The Case for CT's Fiscal Guardrails:

How to Protect Public Pensions and Taxpayers

By: Mariana Trujillo
Jordan Campbell
Steve Vu
Truong Bui
Leonard Gilroy
David Flemming

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About the Authors

Author:

Mariana F. Trujillo is a Policy Analyst with Reason Foundation's Pension Integrity Project.

Project Directors:

Leonard Gilroy is Vice President of Government Reform at Reason Foundation and Senior Managing Director of Reason's Pension Integrity Project.

David Flemming is the Director of Policy and Research at Yankee Institute.

Data and Modeling:

Jordan Campbell is a Quantitative Analyst at Reason Foundation.

Steve Vu is a Quantitative Analyst at Reason Foundation.

Truong Bui is the Director of Data Strategy and Analytics at Reason Foundation. He is also a managing director of Reason Foundation's Pension Integrity Project.

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I. Executive Summary

In 2017, Connecticut faced a severe budget crisis that prompted significant fiscal reforms known as the fiscal guardrails.

These reforms established mechanisms to control spending and revenue streams, directing a share of revenue to a Budget Reserve Fund (BRF).

The BRF is capped at 15% of the state's revenue, with any surplus above this cap allocated to Connecticut's largest and most underfunded pension systems: the State Employee Retirement System (SERS) and the State Teacher Retirement System (STRS). These supplemental contributions, in addition to the yearly Actuarially Determined Government Employer Contributions (ADEC), have resulted in the allocation of $7.7 billion from budget surpluses to the pension funds since 2017. This strategic approach to pension debt amortization has already decreased annual required contributions by approximately $170 million, positioning both pension plans on a path toward full funding.[1]

The surplus contributions have markedly improved the financial health of Connecticut's pension plans, but challenges remain.

SERS and STRS have membership bases covering approximately 5.6% of the state's population. Since the fiscal guardrails were implemented, SERS, with 57,327 retirees and beneficiaries, has seen its funded ratio increase from 36% in 2016 to 50.4% in 2023. Despite this improvement, SERS still faces $20 billion in unfunded liabilities.

Similarly, STRS, with 39,843 retirees and beneficiaries, improved its funded ratio from 56% in 2016 to 59.8% in 2023, but still has $16.4 billion in unfunded liabilities.

The modeling in this report indicates that if no economic recessions happen in the next 30 years, SERS and STRS could achieve full funding by 2046 through traditional state employer contributions alone. However, if the state continues to make additional annual contributions of at least $1 billion for SERS and $800 million for STRS from surplus revenues, full funding could be reached nearly a decade earlier, by 2037 and 2038, respectively. This acceleration of the pension debt payment would save Connecticut $6.77 billion in interest costs over 30 years, accounting for inflation.

The stress testing modeling scenario indicates that the occurrence of two economic recessions before 2053 could impede full funding, with STRS reaching only 90.3% and SERS 86% by 2053. Even with supplemental contributions, two recessions and their subsequent impact on state revenue could leave SERS with $4.4 billion and STRS with $3.9 billion in unfunded liabilities — and increase total pension contributions dispersed until 2053 by $51.48 billion.

While recessions may delay SERS and STRS from becoming fully funded, supplemental contributions will still move SERS and STRS into firmer financial standing.

The fiscal guardrails have reversed decades of pension underfunding, improving Connecticut's creditworthiness and financial stability.

This stronger financial position reduces the risk of future tax increases and allows for responsible tax reforms or increased social spending. Therefore, keeping the fiscal guardrails intact is a responsible fiscal policy that benefits the state's employees, residents, businesses and taxpayers.

Revoking the guardrails would breach bond covenants, part of Connecticut's legal documentation with bondholders — putting the state in technical default. This could trigger the downgrading of its bond rating, permanently increasing borrowing costs and stifling the state's ability to raise capital from private markets.

This report evaluates Connecticut's fiscal reforms and their impact on the state's public pension systems, particularly SERS and STRS. It provides an in-depth analysis of these pension funds' historical context, status and outlook — highlighting the fiscal guardrails' impact.
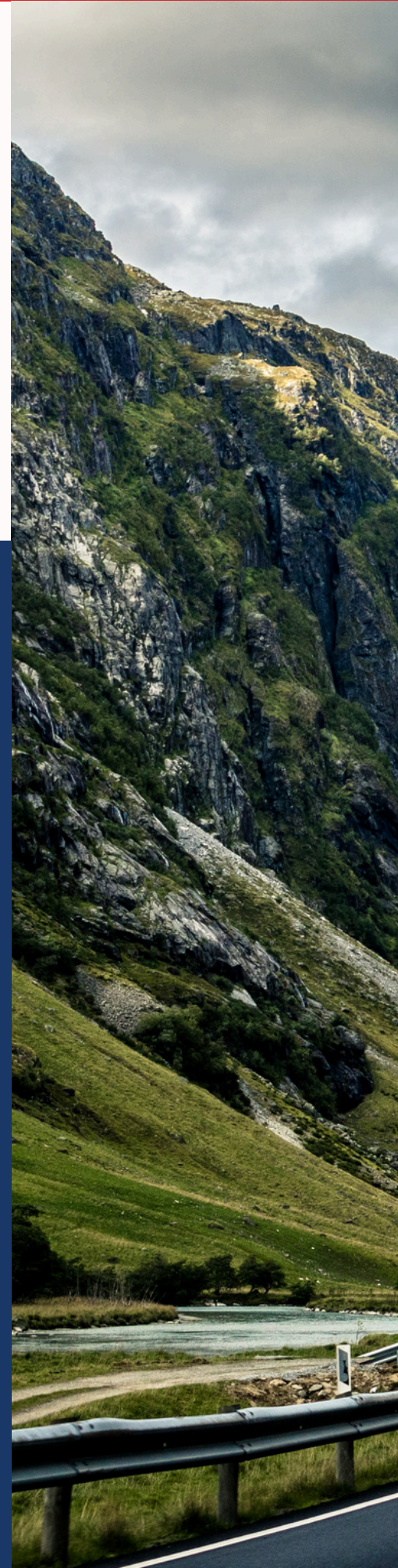
> **The fiscal guardrails have reversed decades of pension underfunding, improving Connecticut's credit-worthiness and financial stability.**

II. A Brief History of Pension Funding in Connecticut

A prolonged biennial budget negotiation in 2017, with Connecticut's General Assembly roughly split between Democrats and Republicans,[2] resulted in significant fiscal reforms. These reforms included spending caps and mandatory revenue-saving measures, which became known as Connecticut's fiscal guardrails.[3] They included:

- **Spending Cap**: Limits the growth in general budget expenditures to the greater of the average five-year increase in personal income or the increase in inflation. This ensures that state spending remains within sustainable limits.

- **Revenue Cap**: Limits the amount of General Fund and Special Transportation Fund appropriations to a percentage of revenue, directing resources to the Budget Reserve Fund ("rainy day fund") and providing a buffer against economic and tax revenue downturns.

- **Revenue Volatility Cap**: Directs collections from volatile revenue sources exceeding a designated threshold into the Budget Reserve Fund (BRF), stabilizing state finances by managing unpredictable revenue streams.

- **Bond Lock**: A contractual obligation to not redefine or alter the fiscal guardrails by adding them to bond covenants.[4] This prevents the waiving of these requirements unless three-fifths of the legislature and the governor say otherwise. If Connecticut were to violate a bond covenant, investors would see investing in the state as a riskier proposition. Breaking bond covenants would significantly stifle Connecticut's ability to raise funds through bonds in the future.

The BRF is limited to 15% (increased to 18% starting FY 25) of the net General Fund. Once the BRF reached the threshold, the overflow funds were set to be transferred to reduce the unfunded liabilities of the Connecticut State Employee Retirement System (SERS) and Connecticut State Teachers Retirement System (STRS) — which were in a very dire position, dragging down the state's creditworthiness and financial status.[5]

In 2016, SERS was in a notably worse position than STRS. The system had a 35.5% funded ratio, only having enough funds to pay for about one-third of the promised retirement benefits to public employees. The median state plan funding ratio in 2016 in America was 70.3%.[6]

The underfunding of Connecticut's pensions resulted from initiatives that underestimated the true costs of promised public employee benefits.

Since 1971, the state has been required to fully fund its plans through the Actuarially Determined Employer Contribution (ADEC), which imposed full payment of normal pension costs and the amortization of unfunded liabilities. Yet both plans became increasingly underfunded year after year. This is mainly due to collective bargaining agreements that altered pension valuations, leading to a chronic underestimation of present costs and underfunding.[7]

For example, a 1992 agreement with the State Employees Bargaining Agent Coalition (SEBAC) extended the amortization period from 30 to 40 years, delaying payments and increasing long-term liabilities.[8] A subsequent 1997 agreement with the SEBAC shifted from "level dollar" to "level percent of payroll" funding, resulting in lower initial payments and larger future obligations. These adjustments were designed to alleviate short-term fiscal pressures and please interest groups by pushing costs into the future — the future in which we now live.[9]

The additional contributions to SERS and STRS in recent years have put both plans on track to correct the past decades of underfunding and eliminate their unfunded liabilities within the next 25 years. Since 2017, the General Assembly has met its ADEC for both funds and contributed additional lump sum funds. SERS's funded ratio has increased from 36% in 2016 to 50.4% in 2023, while STRS's funded ratio increased from 56% in 2016 to 59.8% in 2023 — reversing the previous downward trend in their funded ratios (see Figure 1).

> " *Since 1971, the state has been required to fully fund its plans through the Actuarially Determined Employer Contribution (ADEC), which imposed full payment of normal pension costs and the amortization of unfunded liabilities. Yet both plans became increasingly underfunded year after year.* "

Connecticut's other long-term liabilities have been decreasing, including Other-Post-Employment Benefits (OPEB) and outstanding bonds. As of June 30, 2023, Connecticut's long-term obligations totaled $81.6 billion, down $6.7 billion from the previous year and $13.8 billion from November 2021, due to measures also imposed by the fiscal guardrails.

These fiscal reforms and responsible funding strategies have led to several credit rating upgrades from S&P Global Ratings, reflecting the positive impact of the fiscal guardrails, ensuring a more stable financial future for Connecticut.[10]

Yet despite the improvement in the SERS and STRS funded ratios, they remain far below their peers in other states. According to Equable's *Pension Plan Funded Ratio Rankings for 2023*, STRS' funded ratio ranks 198th while SERS' funded ratio ranks 208th out of 225 pension funds in the United States.[11] There may be light at the end of the fiscal tunnel, but Connecticut cannot afford to halt or slow its steady advance forward.

III. The State of Connecticut's Largest Pension Plans:

State Employee Retirement System (SERS) and State Teachers Retirement System (STRS)

The Connecticut State Employees Retirement System (SERS)

Total membership: 108,013
Retirees and beneficiaries: 57,327
Former employees entitled to benefits but not yet retired: 3,417
Active employees: 47,269
Government Employer contribution rate (ADEC): $2.014 billion (48.31% of payroll)
State Employee contribution rate (fixed, varies by retirement tier and plan type): 2% - 8%
Assumed rate of return: 6.9%
Funded ratio: 52%
Unfunded Liabilities: $20.1 B
Source: SERS 2023 Actuarial Valuation Report.[12]

The Connecticut State Teacher Retirement System (STRS)

Total membership: 95,554
Retirees and beneficiaries: 39,843
Former employees entitled to benefits but not yet retired: 2,275
Active employees: 53,436
Government Employer contribution rate (ADEC): $1.601 billion (31.70% of payroll)
Employee contribution rate (fixed): 8.25%
Assumed rate of return: 6.9%
Funded ratio: 59.8%
Unfunded Liabilities: $16.4 B
Source: STRS 2023 Actuarial Valuation Report.[13]

Historical Analysis

Unfunded Liabilities

The **funded ratio** is a percentage calculated by dividing the value of plan assets by the estimated liabilities of benefits promised to members. It is based on the actuarially smoothed value of assets or the market value of those assets. "Actuarially smoothed reporting of assets" refers to the practice of valuing assets by spreading investment gains and losses over a five-year period to prevent market volatilities from disturbing fiscal planning. The market value estimates are based on the most recent market price of assets (or declared market price).

The difference between plan assets and liabilities is the unfunded accrued liability (UAL), frequently referenced as "pension debt." This measure is also referred to as Net Pension Liability (NPL).

Figure 1 shows the plans' UAL in red and the funded ratio as the blue line. SERS is at a 50.4% funded ratio, as seen in **Figure 1a**. This indicates that SERS still has only about half of the assets it will need to fulfill pension promises made to public workers — short $20 billion. While still dire, SERS current position marks a significant improvement from its low of 36% funded in 2016.
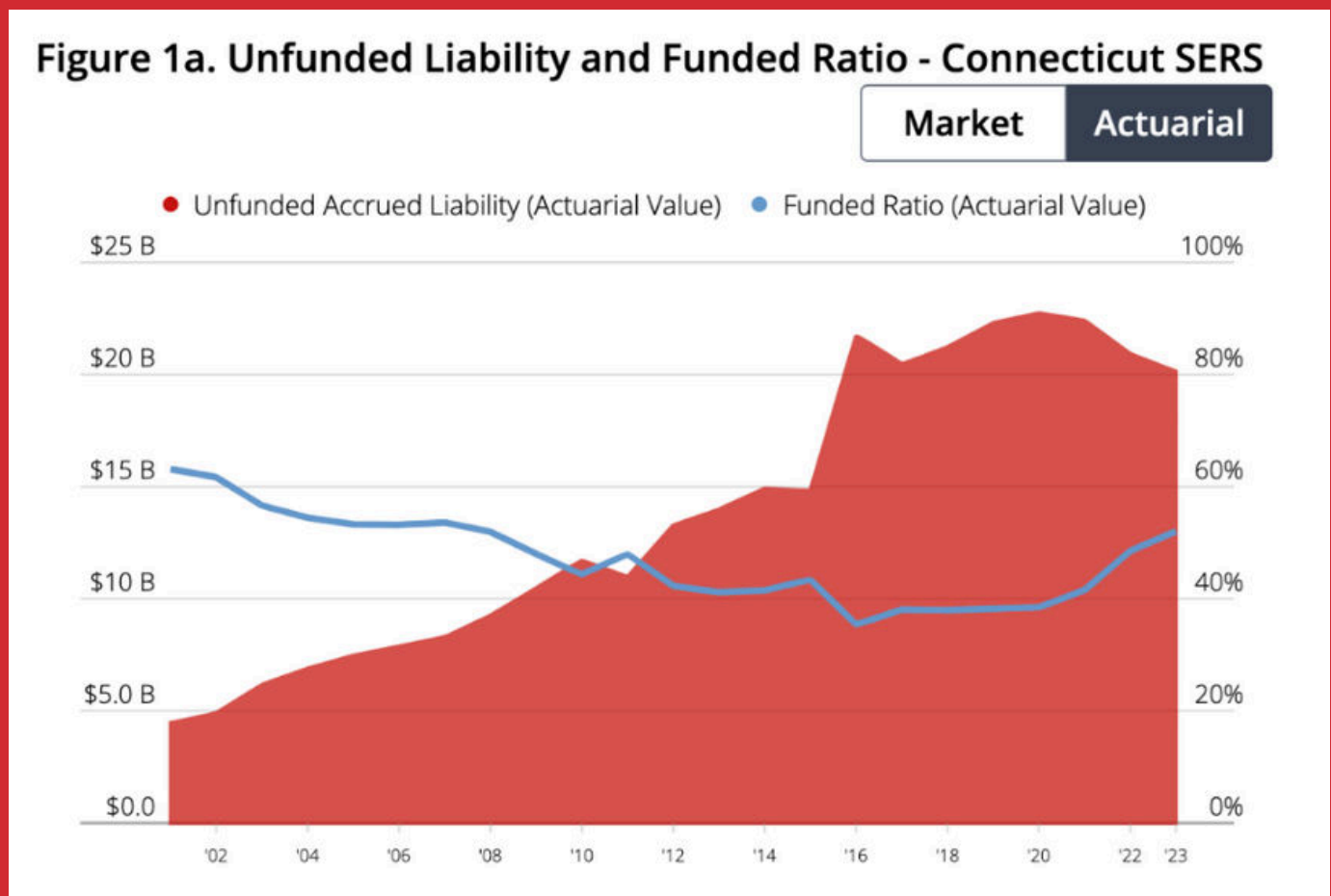

Figure 1a. Unfunded Liability and Funded Ratio - Connecticut SERS

Figure 1b depicts the funded ratio for STRS, which is 59.8%. This is an improvement from the low of 56% in 2016. Despite this progress, STRS still has a $16.4 billion unfunded liability.

The progress can be attributed to the fiscal guardrails implemented in 2017, which directed additional budget funding to stabilize the growth in unfunded liabilities (see Section I). This stabilization has been visible through slowing the growth and eventual reduction of unfunded liabilities past 2016, which is especially impressive considering the accounting assumption adjustments that have increased the present value of both plans' liabilities (see Figure 3).

SERS' funding position demonstrated considerably more improvement than STRS.' This is due primarily to the State Treasurer's decision to prioritize SERS for additional funding.[14] Evidence of this prioritization: in September 2023, the State Treasurer allocated an additional payment of $1.05 billion to SERS to reduce its unfunded pension liability while only directing $272.8 million to STRS.

Both funds are recovering and forecasted to reach 100% funding by 2053, contingent on expectations being met precisely as projected. To protect the retirement security of a membership base that covers more than 5.6% of the state's population, the state must remain committed to significant budgetary allocations for decades. This commitment will ensure the pension systems' long-term viability, allowing them to overcome market volatility or unexpected deviations from accounting expectations.
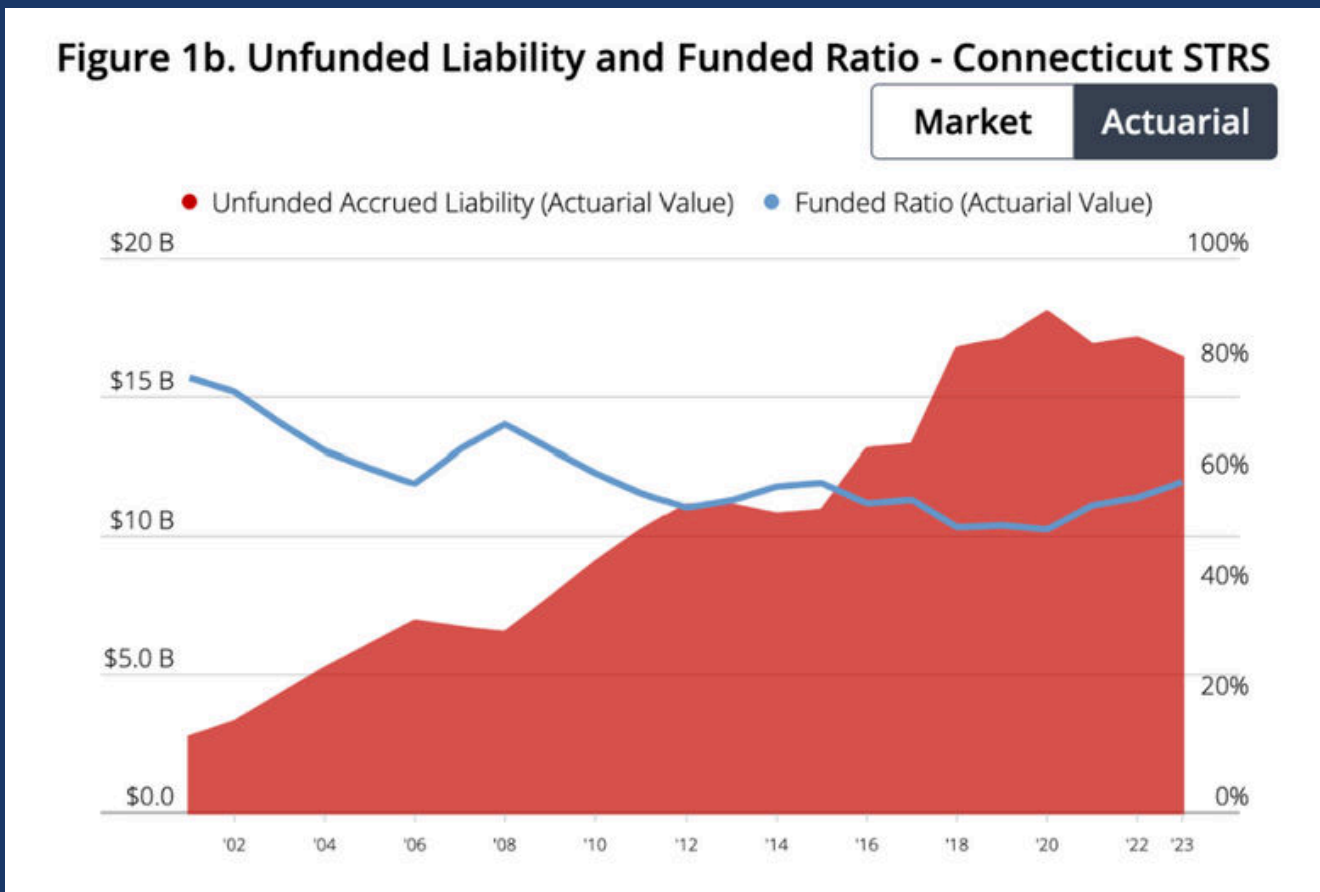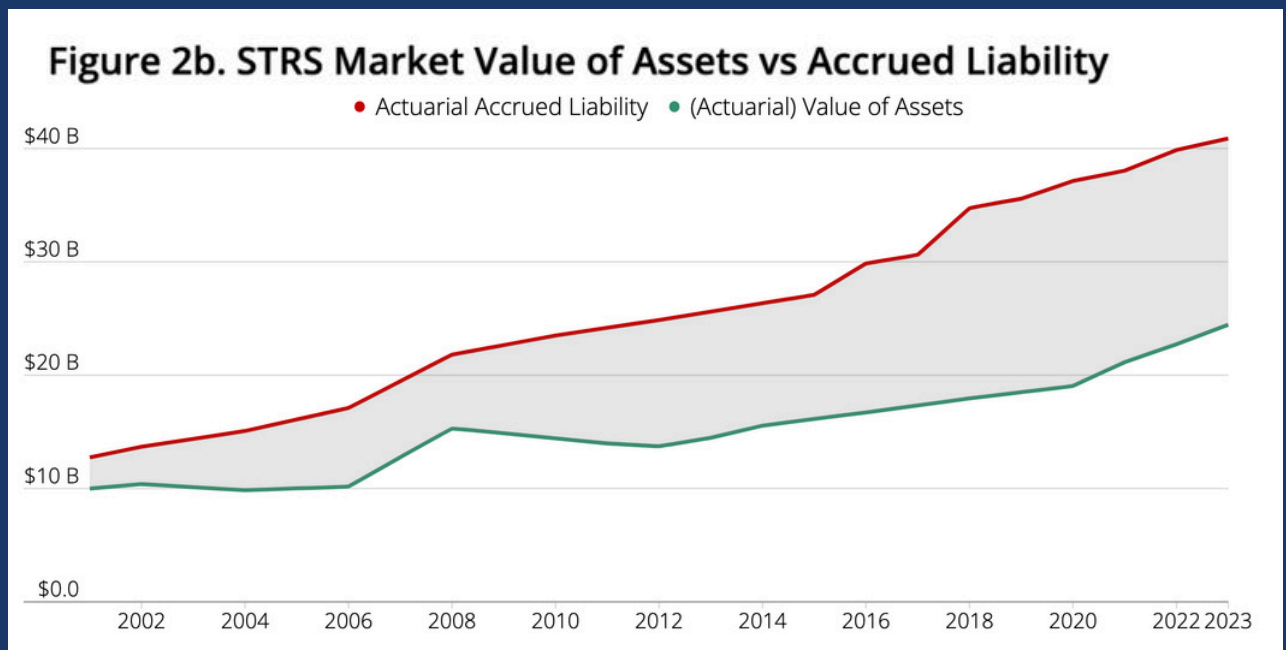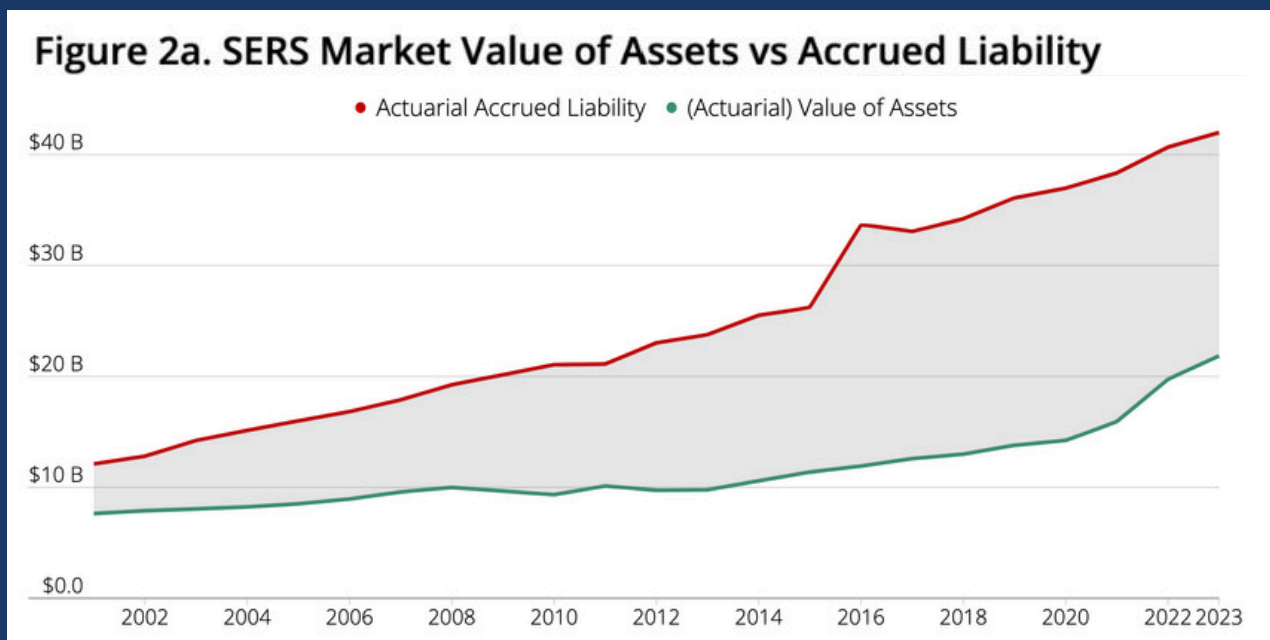

Figure 1b. Unfunded Liability and Funded Ratio - Connecticut STRS

Figure 2 shows the difference between the plans' assets and liabilities, visualizing in gray the extent to which liabilities have grown faster than the fund's assets.

Figure 2a. SERS Market Value of Assets vs Accrued Liability

● Actuarial Accrued Liability   ● (Actuarial) Value of Assets

Figure 2b. STRS Market Value of Assets vs Accrued Liability

● Actuarial Accrued Liability   ● (Actuarial) Value of Assets

Drivers of SERS Debt

What has driven SERS' and STRS' increase in unfunded liabilities from 2004 to 2023?

Unfunded liability is the difference between a pension fund's assets and its liabilities, which occurs because of persistent insufficient pension contributions. Pension liabilities can rise or fall for a multitude of reasons. When a rise in contributions does not immediately accompany a rise in liabilities, unfunded liabilities accumulate.

The $25.86 billion net increase in SERS and STRS pension debt between 2004 and 2024 can be attributed to several key factors (see Figure 3). Much of this increase stems from revisions in actuarial assumptions and methods — i.e., adjustments to investment and demographic expectations to better align with observed outcomes. A major contributor to this change was the necessary reduction in the pension liability discount rate to more accurately reflect investment returns. Pension discount rates are determined by the assumed rate of investment return (see Figure 6).

Suppose a homeowner contracts a builder to construct a house for a fixed price of $600,000. If during construction the cost of lumber significantly exceeds forecasts, the contractor remains obligated to complete the project at the agreed price. The contractor absorbs the extra costs to fulfill the contract without charging the homeowner.

Similarly, the state must fully cover the difference between expected and actual market outcomes to ensure that the promised benefits are fully paid.

This situation places the financial burden of any underperformance in investment returns solely on the state, and by extension, the taxpayer.

Although lowering the assumed return rate increased the pension debt, it was a necessary and prudent decision to align contribution expectations with realistic market conditions, ultimately fostering more accurate and stable long-term financial planning.

After changes in actuarial assumptions, which added $7.09 billion to the UAL, the second most significant factor influencing SERS pension debt growth was the failure of its labor force demographic expectations to align with initial assumptions, thereby adding $4.1 billion to its unfunded liabilities from 2004 to 2023. This labor dynamic is explored further in Yankee Institute's 2022 study, *CT's Growing Problem: Population Trends in the Constitution State*.[15]

Investment returns falling short of expectations added $3.3 billion, highlighting the gap between assumed and actual returns. Net amortization contributed $1.5 billion, as debt payments were insufficient to offset high-interest accruals. (Massive interest costs have prevented significant debt reduction.) Pay increases deviating from actuarial expectations and the rising costs for cost-of-living adjustments (COLA) added $1.4 billion and $1.2 billion, respectively.
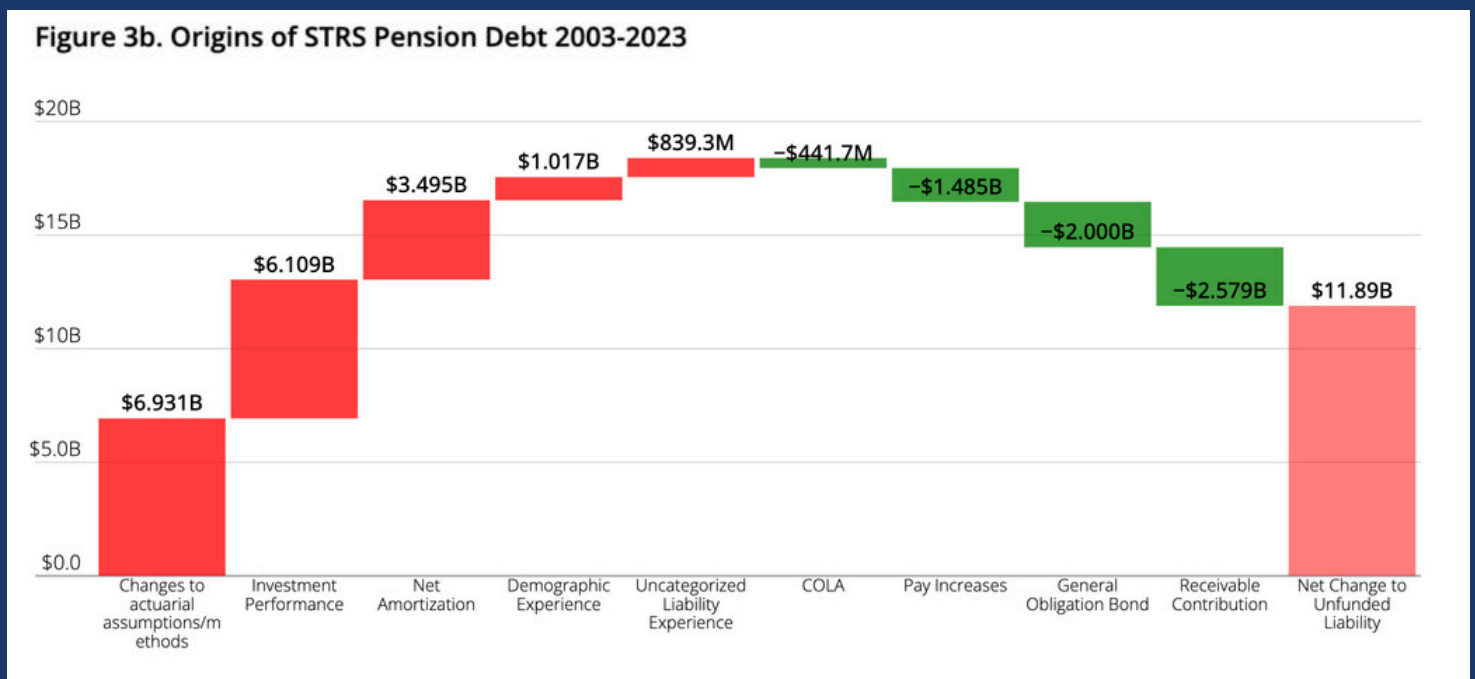

Figure 3a. Origins of SERS Pension Debt 2004-2023

Between 2004 and 2023, here is how SERS pension debt changed [See Figure 3a]:

- Changes to actuarial assumptions/methods added $7.09 billion in unfunded liabilities.
- Demographic experience added $4.05 billion in unfunded liabilities.
- Investment performance added $3.27 billion in unfunded liabilities.
- Net amortization added $1.47 billion in unfunded liabilities.
- Pay increases deviating from expectations added $1.36 billion in unfunded liabilities.
- Cost of living adjustments (COLA) added $1.22 billion in unfunded liabilities.
- Uncategorized liability gain/loss added $922.40 million in unfunded liabilities.
- Other miscellaneous factors reduced unfunded liabilities by $1.27 billion.
- **The fiscal guardrails enabled Connecticut to make surplus contributions, reducing unfunded liabilities by $4.16 billion.**
- Altogether, the net change to unfunded liability added $13.97 billion in unfunded liabilities.

Like SERS, between 2003 and 2023, the most significant contributor to the growth of STRS pension debt was changes to actuarial assumptions/methods, which added $6.9 billion to unfunded liabilities. Investment performance falling short of expectations was the second most significant factor, adding $6.1 billion. Net amortization contributed $3.5 billion, as debt payments were insufficient to cover high-interest accruals. Faulty demographic assumptions to align with initial assumptions added $1.02 billion, while uncategorized liability experience further increased the debt by $839 million.

Certain factors reduced STRS's unfunded liabilities during the period. Reductions in COLA expectations led to a $442 million decrease and pay increases deviating from actuarial expectations reduced liabilities by $1.5 billion. Additionally, revenue from general obligation bonds reduced the unfunded liabilities by $2 billion, and receivable contributions further decreased the debt by $2.6 billion. Despite these estimated decreases and additional funds, the net change resulted in an increase of $11.9 billion in unfunded liabilities over the period.

Figure 3b. Origins of STRS Pension Debt 2003-2023

# Between 2004 and 2023, here is how the STRS pension debt changed [See Figure 3b]:

- Changes to actuarial assumptions/methods added $6.93 billion in unfunded liabilities.
- Investment performance added $6.11 billion in unfunded liabilities.
- Net amortization added $3.50 billion in unfunded liabilities.
- Demographic experience added $1.02 billion in unfunded liabilities.
- Uncategorized liability experience added $839.27 million in unfunded liabilities.
- Cost of living adjustments (COLA) reduced unfunded liabilities by $441.68 million.
- Pay increases deviating from expectations reduced unfunded liabilities by $1.48 billion.
- The General Obligation bonds reduced $2 billion in unfunded liabilities by $2 billion.
- **The fiscal guardrails enabled Connecticut to make surplus contributions, reducing unfunded liabilities by $2.58 billion.**
- Altogether, the net change to unfunded liability added $11.89 billion in unfunded liabilities.

The receivable transfers observed in green for both SERS and STRS, which reduced unfunded liabilities by $4.2 billion, represent the additional General Fund surplus transfers arising from the mechanisms in Connecticut's fiscal guardrails.

Figure 4 illustrates the fund's challenges in reducing debt despite steadily increasing contributions, highlighting the different elements driving interest costs for the pension debt of SERS and STRS from 2004 to 2023. This shows that interest accrued on unfunded liabilities for both plans often exceeded the contributions meant to reduce them.

This negative amortization position indicates that the **system's debt often grew faster than it was being paid down**, posing a challenge to reducing the overall pension debt burden.

For SERS (**Figure 4a**), the trend shows that interest on debt (orange bars) consistently exceeded amortization contributions (blue bars), leading to net amortization (light blue bar) that was often negative — until 2017, when the impact of the additional contributions visibly reverted the trend for most of years since then.

Figure 4a. SERS Interest on Debt Exceeding Amortization 2004-2023
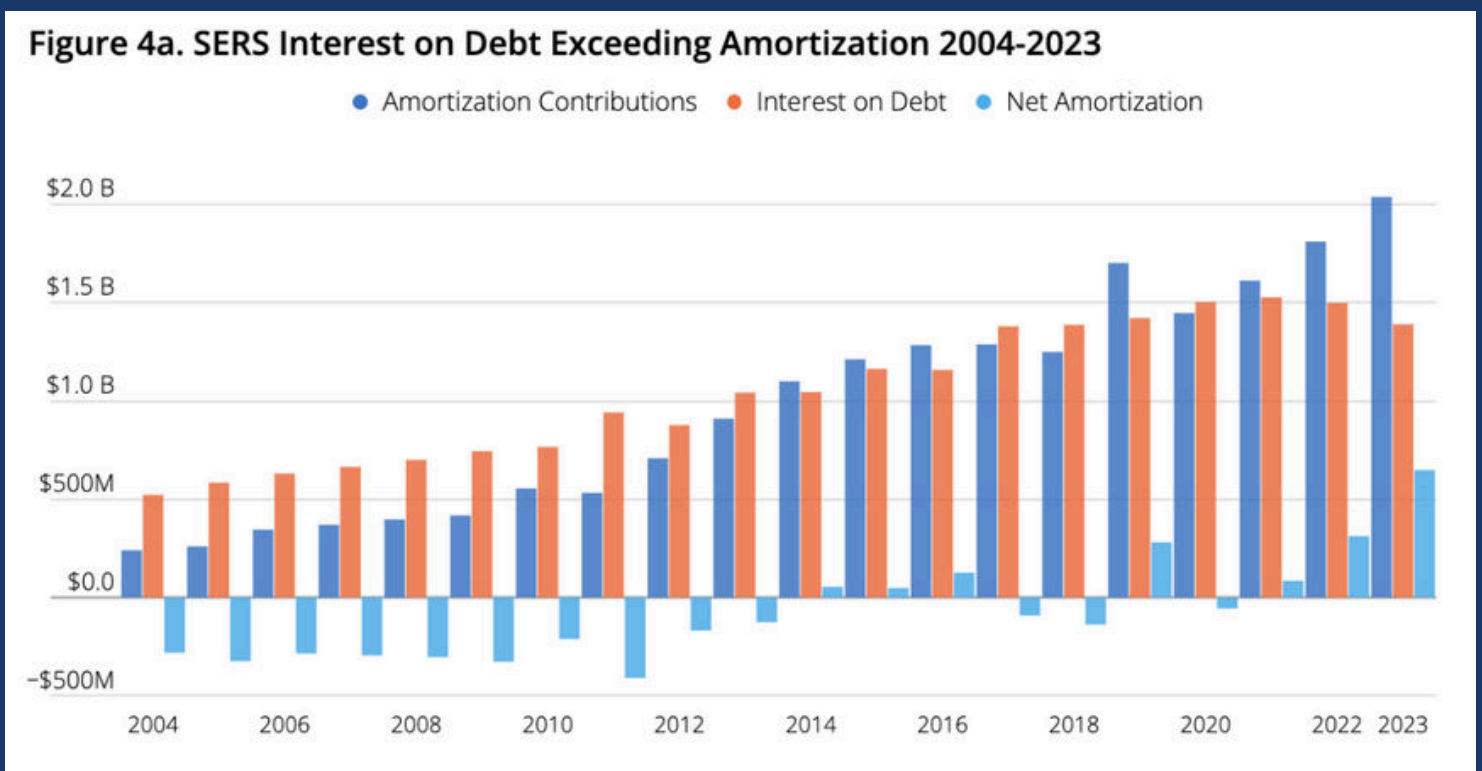
SERS has been in a negative amortization position since at least 1996.[16] However, as the graph demonstrates, it appears to have reverted from this negative amortization, maintaining positive net amortization for more consecutive years than ever since 2004.

Similarly, STRS (**Figure 4b**) displays a comparable pattern, with interest costs frequently outpacing contributions and a more persistent trend of negative net amortization given the funding priority given to SERS (see Section 1).


Figure 4b. STRS Interest on Debt Exceeding Amortization 2003-2023
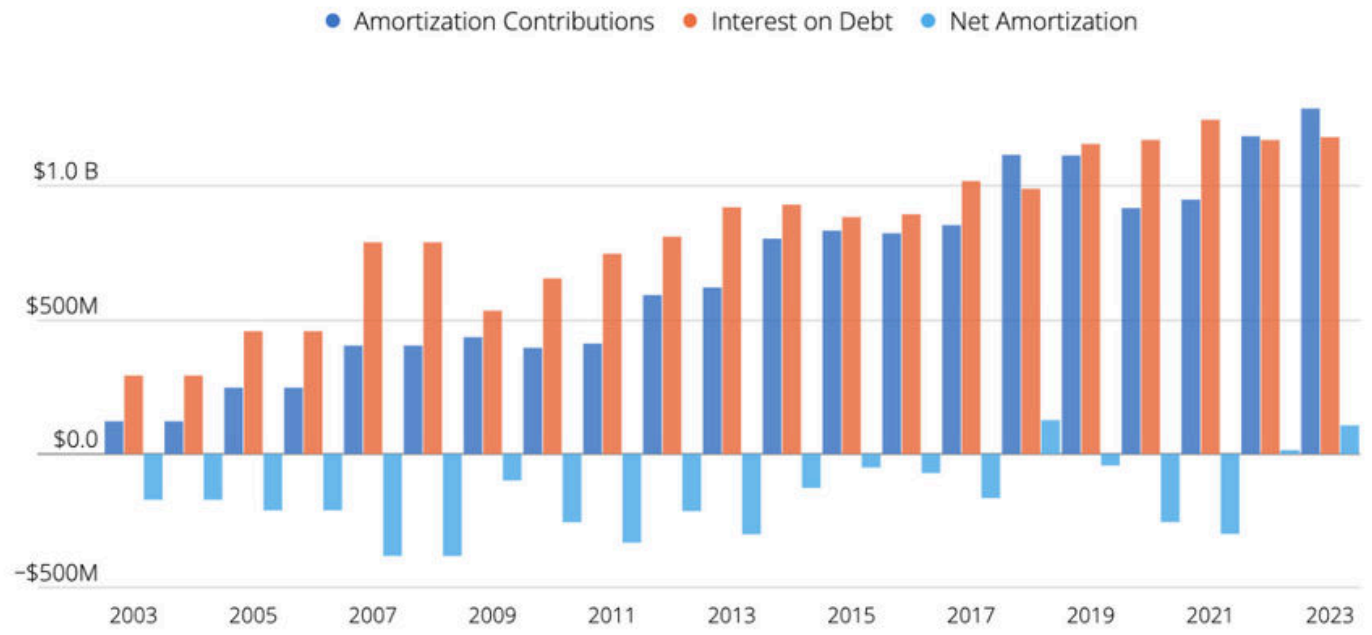
Figures 5a and **5b** display the trend of SERS unfunded liability interest costs contributing to the pension system's debt from 2010 to 2023. The orange section represents unfunded liabilities from other sources, while the shaded gray section indicates the unpaid interest on these unfunded liabilities. This visually illustrates the impact of accrued interest, compounding interest costs, on the overall SERS debt.

Figure 5a. SERS Interest Costs Adding to Debt 2011-2023

Figure 5b. STRS Interest Costs Adding to Debt 2003-2023
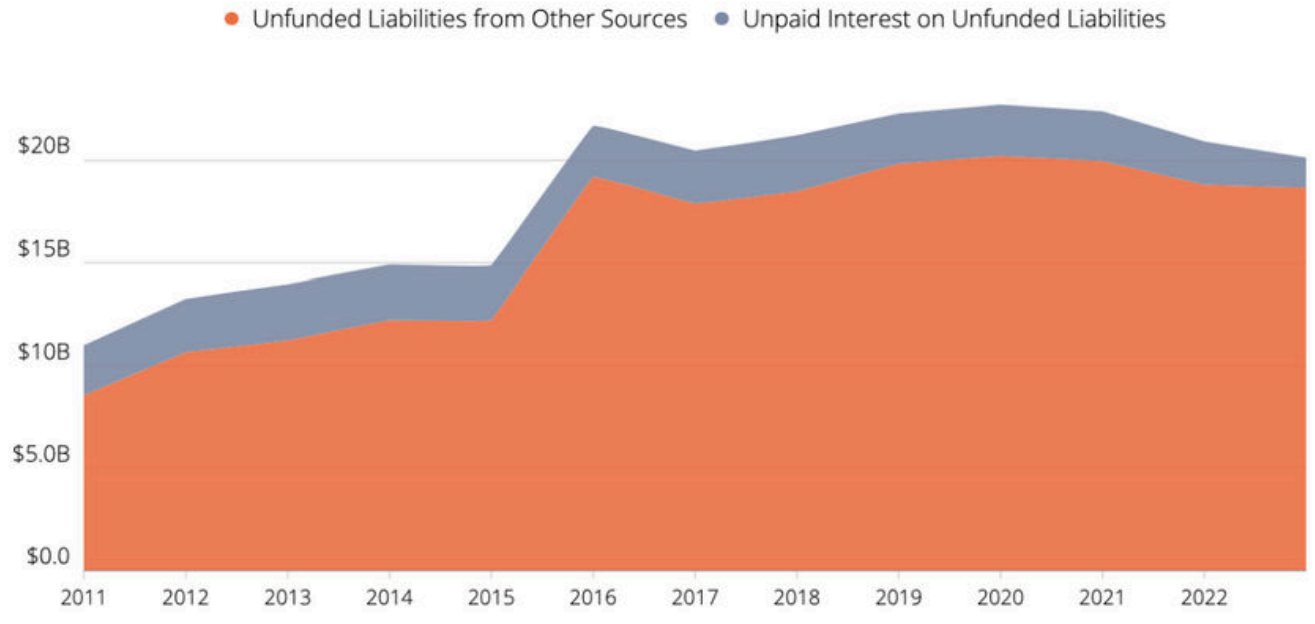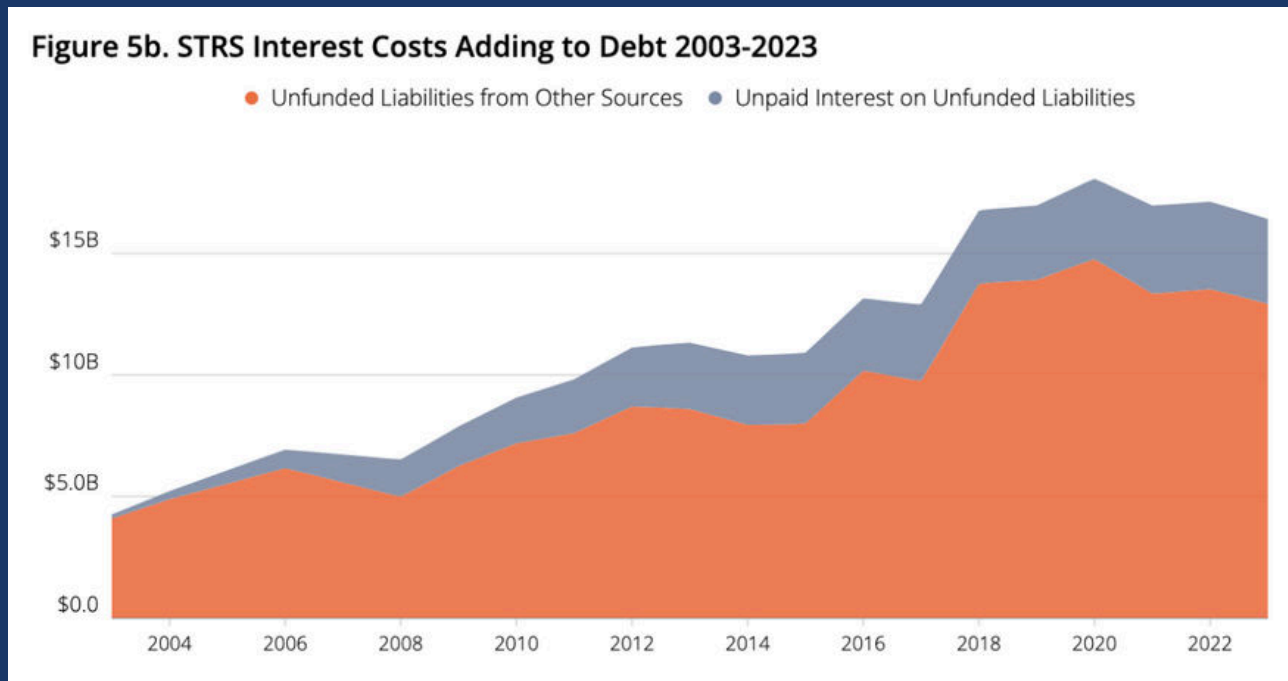
Investment Performance and Asset Allocation

Figure 6a illustrates the investment returns on SERS fund assets from 2001 to 2023. The yellow line represents the assumed return rate, which was initially set at 8.3%. It was first lowered to 8% in 2013 and then prudently lowered to 6.9% in 2017 to more accurately represent the fund's investment returns. The blue line shows actual market returns, while the black and orange lines indicate the 5-year and 10-year rolling average returns at different periods.

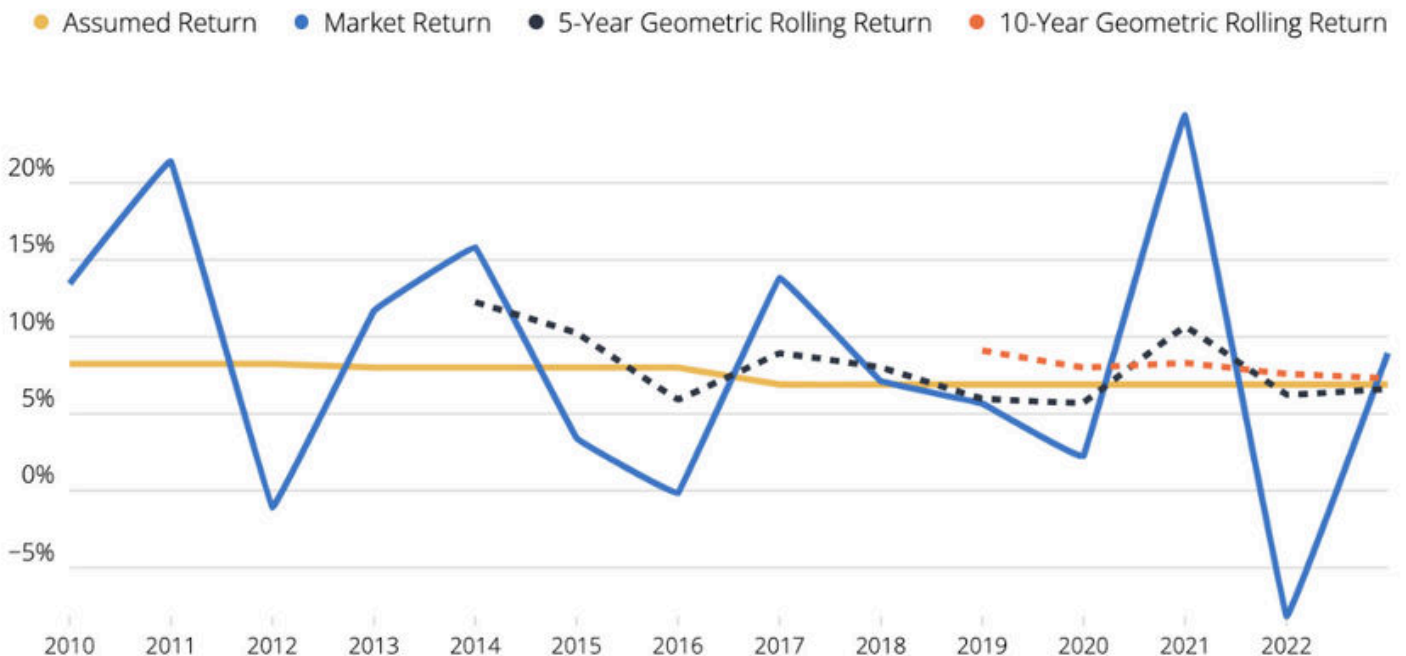Figure 6a. Investment Returns on SERS Fund Assets 2010-2023

Figure 6b illustrates the investment returns on STRS fund assets from 2001 to 2023. The yellow line represents the assumed return rate — which, like SERS, was initially set at 8.5%, then reduced to 8% in 2017 and further to 6.9% in 2018 to more accurately represent the fund's investment returns. The blue line shows actual market returns, while the black and orange lines indicate the 5-year and 10-year rolling average returns at different periods.

Figure 6b. Investment Returns on STRS Fund Assets 2001-2023
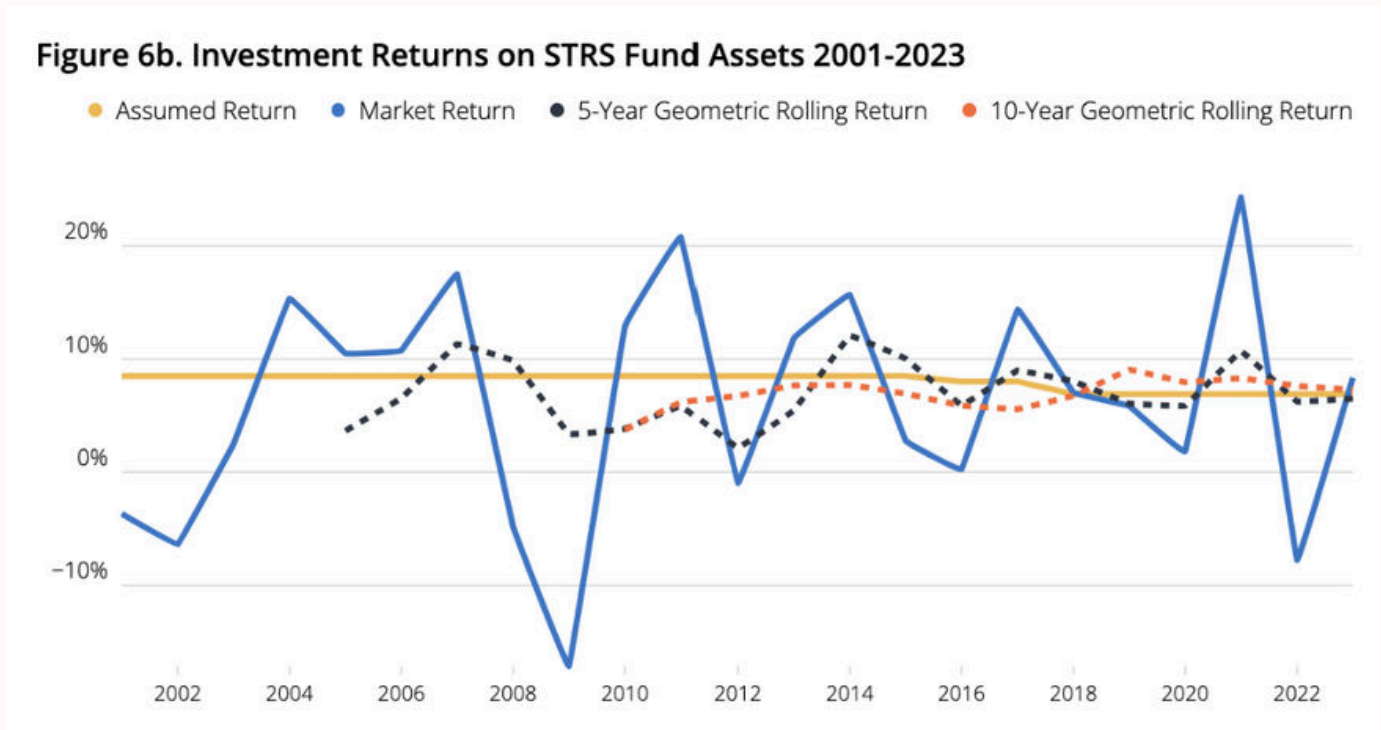
Connecticut's SERS and STRS have had similar investment performance over the past 20 years, though STRS appears more volatile. Both funds initially set high assumed return rates (SERS at 8.3% and STRS at 8.5%) that did not accurately represent their achieved returns, which were later reduced to 6.9%. The 5-year and 10-year rolling average returns for both plans are aligned with the new assumed return rate of 6.9%, indicating a more accurate reflection of long-term investment performance under the adjusted return assumptions. Past performance, however, does not guarantee similar results for the plans' future, as shown in the subsequent Investment Return Probability section.

Figure 7 shows the allocation of SERS and STRS investment assets from 2000 to 2021, highlighting the shifts in asset allocation over time across various asset classes.

Connecticut's SERS and STRS have exhibited similar asset allocation trends over the past two decades. Both funds have significantly reduced their bond holdings from approximately 25% to about 10% of the total portfolio. Equities have consistently remained the dominant asset class, making up around 60-70% of total assets throughout the period. Real estate and commodities have maintained relatively stable, smaller portions of the allocation.

Both plans have moderately increased their allocations to alternative assets, expanding their real estate, hedge fund and commodity allocations, while keeping the share of their portfolio allocated to private equity stable over the past 20 years.

This trend extends beyond SERS and STRS, as pension systems nationwide have increasingly turned to alternative assets, seeking higher returns through riskier investments. Rather than lowering their assumed return rates to reflect the actual rates achievable with a safer portfolio, some pensions have opted to take on more risk to meet these higher assumptions. While this strategy can boost returns, it also introduces greater volatility and significant downside risks, potentially increasing debt and costs for taxpayers.

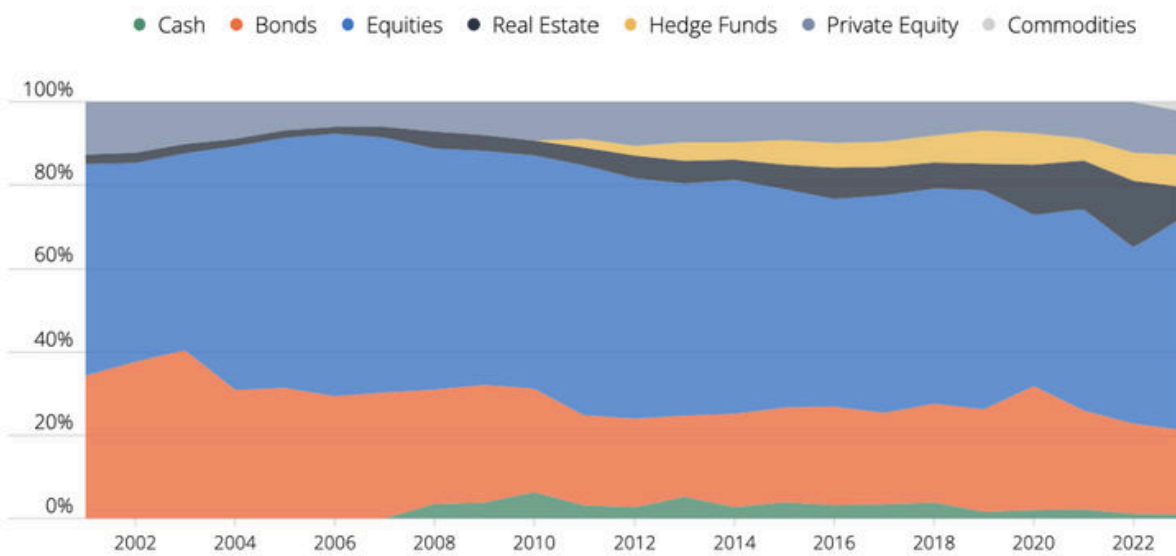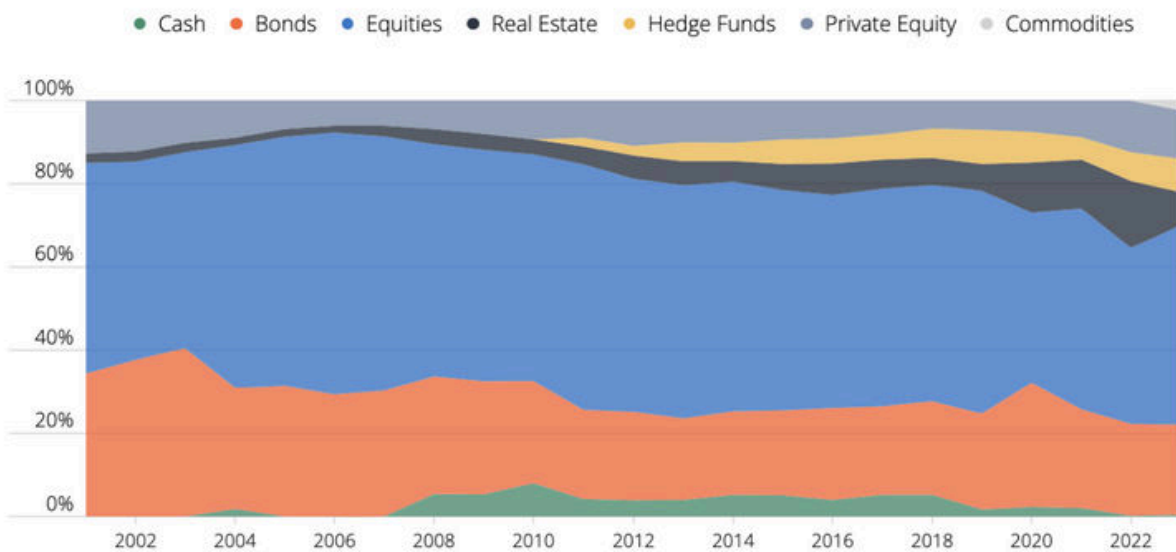Figure 7a. SERS Allocation of Investment Assets 2001-2023

Figure 7b. STRS Allocation of Investment Assets 2001-2023

Investment Return Probability

The **assumed rate of return** (ARR) represents the expected rate of return on the pension fund's investments, which guides how much Connecticut's government must contribute annually to meet pension obligations. This rate also serves as the discount rate for calculating the present value of future liabilities. A higher discount rate lowers the present value of liabilities, while a lower rate increases it.

Pension policymakers set the ARR based on investment advisors' projections. Pension boards first establish the asset allocation — bonds, stocks, alternative investments, etc. — and then determine the ARR from a weighted average of the expected returns in each asset class, aiming for a 50% probability of achievement.

A higher ARR reduces the contributions required from employees and their employers (in this case, the state government), while a lower ARR increases the necessary contributions to fulfill promised benefits. That is why overestimating market returns can ultimately create unfunded liabilities, as the pension fund ends up with fewer funds than anticipated.

SERS and STRS have lowered their ARR to 6.9% over the last few years. Based on market forecasts, what are the chances of these plans meeting its ARR in the next 10 or 20 years?

The probability of the plans meeting their ARR is assessed by applying the current asset allocation to market forecasts from various research and investment firms. Figure 8 illustrates these probabilities based on different sources and historical data.

Figure 8a. Connecticut SERS Unfunded Liability and Funded Ratio
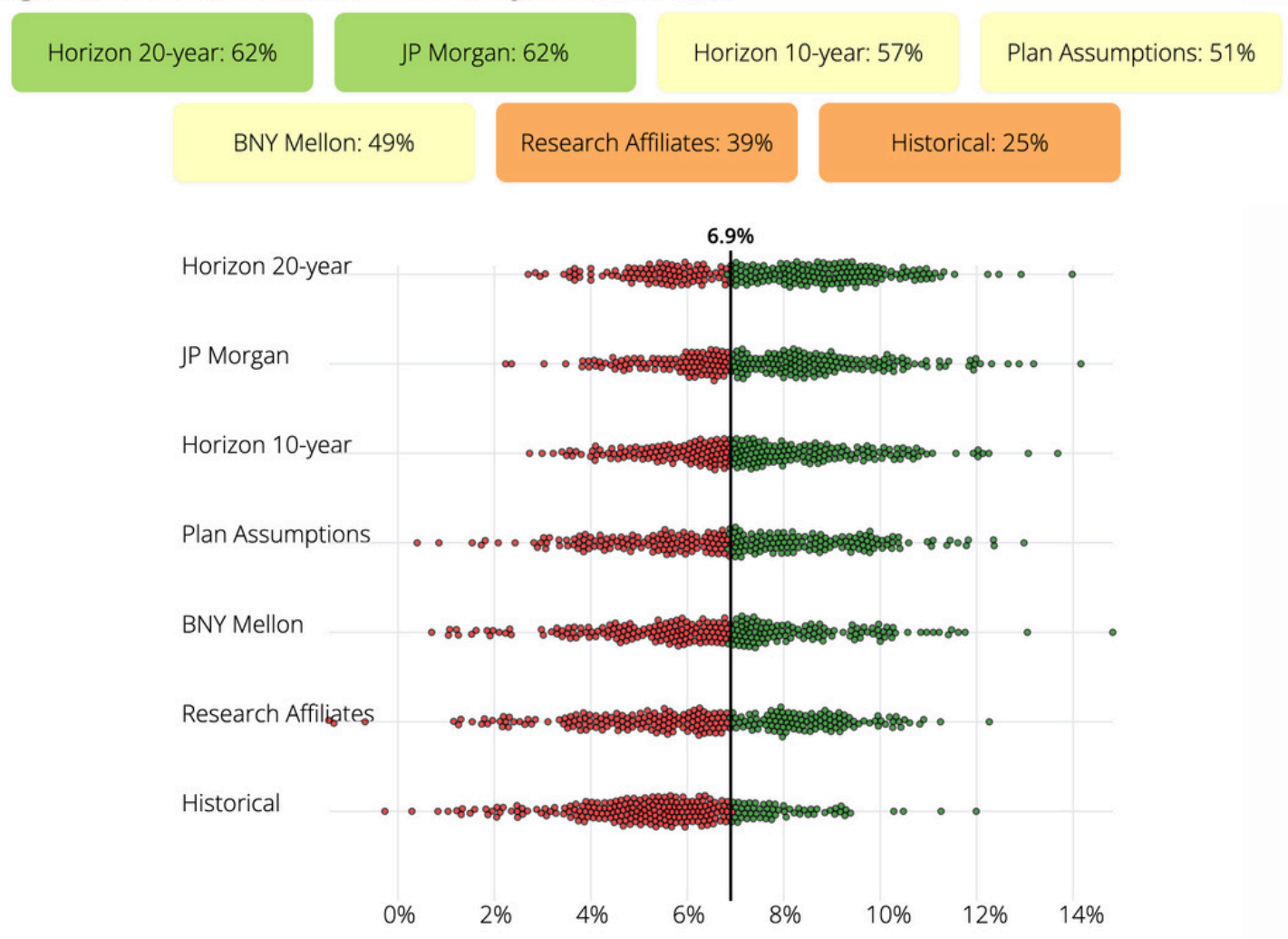
For each of the market forecasts given SERS asset allocations, 10,000 Monte Carlo simulations of investment returns were run. Each of the dots represents a few dozen of these simulations. Green indicates the ARR will be achieved, red indicates it will not. The simulations run using JP Morgan and Horizon's forecasts indicate that there is a 57-62% chance that SERS will achieve the ARR of 6.9%. The BNY Mellon and Research Associates' forecasts indicate that there is only a 39-49% chance that SERS will achieve an ARR of 6.9%. The STRS forecasts were slightly more volatile, but largely mirrored the SERS forecast. This mixed outlook highlights the uncertainty and the challenges the funds face.

Basing the probability on the plan's historical performance suggests only a 25% and 26% chance of SERS and STRS meeting their ARR, respectively.

The Yale School of Management has shown how Connecticut's historical investment performance has frequently ranked at the bottom of pension investment return rankings. Over the last decade, a generic no-overhead 80/20 investment portfolio, without active management and simply tracking the S&P 500, would have outperformed Connecticut's portfolio by 3% annually.[17]

If realized, the plan's current outlook of a 6.9% long-term return rate would improve the fund's performance compared to the last few decades. Policymakers should be aware that assuming a result that hasn't occurred in recent years carries significant risk. Although the current assumption aligns with some market forecasts, it is not a guaranteed outcome, and prudent planning should account for variability.

Figure 8b. Probabilities of STRS Investments Hitting 6.9% Assumed Rate of Return (ARR)
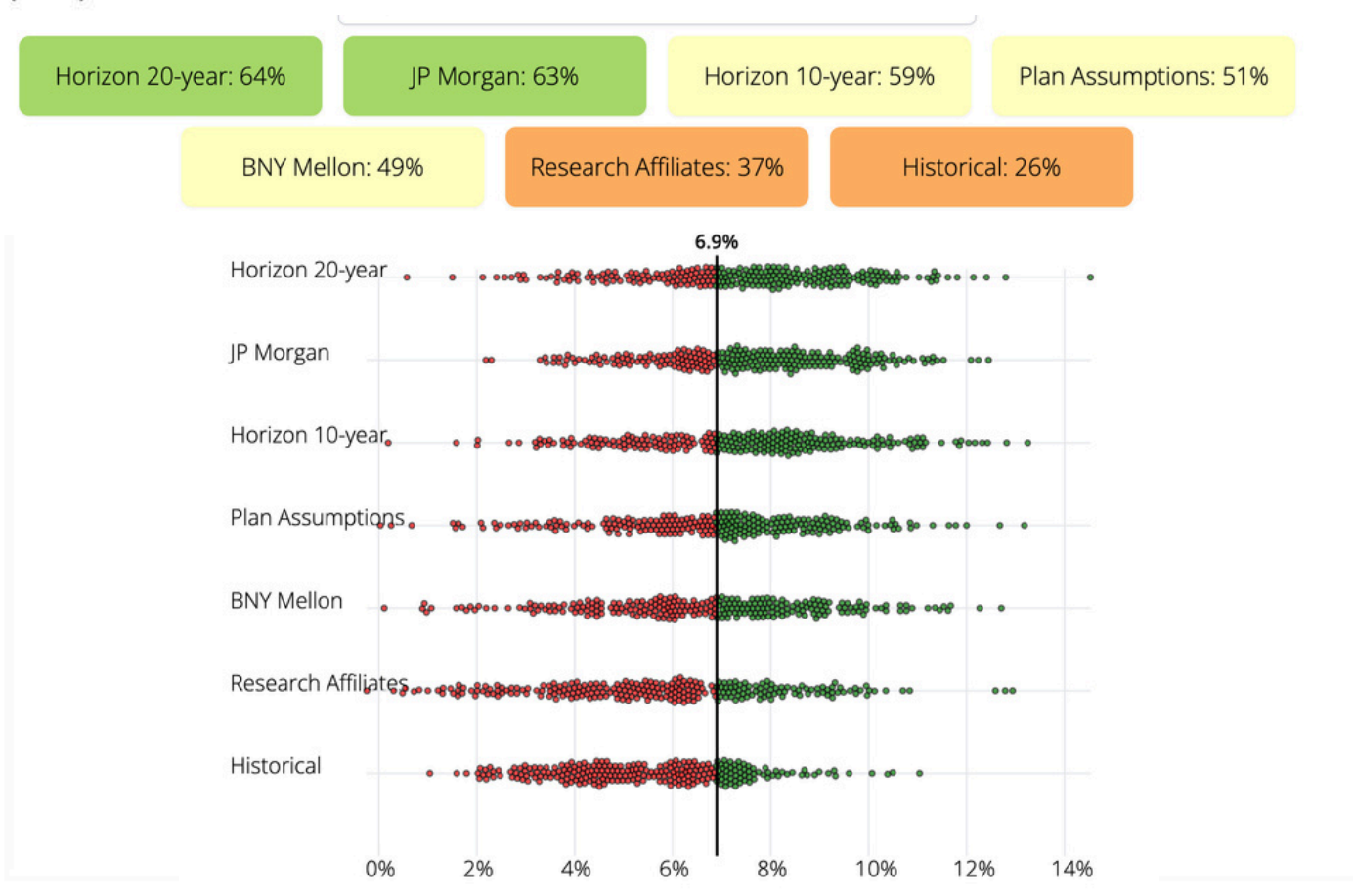
IV. Future Projections

This section models future projections for SERS and STRS, anticipating the trajectories of its funded ratio, unfunded liabilities and state government contributions under different scenarios. To visualize the scenarios in more detail, visit the interactive web dashboard at **ct-pensions.reason.org**

Funded Ratio (MVA) Projections

The first graph shows the projected funded ratio (market value of assets) of SERS from 2024 to 2053.

Unfunded Market Liability (Inflation Adjusted) Projections

The second graph displays the projected unfunded market liability, adjusted for inflation, from 2024 to 2053.
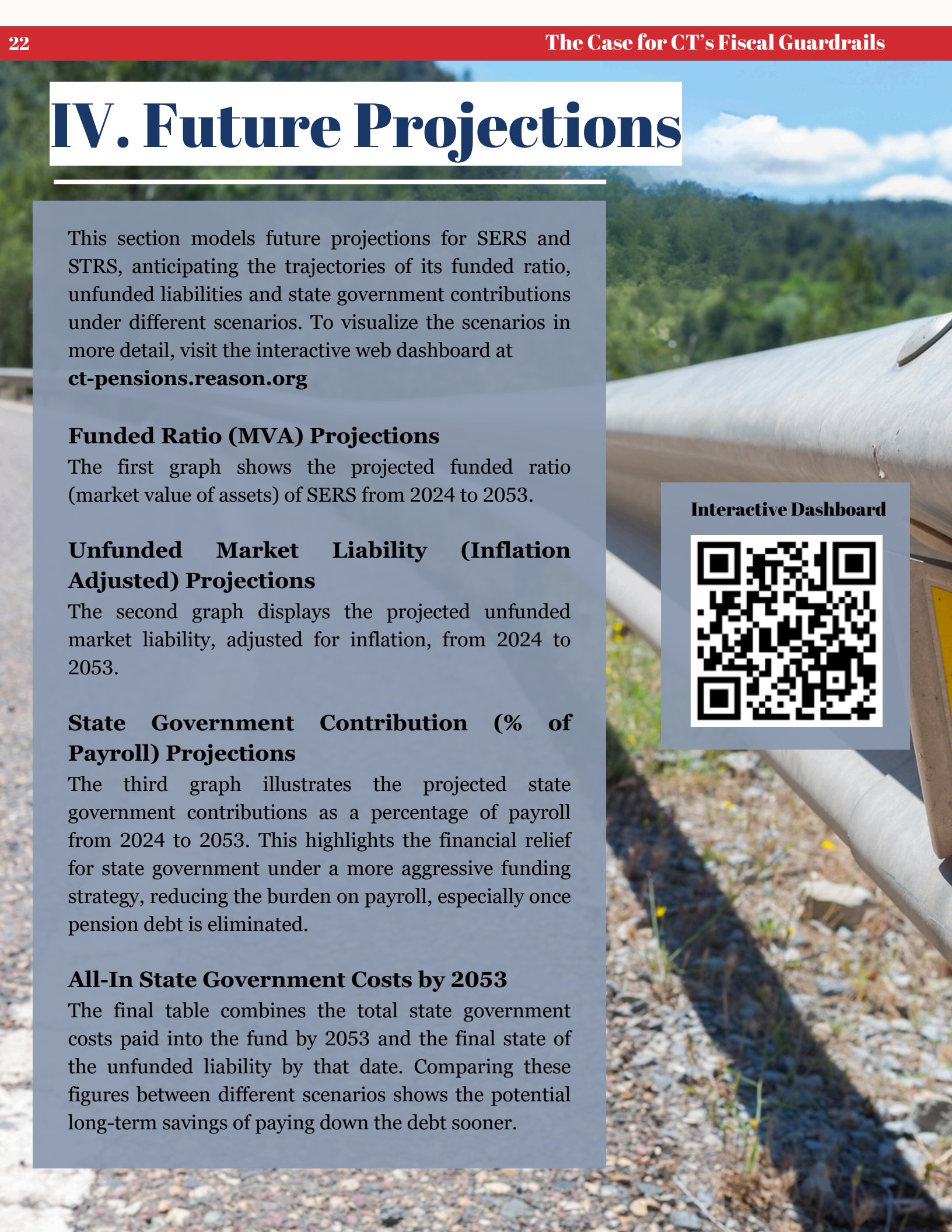
State Government Contribution (% of Payroll) Projections

The third graph illustrates the projected state government contributions as a percentage of payroll from 2024 to 2053. This highlights the financial relief for state government under a more aggressive funding strategy, reducing the burden on payroll, especially once pension debt is eliminated.

All-In State Government Costs by 2053

The final table combines the total state government costs paid into the fund by 2053 and the final state of the unfunded liability by that date. Comparing these figures between different scenarios shows the potential long-term savings of paying down the debt sooner.

Interactive Dashboard

Scenario I: Status Quo Employee and State Government Contributions

This scenario examines the expected financial trajectory of SERS and STRS over the next 30 years if funded solely through established employee and government employer contribution rates. This initial projection does not assume supplemental contributions from fiscal guardrails, which have previously accelerated the recovery of the funds.

The orange line in each graph illustrates the projected trajectory of the pension system under a scenario where it is exclusively funded through Actuarially Determined Employer Contributions (ADEC). This projection assumes that the fund achieves a steady 6.9% rate of return, and it does not encounter any economic recessions throughout the period being modeled.

Figure 9a. SERS funded solely by Employee and Government Employer Contribution
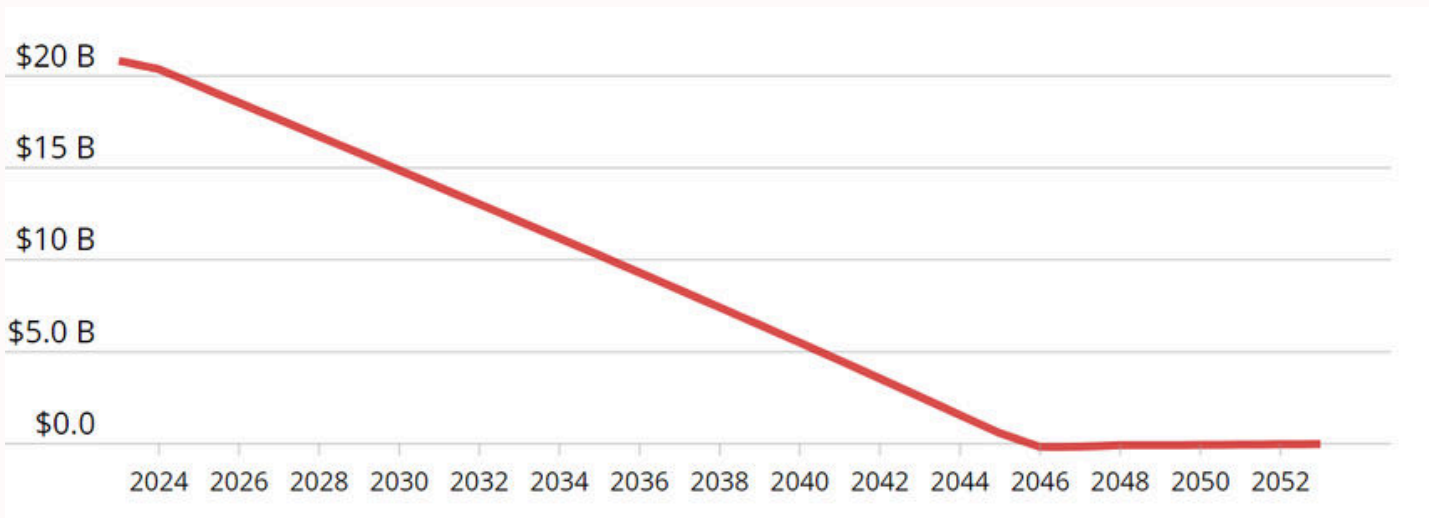
SERS Funded Ratio (MVA)
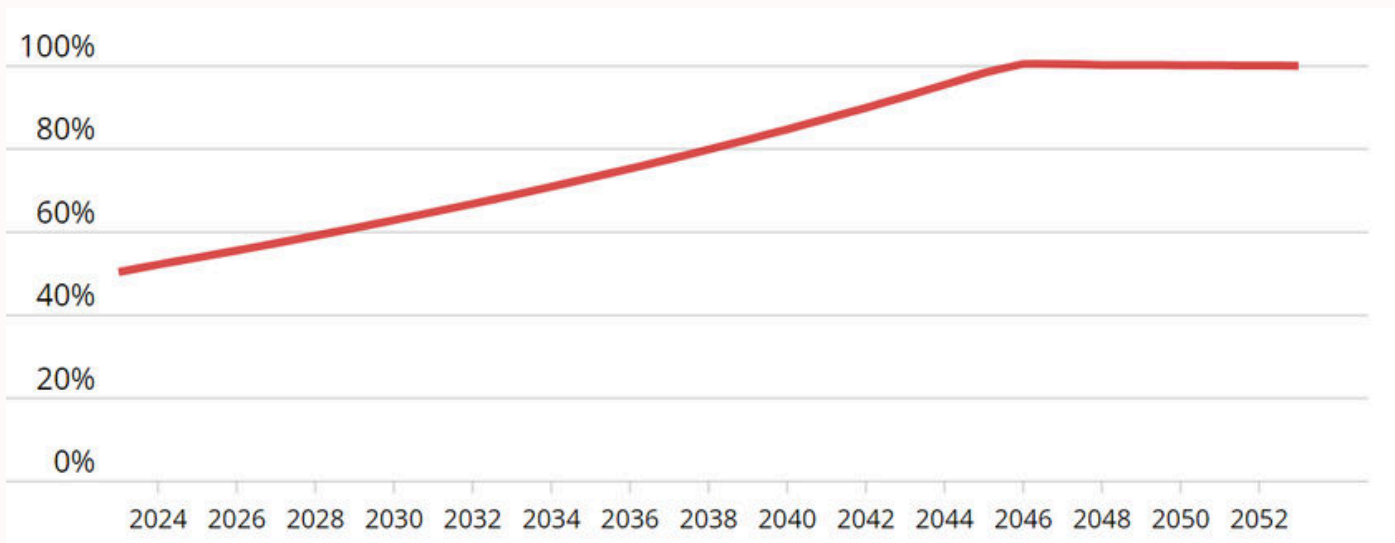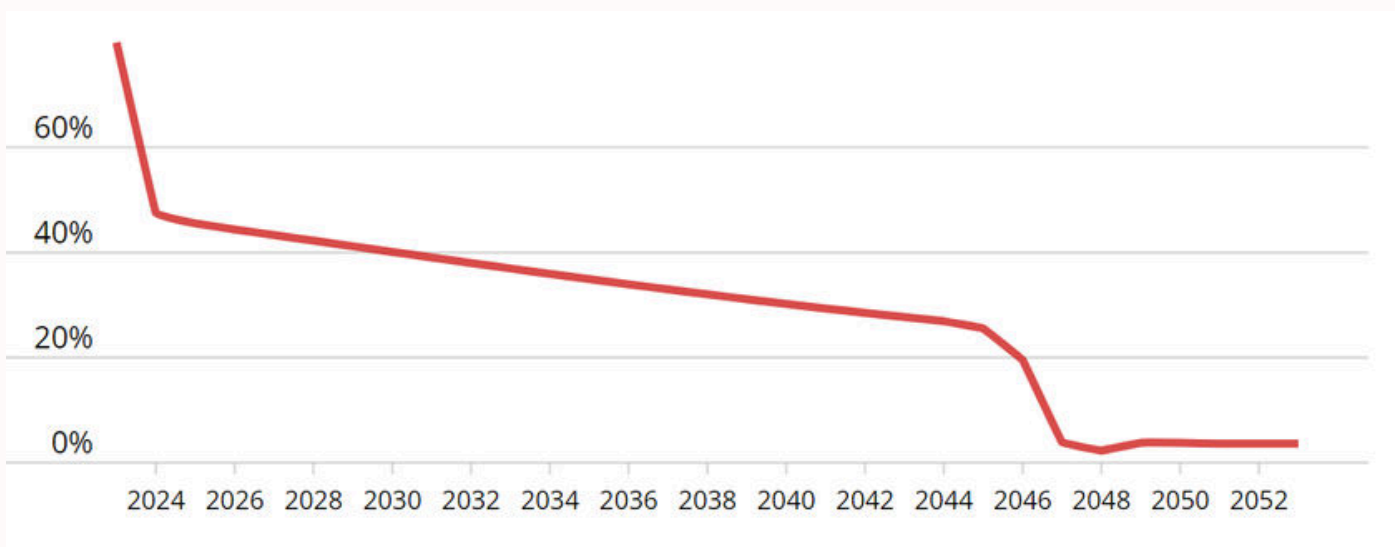
SERS Employer Contribution (% of Payroll)

Red solid line: ADEC contribution, 6.9% return, no recessions
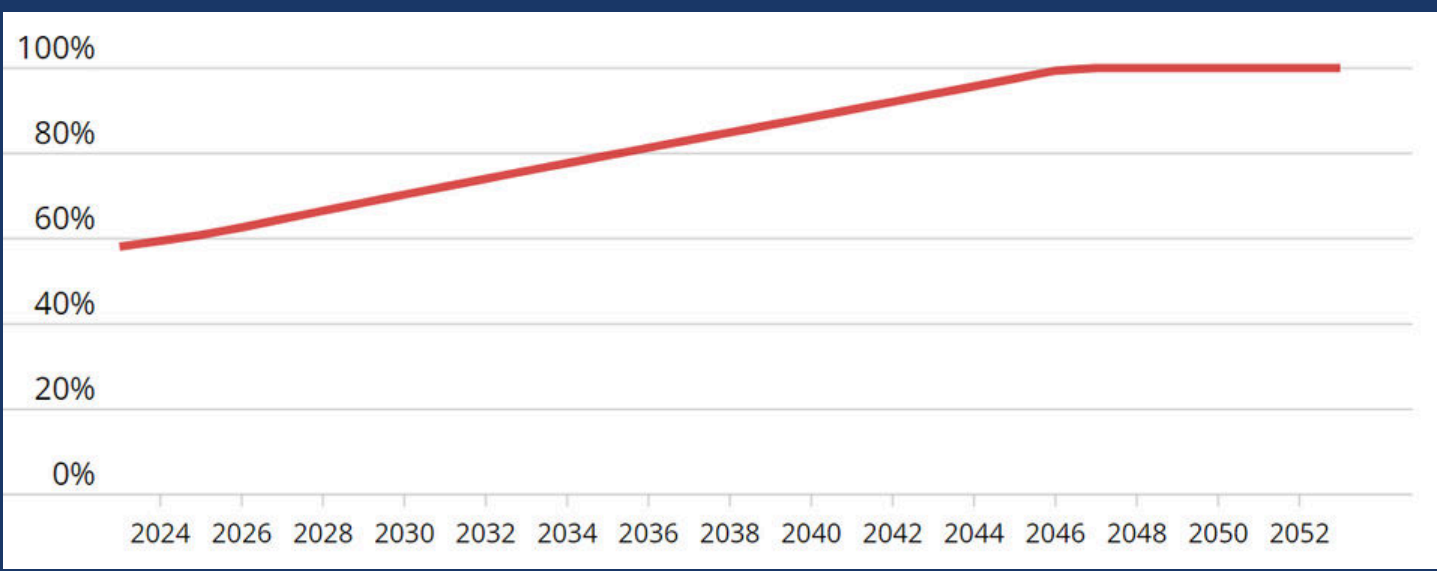
SERS Unfunded Market Liability (Infl. Adjusted)

SCENARIO	TOTAL ER CONTRIBUTION (INFL ADJ)	ENDING UAL (INFL ADJ)	ALL-IN ER COST (INFL ADJ)
Status Quo - SERS 6.9% Assumed Return	$37.53 B	–$20.97 M	$37.51 B

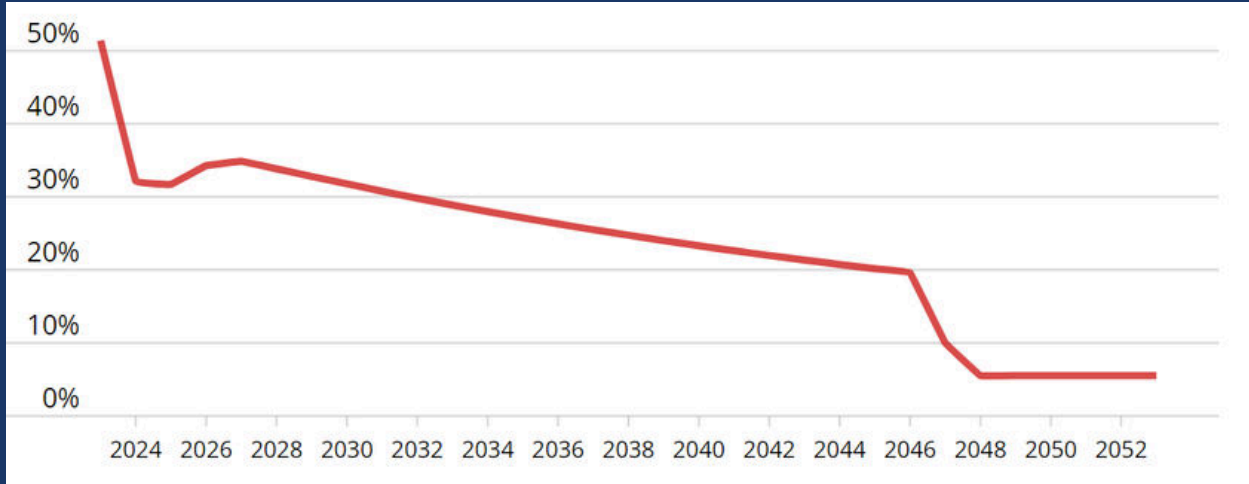All-In Employer Costs by 2053 ⓘ   Chart

Figure 9b. STRS funded solely by Employee and Employer Contribution
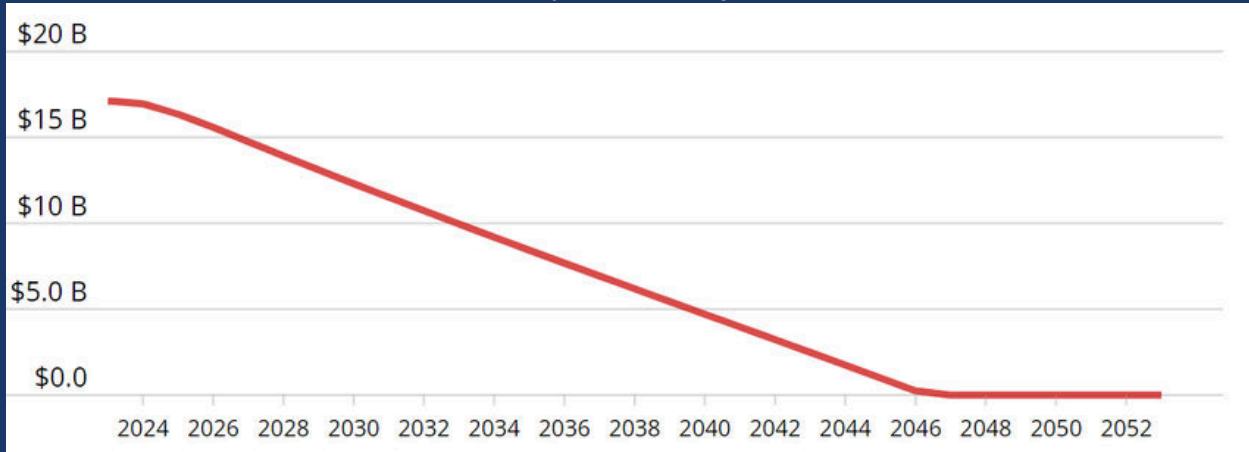
STRS Funded Ratio (MVA)

Red solid line: ADEC contribution, 6.9% return, no recessions

STRS Employer Contribution (% of Payroll)

STRS Unfunded Market Liability (Infl. Adjusted)

All-In Employer Costs by 2053 ⓘ   Chart

SCENARIO	TOTAL ER CONTRIBUTION (INFL ADJ)	ENDING UAL (INFL ADJ)	ALL-IN ER COST (INFL ADJ)
Status Quo - STRS 6.9% Assumed Return	$34.63 B	$791.3k	$34.63 B

Figures **9a** and **9b** illustrate the projections for SERS and STRS funded solely by employee and employer contributions. Under this scenario, if all actuarial assumptions are met, SERS is estimated to reach full funding by 2046 and STRS by 2047— as unfunded liabilities reach zero and the funded ratio tops 100%.

As the legacy pension debt is paid off and the plans approach full funding, government employer contributions as a percentage of payroll decline consistently. Actuarially determined employer contributions as a percentage of payroll are projected to stabilize around **3.5% for SERS by 2047 and 5.5% for STRS by 2048**. This marks a **significant reduction from the current rates of 80% and 55%**, respectively, of payroll contributions for these plans.

Under present actuarial assumptions, the status quo contributive schedule will result in a total government (employer) contribution of $37.51 billion to SERS and $34.63 billion for STRS by 2053.

Scenario II: Traditional Contributions + Additional Yearly Contributions of $1B and $800M until full funding

This scenario evaluates the impact of **additional annual supplemental contributions** from surplus funds under Connecticut's fiscal guardrails, in addition to the traditional employee and government employer contributions. This approach assumes the allocation of an additional $1 billion annually to SERS and $800 million to STRS from surplus funds until both funds reach full funding, approximately what has been contributed annually to the funds since the fiscal guardrails were adopted in 2017.

As shown in **Figures 10a** and **10b**, continuing these supplementary contributions significantly impacts the pension plans' funding trajectory.

If the guardrails continue to function effectively, assuming $1 billion and $800 million in supplemental contributions is reasonable. Additional contributions are sent to the pension funds once the Budget Reserve Fund (BRF) reaches a specific threshold. In FY 2023, the state's contributions included additional contributions of $1.4 billion for STRS and $1.7 billion for SERS, after fulfilling the ADEC. Since 2017, a total of $7.7 billion from budget surpluses have been allocated to the pension funds. This proactive approach to pension debt amortization has immediately reduced the annual required contributions by approximately $170 million.[18]

Figure 10a. SERS Receiving $1B in Supplemental Contributions Until Full Funding
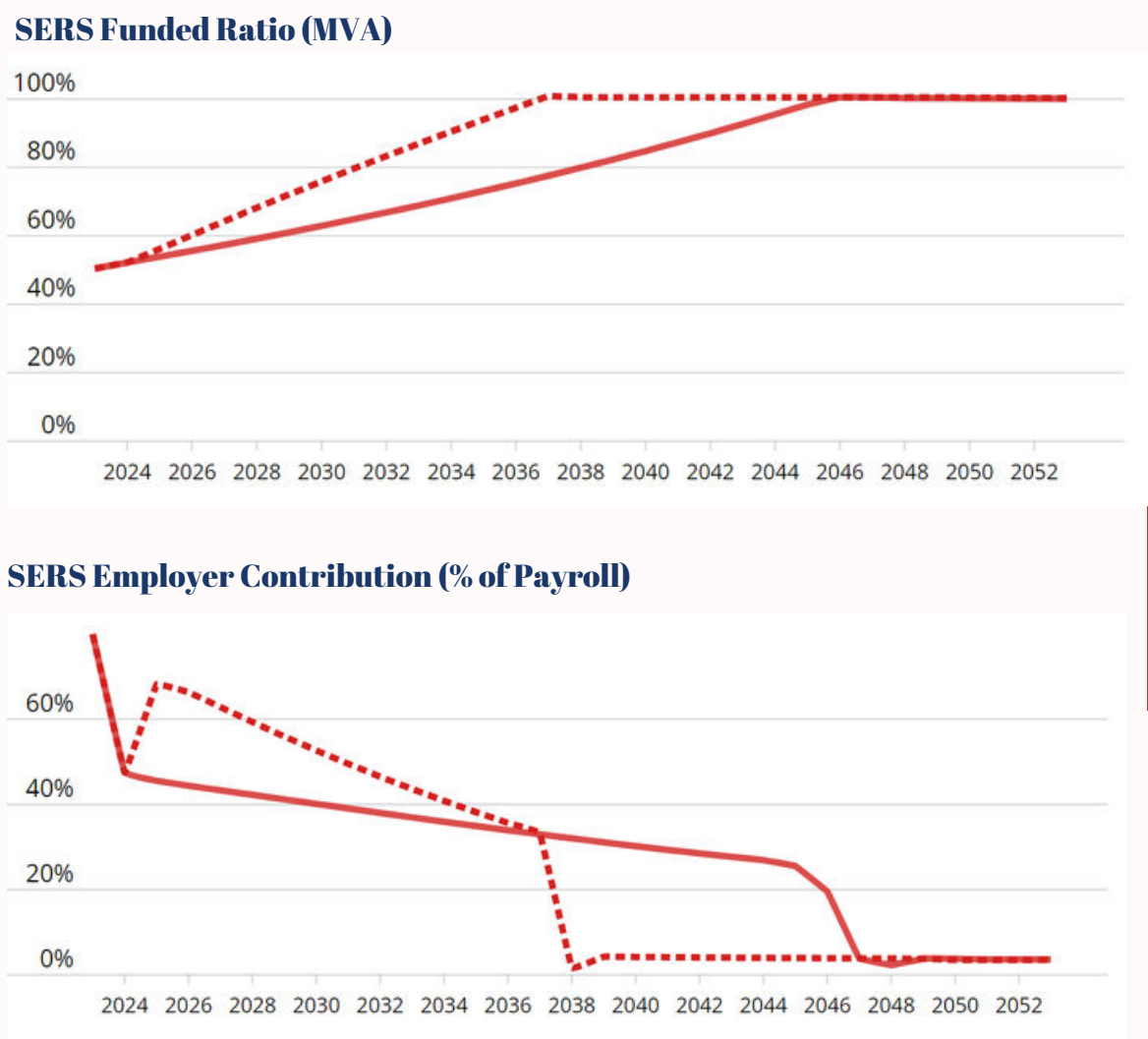
SERS Funded Ratio (MVA)

SERS Employer Contribution (% of Payroll)

Red solid line: ADEC contribution, 6.9% return, no recessions

Red dashed line: ADEC + $1 billion contributions, 6.9% return, no recessions

SERS Unfunded Market Liability (Infl. Adjusted)
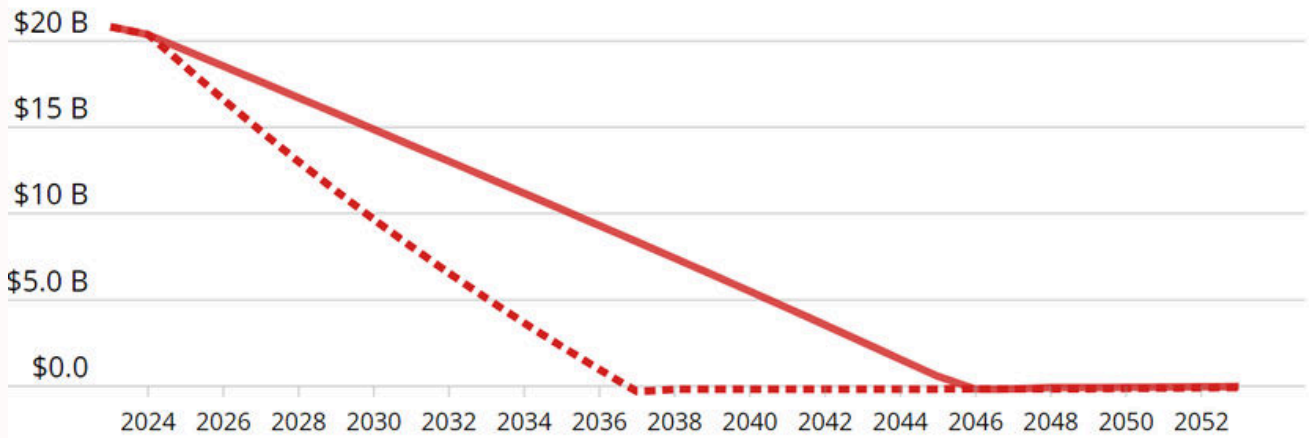
SCENARIO	TOTAL ER CONTRIBUTION (INFL ADJ)	ENDING UAL (INFL ADJ)	ALL-IN ER COST (INFL ADJ)
Status Quo - SERS 6.9% Assumed Return	$37.53 B	−$20.97 M	$37.51 B
Annual $1B - SERS 6.9% Assumed Return	$33.77 B	−$74.34 M	$33.70 B

Assuming **annual supplemental contributions of $1 billion until full funding accelerates the elimination of unfunded liabilities for SERS by nine years**, making the plan fully funded by 2037 rather than 2046. Additionally, these contributions drastically *accelerate* the decrease in the ADEC as the pension debt gets paid faster. That is, the required **employer contributions as a percentage of payroll** reaches the stable rate of **around 3.5% by 2038, as opposed to 2047.**

Figure 10b. STRS Receiving $800m in Supplemental Contributions Until Full Funding

Like SERS, **the annual supplemental contributions of $800 million to STRS until full funding would accelerate the elimination of unfunded liabilities for STRS by nine years**. These contributions also *accelerate* the decrease in employer contributions as a percentage of payroll — reaching the stable rate of **around 5.5% by 2038, as opposed to 2047**.

Supplemental annual contributions anticipate future payments and accelerate the amortization of Connecticut's pension debt. This is projected to save Connecticut $3.81 billion with SERS and $2.96 billion with STRS, resulting in $6.77 billion of total interest cost savings over the next 25 years, accounting for inflation. **Continuing the additional contributions** to the funds and **accelerating the elimination of Connecticut's pension debt from 2038 rather than 2047** will lead **the state to realize nearly $7 billion in interest savings over the next 30 years.**

Scenario I projects that SERS and STRS would reach full funding by 2047 through employee and employer contributions alone. Scenario II, modeling the continuation of supplemental contributions, projects full funding by 2038 — achieving it nine years earlier and saving taxpayers $7 billion in interest costs. However, these projections rely on the assumption that actuarial expectations are met precisely, which is not always the case. If this assumption is faulty, unfunded liabilities can quickly accumulate, complicating the path to full funding. Scenario III accounts for the possibility of economic recessions, providing a stressed 30-year forecast that emphasizes the importance of prudent funding.

STRS Funded Ratio (MVA)
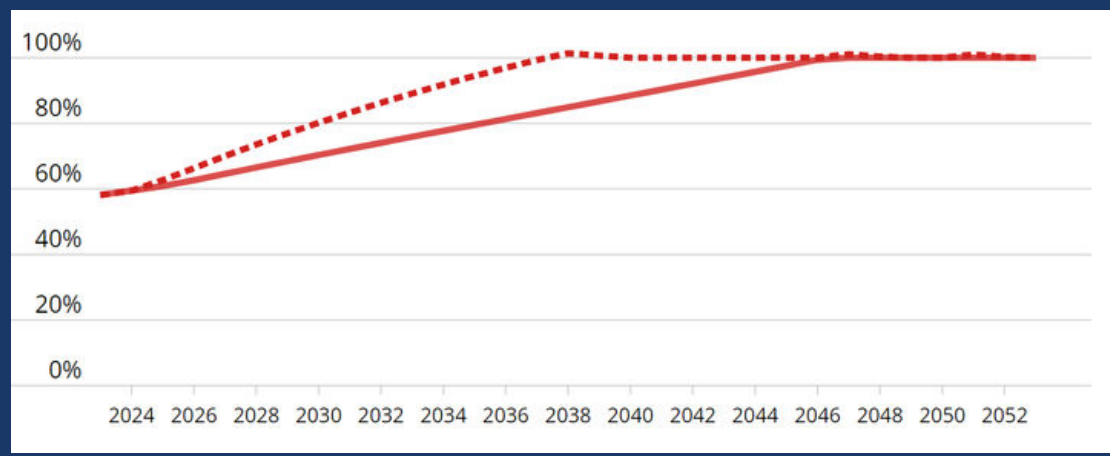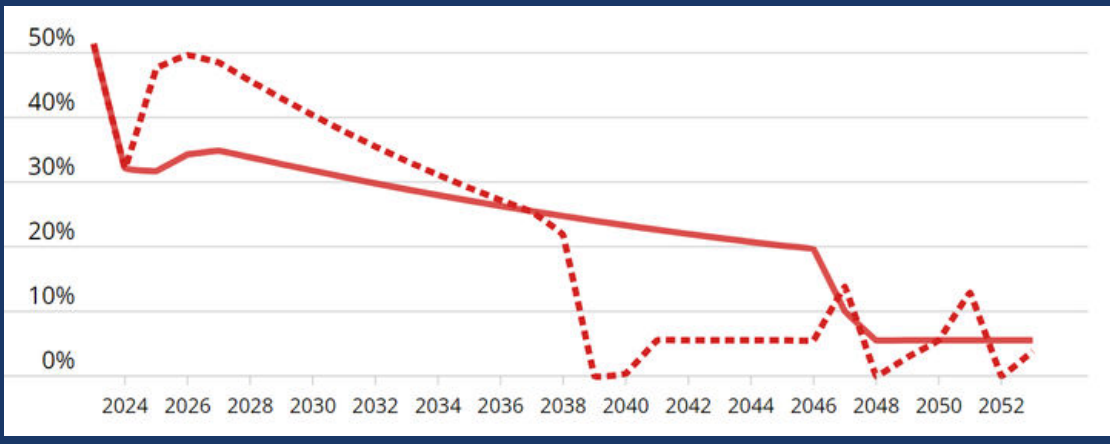
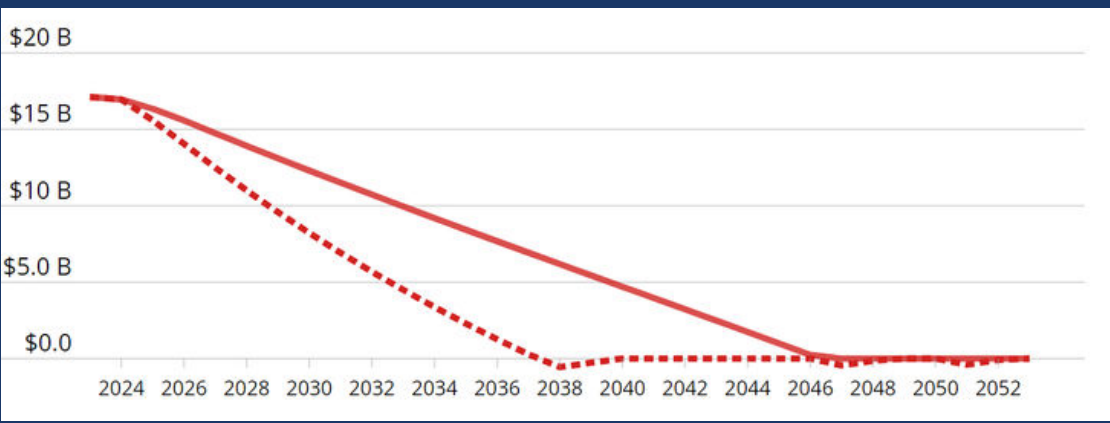### STRS Employer Contribution (% of Payroll)

Red solid line: ADEC contribution, 6.9% return, no recessions

Red dashed line: ADEC + $1 billion contributions, 6.9% return, no recessions

STRS Unfunded Market Liability (Infl. Adjusted)

All-In Employer Costs by 2053 ⓘ   Chart

SCENARIO	TOTAL ER CONTRIBUTION (INFL ADJ)	ENDING UAL (INFL ADJ)	ALL-IN ER COST (INFL ADJ)
Status Quo - STRS 6.9% Assumed Return	$34.63 B	$791.3k	$34.63 B
Annual $800M Cont - STRS 6.9% Assumed Return	$31.67 B	−$48.87k	$31.67 B

Scenario III: Stress Testing Recessions

The stress test scenario evaluates the resilience of the pension system under adverse economic conditions, specifically two major recessions followed by a 3-year suspension in supplemental contributions to account for a recovery period for Connecticut's tax revenue. Stress testing is critical because recessions can drastically impact the funded ratio of pensions. Modeling these impacts aids in predicting long-term outcomes and necessary risk mitigation strategies.

The **solid line** represents the plan's path if funded solely through employee and government employer contributions, while the **dashed line** assumes supplemental contributions of $1 billion for SERS and $800 million for STRS until both plans reach full funding.

The **red line** models the status quo scenario with 6.9% in returns, with the **red dashed line** assuming uninterrupted supplemental yearly contributions.

The **blue line** depicts the stress scenario, showing the impact of two recessions on return rates. The **blue dashed line** still assumes supplemental yearly contributions but suspends them for three years following each recession to accurately represent government tax collections and budget planning lags.

The three-year suspension of supplemental contributions is based on Connecticut's historical tax collection recovery data from recessions. Connecticut's tax revenue typically takes about 2-3 years to return to pre-recession levels when adjusted for inflation.[19] Incorporating realistic tax collection lags and budget planning delays ensures more accurate projections.

Assuming two major recessions until 2053 represents a conservative scenario. Since the end of World War II, the U.S. has experienced 12 recessions, averaging one every 6.5 years.[20]

As shown in Figures 11a and 11b, each recession significantly impacts the funding trajectory of the pension funds. Projections indicate that if two recessions occur over the next 29 years, both pension funds will no longer achieve full funding in the horizon modeled, with STRS only reaching 90.3% and SERS 86% in funding by 2053.

Figure 11a. The Impact of Two Economic Recessions on SERS

SERS Funded Ratio (MVA)
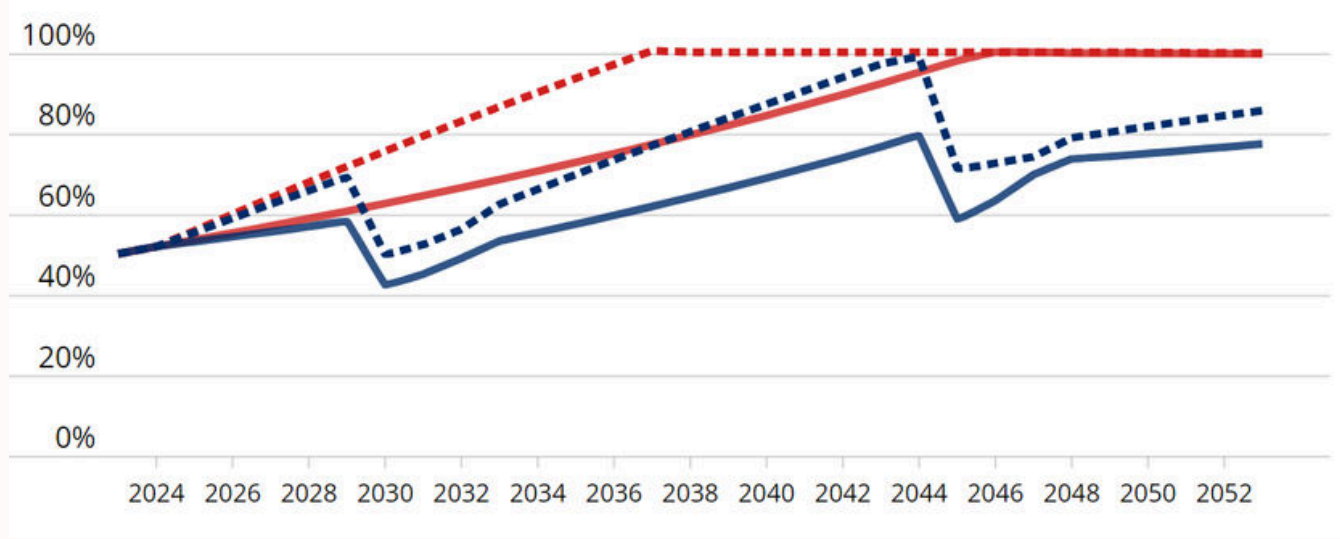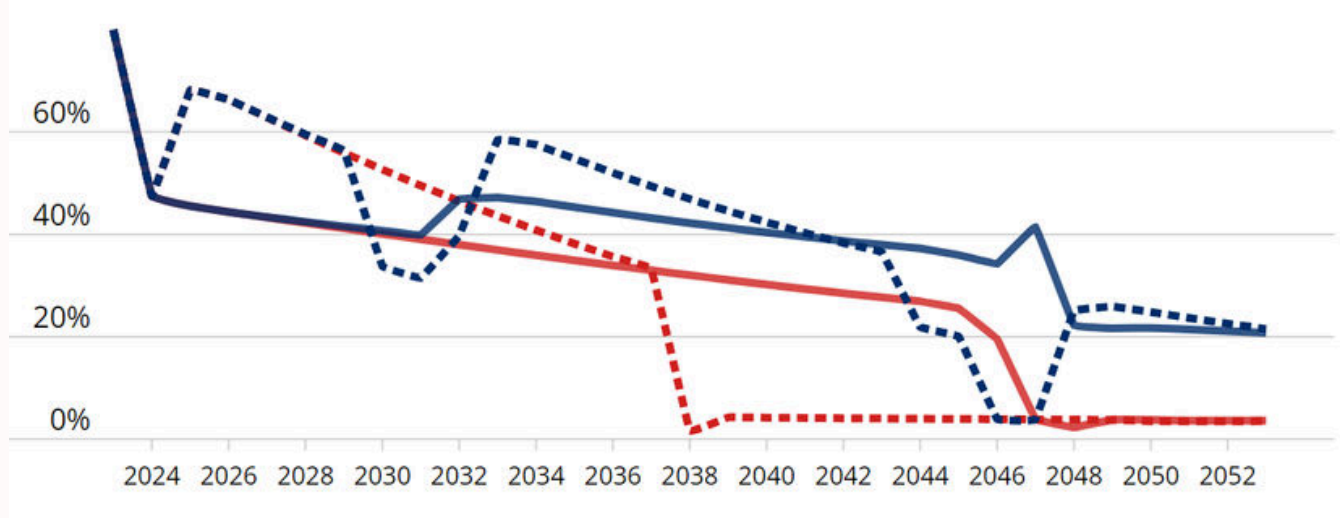
SERS Employer Contribution (% of Payroll)

Red solid line: ADEC contribution, 6.9% return, no recessions
Red dashed line: ADEC + $1 billion contributions, 6.9% return, no recessions
Blue solid line: ADEC contribution, 6.9% return, two recessions
Blue dashed line: ADEC + $1 billion contributions, 6.9% return, two recessions

SERS Unfunded Market Liability (Infl. Adjusted)

SERS All-In Employer Costs by 2053

Figure 11b. The Impact of Two Economic Recessions on STRS
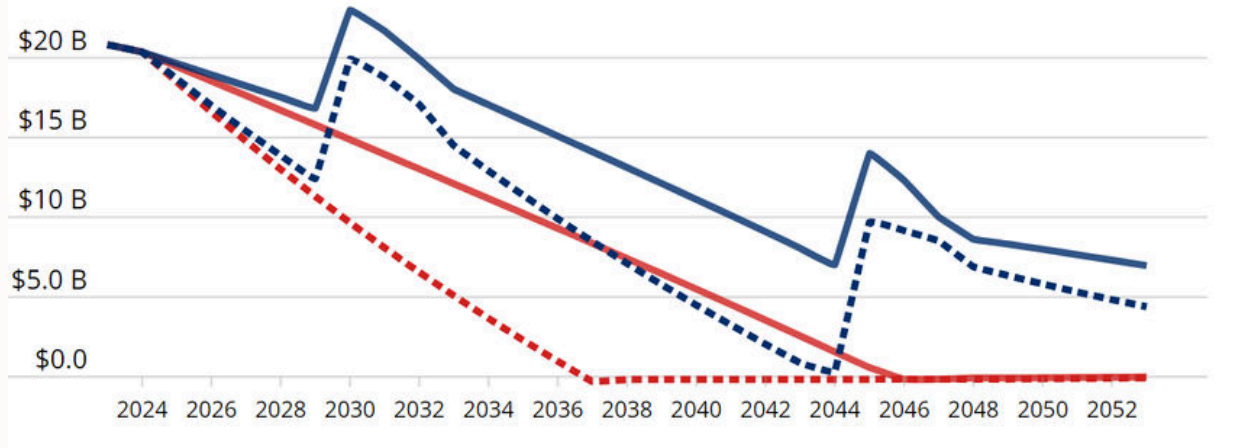
STRS Funded Ratio (MVA)

STRS Employer Contribution (% of Payroll)

Red solid line: ADEC contribution, 6.9% return, no recessions
Red dashed line: ADEC + $1 billion contributions, 6.9% return, no recessions
Blue solid line: ADEC contribution, 6.9% return, two recessions
Blue dashed line: ADEC + $1 billion contributions, 6.9% return, two recessions

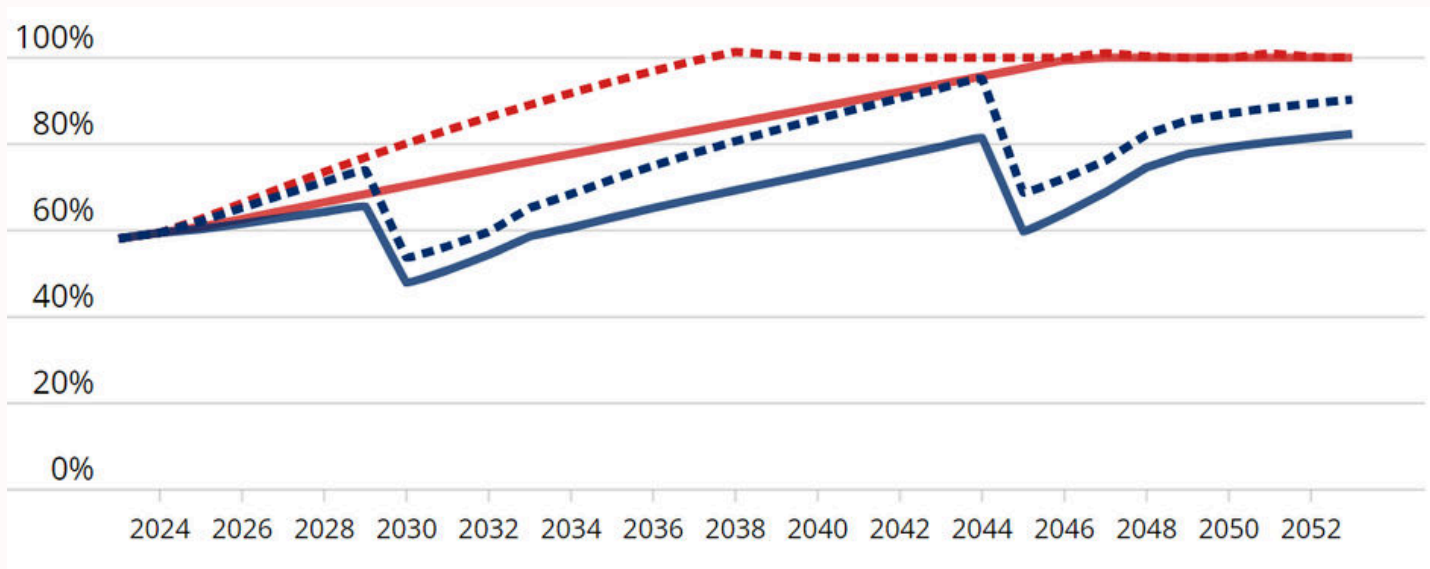**STRS Unfunded Market Liability (Infl. Adjusted)**
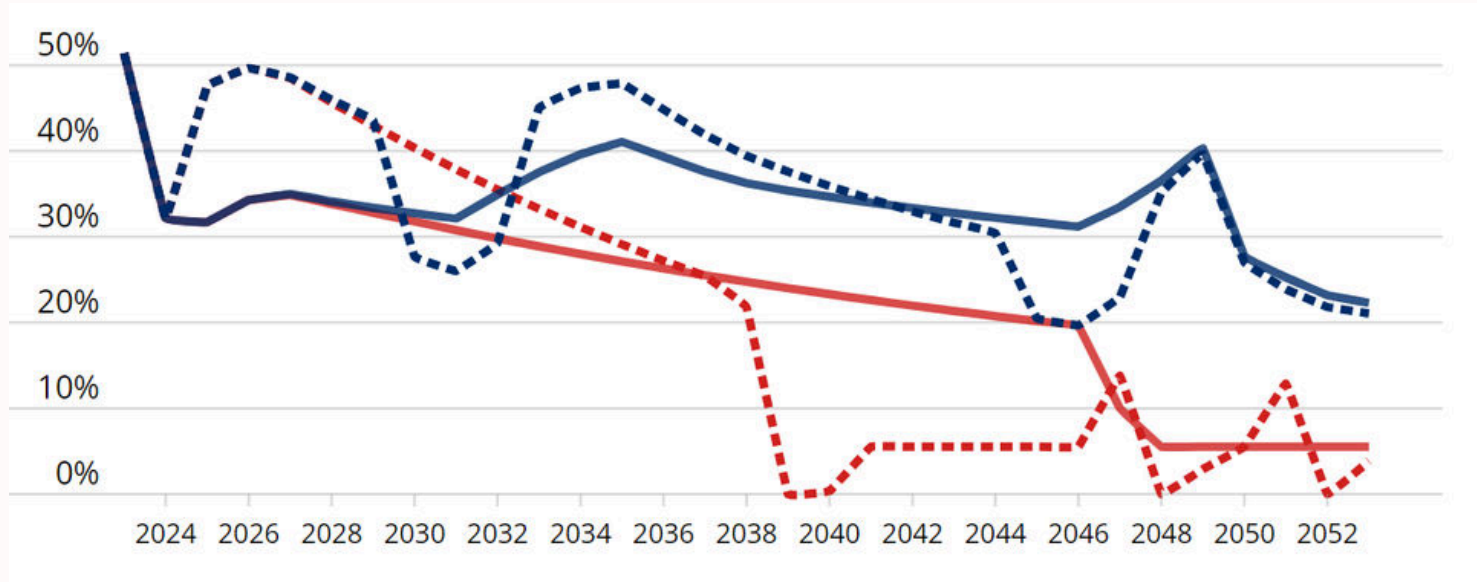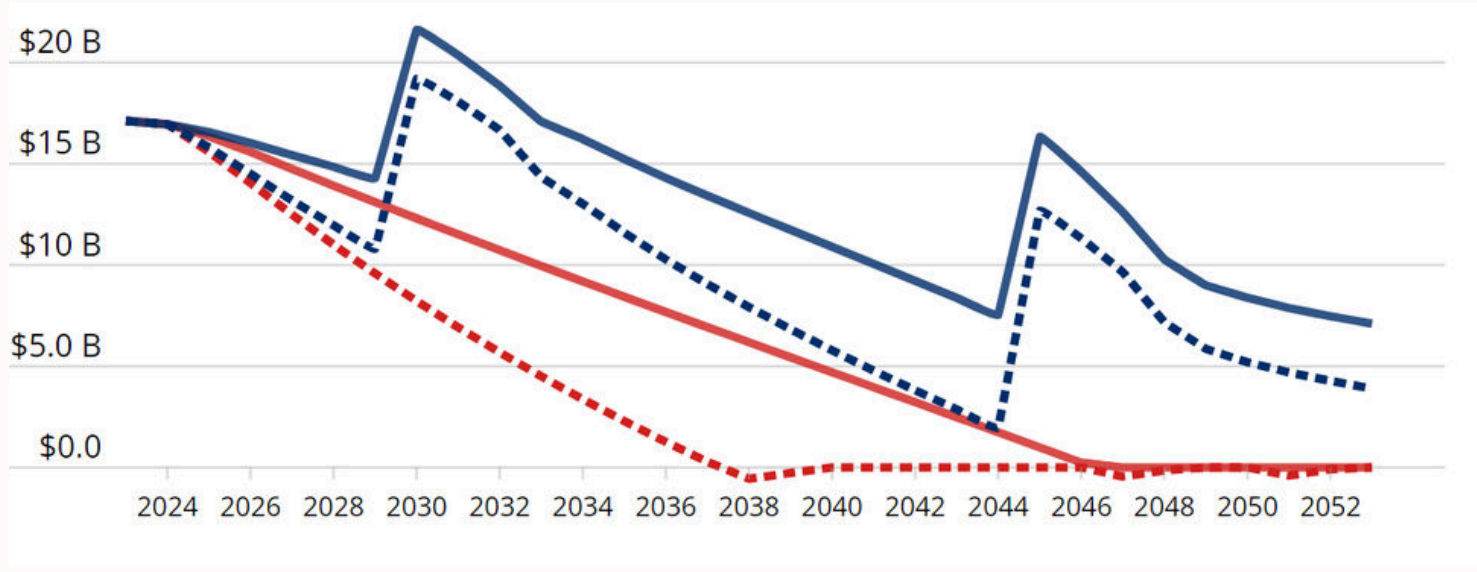
STRS All-In Employer Costs by 2053

It is important to consider economic recessions because they can significantly increase the impact that pensions have on state finances. During economic downturns, pension plans experience investment losses, leading to immediate increases in Actuarially Determined Employer Contributions (ADEC) to cover shortfalls. This adjustment places additional financial pressure on state governments and taxpayers, who are already facing economic hardships. Consequently, **underfunded pensions can amplify the negative effects of recessions** by forcing states to allocate more resources to pension liabilities at a time when financial flexibility is most needed.

Even assuming the continuation of supplemental contributions (with a three-year suspension post-recession), SERS would still have $4.4 billion in unfunded liabilities, and STRS $3.9 billion by 2053, under the two-recession scenario.

Both funds also face **much higher total costs in this case**. Two recessions from 2024 to 2053 would result in a total state cost of $58 billion in contributions for SERS and $59 billion for STRS, a respective $24.3 billion and $27.18 billion increase from the previous scenario that doesn't account for economic recessions — meaning assuming **two recessions in the next 30 years increases total pension costs paid by 2053 by $51.48 billion**.

These projections serve as a reminder of the importance of realistic assumptions and proactive funding measures that account for market fluctuations. **Unexpected changes in investment returns can significantly impact costs**, making the adoption of sound and resilient investment strategies crucial.

In the SERS and STRS defined benefit structure, if markets fall short, the burden between the assumed and the actual rate of return lies entirely on the state. Overestimating return expectations can lead to underfunding, as it underestimates the necessary contributions by overestimating how much the investments will generate. **By setting more realistic return assumptions, pension plans can better ensure that annual employer contributions are adequate to meet future obligations**, reducing the risk of underfunding and the need for abrupt contribution rate increases when overestimations are corrected.

V. Why Fund a Pension

Connecticut's pension plans, once among the worst in the country, are now in a better position due to additional legislative funding. This funding has honored commitments to public employees, reducing retirement insecurity as pension funding rises. The substantial improvement must be attributed largely to fiscal guardrails established in 2017, which have not only stabilized the state's fiscal budget but also enabled appropriate contributions and surplus budget allocations to expedite the repayment of unfunded employee benefits.

Addressing Frequent Criticisms

Have we overspent on pensions?

Critics have argued that excessive pension funding can stifle economic development by preventing investment in other pursuits with better long-term returns for the state than funding pension liabilities.

As demonstrated through long-term modeling, advanced payment of pension debt creates billions in interest savings for the state of Connecticut — and frees up significant immediate funds that can be spent on other state priorities by reducing yearly payments needed to pay off previous pension debt. **The faster pension and public employee debt is paid, the more affordable it becomes**.

Connecticut's State Comptroller reported in 2023 that the pension deposits enabled by the fiscal guardrails have freed approximately $738 million annually for the state budget.[21]

Responsible fiscal policy yields high returns for the state, its residents, businesses and taxpayers. Not only does it make the state more attractive for long-term private investments, but paying off pensions **improves Connecticut's ability to raise funds for infrastructure and developmental projects at lower interest rates**. Well-funded pensions improve the state's creditworthiness, generating further savings in future bond issuances for decades to come.

In FY 2023, Connecticut received several credit rating upgrades due to continued fiscal improvement and the extension of the fiscal guardrails.[22] In December 2022, S&P Global Ratings upgraded the State General Obligation bonds from "A+" to "AA-"and the Special Tax Obligation (Transportation Purposes) bonds from "AA-" to "AA." [23] [24]

Why prioritize pension funding instead of tax cuts?

The fiscal guardrails ensure that in times of excess revenues, funds are directed toward reducing pension liabilities, generating significant interest savings, and improving the state's creditworthiness. This disciplined approach to fiscal management creates a more stable financial environment, enabling Connecticut to responsibly pursue tax reform initiatives or redirect funds currently used for pension contributions to other ventures once pension debts are addressed. Proactive pension funding paves the way for responsible spending increases or tax reform.

However, if Connecticut had continued its pre-2017 path and failed to address its underfunded pensions, **the state would be in a position that might require increases in taxes at the most damaging times**. Postponing the payment of this growing debt would place the state in a precarious position, particularly during economic downturns when fiscal pressures intensify. **During recessions, pension plans become more underfunded**, requiring more contributions (see Figure 11) and attracting negative attention from bond rating agencies. As long as Connecticut is legally required to at least make ADEC contributions, tax increases are an ever-present threat during recessions, so long the SERS and STRS remain underfunded.

Failing to address pension payments during times of fiscal surplus would force the state to confront its unfunded liabilities during challenging economic periods, **when levying additional taxes on its residents might become the only viable option to increase revenue**.

By prioritizing pension funding during prosperous times, Connecticut not only avoids burdening taxpayers with potential tax increases during economic downturns but also paves the way for near-future tax reform — as funded pensions mean the state has lower revenue needs. This strategy minimizes financial uncertainty and enables near-future tax cuts or increased spending in a fiscally responsible manner.

Are pensions sending money out of Connecticut?

Most of Connecticut's pension assets are invested outside the state, meaning funding the pensions implies that significant portions of state funds are allocated to out-of-state investments.

It may sound like funding a pension diverts resources from Connecticut to other states (and countries). That is incorrect; seeking investments that maximize returns will lead to maximized savings for the state. The higher the investment returns, the faster Connecticut can pay off its debt — at the least cost. Seeking high and safe returns, regardless of where those investments are made, means cheaper pension benefits, as higher returns lead to lower pension contributions needed to fulfill retirement promises.

Have the guardrails forced Connecticut to borrow at high interest rates while sitting on surpluses?

Despite significant surpluses, the legislature resorted to borrowing to fund core programs in the 2023 legislative session. Some consider this borrowing fiscally irresponsible, arguing that available surplus funds should be used instead of accruing interest on borrowed money.

Guardrails demand spending restrictions by nature. If legislative desires can override such restrictions at will, they become meaningless. Properly addressing pension liabilities will free more funds for essential programs in the long run, creating future budget flexibility.

It is also notable that the interest costs for pension debt are around 7%, meaning that delays in settling pension debt compound at a much higher rate than the interest on the borrowed funds the legislature took to fund core programs in the previous session.

What are the consequences of reducing pension funding?

Until the pension debt is eliminated, reducing pension spending would lead to cost increases in Connecticut. As displayed on SERS and STRS's funding sections, the higher the immediate contributions, the faster pension debt is paid — and the "cheaper" it is to provide the same retirement benefits to public employees.

Delaying pension funding would result in billions in interest costs for the state, as it would require more time to pay off the pension debt and make the state less resilient to market downturns — or if assumptions fall short of expectations.

What are the consequences of altering Connecticut's fiscal guardrails?

The fiscal guardrails are tied to Connecticut's general obligation bonds through its bond covenants; significant changes would be a breach of contract. This was result of deliberative negotiations, and is referred to as the "Bond Lock" guardrail.

Bond covenants are part of a bond's legal documentation and are also found in corporate and government bonds. When an issuer violates a bond covenant, it is considered a technical default. This often triggers the downgrading of a bond's rating, which could make it less attractive to investors and increase the issuer's borrowing costs. Breaking a promise to bondholders would permanently stifle the state's ability to raise capital from private markets in the future, hurting the state's credit rating and potentially leading to the need to increase the interest rates of future bond issuances (and immediately devaluing the resale value of Connecticut's outstanding bonds).

What is net amortization?

Net amortization is the difference between the amortization contribution made to pay down the unfunded liability and the interest accrued on the unfunded liability. If the amortization contribution exceeds the interest on the unfunded liability, we have positive amortization, meaning the contribution will reduce the pension debt. Conversely, if the amortization contribution is less than the interest, we have negative amortization, meaning the pension debt will increase despite the contribution.

Net Amortization = Total Contribution – Normal Cost – Interest on Unfunded Liability (UL)

How were the SERS and STRS models created?

Both the Connecticut SERS and STRS actuarial models are developed using key assumptions and data from the valuation reports and GASB No. 67 reports. These assumptions include the assumed rates of return, payroll growth rates, cost-of-living adjustment provisions, mortality assumptions, and others. For each plan, the general method involves projecting both actuarial accrued liabilities and assets using a roll-forward technique. Specifically, the actuarial accrued liabilities are projected by adding normal cost and deducting benefit payments from the previous year, adjusted for interest. The assets are projected by accounting for investment gains/losses and contributions, while deducting benefit payments from the previous year. Contributions are determined by summing normal cost and amortization payments, with amortization calculated using layered amortization under the plans' funding policies.

VI. Policy Recommendations

To ensure the long-term viability and stability of Connecticut's SERS and STRS, the following policy recommendations are proposed:

A. Fund SERS and STRS Beyond the Actuarially Determined Minimum

Whenever excess revenue is available, it is crucial that it be used to accelerate the payment of pension debt in Connecticut's largest pension systems. This approach expedites the reduction of unfunded liabilities, minimizes interest costs, and strengthens the overall financial health of the pension systems. Connecticut can make significant strides in stabilizing and ultimately eliminating pension debt by committing to contributions above the actuarially determined minimum (ADEC) whenever surplus funds permit.

B. Maintain the Fiscal Guardrails

The 2017 fiscal guardrails have proven very effective in controlling spending and ensuring that excess revenues are directed toward reducing pension liabilities. These guardrails provide a mechanism where funding STRS and SERS becomes the default option once the Budget Reserve Fund (BRF) reaches its threshold. Maintaining these fiscal policies is essential to continuing the progress made and safeguarding the financial stability of the state's pension systems. The successful implementation of these guardrails has enhanced Connecticut's fiscal reputation in prudent financial management — increasing the state's attractiveness to residents, investors and businesses.

C. Adopt Realistic Assumptions

Utilizing realistic assumptions in the making and discounting of pension liabilities projections is critical. By adopting more cautious investment return assumptions and demographic projections, the state can better prepare for potential shortfalls and reduce the risk of unfunded liabilities. Realistic assumptions help ensure that the pension funds are not overly optimistic, which can lead to underfunding and increased financial stress during economic downturns.

D. Implement Stress Testing

Regular stress testing of the pension funds should be conducted to assess their resilience under various economic scenarios. Stress testing involves modeling the potential impacts of economic recessions, market volatility, and other adverse conditions on the funded status of STERS and SERS. These tests help identify vulnerabilities and inform strategies to mitigate risks, ensuring that the pension systems can withstand economic shocks and continue to meet their obligations to beneficiaries.[25]

VII. Conclusion

The 2017 fiscal guardrails have significantly contributed to the improved funding status of Connecticut's SERS and STRS. Both funds have seen substantial progress, but meaningful challenges remain. The analysis highlights that continued commitment to the current fiscal policies is critical to ensuring the long-term viability of these pension systems.

SERS and STRS have demonstrated improved funded ratios and reduced unfunded liabilities due to increased contributions and strategic financial management. However, to achieve the projected full funding by 2053, the state must adhere to disciplined budgetary allocations and remain vigilant against market volatility and unexpected economic shifts.

The additional contributions from budget surpluses have accelerated debt repayment and generated significant interest savings, enhancing Connecticut's fiscal stability and creditworthiness — which leads to a positive feedback loop of interest savings. Maintaining this trajectory will require ongoing legislative support and prudent financial planning to secure public employees' retirement benefits and safeguard the state's economic future.

The fiscal guardrails, along with Connecticut's General Assembly and Governor's persistence in pursuing pension solvency, have been vital in stabilizing and improving the state's pension and overall budgetary position. Their continuation is essential for achieving the long-term financial health and sustainability goals for SERS and STRS, benefiting not only the pensioners who rely on these plans (over 5% of Connecticut's population) but also the state's present and future taxpayers.
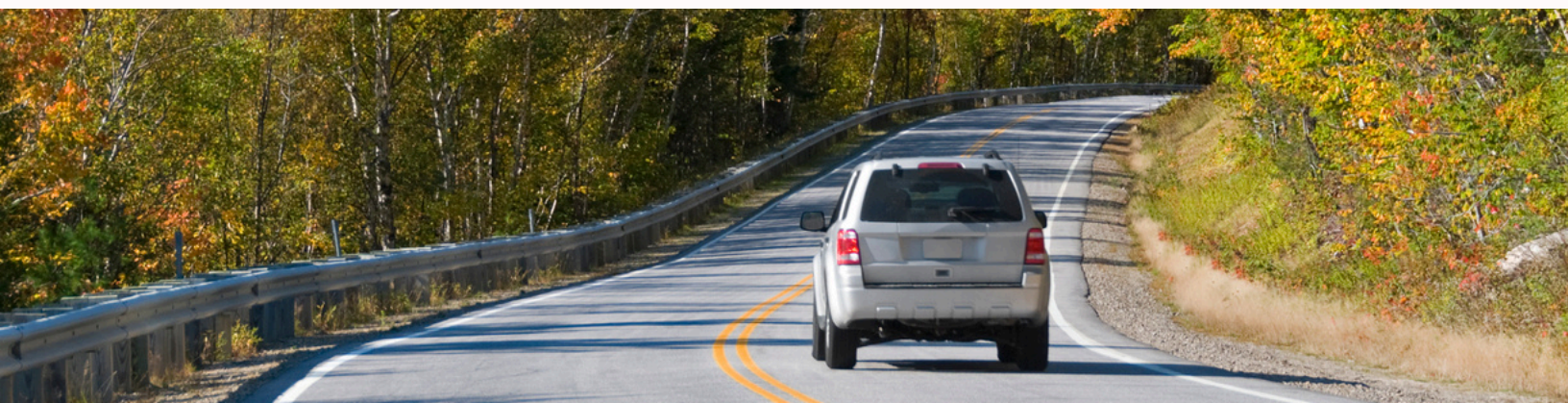
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Yankee Institute

915 Silas Deane Highway
Second Floor, Suite 2
Wethersfield, CT 06109

YankeeInstitute.org