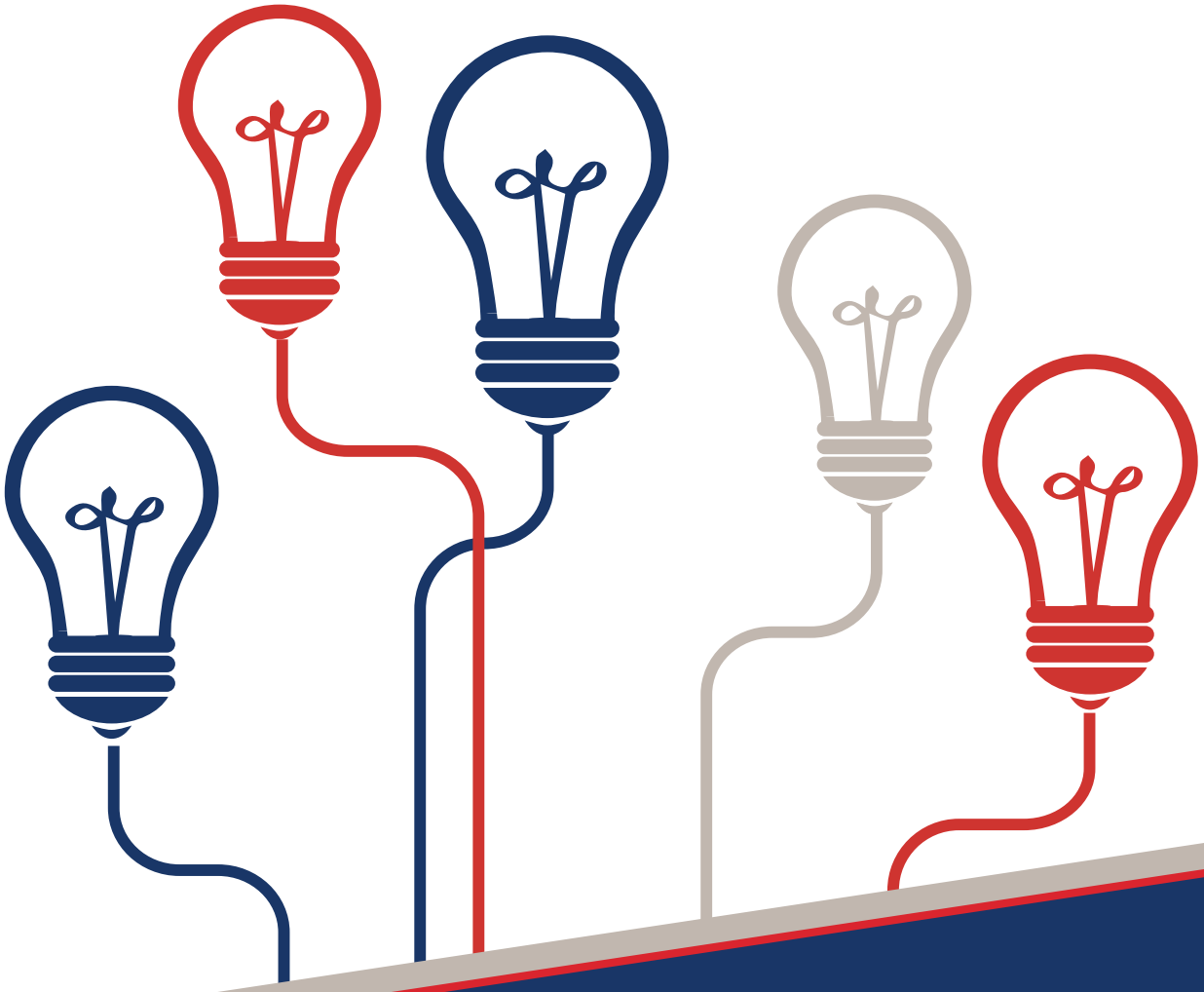
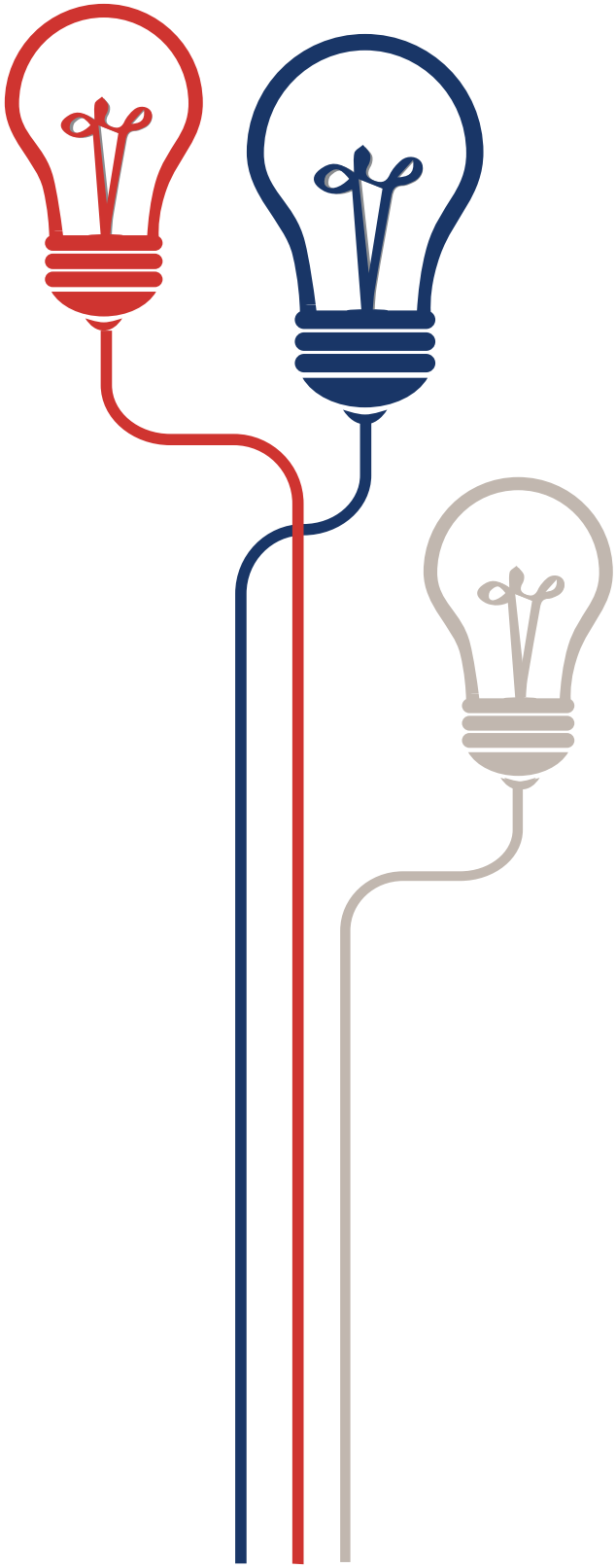


Securing Our Future: A Menu of Solutions to Connecticut's Pension Crisis

By Anthony Randazzo, Daniel Takash, and Adam Rich

YANKEE INSTITUTE for Public Policy

Reason



Letter from the Yankee Institute

Connecticut's pension crisis has been devastating for the state. The rising costs of paying for the state's pensions have led lawmakers both to raise taxes and cut services, stalling economic growth and frustrating the state's citizens.[1]

This paper provides fresh research and actuarial analysis of solutions to the problem with the current pension system. It offers state lawmakers a much-needed opportunity to analyze the causes of this crisis, and to find a lasting solution that will set Connecticut on a better path for the future.

Pension adjustments in 2011 and the December 2016 agreement between Governor Dannel P. Malloy and the State Employees Bargaining Agent Coalition (SEBAC) are not sufficient to put the state on a more sustainable path. Rising pension costs in coming years will again require either further service cuts or higher taxes. This cycle must be stopped if Connecticut is going to move past this crisis.

Of particular concern is that Connecticut's pension governance structure is much different than those of most other states. Taxpayers and their closest representatives – lawmakers in the state's General Assembly – have been largely cut out of the decision making process. Instead, the executive branch and government unions set pension benefits for years through the collective bargaining process. Also problematic is a pension board that lacks truly independent voices and balanced taxpayer representation.

To avoid perpetuating the current crisis, any reforms to the pension system must include two equally important elements: changes to how current benefits are set and paid for; and changes to what benefits future employees are offered.

1 An examination of some of these challenges can be found in Yankee Institute's 2014 study, *Born Broke: Our pension debt problem*, J. Scott Moody and Wendy P. Warcholik, PhD. https://www.yankeeinstitute.org/wp-content/uploads/2014/08/Born-Broke-full-study.pdf.

EXECUTIVE SUMMARY

There are several challenges confronting Connecticut's State Employee Retirement System (SERS): (1) the pension plan's assumed rate of return has significantly overestimated investment performance and continues to be unrealistic; (2) actual contributions have consistently been less than actuarially recommended rates; and (3) the long-term actuarial experience of the plan has not matched the actuaries' estimated costs. Each year that new state employees are enrolled in this plan, future problems accrue.

Some changes have been adopted in an effort to address Connecticut's pension problems. A December 2016 collective bargaining agreement between Governor Malloy and the State Employee Bargaining Agent Coalition (SEBAC) recommended the lowering of the assumed return to 6.9%, a positive step that will reduce at least some risk. However, on its own, this and the other changes adopted in the SEBAC agreement are not enough to ensure the state breaks out of the cycle of unfunded liability growth — the new targeted rate of return remains unreasonably optimistic and the governance problems for how funding policy is determined remain.

The SEBAC agreement also increased the total amount Connecticut taxpayers will pay to provide retirement benefits to public workers by stretching out payments on certain unfunded pension liabilities over an extra 14 years. The process of shifting debt onto the shoulders of taxpayers in the 2030s and 2040s will cost at least an extra $8 billion to $9 billion in interest payments, even without adjusting for the plan's unrealistic assumptions, which significantly understate the amount of existing pension debt. What's more, the agreement did nothing to reform the benefit design of the current system — the feature that is undermining the solvency of the whole enterprise.

This paper provides a comprehensive look at a range of policy options for Connecticut lawmakers to consider if they are serious about enacting real pension reform that stops the long-term growth of unfunded liabilities for SERS.

Potential improvements to the existing pension plan include:

1. **Lowering the Assumed Rate of Return to Around 5%**
2. **Increasing Employee Contribution Rates**

   Increasing SERS members' contribution rates to 6% would reduce taxpayer contributions by about $4.3 billion over 30 years
3. **Adopting a Cap on Compensation Eligible for Pension Benefit Determination**

   Applying a cap of $100,000 for new hires would reduce employer contributions by about $4.1 billion over 30 years
4. **Changing the Formula for Cost-of-Living Adjustments**

   Setting the COLA at inflation up to a maximum of 2% would reduce employer contributions by around $1.3 billion over 30 years
5. **Amending the Definition of Compensation to Remove Overtime**

Certainly, meaningful pension reform in Connecticut must improve the funding policy for the existing plan and adjust the benefit design to improve the solvency of SERS. But — of equal importance — Connecticut must resist any temptation to enroll new hires into the existing, broken system. A more sustainable plan design for new hires could adopt any of the following forms:

1. **A Tier IV Defined Benefit Plan** — priced with conservative actuarial assumptions and designed with cost sharing for unfunded liability amortization payments
2. **A Cash Balance Plan** — guaranteeing a fixed investment return for individual employee accounts plus revenue sharing for years with returns above the assumed rate
3. **A Defined Contribution Plan** — offering an employer rate similar to the current employer contribution plus an employee contribution that, together, would provide robust retirement benefits
4. **A Combined Defined Benefit / Defined Contribution Hybrid Plan**
5. **An Option for New Hires to Choose Between a DB-DC Hybrid Plan or Defined Contribution Only Plan**

Finally, pension reform for Connecticut must also include reforms to the governing structure for SERS. Potential adjustments include changing the management system so parties with the greatest liability — currently the taxpayers — have increased input in funding policy decisions, and reforming the process for determining contribution rates so employees and retirees share in the downside risk associated with funding policy.

INTRODUCTION

In December 2016, Governor Dannel P. Malloy announced a collective bargaining agreement with the State Employees Bargaining Agent Coalition (SEBAC) intended to address the state's then-reported $15.6 billion unfunded liability for the State Employee Retirement System (SERS). The agreement does not fix the problem of pension debt — it just lets the state pay it off more slowly with marginally more reasonable, but still unrealistic, assumptions.[2] And by "state" we mean future taxpayers.

The reason that SERS unfunded liabilities continue to grow is because the underlying assumptions for the existing defined benefit plan do not fully account for the actual long-term costs of the pension plan. At a fundamental level, the most recent SEBAC agreement does not change this calculus.

This is not to say that the problem is simply having a defined benefit pension plan; rather it is the misaligned incentives created by the design of the current defined benefit plan. The parties with the greatest liability — taxpayers — either don't know how pension finance works or have other priorities they want their elected leaders in Hartford to address. The parties with the least liability — employees — are rationally driven to attain the maximum possible benefit. But public employees actually have competing incentives – to have a fully funded plan to pay their benefits, but also to avoid a comprehensive funding policy if it drives up the perceived cost of providing those benefits.

Ultimately defined benefit pension plans can work, but only if they are *actually* funded. And in Connecticut pension benefits never have been accurately priced and paid for.

This current fiscal year the state is paying 43% of payroll to fund the benefits for new hires, but if the current defined benefit plan for new hires were priced using more accurate, conservative assumptions that reduce taxpayer risk and minimize volatility then employer contributions today would be closer to 60% of payroll.[3] Fully recognizing the kind of costs necessary to guarantee pension fund solvency would likely then foster political opposition to the very nature of the defined benefit plan. Thus, there has been little incentive during the past few decades for labor leaders to use their influence to encourage strong funding policies. It has been easier for SEBAC to support funding policy agreements that minimize near-term contribution rates while protecting or increasing promised benefit payouts.

The December 2016 SEBAC agreement does partially address one reason why SERS' unfunded liability is growing, by recommending a lower, 6.9% assumed rate of return. The proposed rate — approved unanimously by the State Employees Retirement Commission in December 2016 — does not go far enough to accurately price benefits and minimize taxpayer risks.[4] Meanwhile, the SEBAC agreement makes the problem worse by stretching out the number of years needed to pay off the unfunded liabilities while *adding $8 to $9 billion in additional interest payments on that debt* over the next three decades.[5]

What the state does over the next few years will be critical to the long-term solvency of the plan. Most of the ideas proposed in Connecticut, such as 2015 reports from the state comptroller and from the Center for Retirement Research at Boston College, have accurately focused on the funding policy aspects of SERS and some of their ideas were incorporated in the SEABC agreement. But the list of ideas presented in Connecticut has been less

2 Note: this paper will occasionally use the colloquial shorthand of pension debt when referring to the unfunded actuarially accrued liabilities of SERS. However, in practice this terminology is imprecise when technically defining the unfunded liability. The SERS unfunded liability is an accounting metric based on a range of actuarial assumptions and actual experience of retirement and mortality that makes it fundamentally different than state general obligation bonds or municipal bonds, which are instead fixed-debt products with specified yields. This difference is important because it means that unfunded liability amortization payments should not be classified as the same kind of obligation as other forms of debt in relation to the Connecticut constitutional spending cap. However, for the purposes of explaining the nature of unfunded liabilities the terminology "pension debt" can be a helpful clarifier for the lay reader, which is why we employ the term in this paper.

3 The averaged cumulative employer contribution of 43% is applicable for fiscal year July 1, 2016 to June 30, 2017 (see Connecticut SERS Roll Forward Actuarial Valuation Report as of June 30, 2015). Employer contributions for that same time frame would range from an estimated 50% to 70% depending on how conservative the changes to the assumed return, discount rate, payroll growth rate, and mortality tables.

4 Governor Malloy and Secretary Barnes Applaud State Employees Retirement Commission Approval of Pension Agreement, Press Release December 15, 2016.

5 Dec. 8, 2016 Memorandum of Understanding between the State and SEBAC.

than comprehensive in covering the range of solutions needed to fix the mess once and for all.

To fill that gap in information, this paper presents a robust set of pension reform options for Connecticut to consider, along with our own analysis of the specific challenges that comprehensive pension reform will have to address.

Part 1 provides some background on how the unfunded SERS liabilities originated, looking both at the composition of the debt as well as other recent research on SERS.

Part 2 goes into detail on the problems that pension reform needs to solve to meaningfully address the issue.

Finally, **Part 3** offers a wider range of reform options than those that have been presented to Connecticut policymakers before, as well as an analysis of how these options could lead to better long-term outcomes for the retirement system and Connecticut taxpayers.

HOW DEFINED BENEFIT PLANS ARE FUNDED

Defined benefit pension plans like SERS are supposed to be *pre-funded*.[6] This means that the contributions the plan receives during the years an employee is earning benefits — taking into account the plan's assumed rate of return on saved assets — should be enough to pay out all promised future benefits to that employee when he or she retires. This is structurally different than Social Security, where current workers are taxed to pay the benefits of current retirees.[7]

Two primary components determine how much employers and employees should contribute in a given year to fund the payment of future benefits. (1) First, the annual cost to pre-fund pension benefits earned that year by workers, known as "**normal cost,**" which is actuarially determined.

(2) Second, the cost to pay off accrued pension debt, known as "**unfunded liability amortization payments,**" that occur if normal cost is miscalculated, employers don't make their required contributions, investment returns underperform, or actuarial experience deviates from assumptions.

Normal cost is determined by an actuary, who estimates how much will be needed in the future to provide the benefits promised to existing workers, in part using actuarial assumptions about salary changes, turnover rates, disability costs, and life expectancy. Contributions for projected obligations are then reduced using an assumed rate of return on assets to figure out how much should be paid into the system's coffers in a given year to ensure long-term solvency of the system. The annual normal cost payment is divided between contributions from the employer and the employees.

In Connecticut, the portion of normal cost paid for by employee contributions varies depending on when an employee in SERS was hired. However, as is typical for most defined benefit plans, Connecticut state employees contribute only to the normal cost of their benefits, they do not contribute towards unfunded liability amortization payments.

Unfunded liability amortization payments are the annual contributions that an employer needs to pay to make up the difference between the value of the promised pension benefits and how much has actually been saved to pay for them.

In technical terms, the unfunded accrued liability (UAL) is the difference between the value of assets in a plan, and the net present value of actuarially accrued liabilities (AAL).

A common way to measure the health of a pension plan is the *funded status* (or funded ratio), which is equal to the value of a pension plan's assets divided by the AAL.

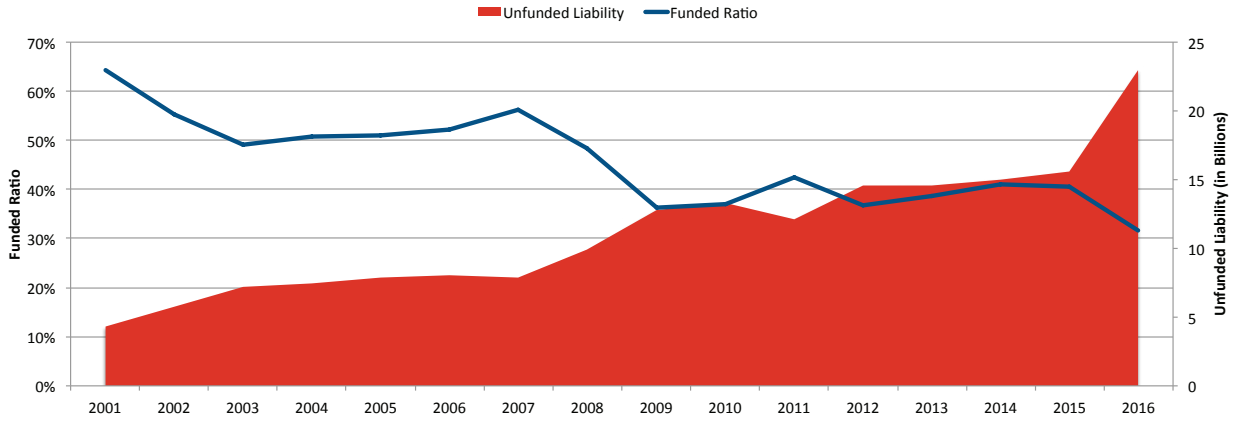
Finally, the total amount necessary to fund a pension plan in a given year is the actuarially determined contribution (ADC), which is the combined total of the normal cost and the unfunded liability amortization payment.[8]

6 This text borrows from previously published analysis by Reason Foundation. For a longer discussion, read "How Public Sector Defined Benefit Plans Are Funded," Reason Foundation, March 2016.

7 The contribution rates to defined benefit plans are actuarially determined based on the demographics and trends of the members of the plan and the particular assumptions adopted by the plan's directors. The normal cost rate for any given employee theoretically should be the contributions necessary in order for the plan to honor the promised stream of payments in retirement to that employee. By contrast, Social Security explicitly draws on the revenue from taxing active employees to pay benefits for retirees, and the contribution rates are determined through a political process that is disconnected from any actuarial analysis of the program's members.

8 The Governmental Accounting Standards Board (GASB) updated the language from annual required contribution (ARC) to Actuarially Determined Contribution (ADC) in 2012. Though the ARC terminology is still regularly used, for the purpose of this analysis we will use the term ADC.

Figure 1: Connectict SERS Funded Ratio and Unfunded Liability
2001-2015, (market value in billions)



Source: Reason Foundation Analysis of SERS Valuation Reports

If all of the assumptions used to calculate normal cost and determine the amortization payment are correct, then a pension fund that consistently pays 100% of this ADC will be fully funded — i.e. the total assets will equal the present value of the all liabilities.

As of June 30, 2016, SERS had a reported funded status of just 31.6%, making it one of the worst funded pension systems in the United States. The reported unfunded liability was $23 billion, using market valuation of the plan assets. However, SERS unfunded liabilities are likely closer to $34 billion, based on a re-valuation of promised pension benefits using a more market-valued discount rate.[9] Table 1 provides a basic summary of the financial situation of SERS, including these figures.

SERS has maintained a poor funded status for most of its history, as shown in Figure 1. Prior to 1971, it was funded on a pay-as-you-go or "pay-go" basis, where benefits received by pensioners in a given year were paid out of general fund revenues, similar to how Social Security operates. However, as discussed previously, defined benefit plans are supposed to be pre-funded. This financial failure by the state has haunted Connecticut ever since.[10]

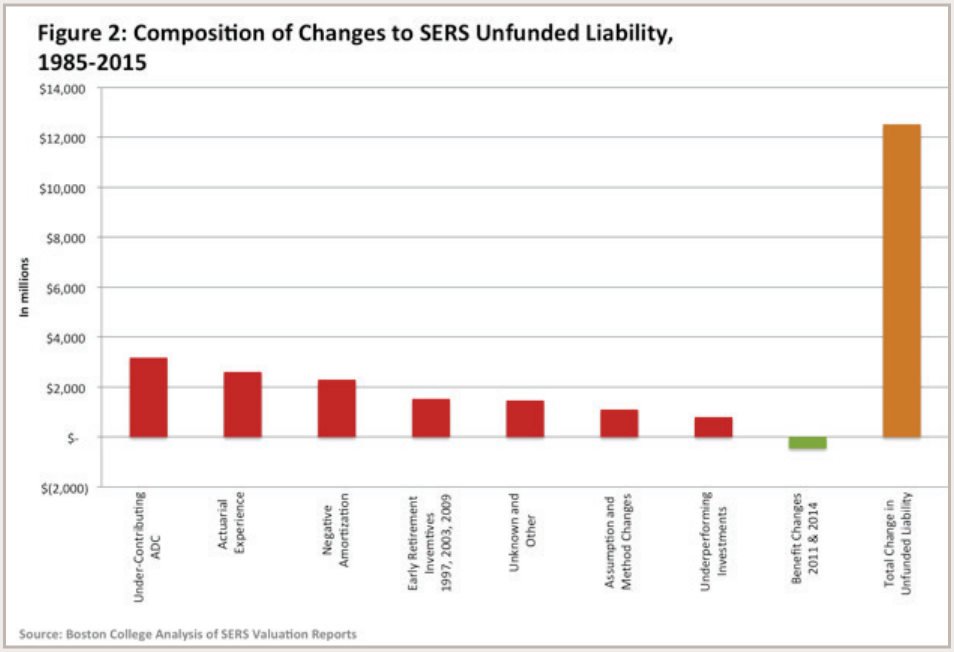
9 Estimate assumes a 5% discount rate, which reflects using yields on 30-year Treasury bonds as a proxy for a risk free rate of return plus a 200 basis point (2%) risk premium. This rate reflects the same risk spread implied by the SERS discount rate in 2001, and the method reflects the concept in financial economics that liabilities should be valued based on the risk of those liabilities, not the supposed risk of the assets.

10 In 1971, Public Act 666 changed SERS to an actuarial reserve basis, also known as a "pre-funded" plan, where funds are set aside each year to pay for the estimated cost of benefits accrued by employees in that year. Additionally, Public Act 666 gave the State Employees Retirement Commission discretion to set the future contribution levels after 1986 based on a biennial valuation report (though from fiscal year ending 1972 to 1989, the amortization schedule was set by statute). See Connecticut State Statutes, Chapter 66 Sec. 5-156.

Table 1: CT SERS Pension System Financial Summary as of June 30, 2016

Discount Rate	Market Value of Assets	Actuarial Accrued Liability	Unfunded Liability	Funded Status	Pension Debt As A % of Payroll	Pension Debt As A % of General Fund Revenue
6.9%	$10,637 million	$33,617 million	$22,980 million	31.6%	617.6%	139.9%
5.0%	$10,637 million	$44,789 million	$34,120 million	23.8%	917.0%	207.7%

Source: Reason Foundation analysis of Connecticut SERS 2016 valuation report. Note: Table provides estimated accrued liability as of June 30, 2016 assuming a 5.0% discount rate that reflects a valuation closer to market valued liabilities.



PART 1: WHERE THE UNFUNDED LIABILITIES CAME FROM

Understanding where the unfunded liability of SERS came from is fairly straightforward even when using the system's own annual reports. Every year SERS publishes an actuarial valuation that includes details on what caused asset values to increase or decrease, and what factors resulted in a gain or loss in the actuarially accrued liability. Figure 2 provides a visualization of this data over the past 30 years, originally compiled by the Center for Retirement Research at Boston College (CRR) in 2015.

Looking at the patterns in the SERS data, it is clear that the largest contributor to SERS unfunded liabilities has been actual experience diverging from the assumptions used by the plan in the past — in particular, the combination of investment return underperformance relative to assumed rates of return, people living longer than expected, and other missed actuarial assumptions.[11] The second largest contributor to unfunded liabilities has been the failure in many years for state employers to pay the full actuarially determined contribution rate. A third primary source of pension debt has been amortization schedules set at such a long timeframe that even when all actuarially determined contributions were paid they didn't always cover the interest on the unfunded liabilities, leading to negative amortization similar to when mortgage payments on a home are less than the annual interest accrued.

Actuarial Assumption Changes That Better Reflect Reality

It is important to note that sometimes the reported value of unfunded liabilities can increase following a responsible change to the funding policies of a defined benefit plan like SERS. For example, SERS periodically reviews the actuarial assumptions used to calculate the value of promised benefits, including estimates related to mortality and longevity. When the state decided in 2008 to update the estimates used for life expectancy, it meant recognizing on an accounting basis that there were more promised pension checks for SERS than originally estimated because pensioners would live longer and the plan had not been effectively keeping up with demographic changes. The subsequent change in actuarial assumptions meant reporting a higher number of liabilities and thus a larger unfunded liability. The change in actuarial assumptions themselves didn't mean more pension debt for SERS

11 When SERS experiences a divergence from previously made assumptions the amount of unfunded liability changes. For example, if employees retire later than would otherwise be assumed, there is a net decrease in the unfunded liability because pensioners contribute for a longer period of time and defer receiving pension benefits until later. Similarly, if pensioners live longer than was otherwise assumed, there is a net increase in the unfunded liability because pensioners are receiving benefits for a longer period of time.

— the number of checks SERS pays out in retirement benefits still depends on how long people live. Rather, *the change in assumptions changed the accounting for that reality.*

This is an important point of emphasis because one of the reported factors in Figure 2 is the growth in unfunded liability due to the change in assumptions. These changes didn't add more debt; they were just a way to more accurately report how much debt actually exists. And to the extent that actuarial assumptions need to change again this will mean recognizing an even larger amount of unfunded liabilities than currently exists.

Why the Debt Continues to Grow

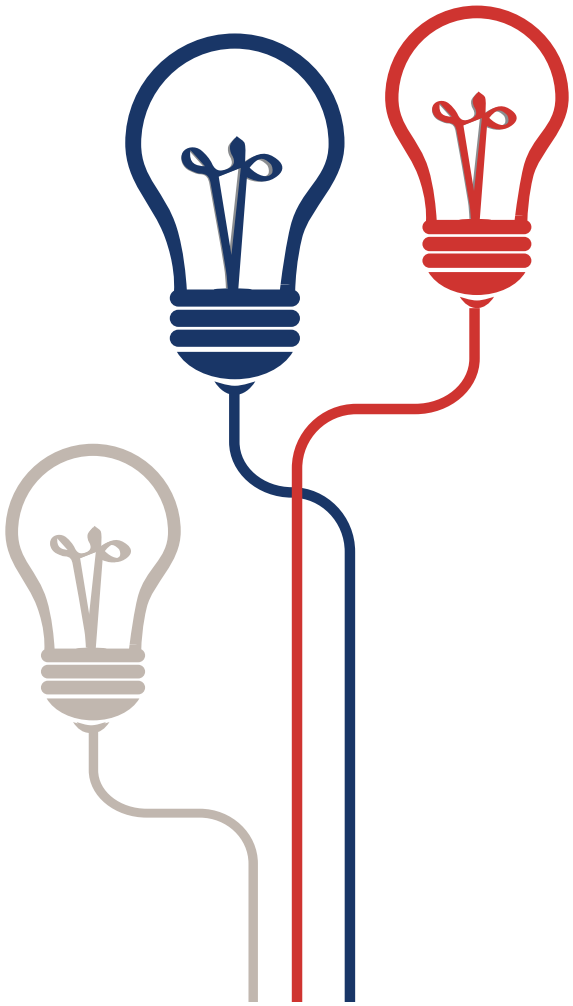
One factor that a 30-year snapshot of SERS experience beginning in 1984 does not capture is the state's pre-1971 funding policy failures. CRR provides a good history of this practice, in which the state abdicated from the pre-funding principles of a defined benefit system and chose instead to simply pay for vested retirement benefits as they materialized — a "pay-go" style similar to how Social Security operates.[12]

Without a doubt, this legacy debt is a structural component of the struggles SERS faces with its pension debt. But the debt has continued to accumulate even in the years after Connecticut started to pre-fund the promised benefits. The pre-1971 legacy debt is a problem, but not the primary problem.

The financial crisis added another large portion of unfunded liabilities to the system, with the large investment losses of 2008 (-4.80%) and 2009 (-18.62%).[13] But gains in 2010 (13.45%) and 2011 (21.39%) offset these losses (the annualized return over these four years was 7.8%). This, suggests that the crisis itself while being *a* problem is also not the *primary* problem.[14]

So what is the fundamental problem with SERS? Why do unfunded liabilities continue to grow? Why has SERS experienced a $12.5 billion increase in unfunded liabilities since 1984?

As reflected above in Figure 2, the critical failure of



SERS has been the underlying operational architecture for its defined benefit plan — including (1) the actuarial assumptions about investment returns, retirement behavior, and longevity; (2) amortization policies for the existing unfunded liabilities that made matters worse; and (3) the lack of a requirement that employers make all necessary contributions.[15] These and other problems are outlined in more detail in the next section.

12 Jean-Pierre Aubry and Alicia H. Hunnel (2015), "Final Report on Connecticut's State Employees Retirement System and Teacher's Retirement System," Center for Retirement Research at Boston College, p. 6.

13 Connecticut SERS Valuation Report as of June 30, 2008, p. 19 and Valuation Report as of June 30, 2010, p. 14.

14 Connecticut SERS Valuation Report as of June 30, 2011, p.16.

15 These finding are similar to those of the Center for Retirement Research's 2015 paper, but with a slightly different emphasis on the primacy of different causes. The primary difference is that we see pre-1971 legacy debt as something that exacerbates the structural problems of SERS rather than the leading factor for today's unfunded SERS liability. In our view, the pre-1971 legacy debt would have been much less of a problem today if not for the funding policy failures and the misalignment of actuarial assumptions with actual experience. Also, while we do not quibble with CRR's identification of pre-1971 unfunded liabilities as larger than post-1971 unfunded liabilities, this is, in part, a function of time, as those liabilities are simply more mature. And, again, if the pre-funding policies adopted for SERS had been more conservative over the past 45 years that pre-1971 legacy debt would not be as troublesome for Connecticut.

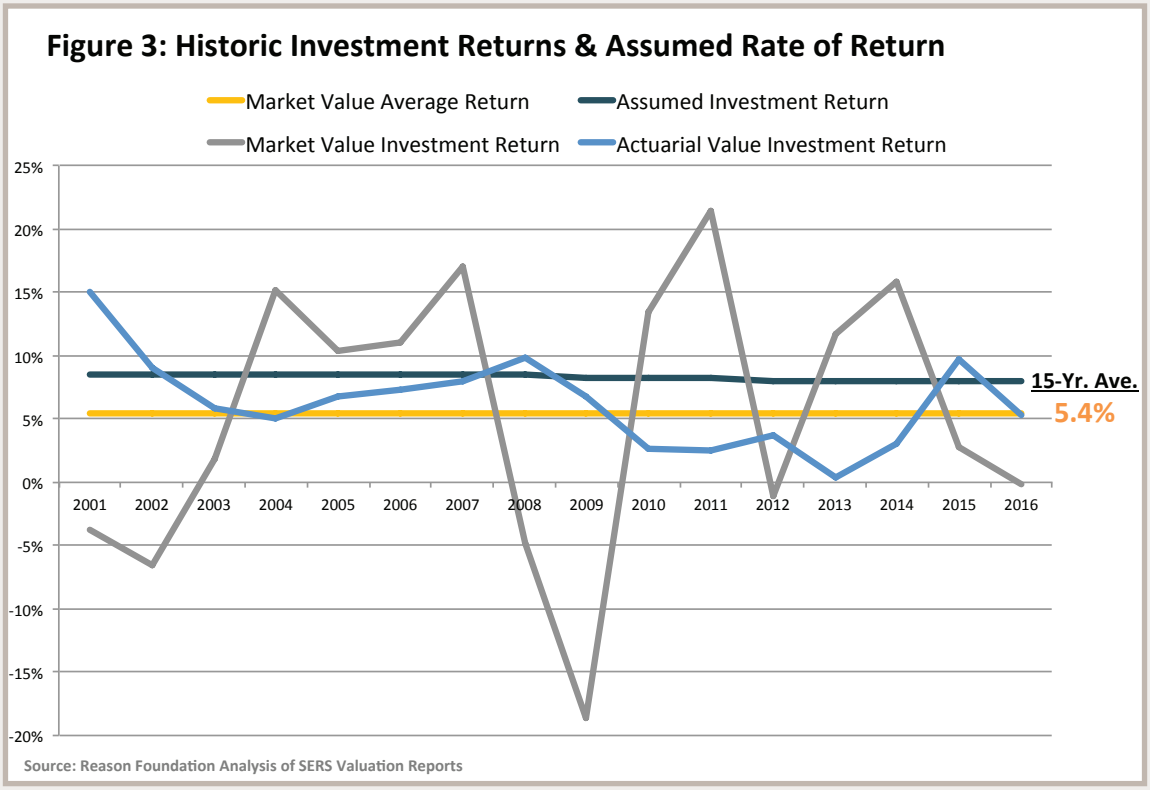


Table 2: SERS Investment Return History, 1997 to 2016	
Current Assumed Return, as of February 2017	6.9%
10 Year Average Return, 2007-2016	5.1%
15 Year Average Return, 2002-2016	5.4%
20 Year Average Return, 1997-2016	6.8%

Source: Reason Foundation analysis of Connecticut SERS valuation reports. Note: The State Employee Retirement Commission voted to adopt a 6.9% assumed rate of return in December 2016.

PART 2: THE PROBLEMS TO BE SOLVED

Problem 1: Underperforming Asset and the "New Normal" for Investment Returns

Over the past 15-years, SERS has averaged investment returns of 5.44%. However, over that same timeframe — from 2002 to 2016 — the assumed return has ranged from 8.5% to 8%. These persistent underperforming returns have added roughly $3 billion to unfunded liabilities.[16]

Figure 3 shows the actual market-value returns for SERS over the last 15 years compared to both the assumed return and actuarially valued return. This snapshot reflects recent market trends, including the financial crisis. While pension plans invest for the long-term, using long-term averages does not always provide helpful benchmarks for the health of a pension plan today, because of shifts in market fundamentals (as discussed below). However, as shown in Table 2, whether measuring SERS over the near-term (i.e., 10-years) or long-term (i.e., 20-years), the average returns are less than have been assumed in the past.

16 SERS Valuation Reports show about $2.9 billion in additional unfunded liabilities added between 2001-14. Center for Retirement Research (2015) estimates $3.2 billion over that time period. Investment returns in 2015 and 2016 were below the assumed rate, meaning this number will have only increased since the last valuation reports.

Average Returns Are Trending Downward

A fairly common principle of investment is that past performance is not always a good indicator of future performance. In the context of pension funds like SERS, it is important to recognize the significant shifts in how institutional investors are allocating assets in their portfolios and why market forecasts based on current conditions are more important than historic performance.

In the 1990s, pension funds could earn 7% to 8% returns on bonds and fixed income products alone. This meant they could achieve stable returns with less risk than is taken with stocks by allocating a large share of their portfolio to safer assets — *if* pension fund managers wanted to take a conservative approach. However, over the past several decades the yield on 30-year U.S. treasuries has fallen to less than 3%, while yields on 10-year treasury notes are earning less than 2%. At the same time, investment returns on global fixed income investments have also declined substantially.

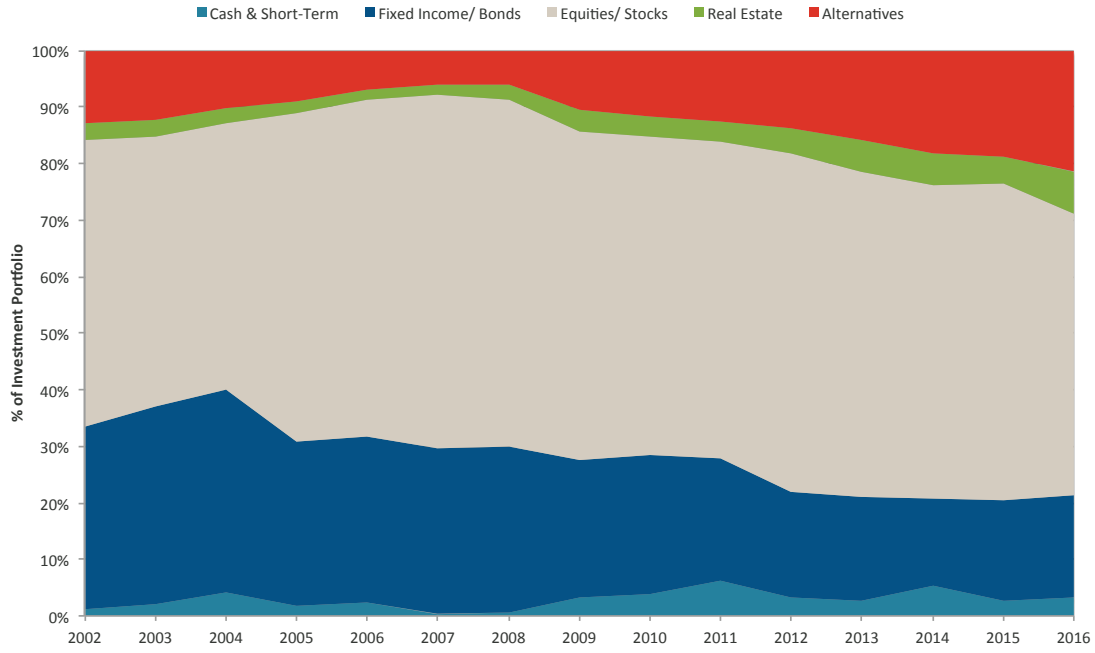
Looking forward, McKinsey & Co. estimates that over the next two decades the average yield on U.S. and foreign bonds will be between 0% and 2%. This is a markedly different investment environment from the last three decades, when fixed income yielded an average of nearly 5%.[17] The only option available for pension funds looking to meet assumed returns above 6% has been to diversify portfolios with increased holdings of stocks and alternative investments — i.e. take on more risk.

Over the past 15 years, SERS has adjusted its assumed return from 8.5% to 8% — and most recently the change down to 6.9% — but to achieve these kinds of returns Connecticut still needs to take on considerable investment risk in the form of more volatile assets, such as stocks and "alternative" investments, like hedge funds or private equity.[18] Figure 4 shows this change in asset allocation, where the percentage of fixed income and cash has fallen from 33.4% in 2002 to 21.5% in 2016, while the share of alternatives has increased from 12.8% to 21.4%.

17 Richard Dobbs, et al. (2016), "Diminishing Returns: Why Investors May Need to Lower Their Expectations," McKinsey Global Institute.

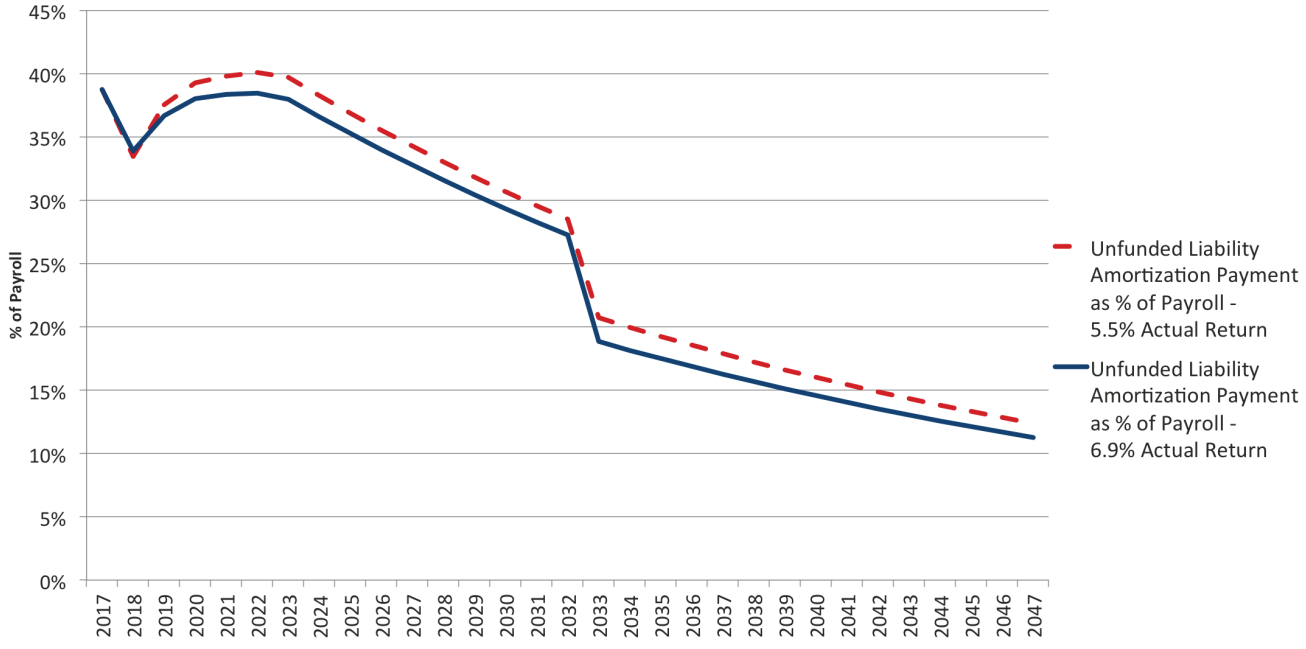
18 In general, there is nothing wrong with private sector investment in private equity or hedge funds, and diversification is encouraged. Investment strategies and principles for public sector institutions, however, carry separate considerations. Because Connecticut taxpayers ultimately share the downside risk of the investment strategies, more explicit buy-in from the electorate should be necessary to allow for such significant investment risks to be taken. As it stands, the shift in portfolio risk amounts to a tacit increase in taxpayer risks.

Figure 4: SERS Asset Allocation Over Time



Source: Reason Foundation Analysis of Connecticut Investment Fund Comprehensive Annual Financial Report

Figure 5: Unfunded Liability Amortization Payments, 2018-2047 Comparing Actual Returns of 6.9% to Underperforming 5.5% Returns



Source: Reason Foundation & Yankee Institute Forecast of Connecticut SERS

A Lower Assumed Return is Necessary to Avoid Continued Growth in Unfunded Liabilities

As the yields on safer investments have fallen, SERS has been forced to take on more risk in order to try and achieve its 8% (previously 8.5%) assumed return. Given this, the 6.9% assumed return approved by the State Employees Retirement Commission in December 2016 is a step in the right direction. For Connecticut to better balance the investment risk borne by taxpayers, a lower investment target is necessary so SERS's asset allocation does not have to remain so speculative.

In addition, given recent investment experience and prospective market outlooks, the decision to lower the assumed return to 6.9% does not go far enough to ensure SERS will avoid continued growth in unfunded liabilities. Figure 5 shows a forecast of SERS's unfunded liability amortization payments over the next 30 years assuming the state experiences a 6.9% annual return versus a 5.5% return (which is closer to the SERS historic investment experience).

A Lower Assumed Return is Necessary to Accurately Price Benefits

One reason Connecticut has not lowered the assumed return further is because it would mean an increase in contribution rates today. The less investment returns SERS anticipates in the future, the more it requires in contributions today. However, if the state knows that it is unlikely to achieve a certain investment return and chooses to assume that relatively high rate of return anyway, then in practice the true cost of providing retirement benefits is being underpriced. In this scenario, the state would be choosing to pay for benefits in part through normal cost today, and in part through unfunded liability amortization payments in the future.

And, in effect, this is what Connecticut is doing by using an unreasonably high assumed return. For example, Table 3 shows estimated normal cost for SERS Tier III given alternative assumed returns.

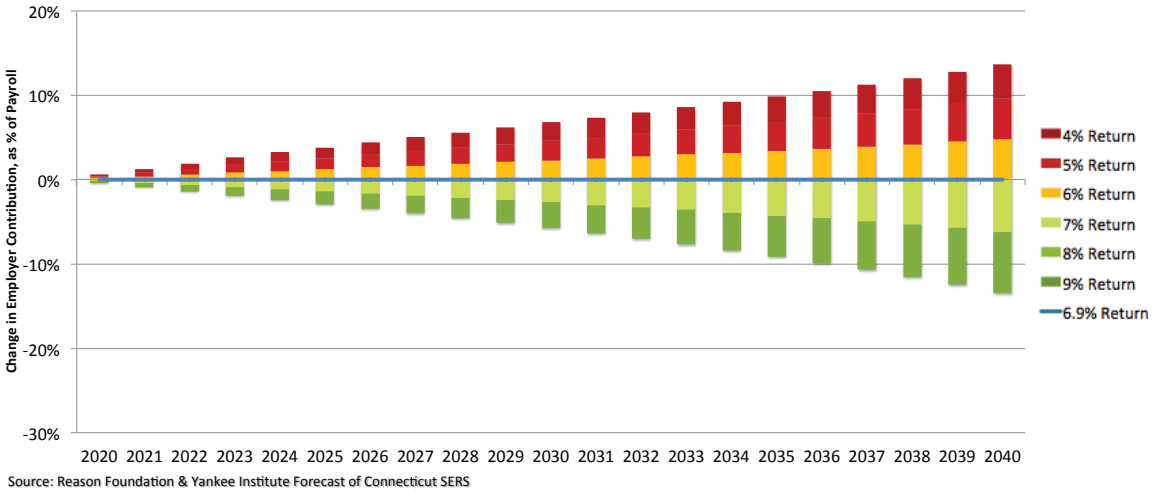
Table 3: Tier III New Hire Normal Cost Sensitivity to Changes in the Assumed Return			
Assumed Rate of Return	Gross New Hire Normal Cost	Non-Hazardous Employee Contribution Rate	Employer NC Contribution Rate
8%	7.8%	2.0%	5.9%
6.9%	9.8%	2.0%	7.8%
5.5%	13.3%	2.0%	11.3%
Assumed Rate of Return	Gross New Hire Normal Cost	Non-Hazardous Employee Contribution Rate	Employer NC Contribution Rate
8%	9.7%	5.0%	4.7%
6.9%	12.4%	5.0%	7.4%
5.5%	17.1%	5.0%	12.1%
Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS.			

The decision to lower the assumed return to 6.9% is a positive step toward addressing the problem of underperforming investment returns and undervalued benefits. However, because 6.9% is likely still too optimistic given current market forecasts, and at the same time still requires substantial allocation to alternatives instead of safer, lower-yield investments, comprehensively addressing this problem requires adopting an even lower assumed return, likely between 5% and 6%.

Problem 2: Long-Term Volatility in Employer Contributions

Using aggressively optimistic actuarial assumptions such as a high assumed rate of return not only risks continued growth in unfunded liabilities, but it also means less predictability in contribution rates. For the purposes of budgeting and planning, contribution rate volatility creates significant challenges — as has been shown over the past few years by the outcry over growing contribution rates for Connecticut pension plans.

Figure 6: Employer Contribution Rate Volatility, 2020 to 2040
Change in Employer Contribution Rate Given Various Actual Rates of Return
Baseline: 6.9% Assumed Rate of Return



Source: Reason Foundation & Yankee Institute Forecast of Connecticut SERS

Figure 6 shows the volatility in possible employer contribution rates for SERS over the next 30 years given different actual average investment returns. The expected contribution rate path is based on a 6.9% average return, and if actual experience matches this assumption there will be no variance — reflected by a flat line in the forecast. If actual returns are higher or lower than 6.9% then the employer contributions will fluctuate — reflected by the columns showing projected differences in contribution rates under different actual returns.

The forecast forms a cone of volatility: the wider the cone, the greater the volatility and the larger the challenge for future legislatures. Addressing this problem requires adopting funding policy changes and benefit design changes that reduce volatility.

Problem 3: Amortization Method Exacerbating Existing Unfunded Liabilities

Up until the end of 2016, the SERS unfunded liability was amortized on a fixed schedule, with the target of having all pension debt paid off by 2032. However, the December 2016 SEBAC agreement pushes that date out to 2047, exacerbating an already troubled part of the SERS funding policy — in exchange for relieving budgetary stress and simultaneously lowering the assumed rate of return.

The previous schedule, adopted in the 1992 SEBAC agreement, was originally designed to minimize payments in the near-term by spreading out the payments over a 40-year period. In 2000, the schedule was changed to reduce near-term payments again by spreading out unfunded liability amortization payments as an equal percentage of payroll for the remaining 32 years on the debt clock.[19] This adjusted method of paying off pension debt, known as "level-percent of payroll," means the payments toward unfunded liabilities grow as a dollar amount each year. The explicit intention of a level-percent of payroll method for paying off unfunded liabilities is to backload the payments, making it easy to budget for the first several years of paying off the debt.

The downside of using long schedules (i.e., anything greater than 15 to 20 years) combined with a level-percent method is that it creates negative amortization — meaning the payments towards the debt are not enough to pay off even the interest accumulated on that debt in a given year. Thus, the specific amortization method used by SERS resulted in unfunded liabilities growing instead of shrinking. CRR estimates that the SERS level-percent amortization method added $2.3 billion to unfunded liabilities between 1985 and 2014.

The ultimate effect of back-loaded, level-percent unfunded liability amortization payments is that as the final date to pay off the pension debt approaches, the contribution rates skyrocket. This is the scenario that Connecticut was facing.

The unfunded liability amortization payment in 2015 was about $1.2 billion and would have grown to over $3 billion by 2032[20]. However, at the turn of the century the amortization payments made in 2000 were just $101.2 million.[21] Today's legislature and taxpayers are facing a situation created for them by the government in 1992.

To mitigate this existing amortization method problem, the December 2016 SEBAC agreement changed to a level-dollar method of paying off the unfunded liabilities, but in return extended the schedule to spread out the payments further. Moving to level-dollar was a wise choice, but extending the debt schedule was the opposite of what should have been done to address the debt payments. Unfortunately, in effect, the recent agreement simply perpetuates the practices of previous SEBAC agreements, which is to push payments off into the future any time the budgetary stress of unfunded liability amortization payments becomes politically intolerable.

Considering Whether the Recently Adopted Changes Will Be Worth Their Cost

The ultimate goal of the December 2016 SEBAC agreement is to avoid the forecasted growth in unfunded liability amortization payments over the next decade and a half that were designed in debt schedules created by previous SEBAC agreements. All unfunded liabilities attributable to members hired before December 31, 1983 will be paid off by 2032. But all other unfunded liabilities in the plan today will be put on a new, 30-year schedule with a targeted payoff date of 2046.

The SEBAC agreement also requires that newly accumulated unfunded liabilities be paid off using individual 25-year amortization schedules for each

19 Connecticut SERS Valuation Report as of June 30, 2000, p. V-1, C-1.

20 Connecticut SERS Valuation Report as of June 30, 2014.

21 Connecticut SERS Valuation Report as of June 30, 2000, p. IV-1, V-4.

year of actuarial gains or losses. In general, there are worse policies than using this "layered" approach to paying off unfunded liabilities (though a fixed date is better). However, using such long schedules is inconsistent with best practices currently recognized by the actuarial community. The individual unfunded liability amortization schedules should match the expected duration of the liabilities they are seeking to pay off, which likely means using a period of 10 to 15 years instead of 25 years.

In exchange for these changes the SEBAC agreement recommended lowering the assumed rate of return and takes the positive step of requiring SERS to shift to a level-dollar method for paying off unfunded liabilities. Level-dollar amortization methods spread out payments in equal dollar amounts each year, increasing contributions in the near-term, but avoiding a spike in contribution requirements at the end of the schedule. The level-dollar method also reduces the net interest payments made on the unfunded liabilities and reduces taxpayer expenses in the long run.

The combined changes to the amortization method for unfunded liabilities will add an estimated $8 to $9 billion in additional interest payments. These are costs that future taxpayers will have to pay that they would not have otherwise faced if the debt schedules were not extended.

The question that will need to be considered in the coming year is whether the changes to the amortization method were worth the additional costs imposed by the deal collectively. By pushing payments on existing unfunded liabilities out into the 2040s, the state is reducing the burden for today's Connecticut taxpayers, but it is increasing the burden for future taxpayers. It is highly probable that within one or two decades Connecticut's governor, taxpayers, and labor leaders will face the same challenges they do now, created for them by state leaders today.

Problem 4: The Discount Rate is Undervaluing Liabilities

Unfortunately, even if investments were performing as expected alongside a responsible amortization method, SERS would probably still have experienced unfunded liability growth. This is because Connecticut is undervaluing the value of all promised future SERS benefits.

In order to determine SERS's funded status, actuaries estimate all expected pension checks that will be paid out of the system in the future and assign a value to those benefits in present dollars.[22] Because money today is worth more than the same amount of money in the future (called "the time value of money"), it is necessary to "discount" future payments to determine how much a future stream of payments is worth in today's money.[23] Actuaries use a "discount rate" to put a value on future, promised pension benefits paid to each member over their lifetime, and this number is reported as the total pension liability (sometimes referred to as the actuarially accrued liability).

Selecting an appropriate discount rate is thus critical for accurately calculating the value of liabilities, which is in turn necessary for knowing what the value of unfunded liability is today, and subsequently setting up an appropriate amortization schedule. The higher the discount rate, the lower the value assigned to the total pension liability. If the discount rate is too high, liabilities will be undervalued, the recognized amount of unfunded liabilities on an accounting basis will be too low, and amortization payments will inherently be less than necessary to get a pension plan fully funded.

A properly calculated discount rate for valuing liabilities will also reflect the risk in a plan's liabilities, or the probability that the state defaults on its payments. However, SERS uses the assumed rate of return as a proxy for the discount rate (though a bad assumption, this is a standard practice for public defined benefit plans). The assumed return is a reflection of a pension plan's portfolio of assets and thus the risk in the plan's investment assets. Using the assumed rate of return as the discount rate for plan liabilities is therefore economically unsound, as the likely performance of a portfolio and the probability of the state's making pension benefit payments are two different things.

22 This text borrows from previously published analysis by Reason Foundation; see Truong Bui and Anthony Randazzo (2015), "Why Discount Rates Should Reflect Liabilities: Best Practices for Setting Public Sector Pension Fund Discount Rates," Reason Foundation, Policy Brief 130.

23 The time value of money, also known as the "risk-free" rate, represents the premium one would have to pay a bondholder to defer consumption today to some time in the future. For example, if one is indifferent between spending $100 today and lending someone that $100 in exchange for $102 one year from now, their annualized risk-free interest rate is 2%. The risk-free rate assumes that one has complete certainty of receiving the $102. Different liabilities have a different probability of a payout, and the "risk premium" reflects this probability. To continue with the previous example, say there were a 5% chance that the borrower will default and the loan would not be repaid. As a rule of thumb, the discount rate should be equal to the risk-free interest rate plus the risk premium (in this case 2%+5%=7%). When taking this risk into consideration, it would be appropriate to charge about $107 — so the risk-adjusted payoff is equal to $102.

So, what should the discount rate for SERS be? The yields on Connecticut general obligation bonds are around 5%, which is a market value of the risk that Connecticut might default on its debt.[24] The risk of defaulting on pension obligations might be even less than this, however, because of certain legal guarantees on pension benefits in Connecticut.[25] Thus a proper discount rate might be closer to 2% or 3% — reflecting risk-free rates of return as measured by Treasury yields.

Whatever the proper rate is, it is clear that it should be less than the current 6.9% discount rate adopted by the State Employee Retirement Commission. Table 4 shows what the FYE 2015 unfunded liabilities would be given alternative discount rates.

24 Coupon of Connecticut Tax Obligation Bond maturing in 2036 as of December 21, 2016.

25 *Pineman* v. *Oechslin* ruled "the statutory pension scheme establishes a property interest on behalf of all state employees…[who are] entitled to protection from arbitrary legislative action." Thus, the probability of the state reneging on its pension obligations is very low. See *Pineman* v. *Oechslin*, 195 Conn. 405 (1985), page 417.

Figure 7 shows the discount rate used by SERS over the past 15-years compared to the yield on 30-year Treasury bonds. If the state had decided in 1997 to peg the SERS discount rate to the change in the 30-year Treasury yield, reflecting a roughly 200 basis point (2.0 percentage point) "risk premium" then the discount rate for SERS today would be closer to 4.75%.

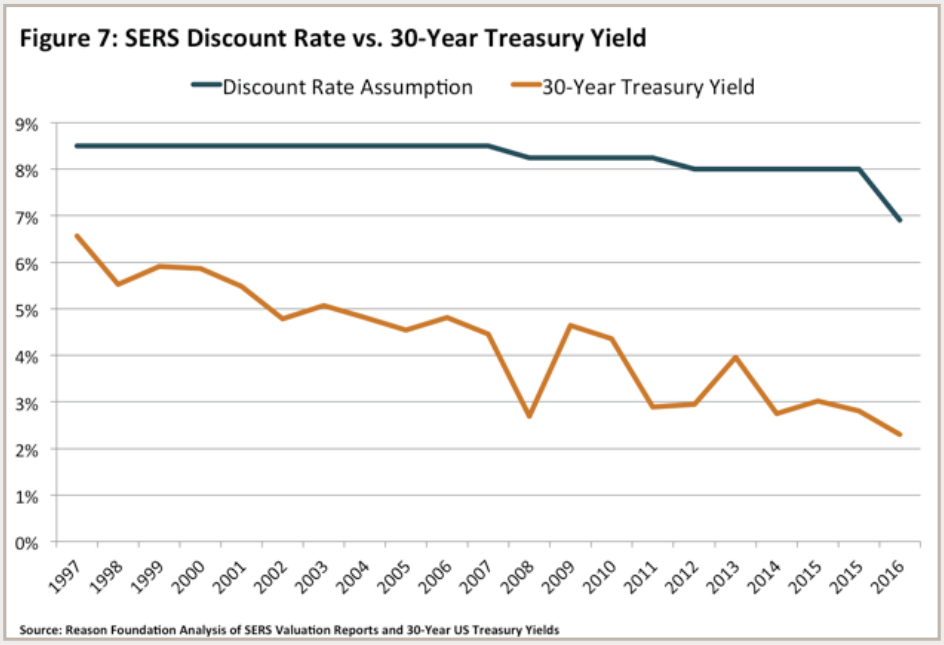
As Figure 7 shows, the discount rate is significantly higher than what one would expect the risk-free rate plus a low risk premium would be. The practical effects of choosing the wrong discount rate have serious actuarial implications when determining the unfunded liability, as demonstrated by the sensitivity analysis shown in Table 4.

Addressing this problem requires changing the approach for determining the discount rate, separating the valuing of liabilities from the valuing of assets.

Table 4: SERS Unfunded Liability Sensitivity to Alternative Discount Rates, as of June 30, 2016 (market value, in millions)

Discount Rate	Accrued Liability	Unfunded Liability	Funded Status
6.9%	$33,617	$22,980	31.6%
6%	$38,486	$27,818	27.7%
5%	$44,789	$34,120	23.8%
4%	$52,199	$41,531	20.4%

Source: Reason Foundation Analysis of SERS



Problem 5: Actual Experience Has Not Matched Actuarial Assumptions

SERS has a history of using actuarial assumptions that might generously be described as aggressively optimistic. For example, until 2008 SERS was using a 1994 mortality table with adjustments, and until last year SERS was still using the RP-2000 mortality table. The failure to update the baseline mortality tables consistently has allowed SERS to avoid an increase in the recognized value of liabilities and an increase in normal cost in certain years when those costs should grow to more accurately recognize what the ultimate value of promised benefits will be.

Another example is the payroll growth rate expectation. Payroll growth assumptions of 4% and 5% through the 2000s were justifiable for some years, but not so over the long-term. The average annual payroll growth from 2000 to 2016 was 2.1%. The overestimation of payroll growth is particularly problematic when the state was calculating the unfunded liability amortization payments using a level-percent method for calculating contribution rates. The level-percent method involves an actuarially determined amortization payment as a percentage of payroll to be applied in a future year. When that contribution rate year arrives and the percentage of payroll is applied, if the actual payroll has not risen to the rate anticipated by the actuary based on prior assumptions, then the actual dollars contributed into SERS's coffers will be less than expected and the unfunded liabilities will continue to grow.

Finally, retirement patterns have not matched assumptions, likely due to the early retirement incentive programs (ERIPs) offered in 1989, 1992, 1997, and 2003. First included in SEBAC II, a number of ERIPs encouraged many retirees to retire early by offering them "incentive years," which credited retirees for years they had not worked when determining their benefits.[26] As also discussed by CRR in their assessment of SERS, the ERIPs "likely caused dramatic deviations from the existing actuarial assumptions for retirement."[27] These "deviations" were in actuality an increased number of pension beneficiaries receiving benefits for longer than actuarially determined contribution rates assumed. ERIPs can only create an actuarial gain if they are designed in tandem with a benefit design for new hires that restricts the growth of liabilities.

Addressing this multifaceted problem would involve adopting more conservative assumptions for the existing defined benefit plans, while also adopting a benefit design for new hires that is built on conservatively established assumptions from its inception (details discussed in the following sections).

Problem 6: State Contribution Rates Are Too Low

An obvious problem for SERS in the past has been the failure to consistently pay 100% of the actuarially determined contribution rate. However, even when this rate has been paid, there has been implicit underfunding of SERS, as discussed in Problems 4 and 5.

26 Retirement Services Division Memorandum on 2009 Retirement Incentive Program, May 26, 2009.

27 Center for Retirement Research (2015), p.2.

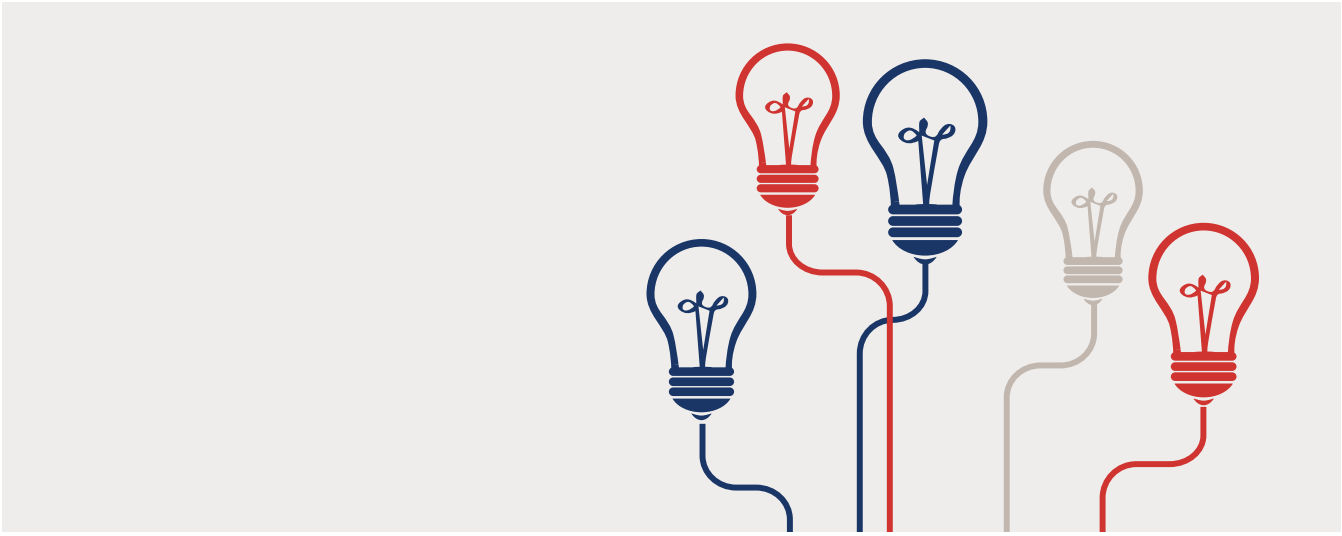
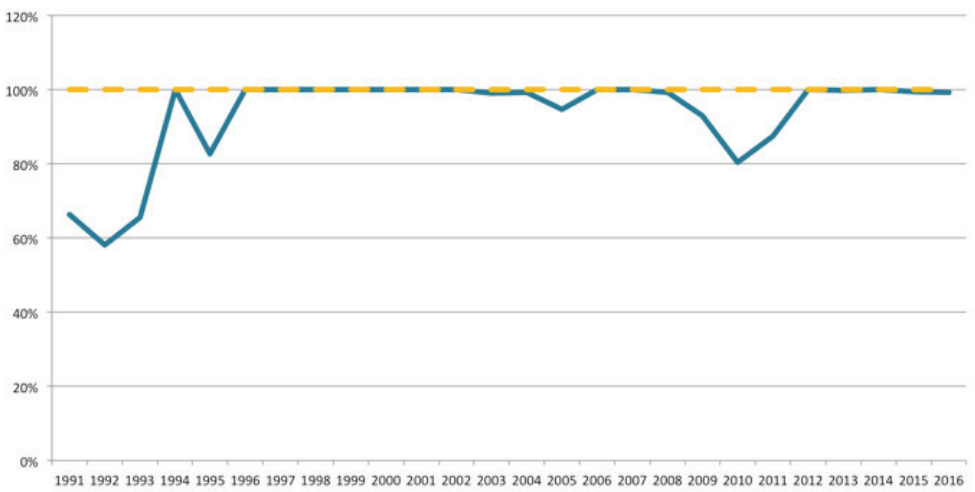


Figure 8: Percent of SERS ADC Paid Over Time, 1991-2016



Source: Reason Foundation Analysis of SERS Valuation Reports

Figure 8 shows the history of the ADC compared to what was actually paid by state employers. Connecticut began pre-funding SERS starting in 1971 by paying 30% of the ADC, increasing by 5% increments thereafter until paying 100% of the actuarially determined contributions in 1986.[28] But paying 100% of the ADC has not remained a consistent practice.

Collective bargaining agreements between the state and SEBAC expressly allowed for Connecticut to reduce annual contributions by state employers, resulting in an estimated $2 billion in underpaid contributions over the past 30 years relative to what was actuarially required.[29] Acting on this collectively bargained authority, between 1992 and 2015 Connecticut explicitly underfunded SERS 14 of those years.

Even when 100% of the ADC is paid, Connecticut is still implicitly underfunding SERS. This is because the state is using an assumed rate of return above realistic investment performance along with other aggressively optimistic actuarial assumptions. This collectively lowers normal cost below what it otherwise should be if it were to accurately price the cost of benefits. Using an amortization method that backloads payments over a longer schedule can lead to negative amortization and the perpetuation of unfunded liabilities. Using a discount rate that undervalues accrued liabilities means that the actuarially calculated unfunded liability amortization payment is inherently less than it otherwise needs to be to eliminate the actual pension debt in SERS.

The cumulative result of these SERS problems is that even when state employers pay 100% of their ADC, the plan is still accumulating unfunded liabilities that won't be recognized until actual experience diverges from the actuarial assumptions.

Addressing this problem would start with a legislative requirement that 100% of actuarially determined contributions are paid within the constitutionally established spending cap.[30] But this would only address explicit contribution shortfalls. Comprehensively addressing the need to increase contributions to the plan would involve (1) establishing more conservative assumptions, particularly with regard to payroll and develop a pattern of more consistently updating

28 Chapter 66 Section 5-156(b).

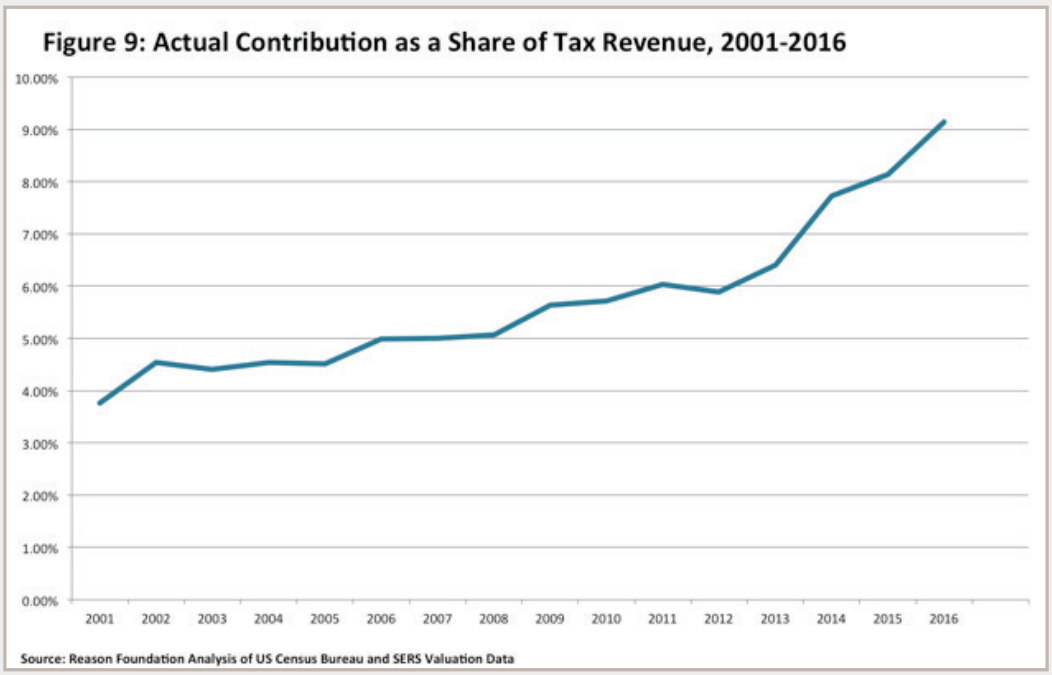
29 The 1992 SEBAC agreement reduced Connecticut's contribution by $215 million (see SEBAC II p.4). The 1995 SEBAC agreement (SEBAC IV p.1) set an explicit cap on the amount that could be contributed to pay off the unfunded liability for FYEs 1999 and 2000. These agreements not only allowed the state to underpay the ADC, but the assumptions and methods they endorsed resulted in the ADC being less than necessary to prevent growth of the unfunded liabilities. Estimate of these combined actions leading to $2 billion in unpaid contributions comes from a review of actuarial valuations from Center for Retirement Research (2015), p.9.

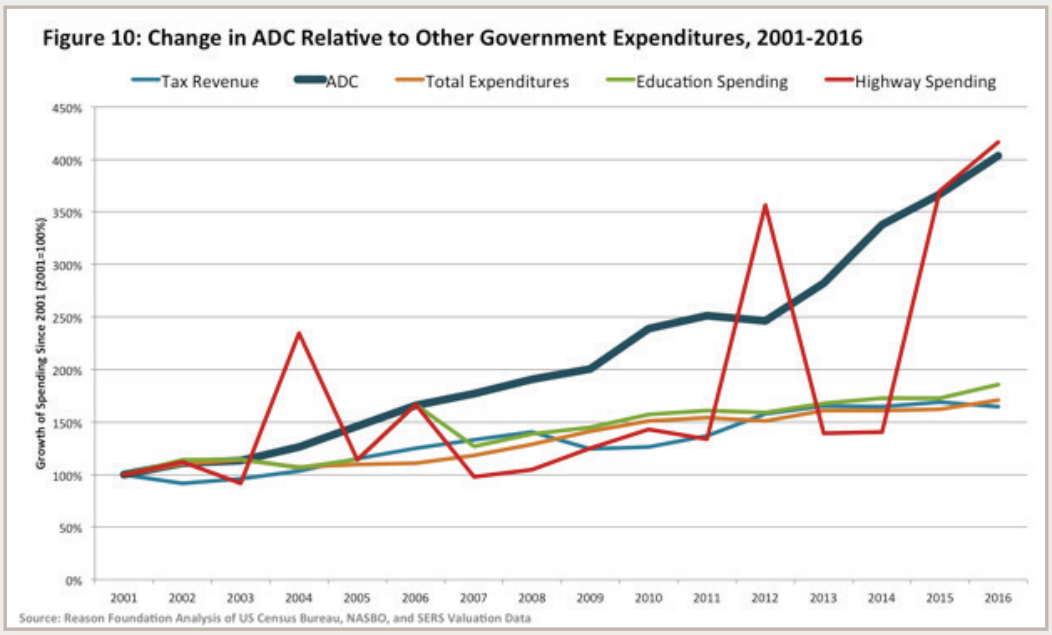
30 Recent SEBAC agreements have also included provisions to underpay the fund under certain conditions. The 2009 agreement allows the State to reduce its contribution by up to $100 million for each year projected revenue falls $350 million below budgeted revenue, or if fewer than 3,000 employees retire as part of the Early Retirement Incentive Program (ERIP).

mortality tables; (2) further reducing the assumed rate of return below 6.9% (allowing the asset allocation to be less risky); and (3) accurately valuing accrued liabilities by using a market valuation of liabilities.

Problem 7: The Crowding Out of Taxpayer Resources

If Connecticut ignores the root causes of the SERS funding problem then the costs of providing retirement benefits to public sector workers will grow in perpetuity, crowding out the use of taxpayer resources for the public goods and services they were originally intended for. This has already become a significant challenge for the state. Figure 9 shows the state contributions to SERS as a percentage of Connecticut's tax revenue since 2001. Figure 10 shows the growing employer contribution requirements for SERS relative to other spending priorities for Connecticut over the past 16-years.





A RANGE OF PENSION REFORM OPTIONS FOR CONNECTICUT SERS

How should Connecticut's government and taxpayers approach solving the problems facing SERS once and for all? There are many options available, most of which are non-exclusive and could form a comprehensive package of reforms to both address the current pension crisis and prevent future crises from emerging. Here is a list of reform ideas that Connecticut should consider, followed by some analysis forecasting how they might change the trajectory of the plan.

Potential Funding Policy Changes for the Existing Plan

1. **Lower the Assumed Rate of Return**

   This would reduce financial market risks and taxpayer exposure to underperformance, allow normal costs to be more accurately priced, reduce contribution rate volatility, and increase the contribution inflows into the plan. Ideally, the state would build on the recent adoption of a 6.9% assumed return and gradually continue to lower it towards a 5% target that would require less investment risk and greater certainty in performance.

   For forecasting analysis, see Scenario 1.

2. **Increase Employee Contributions**

   Members of Tier III — those hired after July 1, 2011 — contribute only 2% of their salaries, while members of Tier III-Hazardous contribute 5% of their salaries. The state should consider increasing the share that employees pay for retirement benefits given the significant amount of decision-making power they have for how the benefits are funded. The national average for state employee contribution rates to their pension funds is 6%.

   For forecasting analysis, see Scenario 2.

3. **Lower the Discount Rate**

   This would more accurately price accrued liabilities in current dollars and ensure that actuarially determined amortization payments are enough to pay down unfunded liabilities of the system completely. On an accounting basis, the total liability of SERS would increase, but contribution rate volatility would decrease, and long-term costs for taxpayers and employers would be reduced because this change would more accurately recognize the liabilities that actually exist.

   For sensitivity analysis, see Table 4 in the full version of this paper online at www.yankeeinstitute.com/pensionreform.

Potential Benefit Design Changes for the Existing Plan

1. **Change the Formula for Cost-of-Living Adjustments**

   The current COLA for Tier III members has a minimum 2% annual increase with a cap of 7.5%, and is primarily calculated as 60% of the increase of CPI-W from year to year. Lowering the COLA could take the form of adopting a 2% cap on COLAs, with a new formula pegged to CPI-W.

   For forecasting analysis, see Scenario 3.

2. **Adopt a Cap on Pensionable Salaries**

   Capping pensionable salaries would mean setting a fixed value on which to base pension contributions and benefits. This would help reduce the harms associated with pension spiking and reduce the total liability of the pension system. Employees would not make contributions on compensation above the cap.

   For forecasting analysis, see Scenario 4.

   Note: An alternative approach would be to change the definition of pensionable salary to include regular pay only and explicitly exclude overtime and other additional forms of compensation. This would enable more accurate contribution rate determinations by actuaries because it is difficult to forecast what kind of overtime behavior employees will use and employers will allow over time.

   Proposals to reduce the accrued retirement benefits of retirees or active members should be rejected. This would violate the promise made to those public sector employees.

What's more, there are reasonable steps that can be taken to improve the solvency of SERS and avoid adding additional liabilities to the troubled system.

Potential Benefit Design Changes for Future Hires

1. **Create a Tier IV Conservatively Priced Defined Benefit Plan**

   Under this proposal, new hires would still be offered a defined benefit (DB) plan, but the new plan would be governed by conservative actuarial assumptions such that (a) the assumed return would be between 4% and 6%; (b) the discount rate would be based on a market value of liabilities; (c) the amortization method for any potential future unfunded liabilities would be on a level-dollar basis over a period of 10 to 15 years; and (d) the overall costs of the plan — including normal cost and any necessary future amortization payments — would be shared between the employer and employee such that the incentives for long-term solvency matched the decision-making power over actuarial assumptions.[31] The difficulty with this proposal is that the normal cost for the plan will be substantially higher than the current plan. Offering a lower benefit multiplier as a percentage of final average earnings may mitigate this challenge, but there is a floor to how low the plan's benefit multiplier can go while still providing retirement security.

2. **Create a Cash Balance Plan**

   A cash balance (CB) plan is a defined benefit system that guarantees a certain rate of return for an individual member's accumulated contributions. If investment returns for a given time period were to fall below the guaranteed rate, Connecticut taxpayers would make up the difference — in this way CB plans are like DB plan guaranteed benefits. If investment returns were to exceed the guaranteed rate, however, Connecticut taxpayers would then split the surplus between plan members and SERS. The specific details on this "upside sharing" vary depending on the state adopting the CB approach. The Kentucky Retirement System implemented a CB plan in 2014, where employee retirement accounts are guaranteed a minimum 4% return and all returns above 4% are split 75% and 25% between the member and system, respectively. Kentucky's plan uses its surplus investment return shares to build a rainy-day fund for times when the actual returns are less than 4%. The advantage of the CB approach would be in having a more affordable retirement plan that caps state liabilities for new hires while also providing some guaranteed retirement benefit.

3. **Offer a Defined Contribution Plan**

   A defined contribution (DC) plan allows the employee or retiree to keep 100% of all contributions made on his or her behalf; keep all investment returns and losses; and gives more flexibility over aligning the investment strategy with the employee's retirement goals. Offering state employees this kind of retirement plan would mean public sector workers would have retirement benefits similar to most of their private sector peers. Well-designed DC plans offer a set of choices on investment strategies that include target date funds and mutual fund options that automatically re-allocate assets based on an employee's age and desired retirement date. It is best for DC plans to avoid requiring an employee to make complicated, micromanagement decisions related to their own retirement investments. The advantage of the DC approach is that over time, the state would no longer have any retirement liabilities and would be able to focus its resources on providing retirement guidance to employees and improving wages.

   For forecasting analysis, see Scenario 5.

4. **Offer a Combined Defined Benefit / Defined Contribution Hybrid Plan**

   The current hybrid plan available to certain SERS members is actually a defined benefit plan that can be converted into a portable, defined contribution account. This approach does not meaningfully cap the growth of liabilities, because it is still based on the aggressively optimistic assumptions of the existing plan. A more effectively designed hybrid would offer a base DB plan with conservative assumptions — such as a 0.5% to 1.5% multiplier

31 The Arizona Public Safety Personnel Retirement System has a similarly designed plan with 50/50 cost sharing and equal representation between employers and employees on the plan's pension board.

for final average earnings — and a DC plan on top with matching employer and employee contributions with rates set to ensure a meaningful retirement benefit. An alternative approach would be a hybrid plan that offers a DB plan on earnings up to a certain compensation threshold — such as $40,000 to $60,000 — and contributions to a DC plan on additional compensation. The primary benefit of such hybrid approaches is to balance the amount of liabilities that taxpayers carry, while also setting the DB portion low enough that using appropriate actuarial assumptions is not cost prohibitive.

5. **Offer New Hires an Option Between a DB-DC Hybrid Plan and Defined Contribution Only Plan**

   This approach would start by creating a DB-DC hybrid plan for new hires, and also allow new hires to opt into a defined contribution-only plan if that was more preferable based on their employment and retirement goals.

Potential Governance Policy Changes

The current process for establishing funding policy, contribution rates, and benefit design has granted a substantial share of decision-making power to parties with minimal liabilities related to SERS. Consider that the State Employees Retirement Commission (the Commission) administers SERS and has default authority over setting actuarial assumptions, unless the General Assembly acts to override a vote of the Commission. The membership of the Commission is primarily made up of six trustees who represent the employees and six trustees who are members of SERS appointed by the governor.[32]

In theory the trustees appointed by the governor are supposed to represent "management." However, since they are required to be state employees and members of SERS, there are misaligned incentives for those individuals. Effectively, all voting members of the commission are state employees, explicit representatives for state employees, or nominated by state employees. The legislature — the closest representatives of the taxpayers at the state level — can act to override a vote made by the Commission, but this is politically challenging for a collective body like the General Assembly.

32 The remaining members are either recommended from these two groups of six or are non-voting ex officio members.

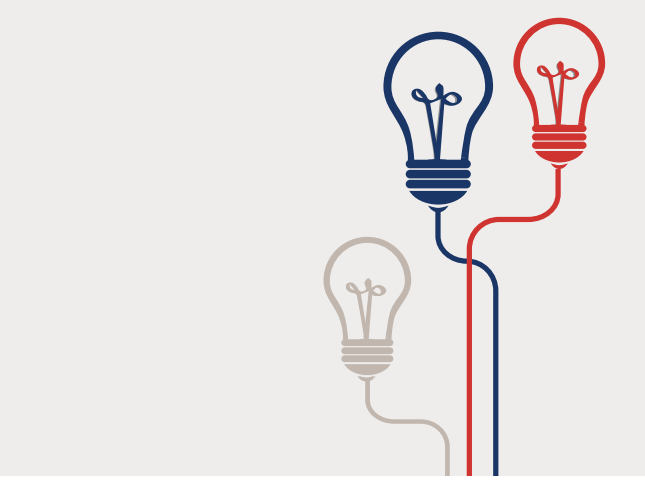
1. **Change the Decision-Making Process so Parties with the Greatest Liability — Currently the Taxpayers — Have an Increased Voice in Funding Policy Decisions**

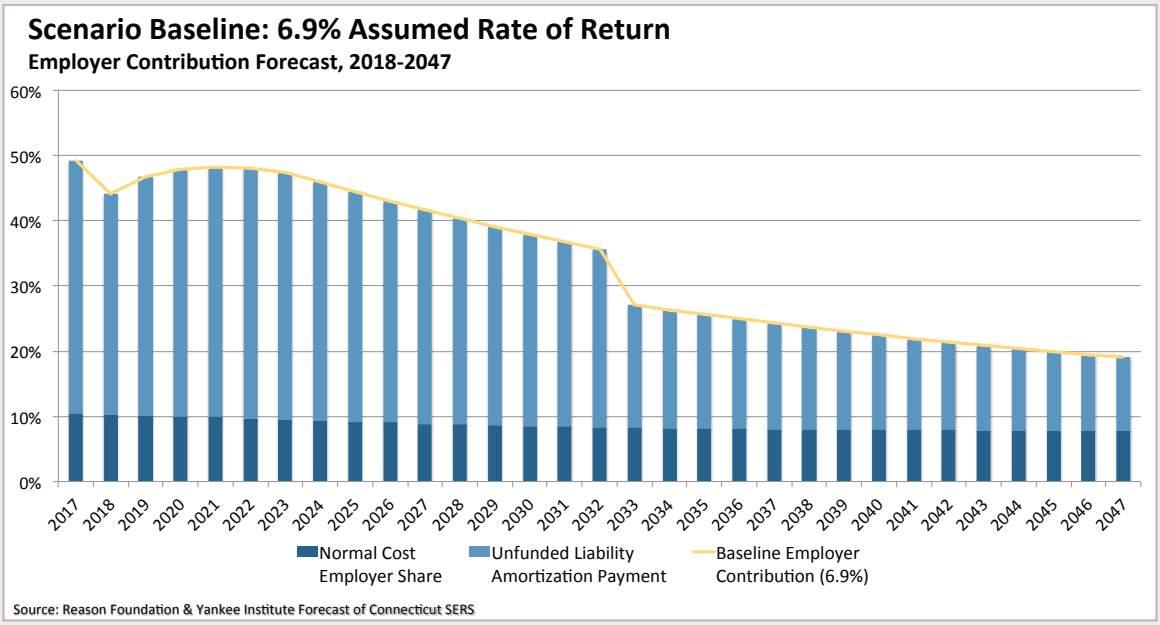
   The qualifications for State Employees Retirement Commission "management" trustees could be changed to require explicitly that they not be members of SERS. The General Assembly could be given more authority in setting funding policy. Additionally, the allocation of votes on the Commission could be changed to add more independent, non-employee trustee positions.

2. **Change the Process for Determining Contribution Rates so Employees and Retirees Share in the Downside Risk Associated with Funding Policy**

   As an alternative to changing the decision-making process itself, employees and retirees could be required to share the risk associated with funding policy decisions. In Arizona, employees pay 50% of any unfunded liability amortization payment — which incentivizes lower assumed rates of return. In Wisconsin, retirees are promised a base pension benefit, and then can have that benefit increased when returns are strong, but decreased as low as the base benefit when returns underperform, meaning all parties share in the upside and downside of the investment allocation.

Other cost sharing models could be designed for SERS, so long as the paramount objective would be to incentivize better funding policy by linking decisions related to risk in the system with the liabilities created both by those decisions and by benefit design.





UNDERSTANDING THE FORECAST

Baseline: The yellow line running across the chart above is the total employer contribution, combining the normal cost plus the unfunded liability amortization payment. This line represents the expected baseline forecast under the current plan assumptions – including the 6.9% assumed rate of return adopted under SEBAC in December 2016. The yellow line baseline representation will remain constant throughout the forecasting scenarios.

Normal Cost: The dark columns at the bottom are the employer's share of normal cost. For the current fiscal year ending 2017, the employer share of normal cost for all tiers is 10.3%. Specific normal cost rates vary depending on the kind of employee, but to consider how any given set of changes would change expected contributions, it is best to look at the combined system as a whole. Note that normal cost is forecast to decline slightly over time, as the normal cost for Tier III (5.5%) is slightly less than the normal cost for legacy tiers.

Unfunded Liability Amortization Payment: The light columns at the top are the amortization payments, and are always paid by the employer. For the current fiscal year ending 2017, the unfunded liability amortization payment is 38.7%. Under the baseline that existed prior to the passage of the December 2016 SEBAC agreement, these were scheduled to end in 2033. With the passage of the agreement, the amortization payments will be stretched out past 2047.

Scenario: This scenario forecast assumes that the actual experience for SERS over the next 30 years is exactly what the actuarial assumptions expect, including actual annual returns of 6.9% and average COLA of 2.3% for Tier III.

Limitations: In order to create an apples-to-apples comparison, we have adopted all assumptions used by the plan (unless expressly indicated otherwise), but that does not mean we endorse those assumptions. The accuracy of these forecasts is only as strong as the reasonableness of the assumptions currently used by SERS. In that respect, we consider all of these forecasts to have underlying limitations in accuracy in relation to the assumptions being used.

Thus, the primary value of these forecasts is in comparing the difference between the scenarios and how a limited change will change the outlook, rather than in the specificity of a dollar amount forecasted 10 or 20 years from now. As previously stated, changes to the demographic assumptions of SERS are necessary to improve solvency, but a detailed analysis of how to apply such changes is necessarily outside the scope of this paper.

Any forecast becomes less reliable the longer out in time it goes, and that is no less true in our forecast than for forecasts by SERS itself.

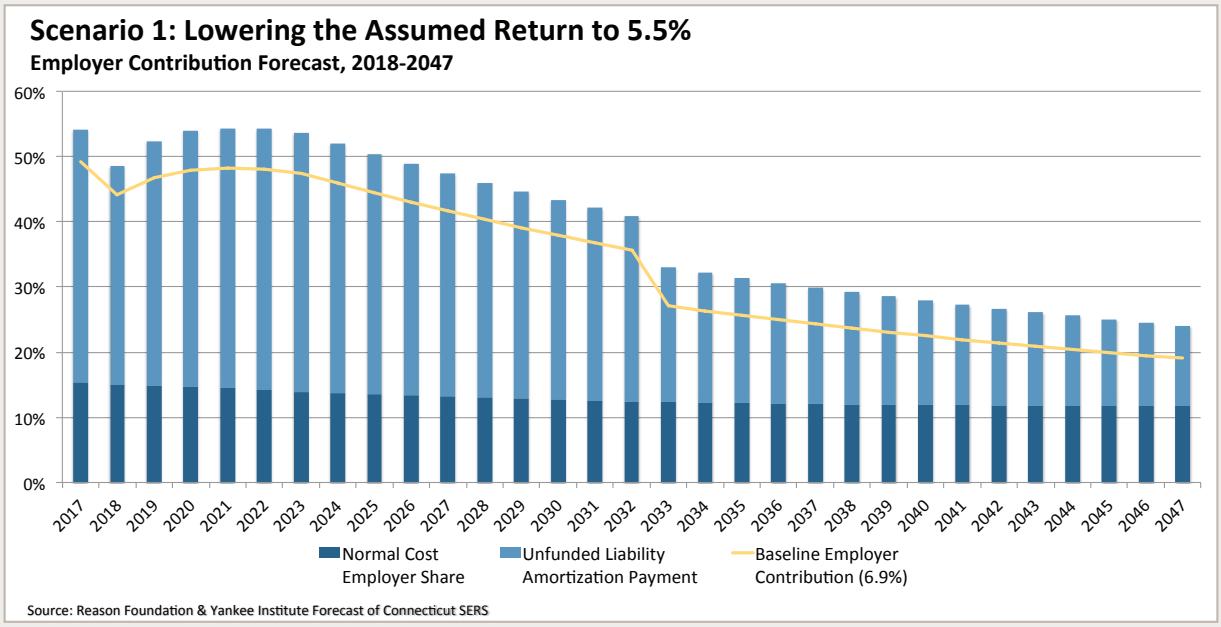


Table S1: Cost / Savings Analysis

	Normal Costs (% payroll) Annual Average			Total Employer Contribution (in billions) Cumulative		
	6.9% ARR	5.5% ARR	Change	6.9% ARR	5.5% ARR	Cost/ (Savings)
2 Year (2018 to 2019)	10.2%	15.0%	+4.8%	$3.2	$3.6	$0.4
5 Year (2018 to 2022)	10.0%	14.7%	+4.7%	$8.4	$9.5	$1.0
10 Year (2018 to 2027)	9.6%	14.1%	+4.5%	$16.7	$18.8	$2.1
30 Year (2018 to 2047)	8.6%	12.8%	+4.2%	$38.1	$44.7	$6.6

Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS.

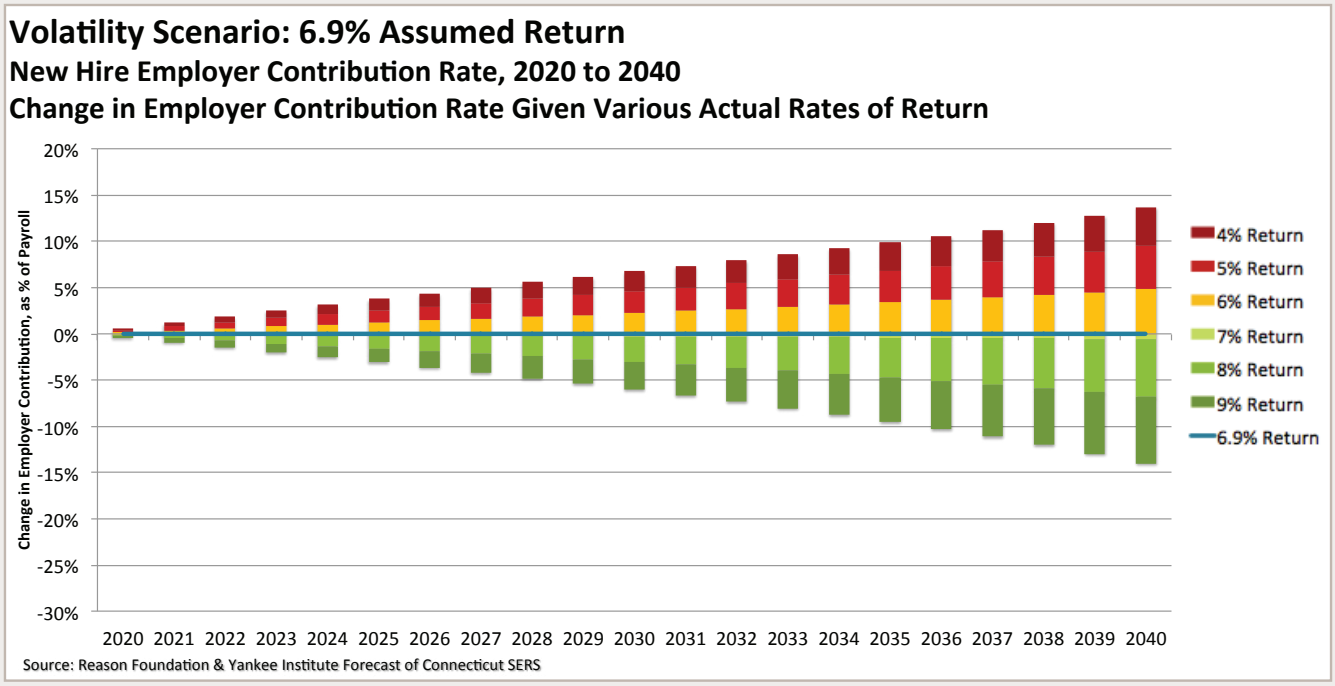
Scenario 1: Lowering the Assumed Return to 5.5%

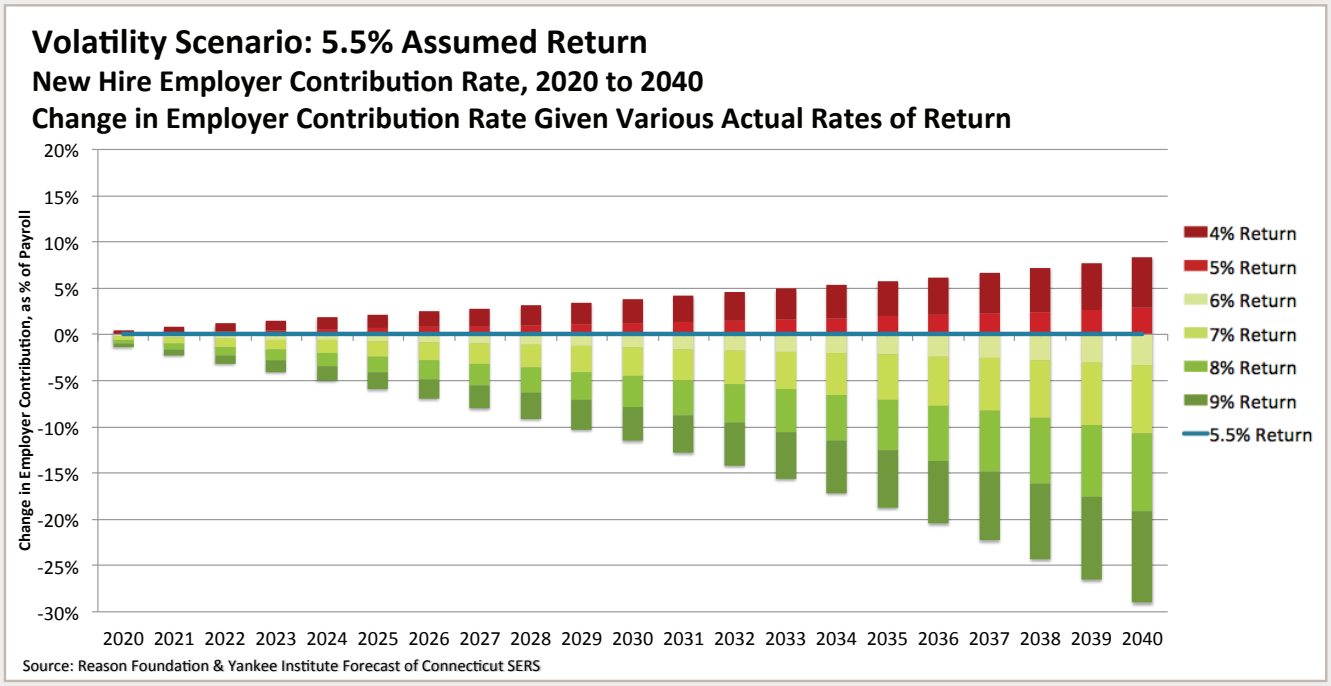
This forecast adopts a 5.5% assumed rate of return starting with FYE 2018, and then assumes the actual experience for SERS over the next 30 years aligns with actuarial assumptions, including actual annual returns of 5.5%, a 5.5% discount rate for valuing liabilities, and an average COLA of 2.3% for Tier III.

The fiscal effect of this change would be to increase gross normal cost for all tiers combined by 4.8% percentage points. We assume no change to the employee contribution rate in this scenario, so the employer would pay for the increase to a more accurately-priced normal cost and contribute 15.1% in fiscal year ending 2018 towards normal cost. The scenario would also change the discount rate to 5.5%, resulting in the recognition of more unfunded liabilities and therefore increase the amortization payment from 44.2% to 48.7% of payroll.

The solvency effect of this would be to reduce market risk exposure and contribution rate volatility while also improving the accuracy of normal cost pricing of benefits.

Scenario 1 Volatility Analysis: The volatility effect of this change would be to reduce the range of probable increases in employer contribution rates because the asset allocation would change to include more stable investment vehicles, decreasing investment risk. The figures below compare volatility illustrations for the change in employer contributions rates given varying actual returns.


Volatility Scenario: 6.9% Assumed Return
New Hire Employer Contribution Rate, 2020 to 2040
Change in Employer Contribution Rate Given Various Actual Rates of Return
Change in Employer Contribution, as % of Payroll
20%
15%
10%
5%
0%
-5%
-10%
-15%
-20%
-25%
-30%
2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040
4% Return
5% Return
6% Return
7% Return
8% Return
9% Return
6.9% Return
Source: Reason Foundation & Yankee Institute Forecast of Connecticut SERS


Volatility Scenario: 5.5% Assumed Return
New Hire Employer Contribution Rate, 2020 to 2040
Change in Employer Contribution Rate Given Various Actual Rates of Return
Change in Employer Contribution, as % of Payroll
20%
15%
10%
5%
0%
-5%
-10%
-15%
-20%
-25%
-30%
2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040
4% Return
5% Return
6% Return
7% Return
8% Return
9% Return
5.5% Return
Source: Reason Foundation & Yankee Institute Forecast of Connecticut SERS

Scenario 2: Increasing Employee Contributions to 6%

This scenario forecast changes all employee contributions to 6% starting with FYE 2018, and then assumes that the actual experience for SERS over the next 30 years aligns with actuarial assumptions, including actual annual returns of 6.9% and an average COLA of 2.3% for Tier III.

The fiscal effect of this change would be to decrease the employer share of normal cost from 10.3% to 6.2%, producing taxpayer savings in the short-term and long-term.

The solvency effect of this change would be based on how the state utilized the savings from the change. If the savings were put back into the retirement system, then the unfunded liability would be reduced faster.

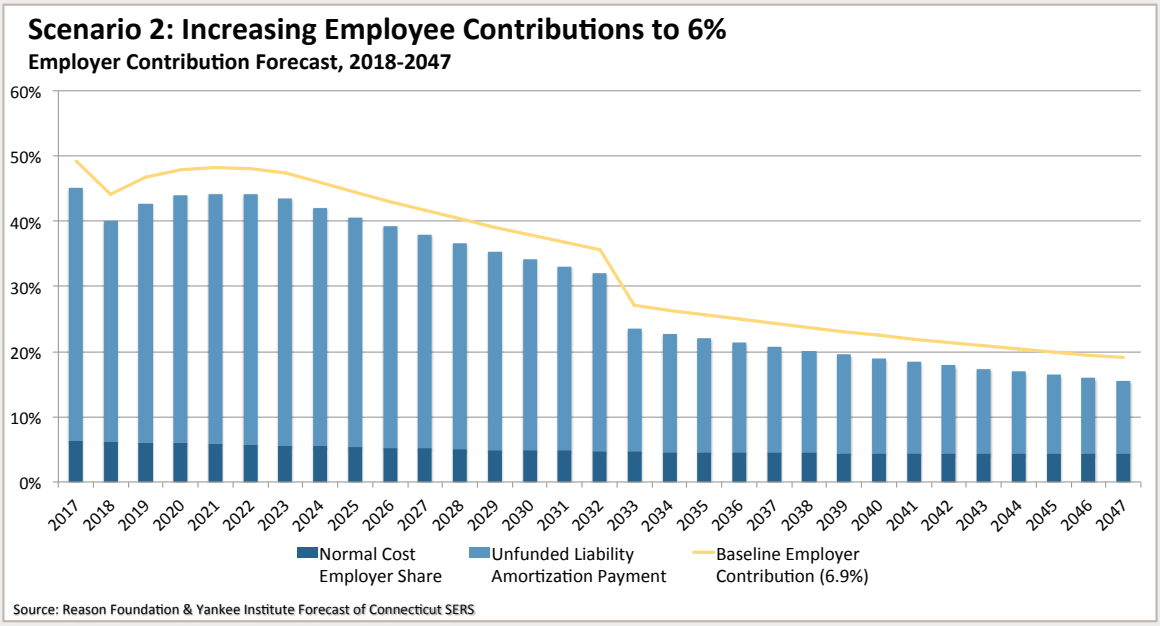


Table S2: Cost/Savings Analysis

	Employer Contribution (% payroll) Annual Average		Employer Contribution (in billions) Cumulative		
	Status Quo Employee Rate	6% Employee Rate	Status Quo Employee Rate	6% Employee Rate	Cost/ (Savings)
2 Year (2018 to 2019)	45.5%	41.4%	$3.2	$2.9	($0.29)
5 Year (2018 to 2022)	47.0%	43.0%	$8.4	$7.7	($0.7)
10 Year (2018 to 2027)	45.8%	41.8%	$16.7	$15.3	($1.4)
30 Year (2018 to 2047)	32.9%	29.2%	$38.1	$33.8	($4.3)

Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS. Assumes a 6.9% discount rate.

Scenario 3: Adopting a Max 2% COLA for All Tiers

This scenario forecast changes the COLA formula to be a maximum 2% benefit adjustment based on the change in CPI-W starting with FYE 2018, and then assumes the actual experience for SERS over the next 30 years aligns with actuarial assumptions, including actual annual returns of 6.9%. The average assumed COLA for all tiers in this scenario is 1.75% since the long-term average for inflation would likely be less than the 2% max.

The fiscal effect of changing the benefit formula would reduce outflows from plan assets and link COLAs with actual inflation instead of a percentage of change in inflation. The current formula has a minimum of 2% to 2.5% and maximum of 6% to 7.5% depending on hire date, and is based on a percentage of the change in CPI-W. However, for almost every year over the past two decades, inflation has been below the minimum COLA rate. From this perspective, COLAs are not benefit adjustments to keep up with inflation, they are simply a benefit increase.

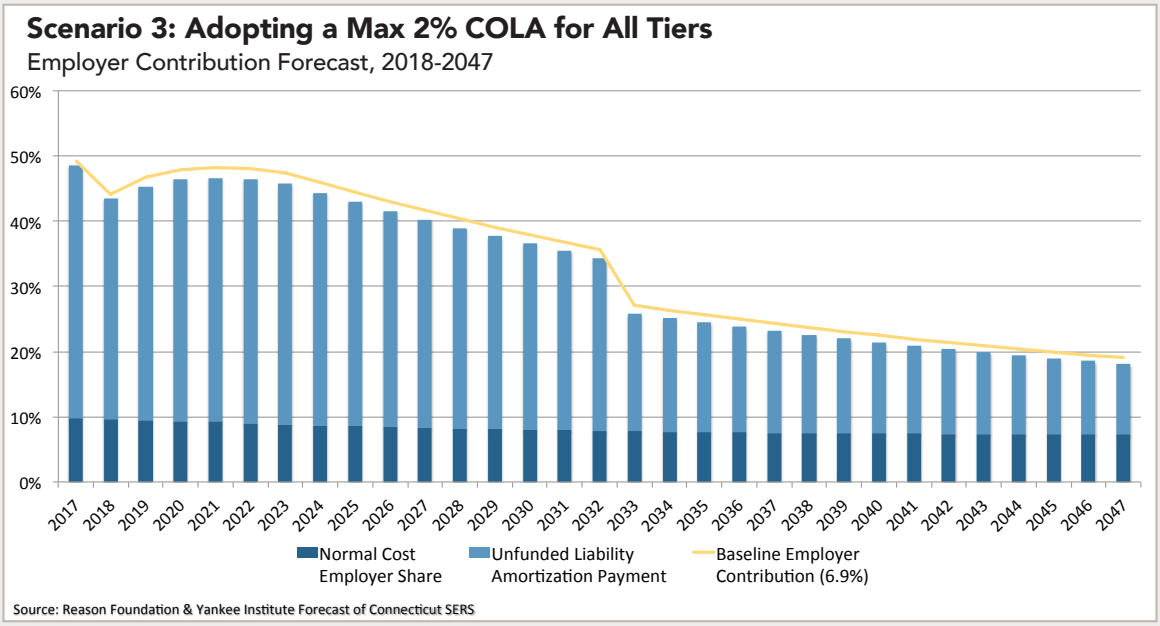
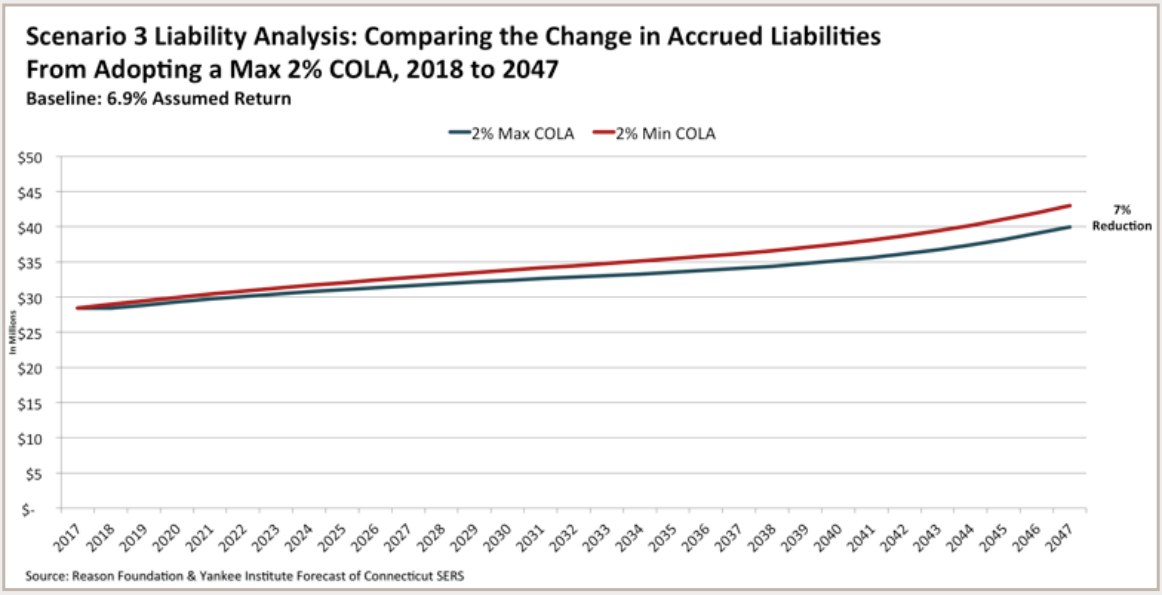


Table S3: Cost / Savings Analysis

	Normal Costs (% payroll) Annual Average			Employer Contribution (in billions) Cumulative		
	2% Min. COLA	2% Max COLA	Change	2% Min. COLA	2% Max COLA	Cost/ (Savings)
2 Year (2018 to 2019)	10.2%	9.6%	-0.6%	$3.23	$3.15	($0.1)
5 Year (2018 to 2022)	10.0%	9.3%	-0.6%	$8.4	$8.2	($0.3)
10 Year (2018 to 2027)	9.6%	9.0%	-0.6%	$16.7	$16.2	($0.5)
30 Year (2018 to 2047)	8.6%	8.1%	-0.6%	$38.1	$36.7	($1.4)

Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS. Assumes a 6.9% discount rate.



Scenario 3 Liability Analysis: The liability effect of this change would be a reduction in the forecast of accrued liabilities, since the expected adjustment of benefits would be less under a system with a maximum 2% COLA compared to a minimum 2% COLA. As shown below, there would be a 7% change in liability growth over the next 30 years as a result of adopting a maximum 2% COLA.

The solvency effects would be lower benefit outflows from plan assets, allowing previously accrued contributions made in anticipation of higher COLA payments to be applied towards overall plan solvency, and lower growth in liabilities that are exposed to the aggressively optimistic actuarial assumptions of SERS.

Scenario 4: Adopting a $100,000 Pensionable Pay Cap for New Hires

This scenario forecast adopts a cap on pensionable compensation for new hires only at $100,000 starting with FYE 2018, and then assumes the actual experience for SERS over the next 30 years aligns with actuarial assumptions, including actual annual returns of 6.9% and an average COLA of 2.3% for Tier III. The scenario also assumes that new-hire employee contributions are based on only the first $100,000 of salary.

The fiscal effect of creating a Tier IV employee class with a pensionable compensation cap would depend on where the cap is placed and how many employees would become subject to the cap. The 2016 current cap from the IRS is $265,000, which applies to very few state employees. Lowering the pensionable compensation cap to a fixed $100,000 would mean paying out lower benefits, since the largest final average earnings figure would be the $100,000 limit.

The solvency effect would be based on lower growth in liabilities that are exposed to the aggressively optimistic actuarial assumptions of SERS.

Scenario 4 Liability Analysis: The liability effect of adopting a lower pensionable compensation cap would be a reduction in the forecasted accrued liabilities, since the expected benefits for the new Tier IV would be less than the benefits expected for new hires into Tier III. As shown in the figure below, there would be a 24.6% change in liability growth over the next 30 years as a result of adopting $100,000 pensionable compensation cap.

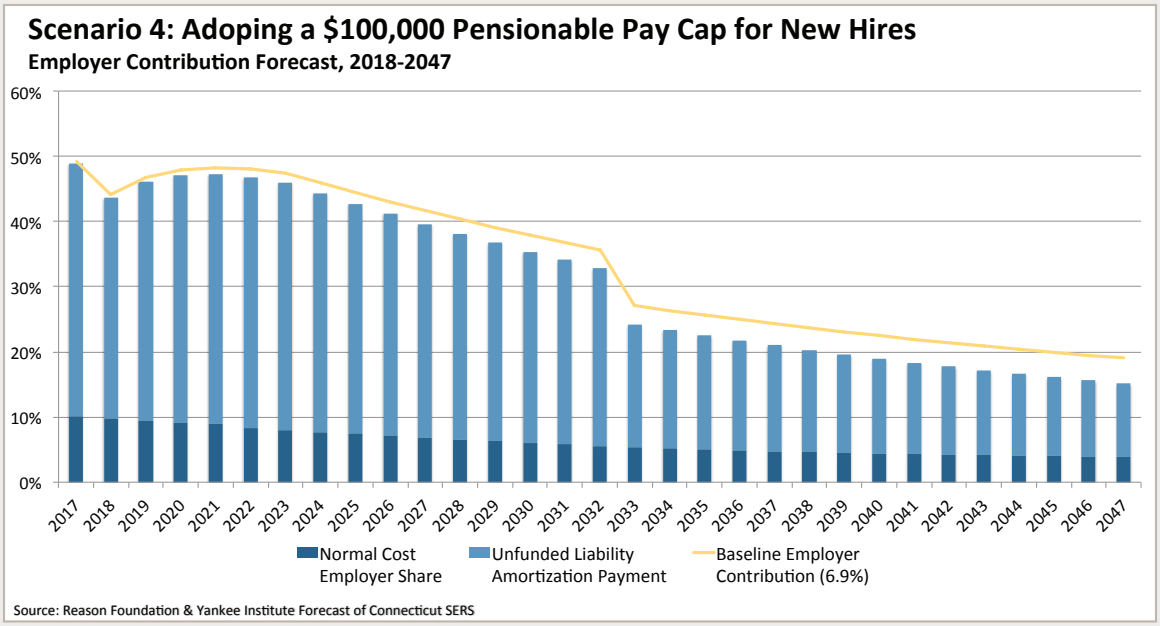
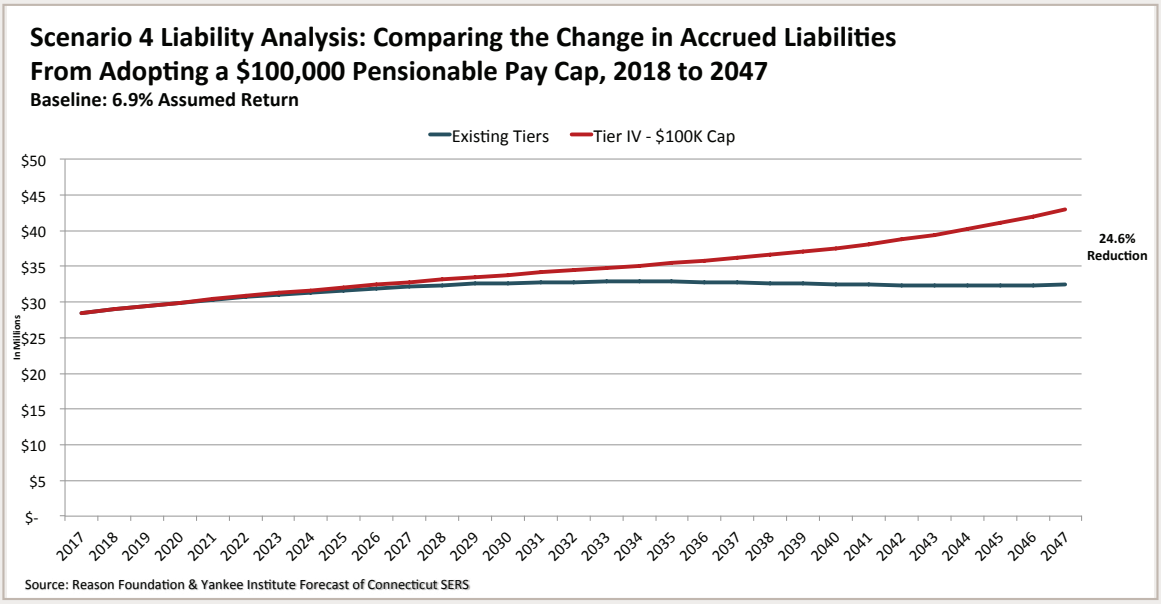
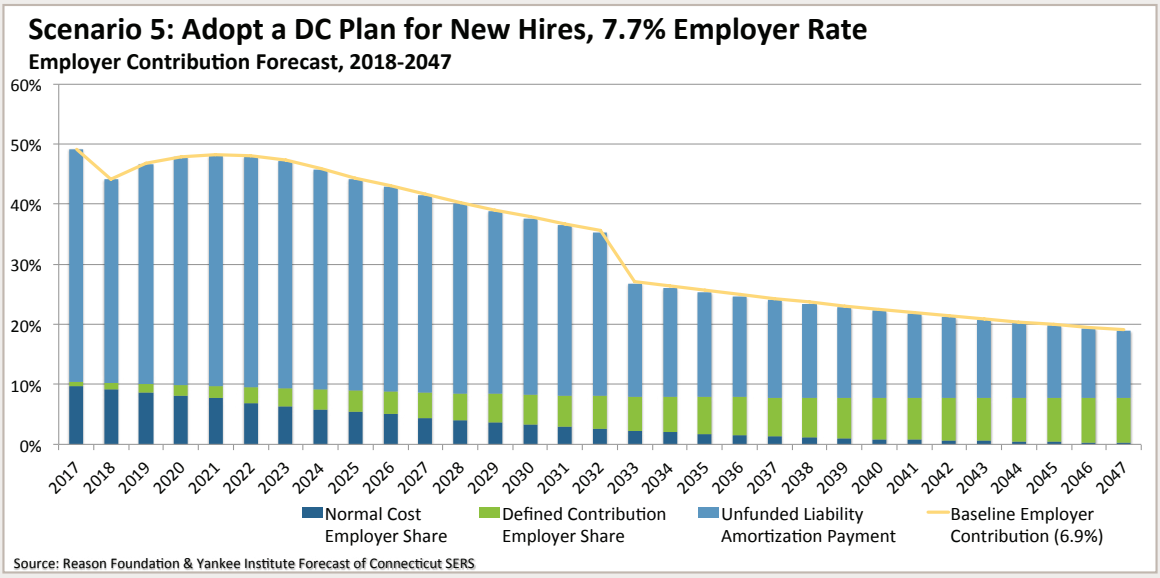


Table S4: Cost / Savings Analysis

	Gross Normal Cost (in millions) New Hire Only, Annual Average			Employer Contribution (in billions) Cumulative		
	Tier III Status Quo	Tier IV $100K Cap	Cost/ (Savings)	Tier III Status Quo	Tier IV $100K Cap	Cost/ (Savings)
2 Year (2018 to 2019)	$52.2	$28.7	($23.5)	$3.23	$3.18	($0.04)
5 Year (2018 to 2022)	$79.1	$43.6	($35.5)	$8.44	$8.28	($0.16)
10 Year (2018 to 2027)	$131.6	$72.1	($59.5)	$16.7	$16.2	($0.5)
30 Year (2018 to 2047)	$396.0	$200.9	($195.1)	$38.1	$35.0	($3.1)

Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS. Assumes a 6.9% discount rate.





Scenario 5: Adopt a DC Plan for New Hires, 7.7% Employer Rate

This scenario forecast adopts a Tier IV defined contribution plan only for new hires starting with FYE 2018, and then assumes the actual experience for SERS over the next 30 years aligns with actuarial assumptions, including actual annual returns of 6.9% and an average COLA of 2.3% for Tier III. The defined contribution plan modeled here would have an employer contribution of 7.7%, which is roughly equivalent to the employer's share of normal cost for new hires into Tier III. The forecast assumes existing unfunded liabilities would be amortized over total payroll, with the same method and schedule as the status quo.

The fiscal effect of creating a defined contribution plan for new hires primarily depends on the contribution rate offered by the employer. If the DC employer rate exceeds expected (though probably underpriced) normal cost for new hires, then there will be a forecasted cost increase. If the DC employer rate is less than expected normal cost for new hires, then the forecast will expect savings.

The solvency effect created by switching to a defined contribution plan is also important for understanding the fiscal effects. Bringing all new hires into a plan with zero accrued liabilities means that, over time, the amount of pension promises exposed to the aggressive current actuarial assumptions of SERS will decrease rather than increase. Reducing the liabilities that will likely be underfunded by the current funding policy means that, over time, SERS will be better funded with a DC plan in place for new hires relative to the status quo.

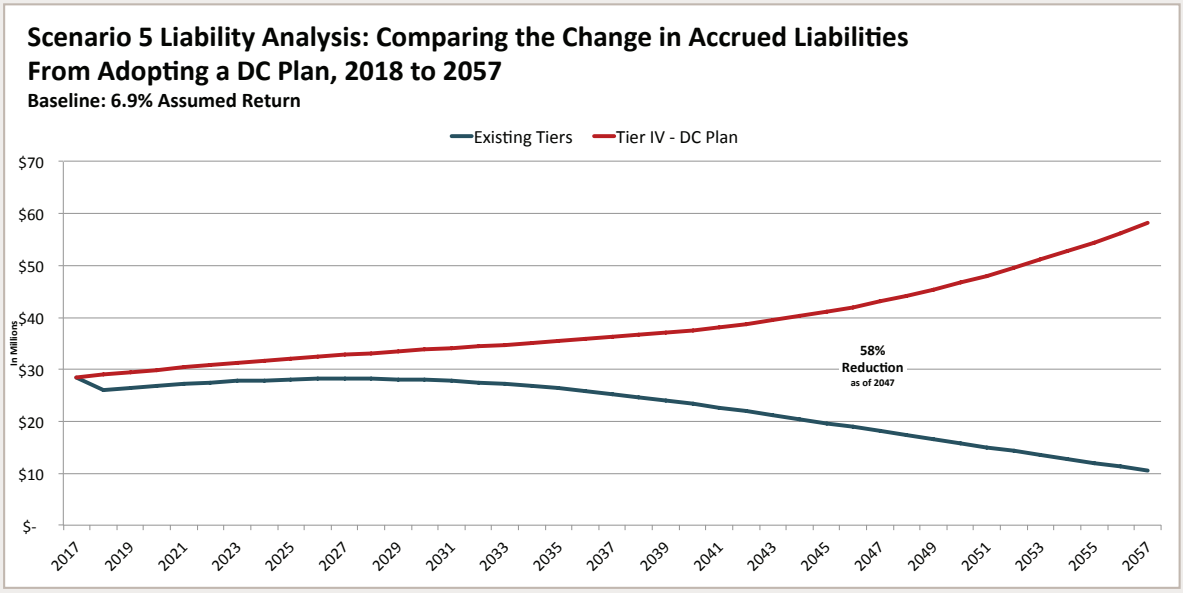
Note: The same kind of solvency effects would be created by a cash balance plan or a DB-DC hybrid plan, though to a lesser extent.

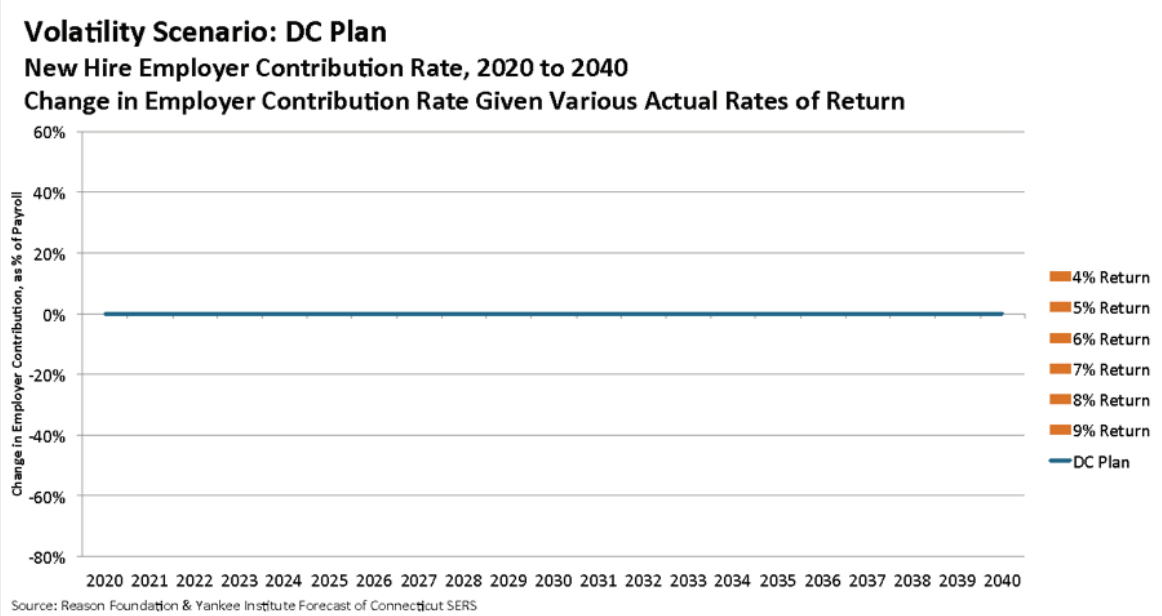
Scenario 5 Liability Analysis: The liability effect of adopting a defined contribution plan for new hires would be a directional change in the forecast of accrued liabilities, since new hires into Tier IV would produce no liabilities. As shown in the below figure, liabilities will grow slightly in the first few years following the adoption of a DC plan for new hires, because members already in the defined benefit tiers of SERS would continue to accrue pension benefits until they retire. After about 10 years, the liabilities begin to decline and eventually fall to zero.

Table S5: Cost / Savings Analysis

	New Hire Normal Cost (1% payroll) Annual Average			Employer Contribution (in billions) Cumulative		
	Tier III Status Quo	Tier IV DC Plan	Cost/ (Savings)	Tier III Status Quo	Tier IV DC Plan	Cost/ (Savings)
2 Year (2018 to 2019)	7.7%	7.7%	0.0%	$3.23	$3.23	($0.00)
5 Year (2018 to 2022)	7.7%	7.7%	0.0%	$8.44	$8.43	($0.01)
10 Year (2018 to 2027)	7.7%	7.7%	0.0%	$16.7	$16.6	($0.10)
30 Year (2018 to 2047)	7.7%	7.7%	0.0%	$38.1	$37.9	($0.20)

Source: Reason Foundation & Yankee Institute Forecasting Analysis of Connecticut SERS. Assumes a 6.9% discount rate.





CONCLUSION

SERS is clearly a troubled pension plan, with $21.7 billion to $25 billion in unfunded liabilities (depending on how they are valued). Over the past few decades, investment returns have consistently underperformed expectations by a wide margin, while the asset allocation has been shifting toward riskier investments in an effort to compensate for these shortfalls and chase higher yields. Over the past 15 years, the share of relatively safer, fixed income products has been reduced from about one-third of plan assets to only a one-fifth of plan assets.

Given SERS's current actuarial assumptions and funding policies, there is a high degree of volatility in prospective future employer contribution rates, creating budgeting challenges down the road. The amortization methods used for paying down unfunded liabilities over the past few decades have been focused just on keeping near-term payments low, rather than actually reducing or eliminating pension liabilities. And even when the state has paid 100% of the actuarially determined contributions — a practice that has been anything but consistent — they haven't been enough to fund the plan properly because the discount rate used to value liabilities has been too high. Collectively, the net effect of these problems has been spiraling pension payments, which crowd out spending on other government services and require higher taxes.

Those with power in the decision-making process — including members of the State Employees Retirement Commission, labor leadership associated with SEBAC, and prior state governments — have failed to adequately ensure the long-term solvency of SERS. Prior collective bargaining agreements ignored the need to adjust actuarial assumptions to account for demographic and market changes, while explicitly allowing the underfunding of actuarially determined contributions.

Solving these problems requires all interested parties in Connecticut to focus on ensuring the long-term solvency of SERS; provide retirement security for its members; stabilize contribution rates; reduce taxpayer exposure to financial risk; reduce long-term costs; ensure the ability to recruit 21st century employees; and improve the incentive structures within the current governance of the plan.

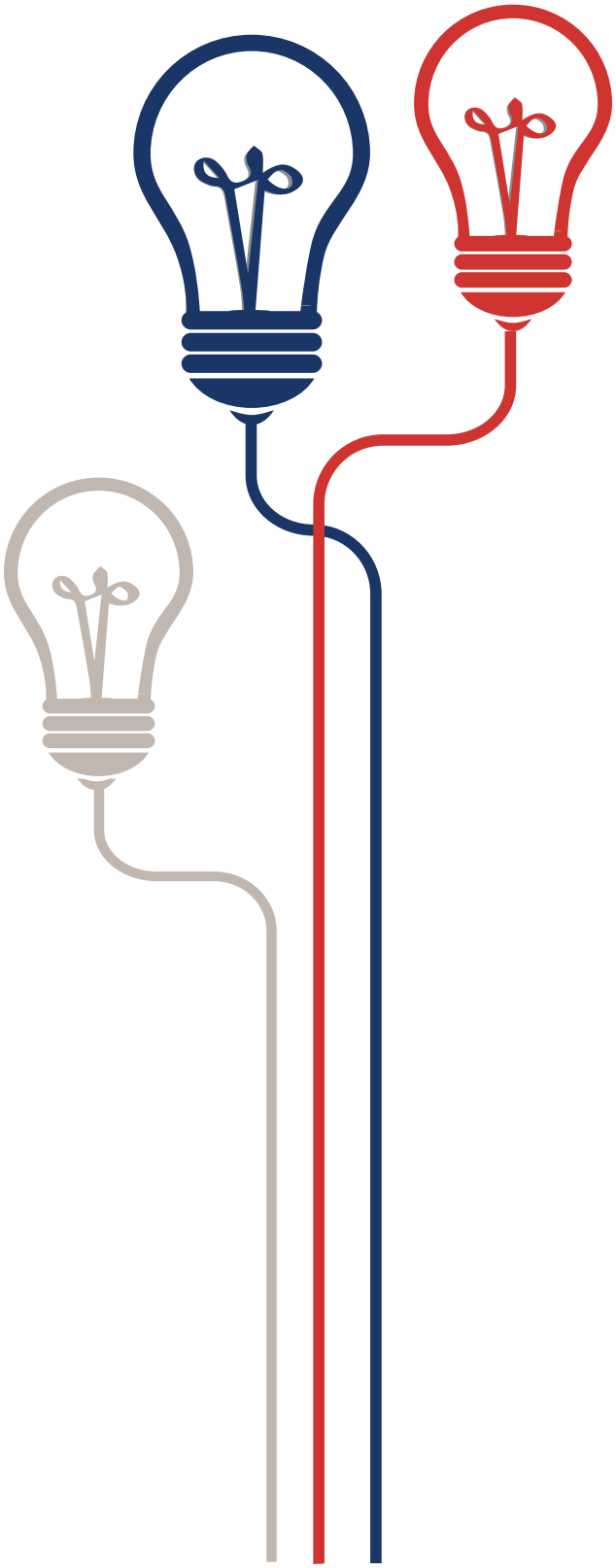
The most substantive action taken recently with respect to addressing SERS's problems was the December 2016 SEBAC agreement. However, the plan as presented to the General Assembly took only one limited step toward improving the actuarial assumptions of the plan — lowering the assumed return from 8% to 6.9% — while taking several steps backwards in once again extending the schedule for paying of unfunded liabilities. This "solution" — adding more years to the timeline for paying off the debt in order to reduce payments in the near term — just repeats failed policies of the past that contributed to the problem today. The net outcome of the agreement adds $8 billion to $9 billion in additional interest payments on the unfunded liabilities for taxpayers in the future, just to make budgeting in the next decade easier.

The next set of solutions should start with careful consideration of the menu of meaningful reform options set forth in this paper, including:

1. Lowering the assumed rate of return to a level that would allow a less risky asset allocation and more accurately priced normal cost;
2. Lowering the discount rate to a level consistent with the market value of liabilities;
3. Increasing employee contributions;
4. Changing the formula for cost-of-living adjustments;
5. Adopting a cap on pensionable compensation for new hires;
6. Offering new hires a more appropriately priced and governed defined benefit plan;
7. Offering new hires a defined contribution plan, cash balance plan, "DB-DC" hybrid plan;
8. Offering new hires an optional defined contribution only plan;
9. Re-organizing the governing process for SERS such that the parties with the most liabilities have the greatest degree of control over funding policies.

Addressing pension challenges is no easy task. It is a complicated, multifaceted problem with a wide range of competing, powerful, and often-vocal political interests. But what's even more obvious is that inaction would be catastrophic.

There are sensible and sustainable options on the table. Now it's time for the people's representatives to summon the statesmanship and courage necessary to keep past promises by protecting existing pension benefits, and securing our state's future by ensuring that future state worker retirement benefits do not undermine the financial condition of the state and the taxpayers they have been elected to serve.



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