Public Pension Stress Testing: North Carolina

TSERS and LGERS Board of Trustees Meeting
Raleigh, North Carolina
October 31, 2019

David Draine, Senior Officer
Michael Lowenthal, Manager
Strengthening Public Sector Retirement Systems

The Pew Charitable Trusts

- An independent, nonprofit and nonpartisan research and policy organization.
- "Driven by the power of knowledge to solve today's most challenging problems."
- Our mission is to:
  - Improve public policy
  - Inform the public
  - Invigorate civic life

Pew's Public Sector Retirement Systems Project

- Research since 2007 includes 50-state trends on public pensions and retiree benefits relating to funding, investments, governance, plan design, and retirement security.
- Technical assistance for states and cities since 2011.

Background

- After ten years of economic recovery, public pension debt remains at historically high levels.

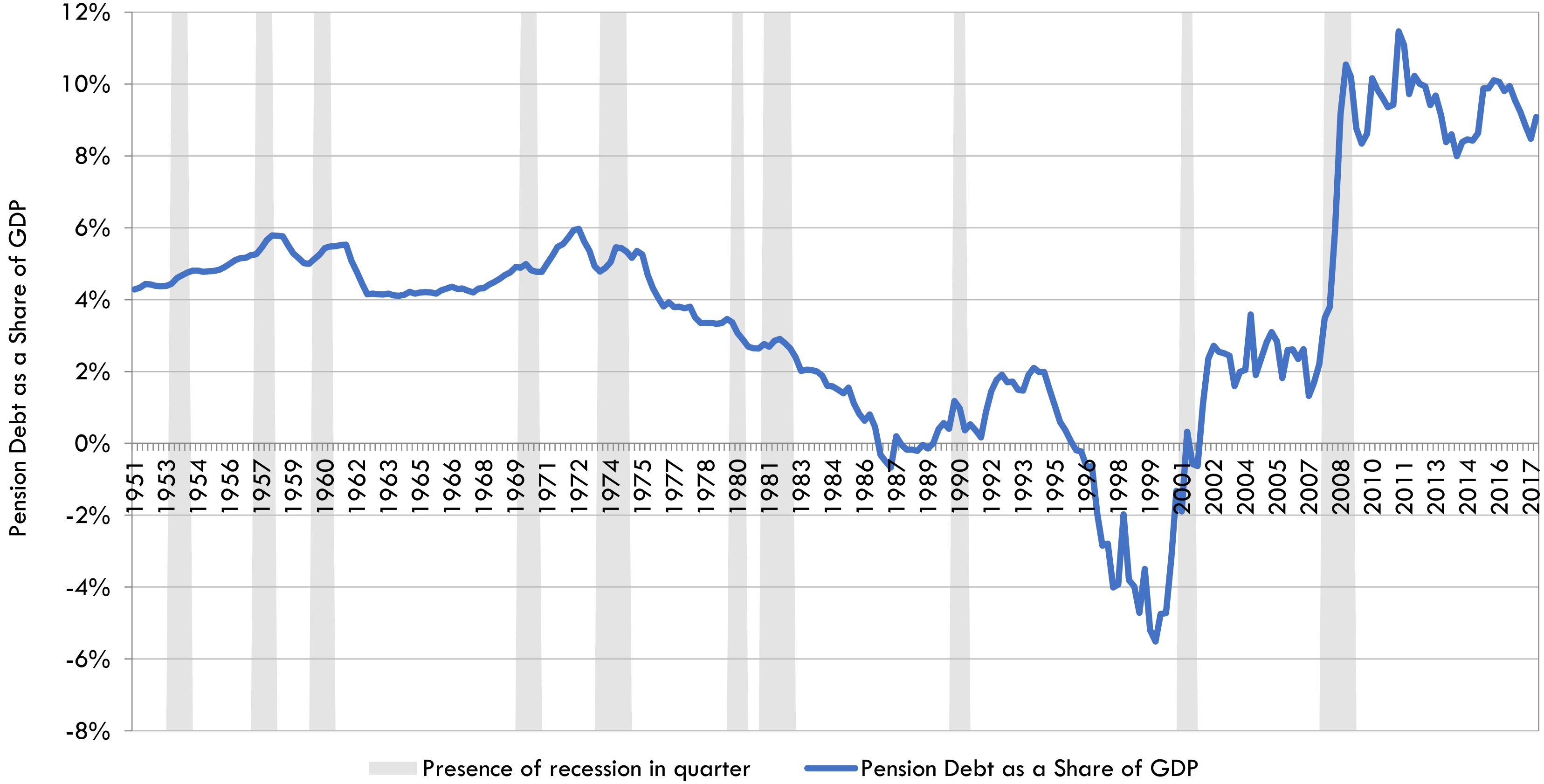
- Stress testing provides state officials with a tool to understand how pension plans and state budgets will weather the next recession.

- This is not an academic exercise: Eight states have adopted stress testing requirements since 2017. Stress test analysis prompted needed reforms in Colorado and was central to reform evaluation in Pennsylvania.

State Pension Debt Remains at Historically High Levels

(Aggregate of 50 States)

State and Local Pension Debt as a Share of Gross Domestic Product



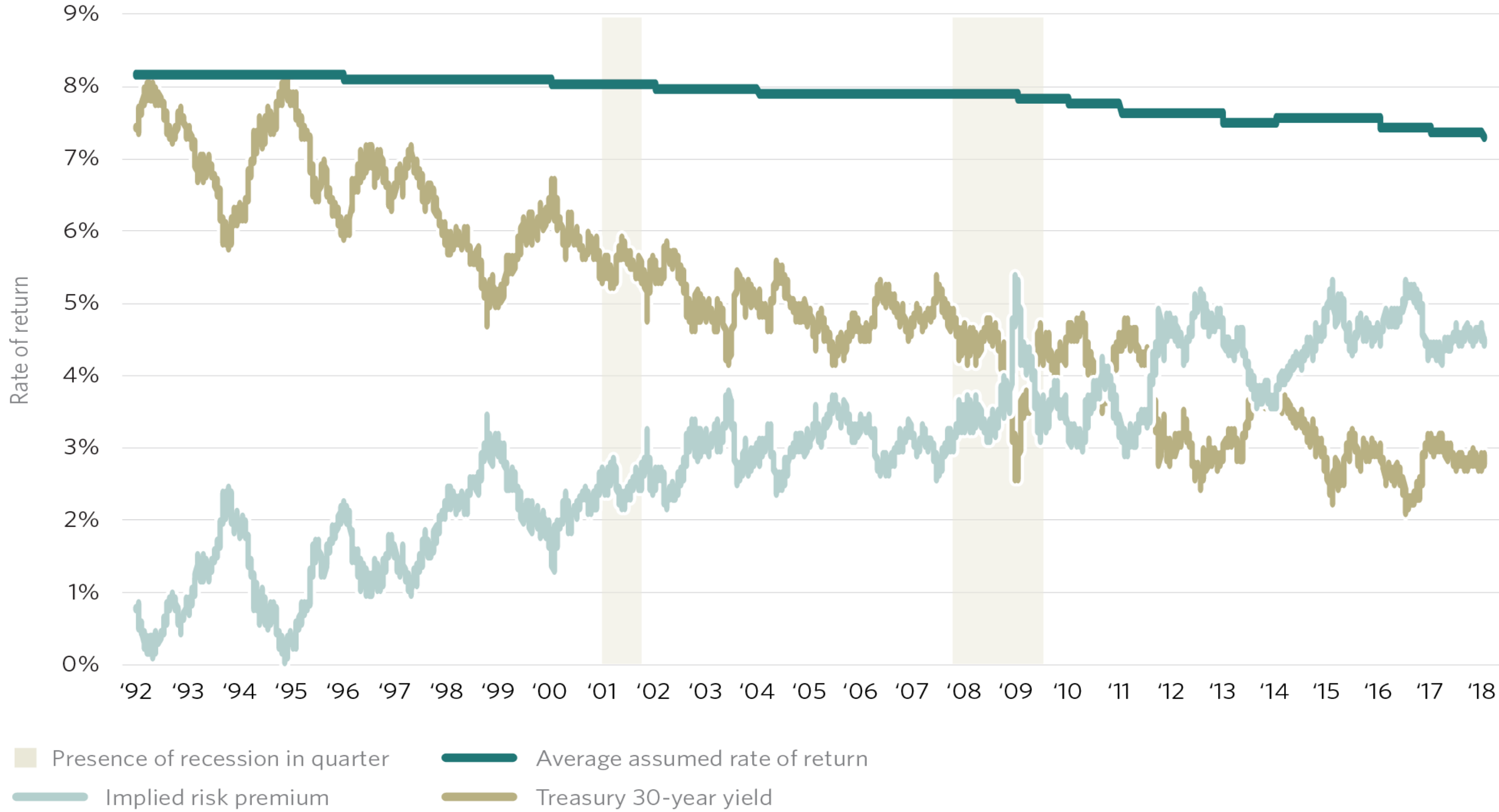
Sources: The Federal Reserve and U.S. Department of Commerce Bureau of Economic Analysis

THE PEW CHARITABLE TRUSTS

pewtrusts.org

Pension Fund Risk Premium at Historic High

Plan's average assumed rate of return remains relatively stable, while bond yields have declined



Sources: Pew analysis of comprehensive annual financial reports, actuarial valuations, and related reports from states, U.S. Treasury data, and Public Plans Data

THE PEW CHARITABLE TRUSTS

What is Stress Testing?

- A simulation technique to assess the potential impact of **investment risk** and **contribution risk** on pension balance sheets and government budgets.
- An emerging trend that aligns with new actuarial standards (ASOP No. 51.).
- A tool to help policymakers plan for economic uncertainty and the next recession.

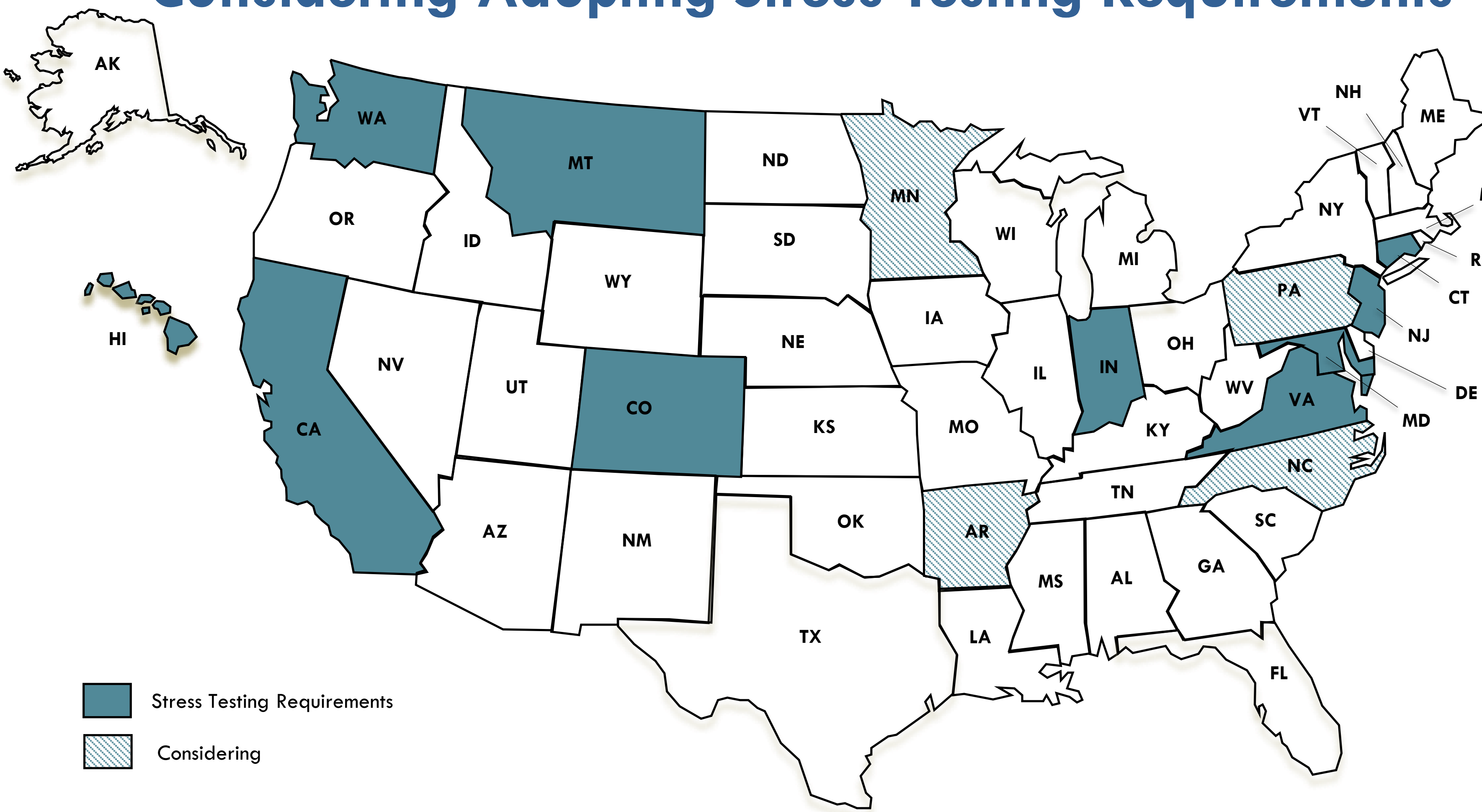
What gets Measured gets Managed!

Notes: Pew's recommended framework is detailed in the Foundation for Public Pensions Risk Reporting, The Foundation was informed by input from various academics, practitioners and other stakeholders in the field of public sector retirement and in partnership with the Harvard Kennedy School of Government; It focuses on the measurement and assessment of investment and contribution risks for public pension plans – to inform planning and decision making.

Risk Reporting Developments for Public Pensions

Since 2017: New actuarial standards have been adopted and eight states have adopted stress testing requirements.

Emerging Trend: States that Have Enacted or are Considering Adopting Stress Testing Requirements



Note: Of the states that have adopted stress testing requirements by statute, at least four (WA, CA, VA, HI) have produced at least two stress testing reports as of January 2019. Map is as of August 2019.

Not Just an Academic Exercise

Powerful tool to ensure that policies are in place to weather economic uncertainty ahead

Comprehensive stress testing can aid officials and policymakers in:

- Preparing for the next recession.
- Planning for lower returns and higher costs over the long-term.
- Managing financial market volatility through the business cycle.
- Evaluating reform proposals in a standard fashion.

Stress testing was used as a tool to help guide reforms in both Colorado and Pennsylvania

North Carolina
Stress Test Results

Fiscal Position on a National and Regional Level

- As of 2017, North Carolina's:
  - Funded ratio was 90.7% (**6th** in the nation).
  - Net amortization to payroll was 1.8% (**9th** in the nation)
  - Operating cash flow to assets ratio was -3.1% (**25th** in the nation).

- Regional Comparisons – Funded Ratio (2017):
  - South Carolina: 54.3%
  - Georgia: 79.2%
  - Tennessee: 96.5%
  - Virginia: 77.2%
  - Kentucky: 33.9%

North Carolina Stress Test

Assumptions

- Forward-looking analysis: Completed by Pew's external actuaries based on publicly available plan documents.
- Model based on **2018** AV.
- We modeled the baseline ("Baseline") as well as one alternative scenario ("Scenario 1"):
  - **Baseline**: Current plan assumptions and assumes ECRSP[1] policy continues indefinitely.
  - **Scenario 1**: Same as baseline, but continuous decrease in the discount rate to 6% in 5 basis points annual reductions.

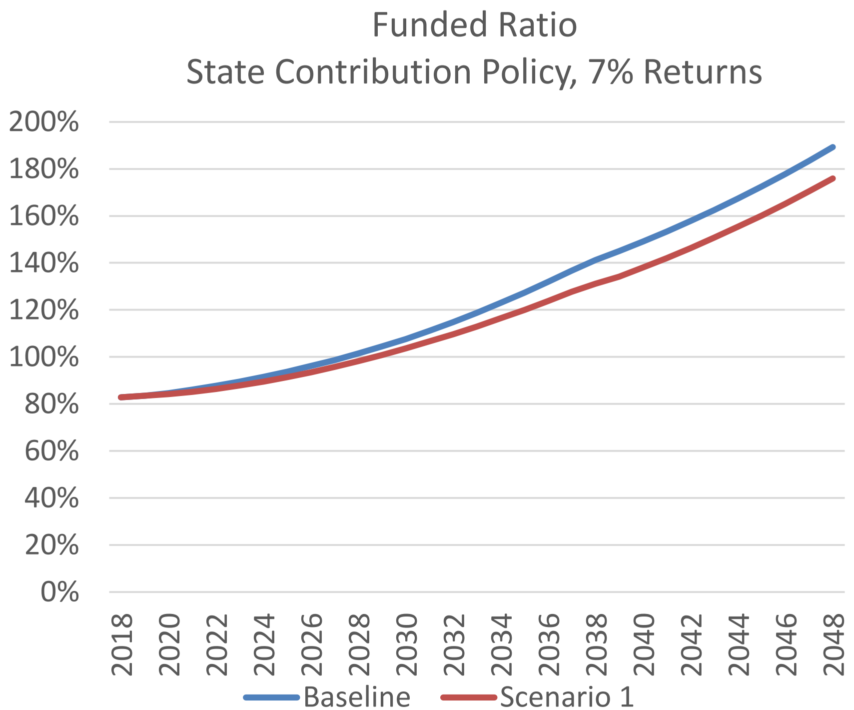
[1] We modeled the Employer Contribution Rate Stabilization Policy as setting a contribution floor as the ADEC using the plan's assumed rate of return and a contribution ceiling of the lower of the ADEC using a risk-free rate of return and 20 percent of payroll. Any year in which the prior contribution rate was between the current contribution floor and ceiling, the contribution rate is increased by .35 percent of payroll.

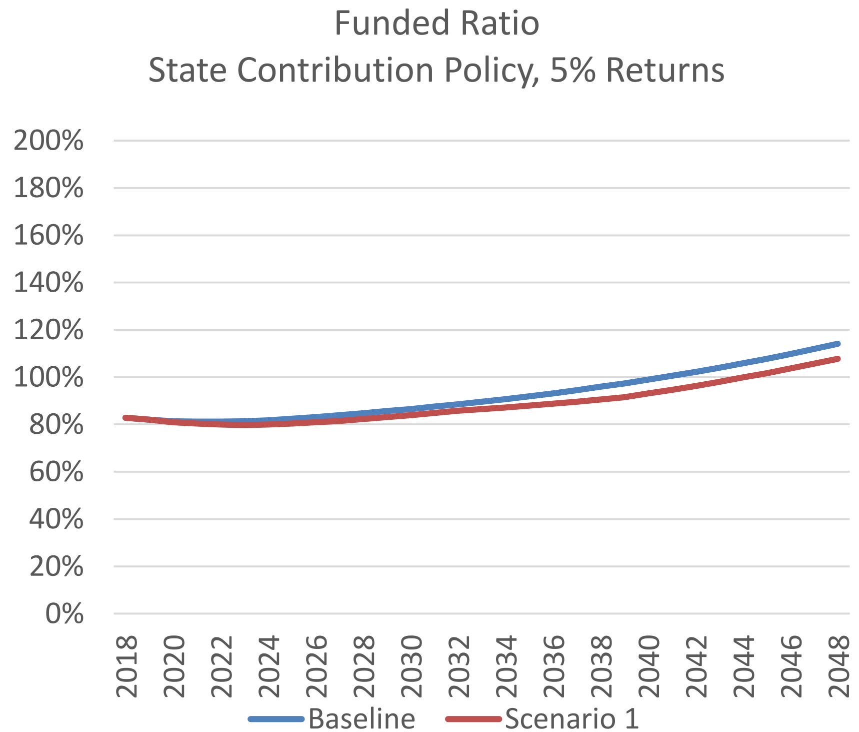
Results Highlights

1. Even in **downside scenarios**, the current funding policy sustains progression to full funding.
   - The ECRSP policy drives predictable increases in contributions that insulate the plan in downturns.
2. If the **current funding policy is not followed** and contributions remain level as a share of revenue, funding levels will decrease under a severe **recession scenario**.
3. A necessary outcome of the plan's strong funding policy is a wider range of possible contribution levels under **stochastic analysis.**
4. Both deterministic and stochastic modeling indicate the plan could consider the **policy option** of continuing to decrease the rate of return, while leaving the ECRSP policy in place, without significant impacts to costs or funding.

Funding Levels Insulated in Downside Scenarios

Strong funding policy ensures funding levels continue to improve.





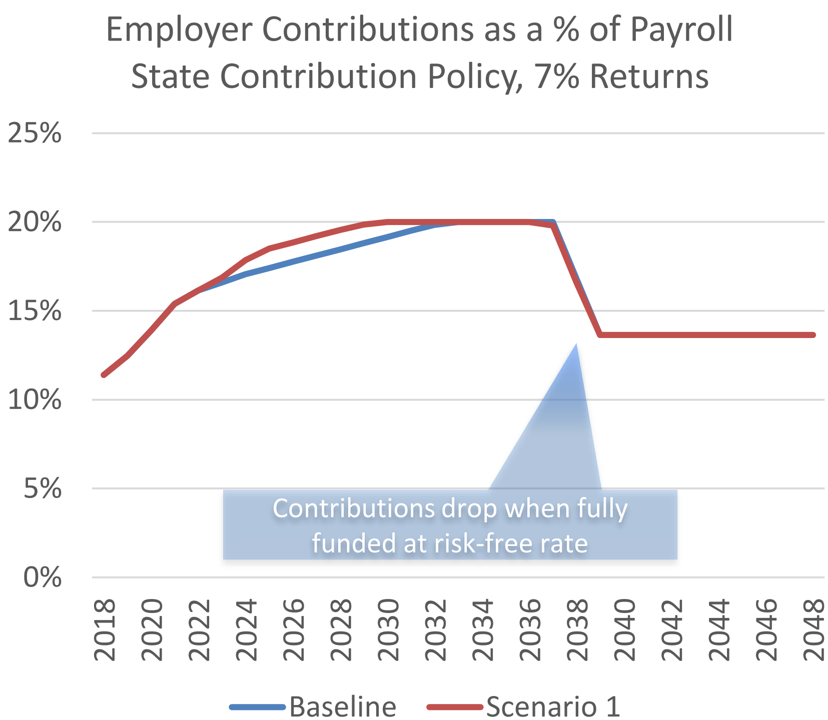
- The ECRSP policy will build a surplus if TSERS meets its investment target.
- Even a low return scenario would still see funding levels approach 100 percent.

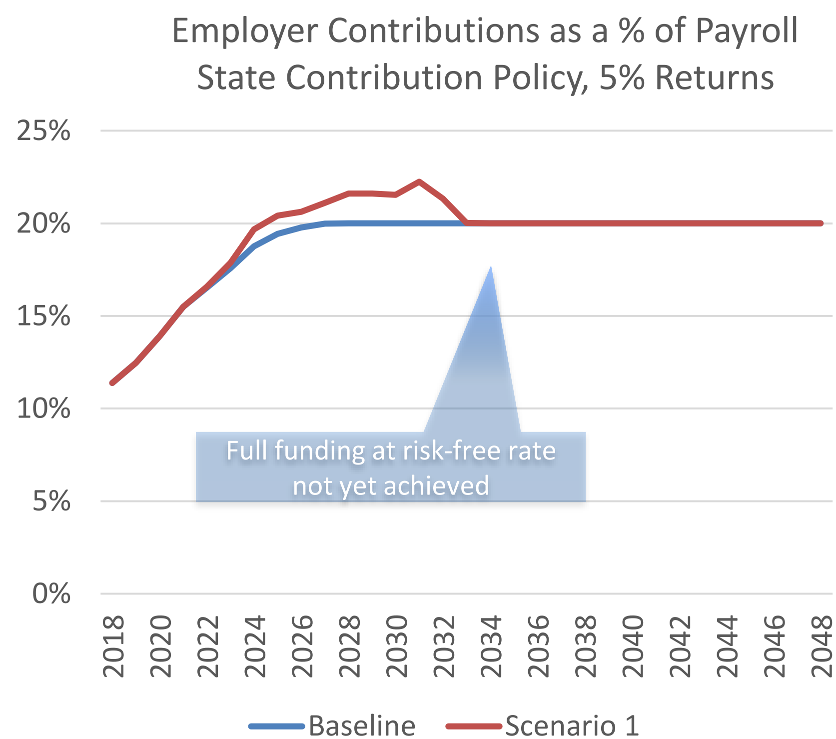
Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Costs Relatively Stable Across All Scenarios

ECRSP policy allows for steady increases in contribution rates.





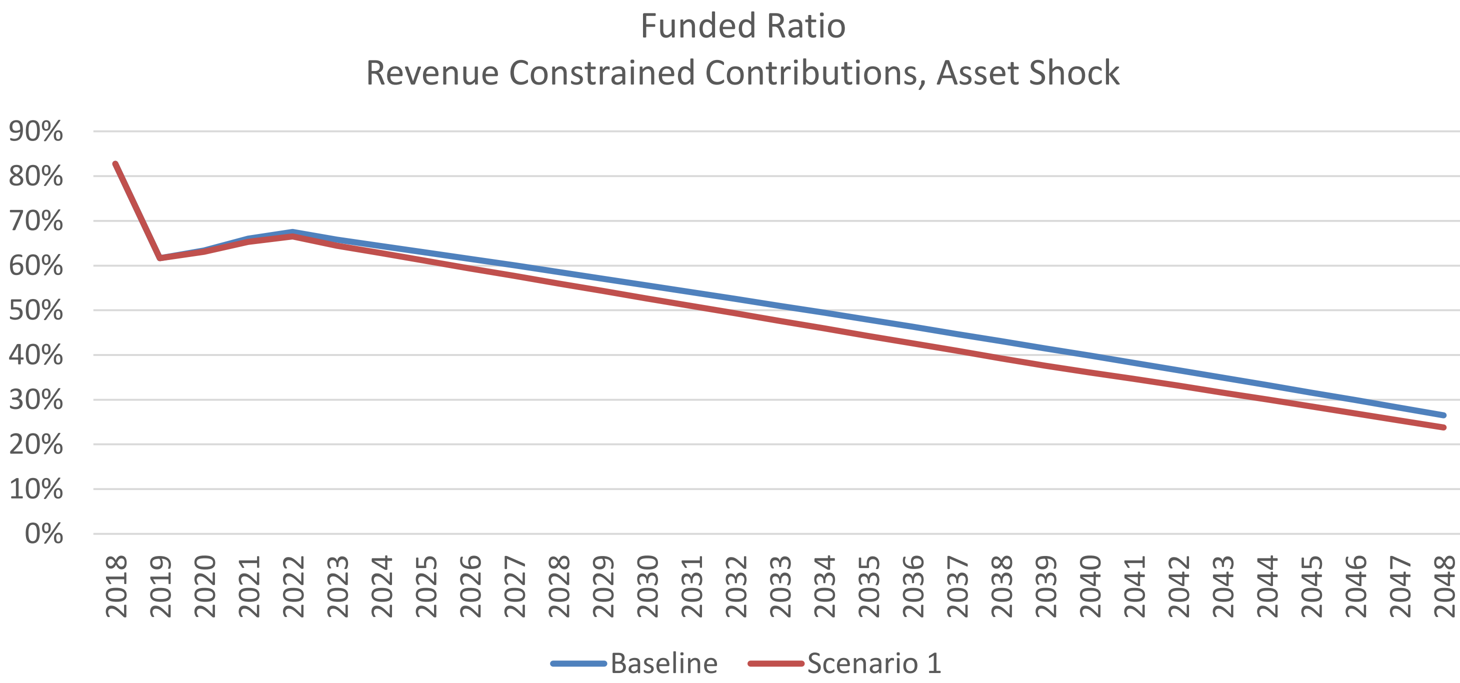
- The ECRSP funding policy will increase contribution rates to 20 percent of payroll until TSERS is fully funded using a risk-free rate.
- If the funded ratio dips sufficiently, contributions can rise above 20 percent of payroll.

Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Funding Policy Key to Sustaining Funding Levels

Funding levels decrease substantially if contributions are fixed as a share of revenue in a Great Recession scenario.



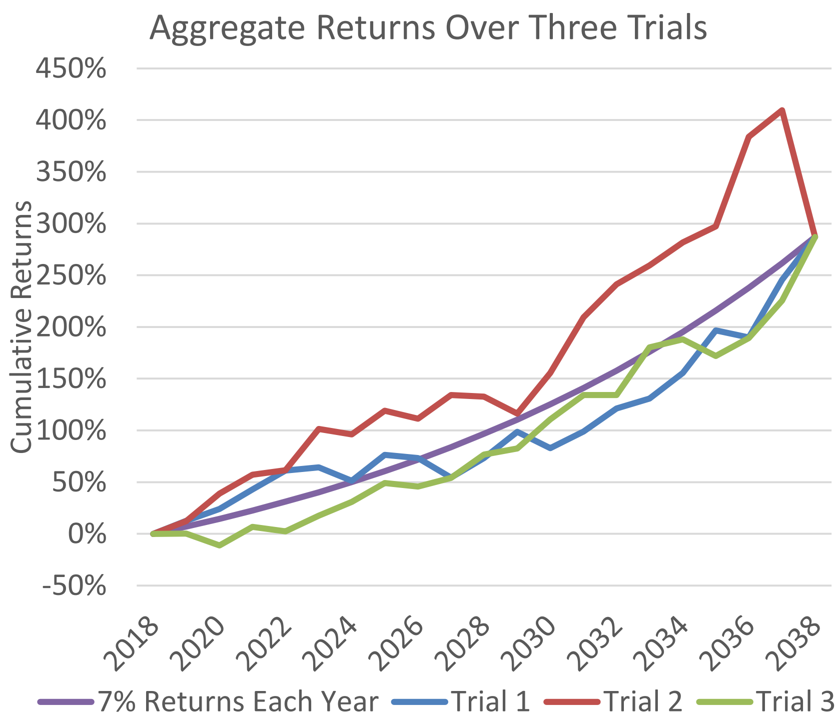
- Financing pension benefits if a severe downturn occurs would require a growing share of state and local resources.
- If contributions instead are held constant as a share of revenue, funded levels will drop.

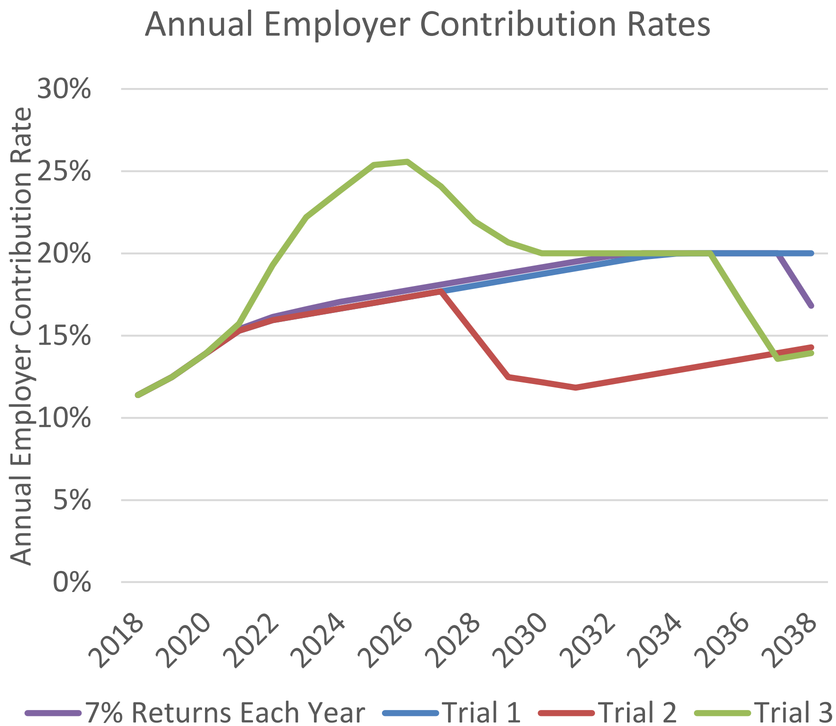
Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Responsive Funding Policy Drives Contribution Variation

12-year amortization means contributions are very responsive to losses.





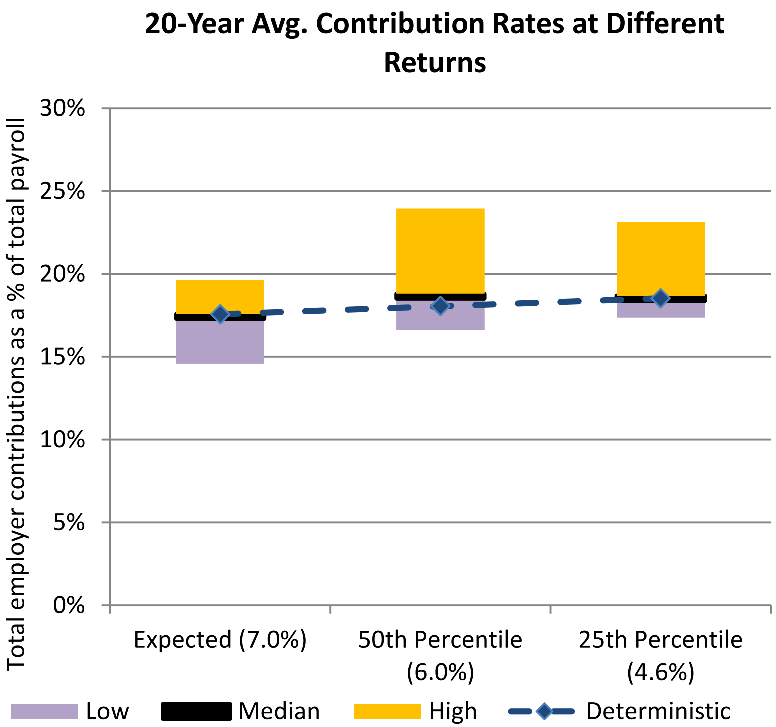
- Three trials with the same 20-year investment performance can very different results regarding contribution rates.
- All three trials reach full funding but one has contribution rates over 25 percent of pay.

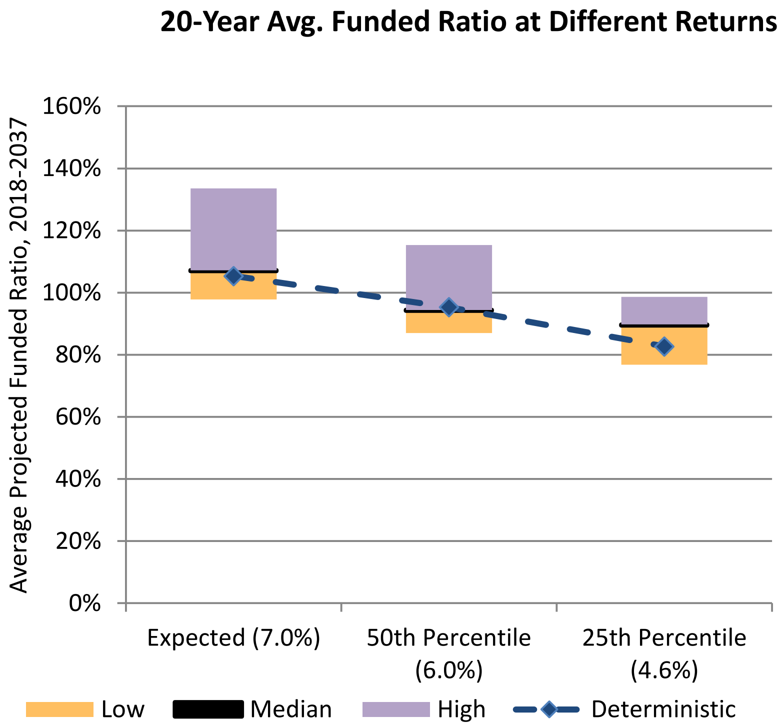
Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Simulation Analysis Shows Uncertainty

Managing year-over-year volatility in returns can be more important than planning for different long-term scenarios.





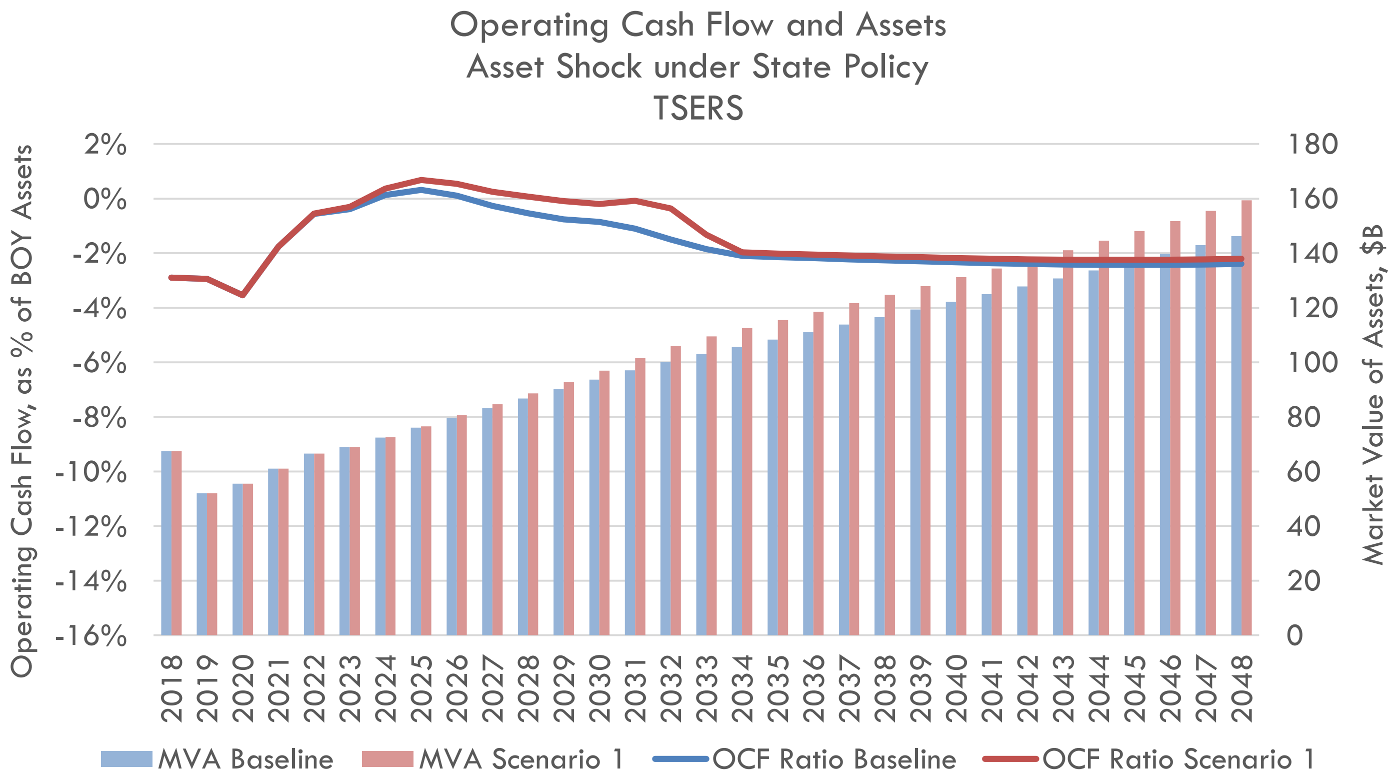
- Plan funding levels will stay relatively high even under very low return scenarios.
- If low returns happen at the wrong time, employer contribution rates could be higher than expected even if long-term assumptions are correct.

Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Plan Fiscal Position Following an Asset Shock

Cash flow becomes positive and asset levels rebound following an asset shock with low-returns. Scenario 1 builds more resilience by relying on more conservative assumptions.



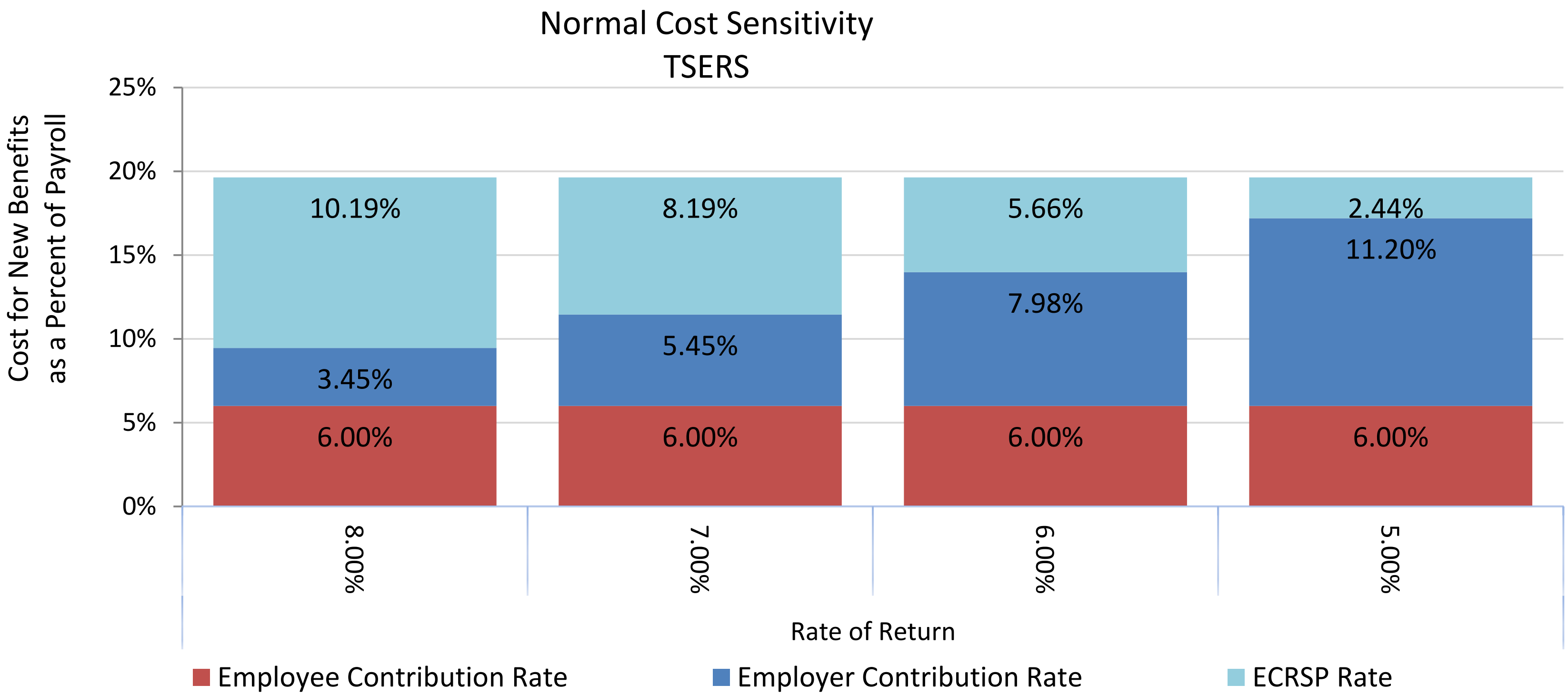
- The operating cash flow ratio is the difference between benefit payments and contributions, divided by plan assets.
- Scenario 1 results in a greater asset base due to less reliance on investments.

Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Sensitivity Analysis of New Benefit Cost

ECRSP policy ensures sufficient contributions under a range of return scenarios.



- Once full funding is reached under a risk-free rate, the ECRSP contribution becomes the normal cost calculated under the same risk-free rate.
- As a result, the baseline ECRSP contribution will be sufficient to fund benefits under a range of returns.

Source: The Terry Group and The Pew Charitable Trusts

PRELIMINARY RESULTS

Conclusion

- After ten years of economic recovery, many state pension plans could be in trouble in the next financial downturn.

- Forward-looking measures can help policymakers and stakeholders understand the outlook for their state.

- North Carolina shows especially well in stress test analysis due to strong funding policy and funding levels.

- Regular stress testing analysis, along the lines required in SB 488, would enable policymakers and plan administrators to regularly monitor the pension system and evaluate any potential changes going forward.

THE PEW CHARITABLE TRUSTS

Michael Lowenthal
mlowenthal@pewtrusts.org
pewtrusts.org/publicpensions

David Draine
ddraine@pewtrusts.org
pewtrusts.org/publicpensions

Appendix

Key Pension Terms

- **Actuarial Required Contribution (ARC) –** This is the sum of the actuarial cost of benefits earned in the current year (called service cost or normal cost) and an additional payment on the unfunded actuarial accrued liability (UAAL) called the amortization payment. Also referred to as the Actuarially Determined Employer Contribution (ADEC)

- **Assumed Rate of Return –** Estimated return on investments used by actuaries to project the rate of return on plan assets and calculate the value of plan liabilities.

- **Funded Ratio –** Assets divided by the actuarial accrued liabilities. A measure of fiscal health.

- **Net Amortization –** A measure of whether state pension funding policies are sufficient to reduce, or amortize, pension debt in the near term.

- **Pension Debt –** The difference between the actuarial accrued liability and the value of plan assets on hand. Also referred to as the Unfunded Actuarial Accrued Liability (UAAL).