Reserve Fund Stabilized Contribution Policy—A Model Public Pension Funding Policy

The Reserve Fund Stabilized Contribution Policy (Reserve Policy) is a potential funding policy for state and local sponsors of pension benefits that builds on standard actuarial funding approaches to achieve greater predictability in contribution rates, a lower risk of sudden spikes in employer costs, and higher levels of plan funding to ensure that future generations of stakeholders will not bear the cost of pension benefits for current public employees and retirees.

For those familiar with current practices in state and local pension plans, this Reserve Policy will be reminiscent of the funding policy used in Tennessee's hybrid pension plan design as well as the pre-funding trusts and side accounts available to participating employers participating in CalPERS and Oregon PERS respectively. While Tennessee's policy was designed to only apply to future hires participating in a hybrid plan with risk sharing, this proposal is an example of how to apply a similar policy to an existing plan without variable benefits or employee contributions.

Funding promised pension benefits over decades using financial markets will result in risk. Even if long-term return assumptions hold true, asset volatility can lead to declines in plan balance sheets and increase in the contributions needed to meet actuarial funding benchmarks. Making additional payments above the actuarial minimum can create a buffer to protect against financial market swings but that requires money and time. As a result, the Reserve Policy is expected to result in higher average contribution rates and will have limited impact on risk in the initial years of the policy. However, once a sufficient reserve fund has been developed, this contribution policy will outperform a standard actuarial funding policy in terms of reducing cost volatility, promoting intergenerational equity, and ensuring plan funding remains strong.

Per best practices for public pensions as well as the rules of this contest, incoming cash flows under the Reserve Policy from the employer contributions and transfers from the reserve fund will be equal to or greater than an appropriate actuarial contribution rate. For purposes of testing this proposal, I used a 20-year level dollar open amortization to set annual contributions, but other reasonable actuarial funding policy could be applied. Investment gains and losses are smoothed over a five-year period. The above actuarial funding policy also serves as the comparison to the Reserve Policy.

Reserve Policy—Rules and Parameters

- In any year the plan trust shall receive an amount equal to the employer actuarial contribution amount from employer payments and transfers from the reserve fund.
- The actuarial contribution shall equal the employer normal cost plus an amortization payment calculated using 20-year open level dollar amortization.
    - Contribution calculations will be based on an actuarial value of assets in which unexpected investment gains and losses are realized over a five year period.
- During an initial transition period, the employer contribution rate shall be the higher of the employer normal cost plus a fixed buffer rate or the actuarial contribution rate plus one percent.

    - The transition period used in testing this plan was 10 years, which allowed for a sufficient reserve fund to be accumulated.
    - The buffer rate was set at 2% of payroll. Thus, the minimum employer contribution rate was 7% of payroll based on a 5% employer normal cost and the above buffer rate.
- After the initial transition period, the goal of the policy is to keep contributions stable. The plan actuary will test whether the conditions are met that would allow for a reduction in the employer contribution rate or would require an increase in the employer contribution rate.
    - The employer contribution rate can be reduced if the prior year rate exceeds the current actuarial rate plus a fixed buffer rate (set at 2%). If that condition is met, the employer contribution rate will be reduced by 1 percentage point though at no point will it go below the employer normal cost plus the buffer rate.
    - The employer contribution rate must be increased if the actuarial contribution rate exceeds the prior year employer contribution rate and there are not sufficient assets in the reserve fund.
    - If the reserve fund is at least 10 times the contribution gap (the difference between the actuarial contribution rate and the prior year employer contribution rate times payroll), the employer contribution rate will remain the same and the prior year contribution rate.
    - If the reserve fund exceeds the contribution gap but is less than 10 times the contribution gap, the employer contribution rate will increase by one percentage point (or increase to the actuarial rate if that would be lower).
    - In either of the above cases, a transfer from the reserve fund equal to the contribution gap will be made to the pension trust.
    - If the reserve fund is less than the contribution gap, the remainder of the reserve fund balance will be transferred to the pension trust and the employer contribution rate will increase to the amount needed to the pay the remaining actuarial contribution amount.
- Any employer contribution in excess of the actuarial contribution rate will be deposited in the reserve fund. The reserve fund will be invested similarly to the pension trust and will be expected to generate similar returns (and suffer similar shortfalls). When the actuarial contribution rate exceeds the employer contribution rate, appropriate transfers will be made from the reserve fund to the pension trust. In addition, if the reserve fund has sufficient assets (defined as equaling or exceeding $1/10^{th}$ of liabilities), a transfer of 10% of the reserve fund balance will be made to the pension trust.
    - I compared keeping the reserve fund in cash against exposing it to the same investment risk as the pension assets and found that latter more effective at reducing contribution volatility. An intermediate approach may be optimal.

Key parameters for the funding policy described were calibrated against the example plan provided for this contest. These parameters include the size of the buffer contribution amount, the length of the transition period, the necessary ratio between reserve fund and contribution shortfall, the necessary ratio between reserve fund and liabilities, and the speed of increases and decreases in the employer contribution rate. Applying this funding policy to a real public pension plan would require a separate review of these parameters based on current funded status, cash flow, investment expectations, and policy priorities.

Testing the Reserve Policy against a more typical actuarial funding policy across 1,000 stochastic asset return trials based on 30 years of projected data shows the improvements that can be achieved using reserve funds to stabilize employer payments. Using stochastic simulations to test contribution policies allows the user to assess how different policies and different contribution parameters react to uncertainty and volatility, which offers a more useful analysis than simply applying one or several fixed investment return scenarios. The 1,000 trials applied are identical for the Reserve Policy and the actuarial funding policy, meaning that any differences in results are due to how the two contribution policies manage the underlying investment volatility.

A key set of metrics is the share of asset return trials resulting in high or volatile employer contribution rates under the two contribution policies. Specifically, I test whether the maximum employer contribution rate in a given trial exceeds 15% of payroll, whether the maximum annual increase in contribution rates exceeds 4% of payroll, and whether employer contribution rates increase at any point after the first 10 years of trial (to focus the assessment after the transition period ends). These tests assess whether the Reserve Policy reduces contribution volatility as compared to a standard actuarial funding policy. I also measure the minimum funded ratio in each trials and the ratio of assets plus reserve fund to liabilities at the end of the trials and test the share of trials with a minimum funded ratio below 60% and final assets plus reserve funds that exceed liabilities. I also measure average contribution rate over the full 30-year projection.

In addition to presenting the above information for all 1,000 stochastic trials, we present the information for the 50 trials closet to the median, the 25th percentile, the 75th percentile, and the 10th percentile, as determined by returns over the trial period. Examining different percentiles shows how the Reserve Policy is particularly effective at managing risk in a moderately low return scenario.

	Reserve Fund Policy Results						
	CAGR	Average ERC rate	ERC rate above 15%	Max ERC increase above 4%	No ERC increase after 10 years	Min funding <60%	Final funding >=100%
All trials	7.0%	9.7%	36%	11%	62%	33%	66%
Median	6.9%	8.6%	22%	8%	60%	20%	98%
25th pctl	5.5%	10.7%	48%	10%	36%	54%	10%
10th pctl	4.2%	13.5%	90%	32%	4%	100%	0%
75th pctl	8.4%	7.7%	16%	2%	92%	6%	100%

Percentile results show 50 trials clustered at the median, 25th percentile, 10th percentile, and 75th percentile of the return distribution

	Actuarial Funding Policy Results						
	CAGR	Average ERC rate	ERC rate above 15%	Max ERC increase above 4%	No ERC increase after 10 years	Min funding <60%	Final funding >=100%
All trials	7.0%	6.5%	48%	18%	27%	40%	43%
Median	6.9%	5.6%	40%	28%	16%	26%	22%
25th pctl	5.5%	9.6%	88%	30%	0%	88%	2%
10th pctl	4.2%	13.3%	100%	24%	0%	100%	0%
75th pctl	8.4%	2.6%	20%	8%	50%	6%	100%

Percentile results show 50 trials clustered at the median, 25th percentile, 10th percentile, and 75th percentile of the return distribution

The top row of each table shows that applying the Reserve Policy leads to a drop in the share of trials where contributions rates exceed 15% (36% from 48%), a reduction in the share of trials with an annual increase in employer contribution rates of more than 4% of pay (11% from 18%), and an increase in the share of trials where contribution rates don't need to increase following the 10th year of the projection (62% from 27%). Plan funding is strengthened using the Reserve Policy with 33% of trials experiencing a dip in the funded ratio (on a market value basis) below 60% compared to 40% of trials with a standard actuarial funding policy. And intergenerational equity is improved upon with 66% of trials having full funding (including the reserve fund) at the end of the projection period compared to 43% with actuarial funding. These improvements come with a cost as the average contribution rate under the Reserve Fund policy is 9.7% of payroll compared to 6.5% with actuarial funding.

The remaining rows show how the relative performance of the Reserve Policy varies across the asset return distribution. The Reserve Policy is strongest around the 25th percentile of results as the level of downward pressure from investment performance is manageable using the reserve fund. The 10th percentile shows the limitations of this approach—while risk is reduced compared to a standard actuarial policy, ultimately the actuarial losses exceed the capacity of the reserve

fund to meaningfully limit volatility. Meanwhile, the 75th percentile shows a higher cost differential between the Reserve Policy and actuarial funding (7.7% instead of 2.7%) as contributions don't decline as much in response to higher than expected investment returns.

Contribution policy choices are about balancing tradeoffs. For policymakers and plan sponsors trying to pay for promised benefits without spikes in contribution requirements that could crowd out important public spending priorities, accepting higher but more stable costs can help put pension plans on a sustainable funding path. Furthermore, by meeting full actuarial contribution requirements and leaving both improved funding levels and a reserve fund, the objective of reducing cost volatility can be met while promoting intergenerational equity and ensuring fund solvency.

Beyond showcasing a potential policy option, I hope this submission and overall contest offer usable models for policymakers and stakeholders to evaluate different funding policies.

I appreciate this opportunity to show how building on actuarial practices can result in a contribution policy that provides greater predictability to plan sponsors while promised benefits are funded without passing on costs to future generations.

Submission Information

Submitted by David Draine on 1/12/2022

I've been studying the funding, design, and administration of public sector retirement systems since 2007, as part of The Pew Charitable Trusts' work on the fiscal health and performance of state governments. Our first report, *Promises with a Price*, examined the funding challenges for state pension plans and retiree health care plans as well as promising approaches and our subsequent work has explored funding practices, plan design, risk reporting, retirement security, and investment transparency. In particular, my research has shown both the importance of actuarial funding policies in setting a minimum funding standard for pension plans as well as the need for less volatility and uncertainty for plans sponsors in funding promised benefits. I anticipate that this contest, and hopefully this entry, will offer potential options for policymakers struggling with how to sustainably fund public pension plans. This submission does not represent the position of The Pew Charitable Trusts as a whole or its Strengthening Public Sector Retirement Systems Project. If my submission is selected, I would request any winnings be donated to The Actuarial Foundation.

I would like to thank Mollie Mills, Brian Septon, and Liaw Huang for their feedback and insight that helped develop and improve this proposal.