liabilities to be “overfunded” or to have “excess assets” since asset values may shift suddenly. A plan that is “overfunded” today may be “underfunded” a year from now and vice versa.

⁴ In extreme situations, the period used to amortize the plan’s unfunded actuarial accrued liability could exceed the maximum established by the GASB for financial reporting purposes. If so, the employer’s financial reports could show a net pension obligation as a liability in the government’s financial statements.

The remainder of this memorandum discusses the advantages and disadvantages of eight methods that could potentially help to stabilize contribution rates. Table 1 compares the methods with the previously mentioned criteria.

CONTRIBUTION STABILIZATION METHODS

Fixed Contribution Rates

Probably the most straight-forward approach to stabilizing contribution rates is to set contributions at a fixed percent of payroll. Currently, this approach is followed by several state and local retirement systems, where employer and (often employee) contribution rates are legislatively fixed at a given percent of payroll. In order to maintain contributions that are sufficient to fund the plan, actuarial valuations allow the amortization period to vary, up to the maximum amortization period established by the Governmental Accounting Standards Board (GASB).

The advantage of a fixed contribution rate is that it is a straight-forward approach that could stabilize contributions in most, but not all, circumstances. One disadvantage is that the fixed rate probably cannot be set at a level that factors in the risks of extreme market declines. If these risks are not factored in, investment declines, like those from 2000 through 2002, could cause the plan's funded ratio to fall and thereby increase actuarially determined contributions. If the actual contributions are not adjusted to equal the actuarially determined contributions, the result could be an additional accounting liability for the employer.

Perhaps a fixed contribution rate could be set at a level that factors in the risk of extreme market declines.⁵ If so, there would be less need to change the rate, but its level might be too high to be politically sustainable given the fiscal pressures governments typically face. While there may be jurisdictions in which such a solution would work, it might be impossible in other jurisdictions.

Limiting Annual Changes in Contribution Rates

Another method for limiting fluctuations in employer contributions is to limit the annual change in contribution rates, either by legislation or through the retirement system's funding policy. Under this approach, state statutes (or local ordinances, plan provisions, etc.) would provide that contribution rates could not increase by more than a specific amount (e.g., one-half of one percent) from one year to the next.

The advantage of this approach is that contribution rates can be adjusted annually within a narrow range to slowly accommodate changing circumstances. The disadvantage is that the limited contribution rate change could be less than the actuarially determined rate, possibly requiring even larger future increases in employer contributions, and possibly producing an additional accounting liability.⁶

Funding Corridors

Under this approach, employer contribution rates remain fixed while the plan's funded ratio is within an established range, and change when the ratio falls outside of the range. For example, employer contributions could be fixed while the plan's funded ratio is between 90% and 110%. However, if the ratio falls below 90% (or above 110%), the contribution rate is adjusted to amortize the underfunded (or overfunded) liabilities over a set period (e.g., 30 years). A plan could also use multiple corridors in order to amortize the liabilities over different periods. In the above example, if the plan's funded ratio fell below 80%, the unfunded actuarial liabilities might be amortized over 20 years.

⁵ An asset-liability study that forecasts the effects of projected future investment returns on plan contributions would be helpful for setting optimal fixed contribution rates in light of investment volatility.

⁶ See footnote 4.

The advantage of this approach is that it stabilizes contribution rates while allowing adjustments that reflect the plan's funded status. Consequently, it helps to guard against plan underfunding or overfunding. Moreover, since the contribution rate is changed to reflect current circumstances, it is unlikely the rate would be set too high or too low over the long term. However, unless the contribution rate is initially based on what would be required at the low end of the funding corridor, an additional accounting liability could be created.

A disadvantage is that the contribution rate might require a sharp adjustment when the corridor boundary is crossed. For example, if the lower boundary is very low (e.g., 70%) significant unfunded liabilities could build up before it is reached. Once crossed, the amortization of unfunded liabilities would likely result in a sharp increase in the employer's contributions, which might not be possible to achieve.

Asset Value Corridors

Another corridor approach is used in conjunction with asset smoothing. Asset smoothing is used in the actuarial valuations of many state and local retirement plans to reduce the effect of year-to-year investment fluctuations on employer contribution rates. Instead of recognizing all investment gains and losses in the year they occur, asset smoothing recognizes annual gains and losses gradually, typically over a three- to five-year period, thus diminishing the effect of market fluctuations on contribution rates.

Asset smoothing has worked effectively for most of the last 25 years. However, when large investment declines (or increases) occur over a prolonged period, the smoothed value of assets can diverge significantly from the market value. To protect against the misalignment of smoothed and market asset values, an asset value corridor may be established. For example, the smoothed value could be prevented from going below 90% or above 110% of the market value.

An advantage to this approach is that it allows asset smoothing but maintains asset values relatively close to market values. Consequently, it prevents the plan's funded ratio and contribution rate from being based on assets values that might be seen as unrealistic. A disadvantage is that the plan is exposed to market fluctuations when the boundary is crossed.

Extending Asset Smoothing Periods

Asset smoothing during extended successive periods of market declines also lengthens the period over which investment losses are factored into contribution rates. While this reduces the volatility of contribution rates, it also prolongs the period over which employer contributions increase. Several governments have recently extended their asset smoothing periods. For example, the California Public Employees' Retirement System (CalPERS) has lengthened its asset smoothing period from 3 years to 15 years.⁷ Moreover, it widened its asset corridor limits for establishing the actuarial value of assets from 90%-110% of market value to 80%-120% of market value. This, combined with several other changes, is expected to reduce annual volatility in employer contributions by more than 50%.

The advantage of extending the smoothing period is that smaller portions of annual investment gains and losses are incorporated in the contribution rate. Since this longer period would likely extend over at least a full economic cycle, market downswings would be mitigated by prior market upswings. The disadvantage is that the smoothed value could become significantly different from the market value, consequently sending conflicting signals about plan funding. For example, when the market value exceeds the smoothed value for an extended period, history shows that pressure builds to spend the difference, thereby compounding funding pressures when markets reverse. Moreover, when the market value is less than the smoothed value for an

⁷ CalPERS Press Release, "CalPERS Advances Employer Rate Stabilization Plan," March 15, 2005. The other changes include amortizing gains and losses over a rolling 30 year period (instead of 10% per year), establishing a minimum contribution rate for all employers equal to one-half of normal costs, and establishing "stabilization accounts" to serve as reserve funds.

extended period, there may be the criticism that reality is being ignored. In this situation, establishing an asset value corridor would help to address these issues.

Asset Allocations that Minimize Investment Volatility

This method is a partial step toward “undoing the tradeoff” that was discussed at the beginning of this paper. Volatility in investment return is a function of asset allocations. Various asset classes are subject to different ranges of returns and have different correlations with other asset classes. Although asset allocations do not guarantee returns, they can be used to diminish investment volatility. Moreover, plan assets can be “matched” with plan liabilities in ways that further reduce the volatility of employer contributions.

An advantage of this approach is that it addresses investment volatility at its source, possibly saving the plan from large investment losses. A disadvantage is that asset allocations that reduce risk are also likely to reduce return. However, if the current allocation is inefficient, changes to the allocation may actually lower risks while increasing returns. If this approach is taken, the investment return assumption needs to be reconsidered. Again, an asset-liability study would be helpful for examining the likely effects of asset allocation changes on investment returns.

Linking Employee Contributions to the Plan’s Financial Position

In most cases, employee contribution rates are fixed by statute or local ordinance and do not change with the plan’s financial status. Consequently, the employer sponsoring the plan bears all of the investment risk. However, some plans adjust employee contribution rates to reflect investment earnings. This can be done either by requiring employee contributions to be some percentage of required contributions for the year (e.g., 40% of the normal cost), or by making more gradual adjustments.

An advantage of this approach is that it distributes the cost of the increased contributions over a wider population, including those who directly benefit from the retirement plan. This lowers the average cost to taxpayers (although increasing it for plan members).

One disadvantage is that large increases in employee contribution rates may result in unexpected financial pressure on active employees, who may then call for salary increases to compensate. Moreover, if employee contribution rates are already high, they may act as a disincentive for employment. In these circumstances, the employer may have difficulty attracting and retaining qualified employees.

Linking Retirement Benefits to the Plan’s Financial Position

Another method for sharing the costs of investment volatility with plan members is to link retirement benefit adjustments with the plan’s financial position. Many state and local retirement plans provide cost-of-living adjustments (COLAs) to retirees and beneficiaries as a means of protecting benefits from inflation. In some cases, these adjustments are linked to the plan’s investment earnings or are made on an ad hoc basis when the plan’s financial position is judged sufficient to finance the COLAs. This allows a portion of the benefits to be directly related to the financial health of the plan.

This could be extended further. For example, a flexible defined benefit approach might combine a relatively low guaranteed benefit (e.g., 1% of final average salary per year of service) with a variable benefit based on investment performance or other factors. This approach is currently applied by some state and local governments that have hybrid plans or that combine defined benefit and defined contribution plans.

An advantage of linking benefits to the plan’s financial position is that the costs of market declines are shared with plan participants, while also sharing the benefits of market increases. A disadvantage is that if the market decline is prolonged, or comes at a time of high inflation, retirees and beneficiaries would likely see an erosion of the purchasing power of plan benefits.

Stabilization Reserves

Some state and local governments maintain pension stabilization reserves in order to supplement government contributions in times of fiscal stress.⁸ During times when the government's revenues exceed projections, the government would make contributions to the stabilization fund in addition to those required to fund retirement benefits. When revenues fall short of projections, the stabilization fund would be drawn down to offset some or all of the government's required retirement plan contributions.

An advantage of stabilization reserves is that they allow governments to set aside funds during good economic times when government revenues exceed expenditures. Moreover, this approach offers flexibility in establishing the fund and its reserves. A disadvantage is that unless the funds are held for the exclusive purpose of stabilizing employer contributions, they may be used for other purposes. Some state laws may also restrict the investment of such reserves, causing them to earn rates of return that are lower than those earned by the plan's investments. Another disadvantage is that it may be difficult to build sufficient stabilization reserves in the first place. There is often pressure to put the funds to "better use" elsewhere.

CONCLUSIONS

The investment declines that occurred from 2000 through 2002 put significant pressure on state and local governments to increase their retirement plan contribution rates. This happened at a time when many governments were facing significant additional fiscal stress. While some stabilization methods were already in place to mitigate short-term fluctuations in employer contribution rates, additional efforts are now underway to address the effects of larger and longer-term market shocks.

This memorandum addresses several such methods that may be used separately or in combination. All have advantages and disadvantages, and the extent to which they help will depend on the individual circumstances of the plan. The best approach would be to use a variety of techniques based on the plan's specific situation.

From a larger perspective, there are general guidelines that will help ensure a stable and well-funded retirement plan. Plan sponsors and their advisors should avoid the temptation to reduce contributions excessively when times are good. That way, when times are bad, the plan will have surpluses that can be used to dampen the need for increases in contribution rates. In addition, labor groups and their representatives should understand the risks associated with pension funding. They can help by encouraging plan sponsors to fund the plan appropriately and by working with their membership to encourage sound plan design and reasonable benefit levels. Overall, a balanced approach should be applied, even though it may take considerable discipline.

⁸ Care should be taken to establish the reserve in a way that dedicates the assets for stabilizing contributions while at the same time accounts for them outside of the pension trust. If the reserved assets are held within the pension trust, they could be considered pension assets for valuation purposes. This might undermine the purpose of holding them in reserve.

Table 1: Comparison of Contribution Rate Stabilization Methods

Methods	Criteria				
	Stability	Sufficiency	GASB Compliance	Optimum Rates	Reasonable Results
Fixed Contribution Rate	Stable by definition.	May not incorporate risks of extreme market declines.	In extreme situations, amortization periods may exceed GASB requirements.	Rate could be too low or too high; asset/liability study would be useful.	Generally not responsive to extreme situations.
Limited Annual Change in Contribution Rate	Stable, with measured changes.	May not incorporate risks of extreme market declines.	In extreme situations, amortization periods may exceed GASB requirements.	Allows for slow adjustments in rates.	Generally slow to respond to extreme situations.
Funding Corridors and Asset Value Corridors	Stable until corridor boundary is reached.	Allows for contribution rate adjustment when boundary is reached.	Can be set to ensure compliance with GASB amortization period requirements.	Rate could be too low or too high; asset/liability study would be useful.	Sudden adjustment when corridor boundary is reached may generate concern.
Extending Asset Smoothing	Rates vary from year to year but impact of investment volatility dampened.	Contribution rates would reflect benefit requirements.	Compliance with GASB amortization period requirements.	Contribution rates would vary as necessary.	Possible misalignment of smoothed and market asset values.
Asset Allocation	May help to stabilize contributions by dampening investment volatility.	Shift from equities to fixed income investments would likely increase contributions.	This approach would not affect GASB compliance.	If equity investment return is greater than risk, contributions would be higher than necessary.	Effort to dampen volatility addresses fundamental cause of contribution fluctuations.
Linking Employee Contributions	Volatility shared with plan members; may reduce upward pressure on benefits.	Contribution rates would reflect benefit requirements.	This approach would not affect GASB compliance.	Contribution rates would vary as necessary.	Extreme situations may require large contributions from members.
Linking Retirement Benefits	Rate increases mitigated through partially variable benefits.	Contribution rates would reflect benefit requirements.	This approach would not affect GASB compliance.	Contribution rates would vary as necessary.	Extreme situations may result in significant benefit loss.
Stabilization Reserves	Stability would depend on accumulated reserves.	Sufficiency would depend on accumulated reserves.	If reserves are held in the pension trust, they could be considered plan assets for valuation purposes.	Funds held outside the pension trust might earn lower returns.	Political support required to maintain sufficient reserves.