Sins of the Past, Present & Future: Alternative Pension Funding Policies

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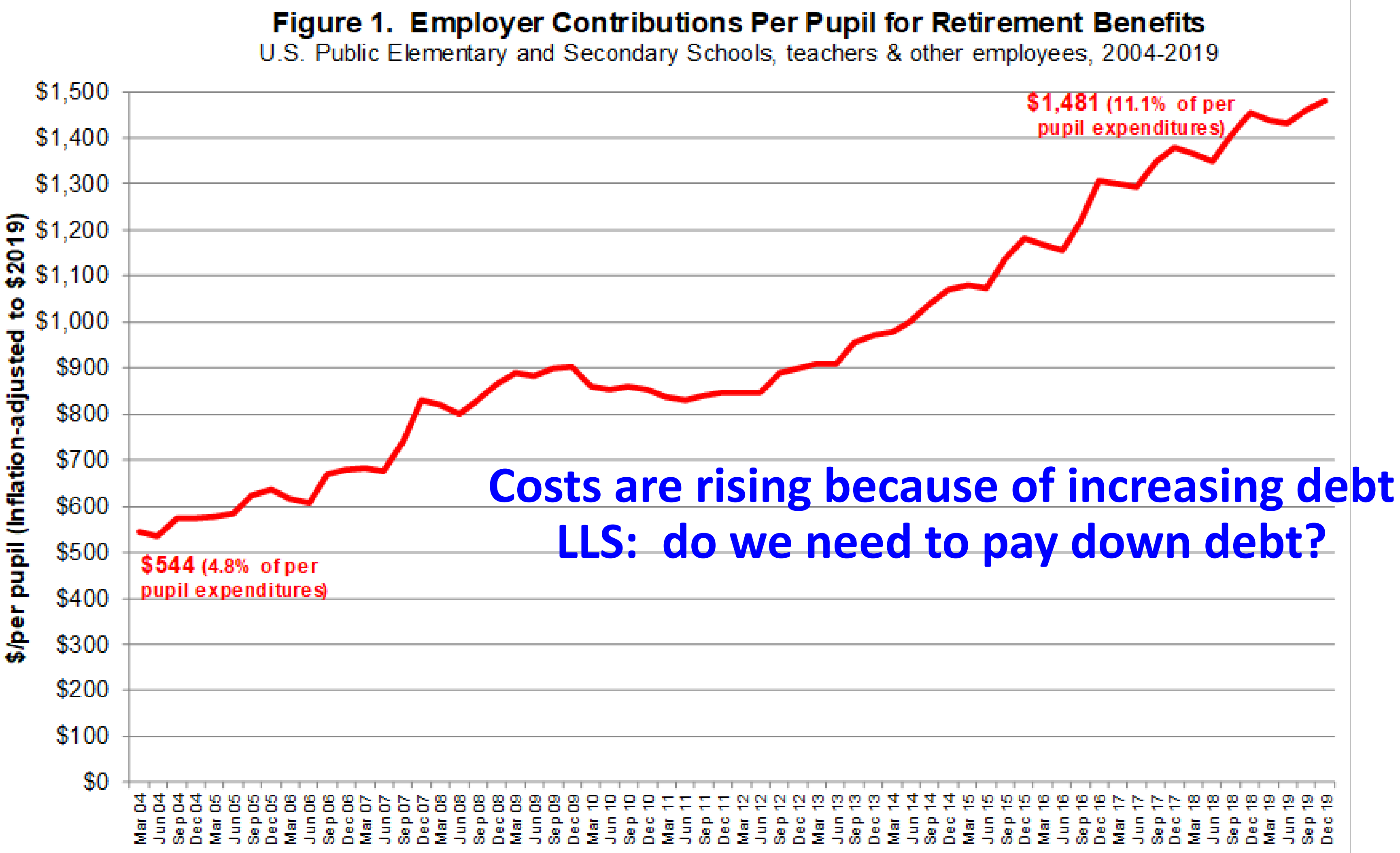
Brookings Municipal Finance Conference
July 14, 2020

Our Paper's Major Objectives

1. Better understand pension funding dynamics
2. Better **incorporate risk** into the analysis of **funding policy for intergenerational equity**

Context: Crowd Out from Rising Pension Costs



Sources: BLS, National Compensation Survey, Employer Costs for Employee Compensation;
NCES Digest of Education Statistics; BLS, CPI; author's calculations explained in Robert M. Costrell:
http://www.teacherpensions.org/blog/school-pension-costs-have-doubled-over-last-decade-now-top-1000-pupil-nationally
Note: Does not include retiree health benefits or Social Security

Pension Funding Dynamics and Policy

- Understanding key features of LLS' deterministic model
  - ➢ Debt rollover untethers asset accumulation from liabilities
  - ➢ Low-risk discount rate for liabilities but risky return on assets
    - o "Conservative discounting" (LLS, November: abstract, p. 1, 3, 15, 23)
    - o But little effect on contribution for debt rollover, **with d < r**. (Costrell & McGee, 2019, 2020a,b)
    - ❖ **Puzzle: why doesn't drop in d raise contributions under debt rollover?**
    - ❖ **Math isolates role of (i) assumed arbitrage profits & (2) delinking c from liabilities**
- Stochastic Simulation
  - ➢ deterministic vs. stochastic model
    - ❖ **What are the future risks of debt rollover policy?**
- General Policy Analysis framework for intergenerational tradeoffs with risk
  - ➢ a first stab: **current contribution vs. expected value of future contributions**
  - ➢ Extensions in future work

Basic Pension Math: Assets & Contributions

- $A_{t+1} = A_t(1+r) + \mathbf{c_t}W_t - c^p{}_tW_t$

Assets grow by investment earnings + contributions – benefit payments

A = assets on hand
W = payroll
c = contributions as % of payroll
c^p = benefit payments as % of payroll ("pay-go rate")
r = rate of return on assets

- The **funding policy simultaneously determines**:
  - **Trajectory of contributions, c_t**
  - **Asset accumulation.**
- We will look at both sides of that coin

Basic Pension Math: Liabilities

- $L_{t+1} = L_t(1+\mathbf{d}) + c^n{}_t W_t - c^p{}_t W_t$

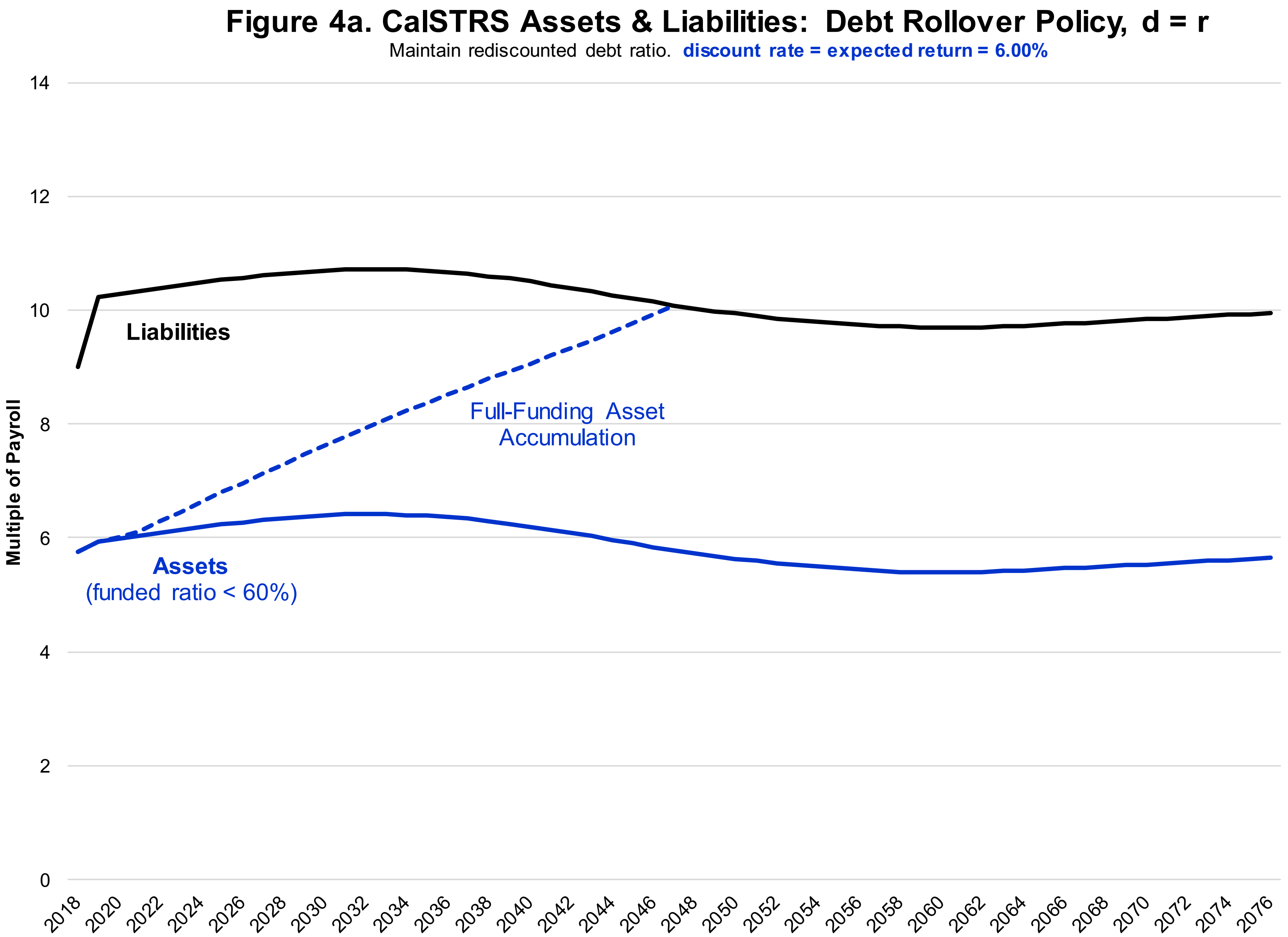
Liabilities grow by interest on old liabilities + normal costs – benefit payout

L = liabilities, the present value of future benefits earned to date
c^n = newly accrued liabilities as % of payroll ("normal cost rate")
c^p = benefit payments, which extinguish liabilities
d = discount rate used to calculate present value of liabilities

LLS sets $d < r$

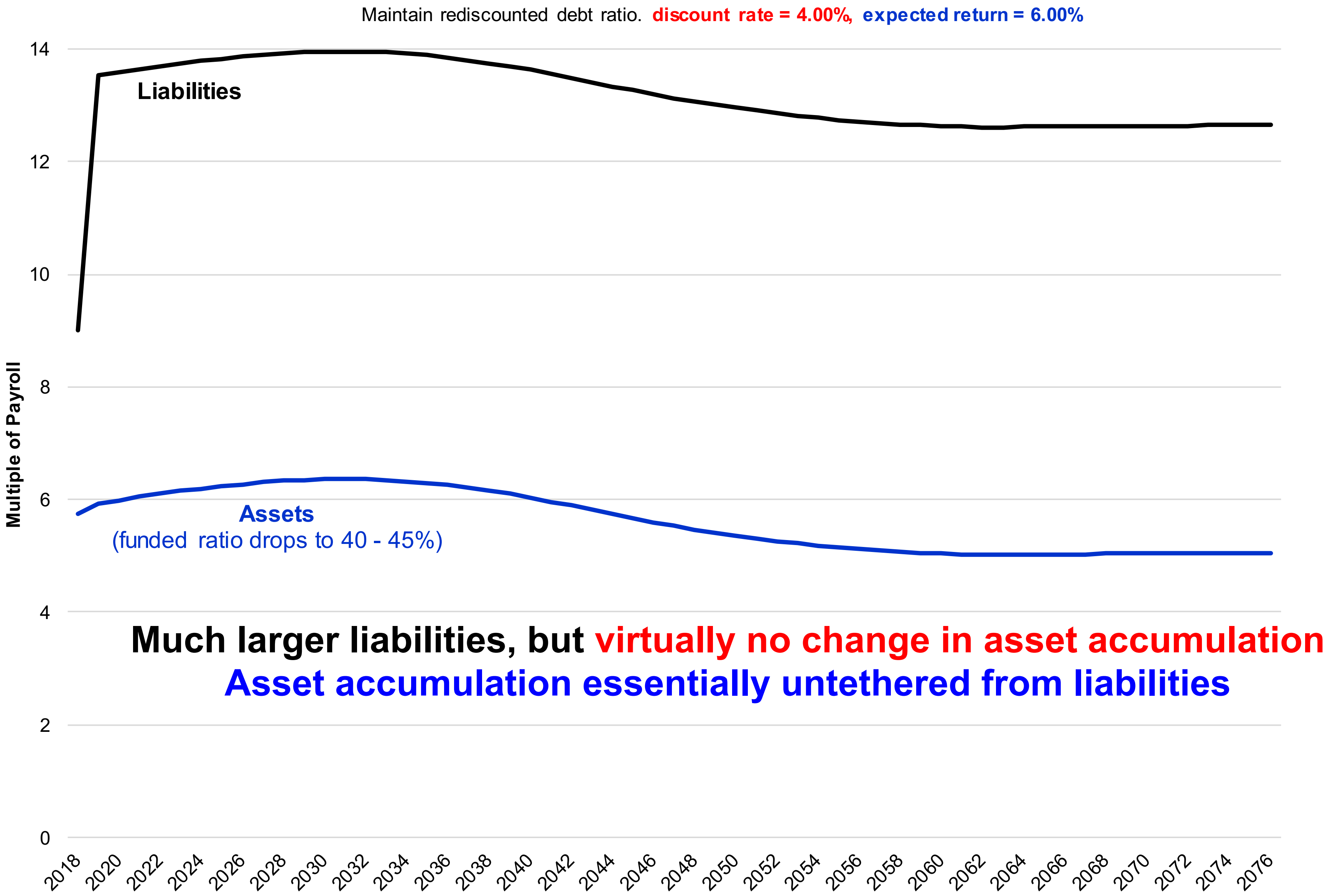
To see implications, we simulate debt rollover policy for CalSTRS
Compare $d = r = 6\%$ vs. $d = 4\%$, $r = 6\%$ in deterministic model.

Maintain Pension Debt/Payroll Ratio at r = d = 6%

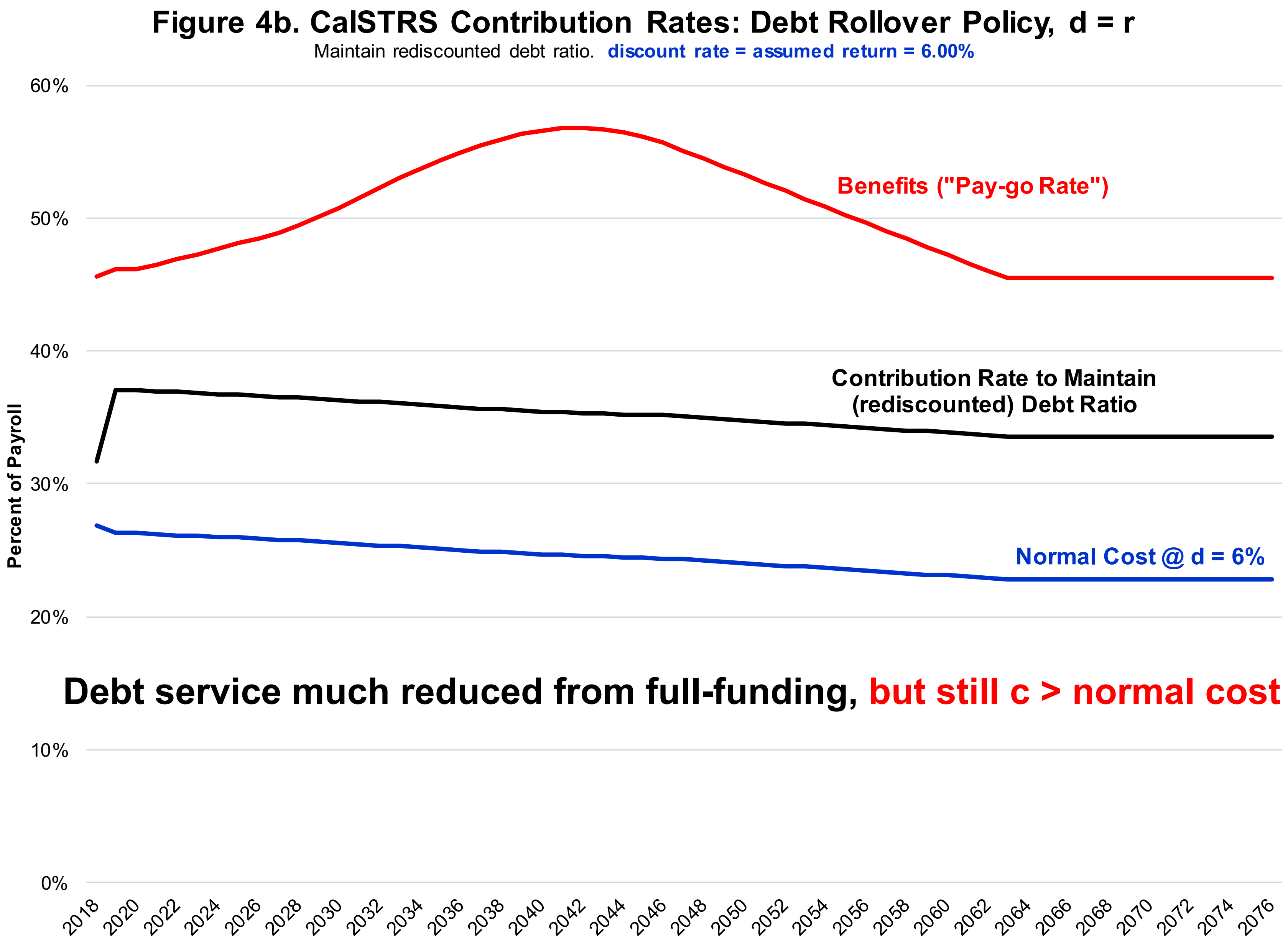


Maintain Pension Debt Ratio at r = 6%, d = 4%

Figure 5a. CalSTRS Assets & Liabilities: Debt Rollover Policy, d < r



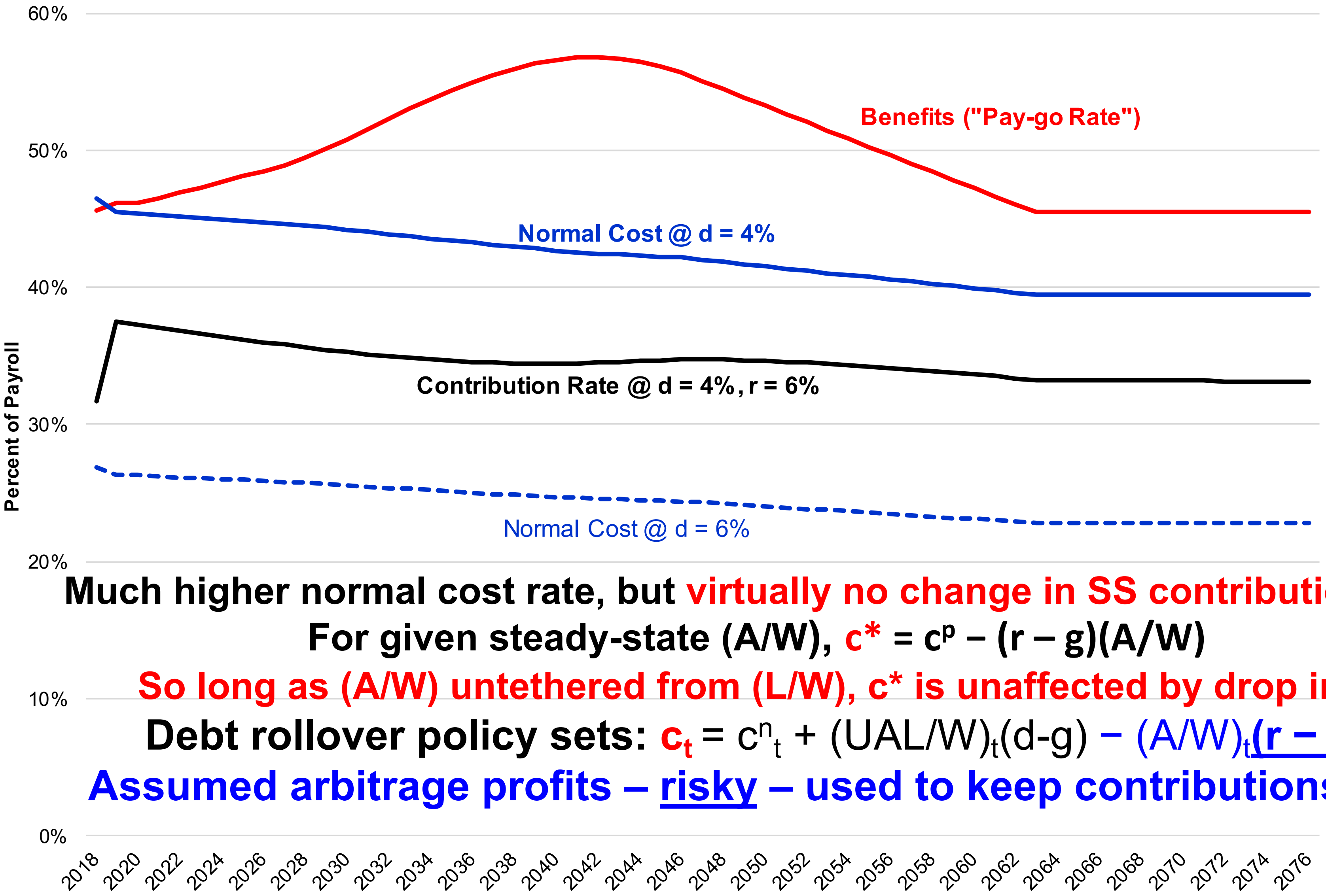
Contributions to Maintain Debt at r = d = 6%



Contributions to Maintain Debt at r = 6%, d = 4%

Figure 5b. CalSTRS Contribution Rates: Debt Rollover Policy, d < r

discount rate = 4.00%, assumed return = 6.00%



Much higher normal cost rate, but virtually no change in SS contribution rate

For given steady-state (A/W), $c^* = c^p - (r - g)(A/W)$

So long as (A/W) untethered from (L/W), c* is unaffected by drop in d

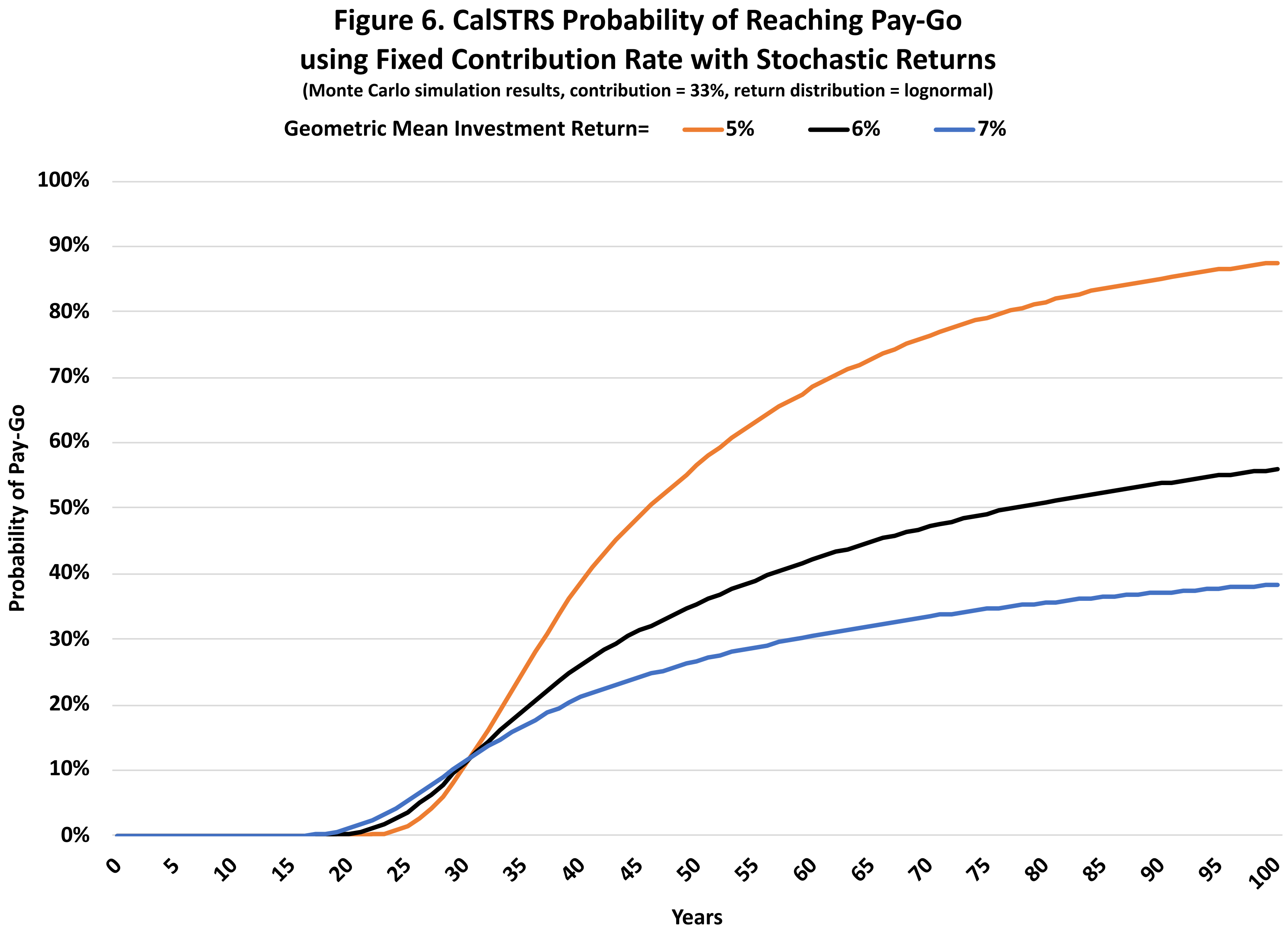
Debt rollover policy sets: $c_t = c^n_t + (UAL/W)_t(d-g) - (A/W)_t\underline{(r - d)}$

Assumed arbitrage profits – <u>risky</u> – used to keep contributions low

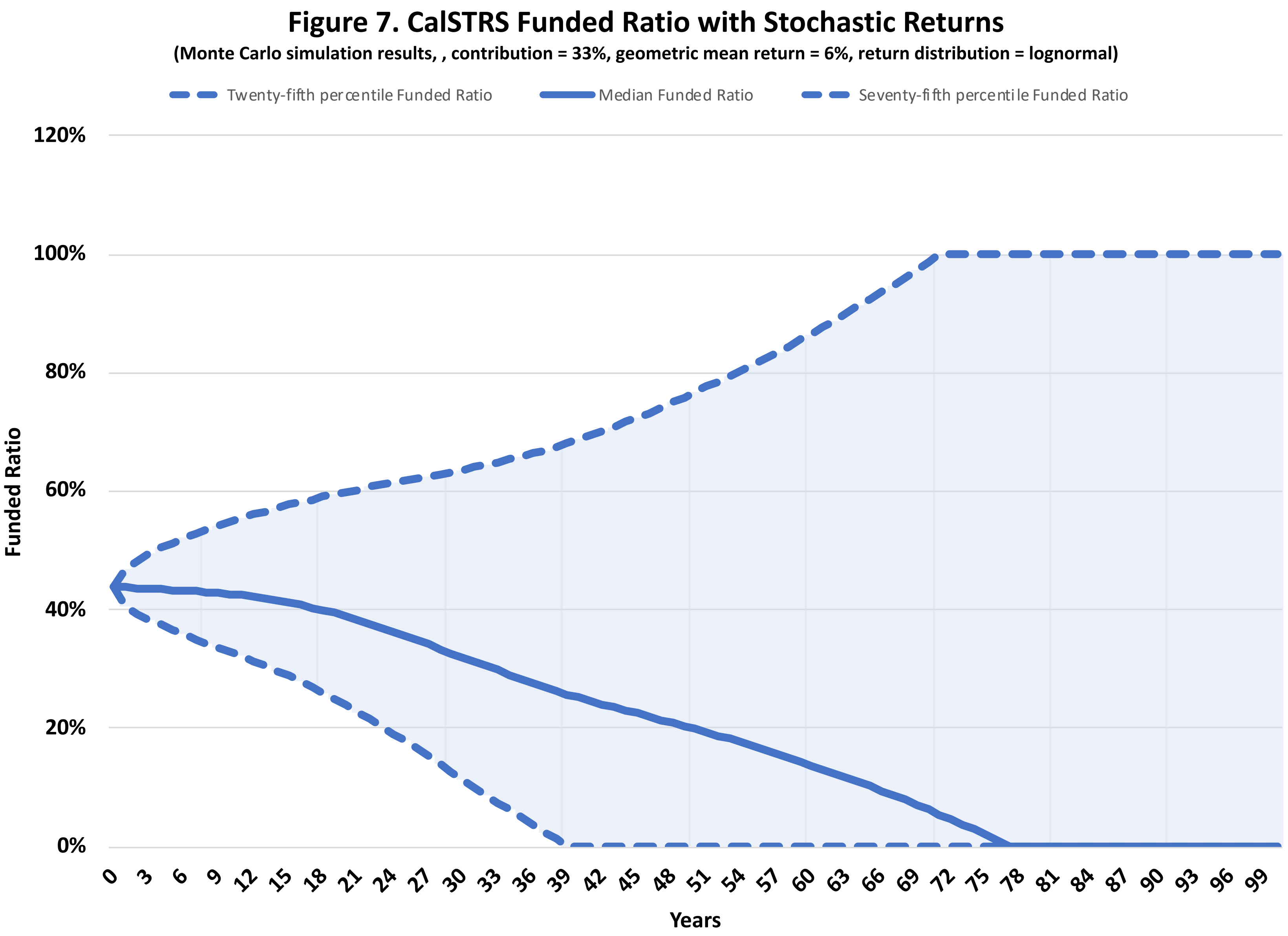
Pension Funding Risks

- **Sustainability** –> Government can't afford contributions
  - Somewhat subjective concept
  - Dependent on taxpayers' willingness to pay
  - Can be self-correcting if earned benefits and contributions are linked
- **Pay-go** –> Plan runs out of assets
  - Benefit payments would be made from annual budget
  - Would require a big increase in contributions for the average plan from ~25% to ~40% of payroll
  - Workers' benefits less secure
- **Intergenerational Equity** –> taxpayers pay more/less than cost of services
  - Pass cost of current services on to future generations
  - Can result in workers receiving vastly different compensation for the same work

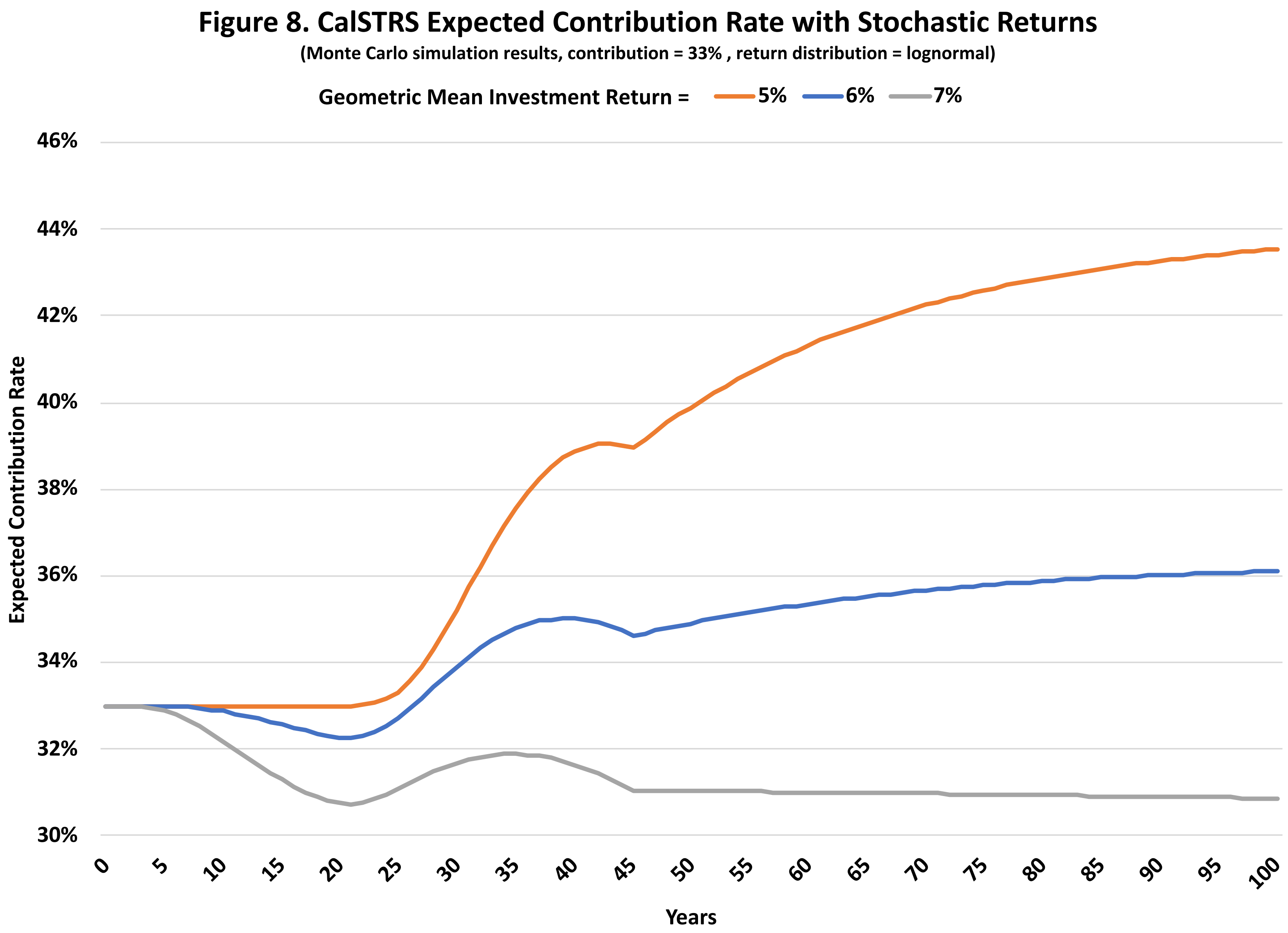
Debt Rollover Policy Would Increase Chances of Pay-go



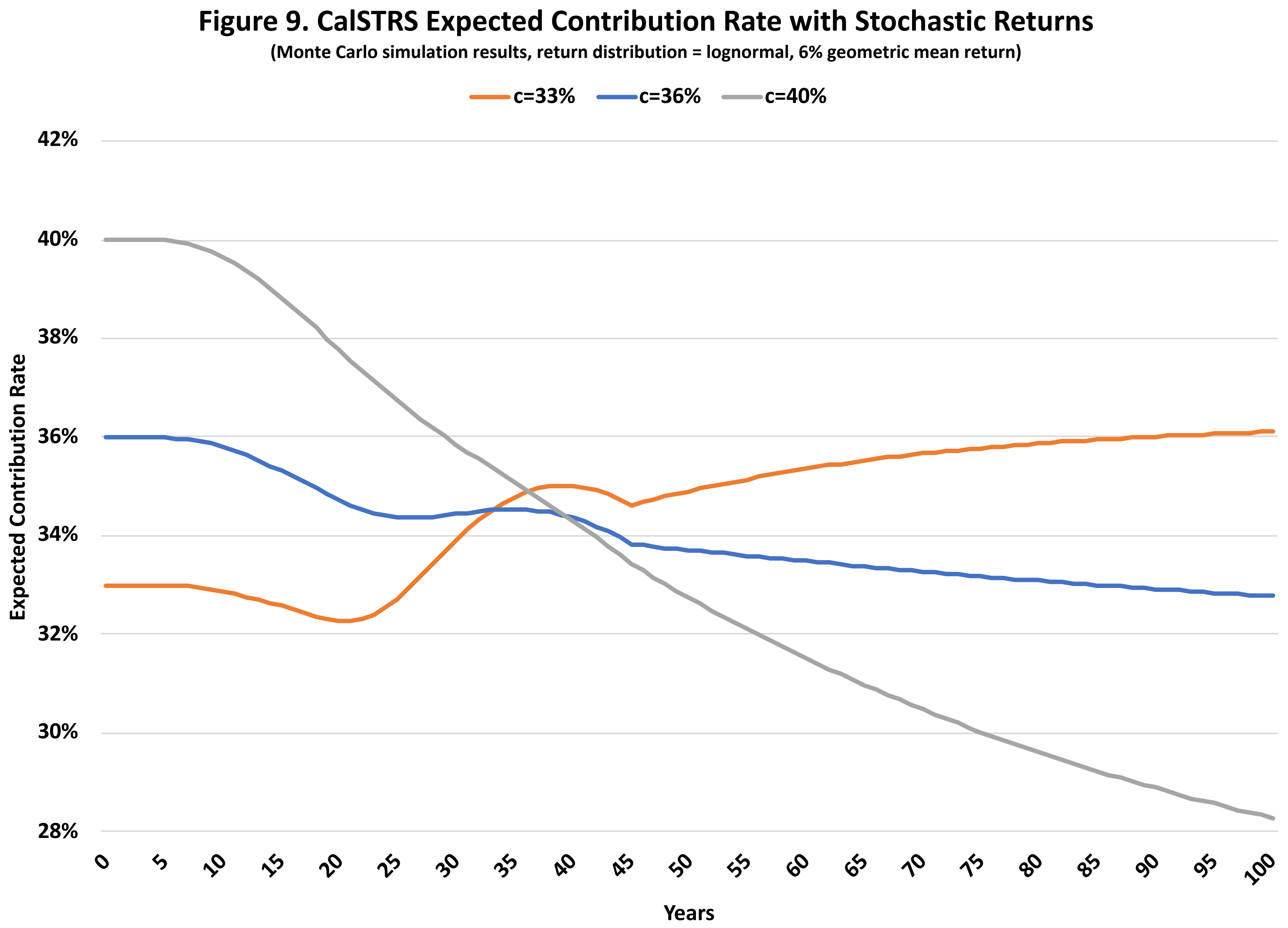
Investment Risk Results in Wide Distribution of Outcomes



Proposed Expected Contribution Rate Incorporates Risk



Lower Contributions Now Increases the Likelihood of Higher Contributions Later



Conclusions

- Debt rollover funding policy would do little to solve the generational equity challenges created by pension funding.
- In fact doing so would exacerbate those challenges by:
  - Increasing the chances of reaching pay-go; and
  - Further decoupling liabilities and contributions.
- We need to re-conceptualize how we achieve the goal of intergenerational equity in a risky world.
- Our proposed expected contribution metric is a start to better incorporate risk and its impact on future cost into funding policy deliberations.

Future Work

- We plan to expand on our expected contribution metric by:
  - Modeling continuous funding policies across a wider array of public plans;
  - Incorporating risk-aversion in our implicit social welfare function; and
  - Aggregating over time with (i) a discount rate and (ii) an intertemporal rate of substitution to characterize policy-makers' social welfare function and highlight tradeoffs.