

FINAL REPORT ON CONNECTICUT'S
STATE EMPLOYEES RETIREMENT SYSTEM
AND
TEACHERS' RETIREMENT SYSTEM

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I. Executive Summary

A. The Challenge

The State of Connecticut administers six retirement systems. The two largest are the State Employees Retirement System (SERS), and the Teachers' Retirement System (TRS). Over the past decade, in spite of a concerted effort to fund by the State,¹ the funded status for both these systems declined by about 20 percentage points and, as of 2014, stood at 42 percent for SERS and 59 percent for TRS – among the lowest in the nation. The total unfunded actuarial accrued liability (UAAL) for the two systems combined was \$25.7 billion – \$14.9 billion for SERS and \$10.8 billion for TRS. As a result, in 2014, the State paid \$1.8 billion to amortize the unfunded liability in both plans compared to about \$400 million for benefits earned by current employees. And the State faces scheduled increases in amortization payments in order to fully extinguish the unfunded liability by 2032, as required under the current plan.

The State has requested an assessment of both SERS and TRS to:

- a) identify factors that have led to today's unfunded liability;
- b) project the systems' finances going forward under the current plan; and
- c) present alternatives to shore up the systems' finances and improve budget flexibility.

B. Factors Driving Current Unfunded Liabilities

Three factors underlie the current unfunded liability of SERS and TRS: 1) legacy costs from benefits promised before the systems were pre-funded; 2) inadequate contributions once the State decided to pre-fund; and 3) low investment returns relative to the assumed return since 2000. For SERS, poor actuarial experience (particularly retirement patterns) relative to expectations also played a role.

Legacy Costs

Both systems have promised benefits to their members since 1939. But the benefits provided by SERS and TRS were not pre-funded until 1971 and 1982, respectively. Until then, benefits were paid each year from the State's general revenues. The many years of unfunded benefits accrued over that period saddled both systems with unfunded liabilities that today account for nearly \$9.3 billion of the combined \$26 billion unfunded liability. The remaining portion of the unfunded liability comes from funding shortfalls – due to inadequate contributions, low investment returns relative to expectations, and negative actuarial experience – for benefits accrued after the systems started prefunding.

¹ Since 2001, the State has paid, on average, 90 percent of the annual required contribution (ARC) for SERS. For TRS, the State issued \$2 billion in pension obligation bonds in 2008 and has paid 100 percent of the ARC since then. Prior to that, TRS funding was inconsistent; the State paid more than 80 percent of the ARC from 2001 to 2003, close to 70 percent in 2004 and 2005, and essentially 100 percent in 2006 and 2007.

Inadequate Contributions

Paying down the unfunded liability has two components: 1) calculating an appropriate amortization payment that keeps the UAAL from growing each year; and 2) making the full annual required contribution (ARC) payment. Connecticut has fallen short in both areas. Prior to 2000, SERS' calculated its amortization payments using a "level-dollar" approach that, if paid, would reduce the UAAL each year. But a lax statutory funding plan and multiple union agreements led the State to underpay for many years. From 2000 onward, the amortization payment was calculated using a "level-percent-of-payroll" approach that, even if paid, allows the UAAL to grow for many years before declining. So, while the State paid more of its required contribution after 2000 (State Employees Bargaining Agent Coalition agreements continued to allow for contributions below the ARC), the contributions were inadequate due to the choice of amortization method.

Unlike SERS, TRS has always used the less effective level-percent-of-payroll approach to calculate amortization payments. Additionally, a lax statutory funding schedule allowed TRS to underpay until 1992. Even after 1992, TRS continued to underpay – setting an unofficial policy of paying only 85 percent of the required contribution. The use of level-percent-of-payroll has added a combined \$6.3 billion in unfunded liabilities to SERS and TRS (\$2.3 billion and \$4.0 billion respectively), while underpayment of the required contribution, however calculated, has added a combined \$4.7 billion in unfunded liabilities to SERS and TRS (\$3.2 billion and \$1.5 billion respectively).

Actual Investment Returns Less than the Assumed Return

The impact of investment returns on plan finances depends on two factors: 1) the assumed return for the plan; and 2) the actual return. Achieving actual returns that are greater than what is assumed lowers the UAAL. Conversely, if actual returns are below what is assumed, it adds to unfunded liabilities. Prior to 2000, the actual investment return for both systems was much higher than each system's assumed return. In fact, from 1985-2000, the difference between each system's actual investment return and their assumed return *decreased* unfunded liabilities by a combined \$5.4 billion (-\$1.9 billion for SERS and -\$3.5 billion for TRS). Since 2000, however, the returns for SERS and TRS have fallen short of their expected return, averaging only 5.6 percent annually compared to an assumed return of 8.5 percent for TRS and 8 percent for SERS (reduced from 8.5 to 8.25 percent in 2008 and then to 8 percent in 2012). From 2000-2014, the difference between each system's actual investment return and its assumed return has added a combined \$8.9 billion in unfunded liability (\$3.2 billion for SERS and \$5.7 billion for TRS).

For SERS, Actuarial Experience

Actuarial experience has accounted for \$4.1 billion in unfunded liabilities for SERS since 1985. Data from 2009 forward suggest that retirement patterns have been the primary source of poor actuarial experience. One reason may be the ad-hoc early retirement incentive programs (ERIPs) introduced in 1989, 1992, 1997, 2003, and 2009. These programs directly impact the retirement patterns of members and likely cause dramatic deviations from the existing actuarial assumptions for retirement. Overall, we estimate that at least \$1.5 billion, or just over a third, of the \$4.1

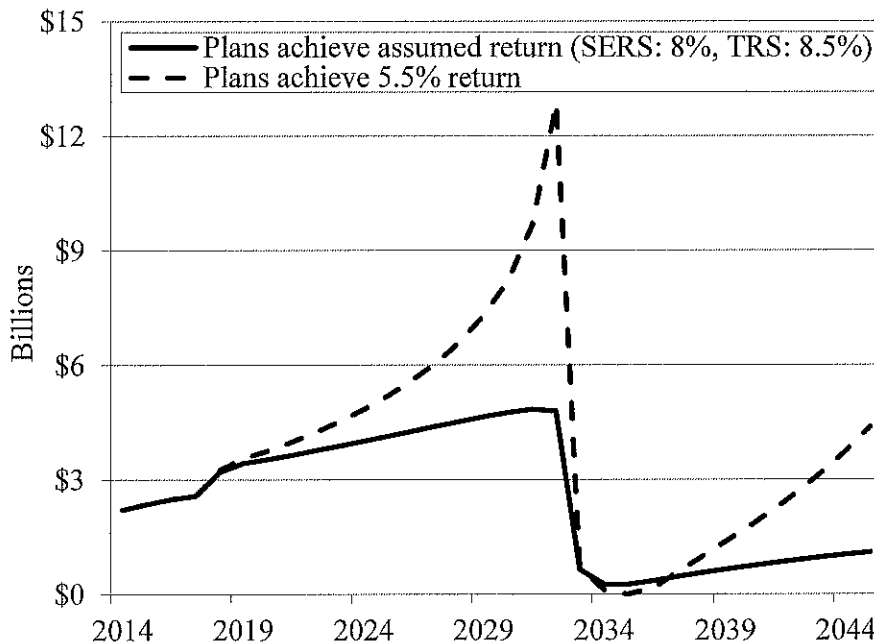
billion is directly due to the ad-hoc ERIPs (read: deviations in retirement patterns). The remaining portion comes from deviations in other assumptions such as mortality, turnover, and salary growth, and likely includes some residual impacts of the ERIPs.

C. Projections of SERS' and TRS' Finances

The main source of pension costs for the State going forward is the amortization of the unfunded liability of SERS and TRS. Currently, payment by the State to amortize the UAAL is about \$1.8 billion, while the normal cost – the amount to fund benefits being earned by workers today – is only \$400 million. In fact, when compared to similar plans across the nation, the normal cost for both SERS and TRS is below average as a percent of employee payroll. And, for SERS, the normal costs are expected to decline further as Tier III members with lower benefits replace current Tier II and IIA members.

Under the current plan, the UAAL for SERS and TRS is scheduled to be paid off by 2032, with costs expected to rise precipitously over the next 17 years as a result of scheduled increases due to the back-loaded amortization of the UAAL. If all actuarial assumptions are met, and the systems achieve their assumed returns, total costs for the two systems will rise steadily from \$2 billion in 2014 to nearly \$5 billion by 2032. The investment experience over the next 17 years is critical to the projection of costs. If, instead of realizing the assumed returns, the systems' investment experience is similar to the past decade, total annual costs for the two systems could balloon to \$13 billion in order to be fully funded by 2032 (see Figure 1).

Figure 1. *Projected ARC for SERS and TRS Combined under the Current Plan, 2014-2045*



Source: CRR calculations based on various actuarial valuations for Connecticut SERS and TRS.

D. Alternatives to SERS' and TRS' Current Funding Methods

The future costs of SERS and TRS hinge on the same elements that have defined their pasts: addressing the unfunded liability, ensuring adequate contributions, and achieving their expected investment returns. Four key adjustments can help.

Shift to Level-Dollar Amortization of Unfunded Liabilities

The level-dollar approach front-loads payments compared to level-percent-of-payroll, but improves funded levels more quickly and is often easier for budgeting because payments stay fixed in dollar terms. Compared to a level-percent method, using a level-dollar amortization from 2014-2032 would reduce nominal contributions by 3.4 billion (\$2.1 billion more over the first 9 years, but \$5.5 billion less over the last 9 years). Even in the event of consistently poor returns, using a level-dollar method would reduce total nominal contributions by \$3.2 billion over the 18-year funding period.

Replace 2032 Full-Funding Date with a Reasonable Rolling Amortization Period

While the 2032 full-funding date has the attractive quality of providing clear end point, it can also invite dramatic cost volatility if the system experiences any shocks as it approaches 2032 because the State must make up for those shocks over such a short period.

An open period delays full funding, but allows for easier management of unfunded liability costs by maintaining a set number of years over which any shocks (new unfunded liabilities) must be amortized.

Lower the Long-Term Assumed Investment Return

By lowering the assumed return, which also serves as the discount rate, the State will have to contribute more, but the pension systems are less likely to accrue unfunded liabilities due to returns that are below the assumed rate. A quick rule of thumb for the impact of a change in discount rate is that a 1-percent change causes a 12-percent change in the accrued liability and a 22-percent change in the normal cost. Using this rule of thumb, lowering the assumed return by half a percent would increase the employer contributions over the next few years to both SERS and TRS by a combined \$225 million annually.

Separately Finance Liabilities for Members Hired before Pre-funding

Separately financing the liabilities associated with members hired prior to pre-funding recognizes the fact that benefits for members hired prior to pre-funding have been consistently underfunded (even after pre-funding started) while benefits for those hired after pre-funding have been relatively well funded.

The two main policy arguments for separately financing the liabilities are intergenerational equity and the perception of benefit costs for current employees. First is intergenerational equity. The majority of members hired prior to pre-funding are now retirees. The unfunded liabilities associated with them were accumulated over multiple generations and the services these members provide are no longer being enjoyed by current generation because the members

are now retired. As such, it is not fair, from an intergenerational equity standpoint, to place the entire burden of funding the remaining benefits for these members on a single generation (as under the current plan). A longer time horizon for amortizing these benefits that spreads the costs over multiple generations would be more appropriate. The second argument is the undue burden that the cost of these benefits places on current employees. Today, the unfunded liability for members hired prior to prefunding represent a combined \$21.1 billion of SERS' and TRS' combined \$25.7 billion unfunded liability, while members hired after prefunding represent only \$4.6 billion. Combining the pension costs for members hired prior to pre-funding with those for members hired afterward skews the perception of pension benefits for current employees by misrepresenting the pension cost of current employees to the taxpayer.

E. Conclusion

Both SERS and TRS face rising pension costs over the next 18 years if they continue with their current plan to fully fund the systems by 2032. The majority of these costs are a result of the relatively short time period over which each System has chosen to pay down their large UAAL. The UAAL is a product of nearly 40 years of unfunded benefit promises made prior to pre-funding in 1970s and 1980s, as well as funding shortfalls after the systems started to pre-fund – namely inadequate contributions and investment returns (since 2000) falling short of assumptions. This report identifies four adjustments to the current funding plan both to address the costs associated with the years of unfunded benefits, and to prevent future funding shortfalls.

To address the costs associated with years of unfunded benefits:

- separately finance – over a long time horizon – the liabilities associated with members hired prior to the pre-funding.

To prevent funding shortfalls for ongoing benefits:

- shift to level-dollar amortization of unfunded liabilities;
- replace 2032 full-funding date with a reasonable rolling amortization period; and
- lower the long-term assumed investment return.

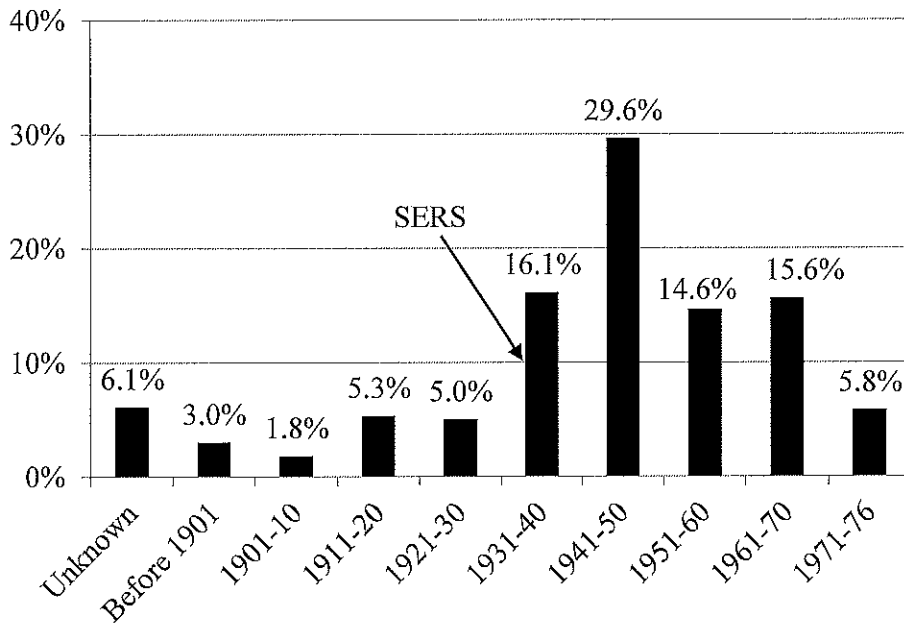
Implementing these changes will more fairly distribute the costs associated with unfunded benefits and better secure ongoing benefits for current employees.

II. Connecticut State Employees Retirement System (SERS)

A. A Brief History of SERS' Funding

SERS has been providing retirement benefits to its members since at least 1939 – longer than most state and local retirement systems in the United States (See Figure 2).

Figure 2. *Percentage of State and Local Plans Established or Significantly Restructured, by Date*

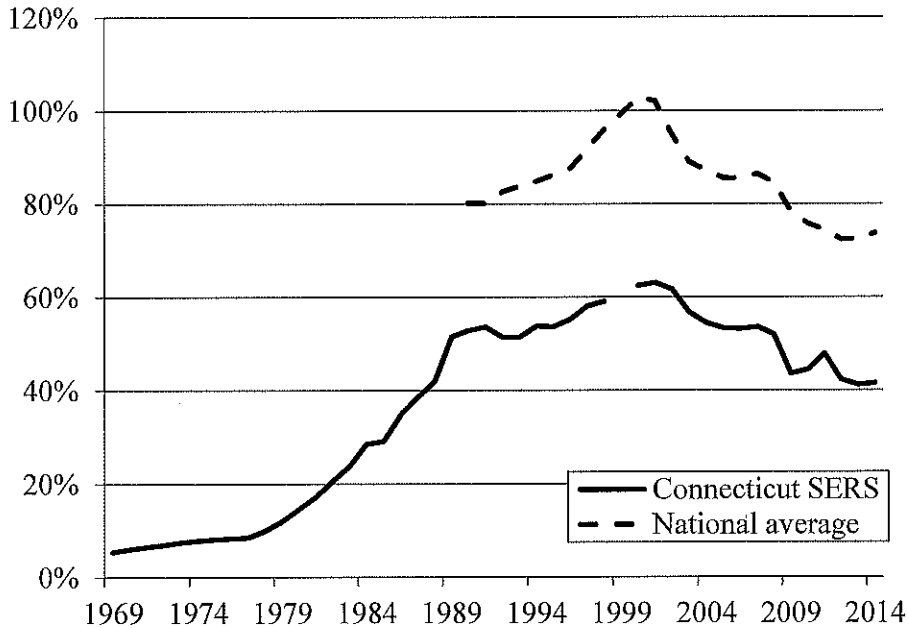


Sources: Various actuarial valuations for Connecticut SERS; CRR calculations based on PENDAT (1990-2000); and *Public Plans Database* (2001-2014).

With the passage of Public Act No. 666 in 1971, the State shifted from its long-standing practice of “funding” benefits on a pay-go basis to pre-funding retirement benefits actuarially (i.e. putting aside enough money in a trust each year while an employee is working in order to fund the payment of the employee’s retirement benefits).

Figure 3 shows the funded status for SERS since its first actuarial valuation performed on December 30, 1969 and provides, for comparison purposes, the average funded ratio for all state and local plans from 1990 forward (data prior to 1990 were not available).

Figure 3. *Funded Ratio of Connecticut SERS Compared to the National Average, 1969-2014*



Note: Funded ratios for 1970-1971, 1973-1977, and 1979-82 were not available for SERS. CRR estimates these data points using a straight line approximation between actual data provided in 1969, 1972, 1978, and 1983. The year 2000 was estimated by taking the average of data in 1999 and 2001.

Sources: Various actuarial valuations for Connecticut SERS; CRR calculations based on PENDAT (1990-2000); and *Public Plans Database* (2001-2014).

Because benefits were financed on a pay-go basis prior to 1971, the system was essentially not funded in 1969 (a small amount of assets had been accumulated through employee contributions). At that point, SERS was 0 percent funded and had an unfunded liability of \$712 million, equaling 284 percent of SERS' payroll. After 20 years of funding by the State, SERS entered the 1990s with a funded ratio of only 52 percent – well below the national average. And, its UAAL was about \$2.7 billion – equal to 147 percent of payroll, compared to a national average of 56 percent. While SERS' funded ratio has remained below the national average over the whole period, it has shared a similar pattern, rising during the stock market boom from 1990-2000, and then declining through two financial downturns since 2000. Today, the unfunded liability of SERS stands at \$15 billion, representing 428 percent of SERS' payroll compared to the national average of 185 percent.

B. Factors Driving Current Unfunded Liabilities in SERS

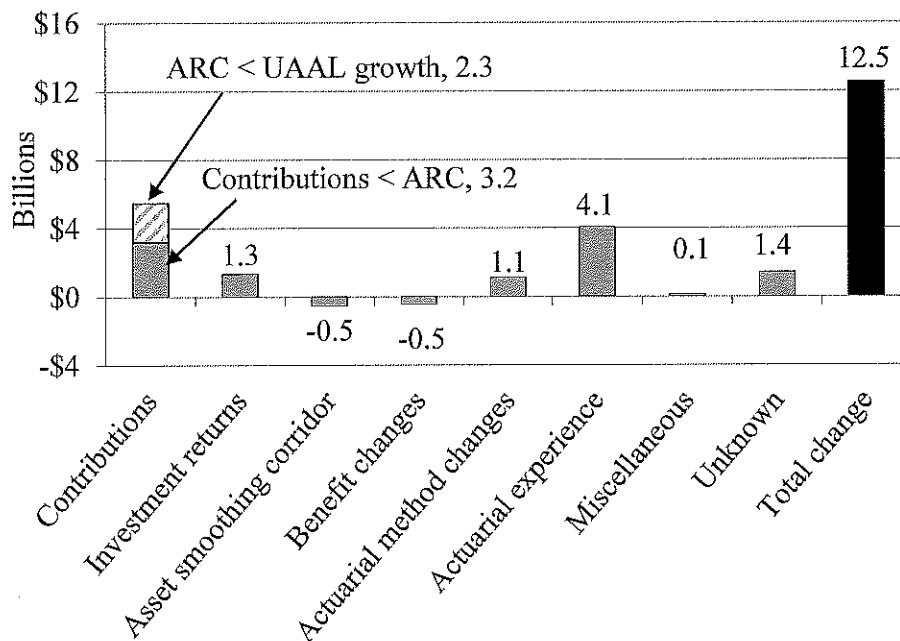
Four factors are behind SERS' current underfunding: 1) legacy costs due to benefits promised before SERS was pre-funded; 2) a history of inadequate contributions once the State decided to pre-fund; 3) low investment returns relative to expectations since 2000; and 4) poor actuarial experience, relative to expectations. Each factor will be discussed in detail below. Dollar amounts have not been adjusted for inflation.

Legacy Costs

A large portion of SERS' current unfunded liability stems from the many years of benefits promised without pre-funding. The burden of those unfunded benefits still lingers in the current finances of SERS, accounting for about \$5.2 billion or about 35 percent of SERS' \$14.9-billion unfunded liability.

Because detailed data on SERS' unfunded liability from 1970-1985 are not available, the assessment of SERS' underfunding focuses on the change in the unfunded liability from 1985-present (see Figure 4).²

Figure 4. Sources of Change to SERS' UAAL, 1985-2014



Source: CRR calculations based on various actuarial valuations for Connecticut SERS.

Since 1985, SERS' UAAL has grown by \$12.5 billion – from an initial value of \$2.5 billion to today's value of \$15 billion. As the figure shows, the two largest contributors to the growth in the UAAL have been inadequate contributions and an adverse actuarial experience, including various Early Retirement Incentive Programs (ERIPs). However, other elements have also been significant, namely investment returns.³

Inadequate Contributions

² See the Appendix for the methodology of the UAAL analysis.

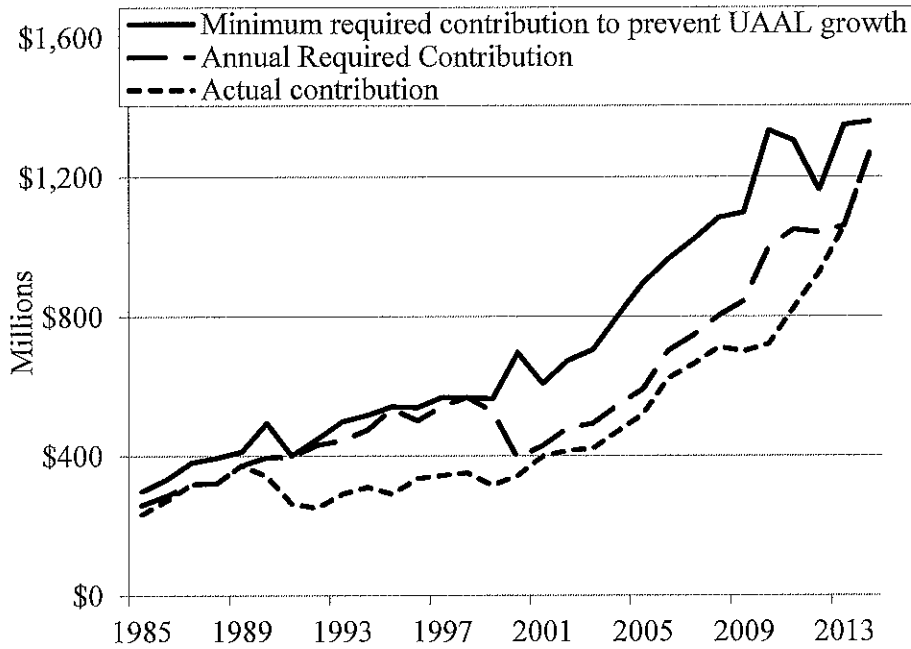
³ See the Appendix for a detailed timeline of all the factors that have contributed to annual changes in the UAAL since 1985.

Paying down the unfunded liability has two components: 1) calculating an amortization payment that keeps the unfunded liability from growing each year; and 2) making the full payment. Connecticut SERS has fallen short in both areas. SERS' underpayment of the ARC began as soon as the State decided to pre-fund. At the outset, State law provided for a ramp-up schedule in the State's funding requirement such that, in 1972, the State was only required to pay 30 percent of the ARC. This percentage was scheduled to gradually increase each year until 1985, when the State would be required to pay the full ARC.

Figure 5 shows the minimum contribution required to prevent UAAL growth, the calculated ARC, and the actual contributions made from 1985-2014. From 1985-2000, SERS used a level-dollar method of amortizing the UAAL and the calculated ARC closely tracked the minimum contribution. And the State paid the full ARC for the first few years, thus limiting UAAL growth. Then, in the 1990s, the State began to underpay, allowing the UAAL grow significantly. Much of the underpayment was sanctioned by agreements between the State and employee unions, known as State Employees Bargaining Agent Coalition (SEBAC) Agreements 1-3. After 2000, SERS switched from a level-dollar method of amortizing the UAAL to a level-percent-of-payroll amortization method. This shift resulted in calculated ARC payments that fell far short of the minimum amount required to prevent the UAAL from growing. And SEBAC Agreements 4 and 5 continued to allow for contributions below the calculated ARC by the State. Since 1985, using the level-percent-of-payroll method to calculate the ARC and contributing less than the ARC have accounted for a combined \$5.5 billion in unfunded liabilities (\$2.3 billion and \$3.2 billion, respectively).⁴ Of the \$3.2 billion due to contributions below the ARC, about \$2 billion were a direct result of SEBAC agreements and other negotiated reductions.

Figure 5. *Minimum Contribution to Prevent UAAL Growth, ARC, and Actual Contributions for SERS, 1985-2014*

⁴ A smaller issue with the calculated ARC is that there is a delay between when the ARC is calculated and when it is scheduled to be paid. Because the calculated contribution is generally not adjusted to account for this difference in timing, contributions are often inadequate to address the unfunded liability that exists when the contribution is made. As a result, from 1985-1999 – even though SERS used the level-dollar approach – the scheduled ARC for each year was often just shy of the minimum required contribution.

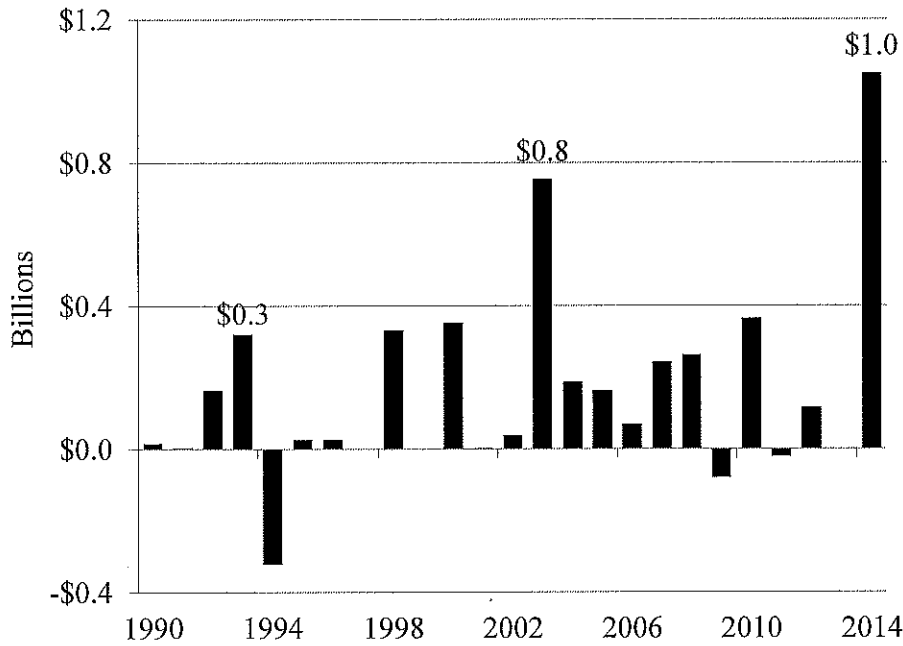


Source: CRR calculations based on various actuarial valuations for Connecticut SERS.

Actuarial Experience

Actuarial experience has accounted for \$4.1 billion in unfunded liabilities since 1985. While actuarial assumptions are not expected to precisely match experience in any given year (in some years, actual experience will fall below assumptions; in other years, it will overshoot), they should align over the long term. Figure 6 shows the annual impact of actuarial experience on SERS' UAAL from 1990-2014. In most years, the difference between assumptions and actual experience has resulted in increased liabilities.

Figure 6. Annual Impact of Actuarial Experience on Unfunded Liabilities for SERS, 1990-2014

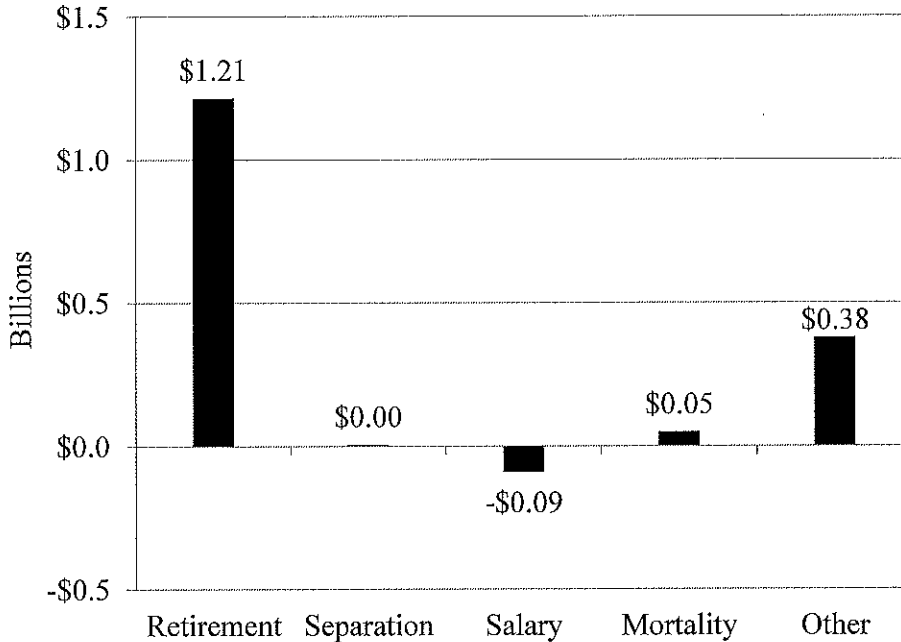


Source: CRR calculations based on various actuarial valuations for Connecticut SERS.

Most plans, including SERS, perform periodic experience studies to test how well assumptions have aligned with experience, and make adjustments if needed. Given these periodic reviews and adjustments, actuarial experience should have only a minimal impact on UAAL growth over time. However, this has not been the case for SERS. One reason may be the ad-hoc ERIPs introduced in 1989, 1992, 1997, 2003, and 2009. These programs directly impact the retirement patterns of members and likely cause dramatic deviations from the existing actuarial assumptions for retirement.

Figure 7 shows the impact that specific types of actuarial experience (turnover, retirement, mortality, or salary growth) have had on SERS' UAAL from 2009-2014. Although detailed data are not available prior to 2009, data from 2009 forward show that, recently, retirement patterns have been the primary source of UAAL growth from actuarial experience, supporting the notion that ERIPs may be a key factor in the poor actuarial experience.

Figure 7. *Impact of Specific Actuarial Assumptions on Unfunded Liabilities for SERS, 2009-2014*



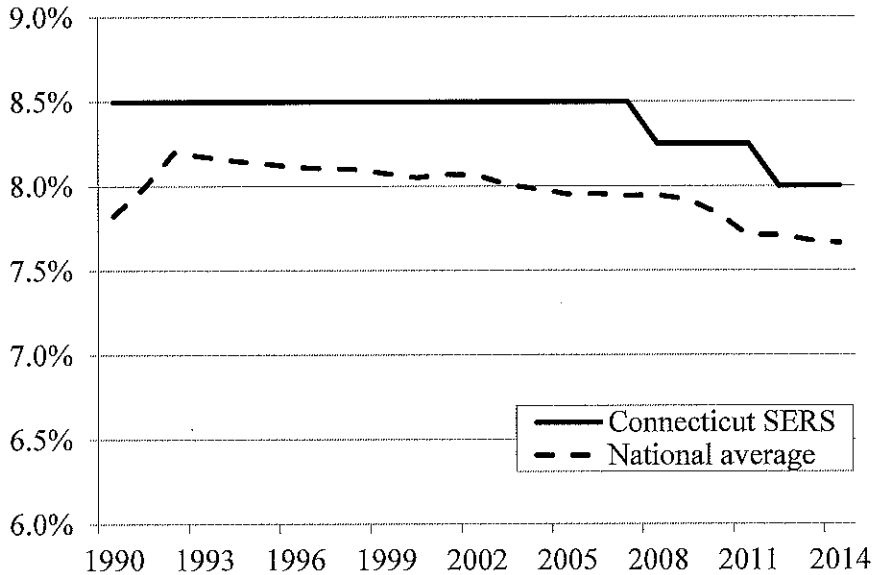
Source: CRR calculations based on various actuarial valuations for Connecticut SERS.

Overall, we estimate that about \$1.5 billion, or just over a third, of the \$4.1 billion in unfunded liabilities from actuarial experience can be attributed to the ad-hoc ERIPs (i.e., deviations in retirement patterns). The remaining portion comes from deviations in other assumptions such as mortality, turnover, and salary growth.

Investment Returns

The impact of investment returns on the unfunded liability depends on the difference between the system's assumed and actual return. For SERS, this difference has generated \$1.3 billion in unfunded liabilities since 1985. Figure 8 shows the SERS' assumed return compared to the national average from 1990-2014. Although SERS has lowered its assumed return from 8.5 to 8 percent in recent years, it still remains nearly 50 basis points above the national average.

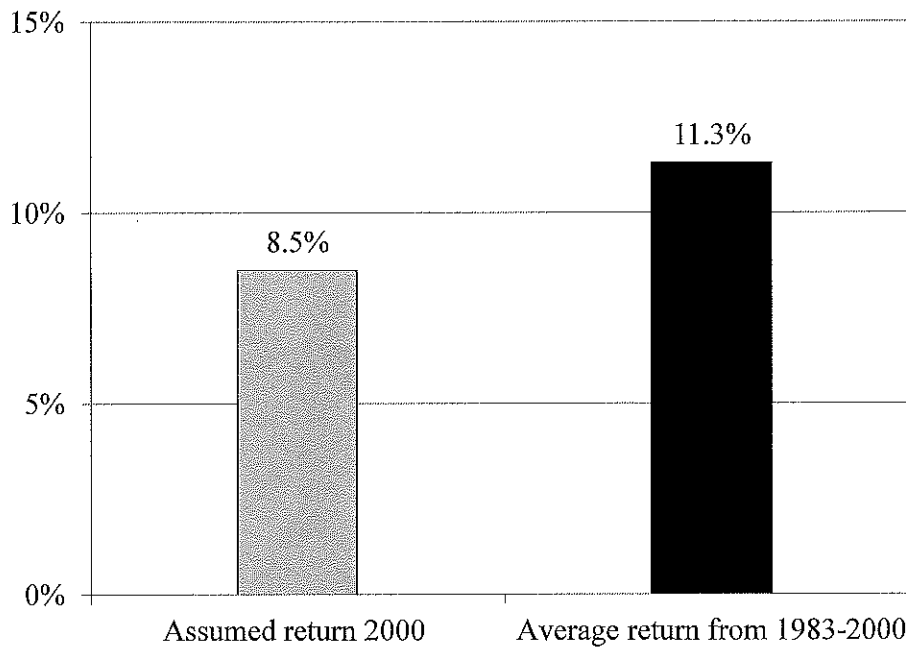
Figure 8. Assumed Return for SERS Compared to the National Average, 1990-2014



Sources: Various actuarial valuations for Connecticut SERS; CRR calculations based on PENDAT (1990-2000); and *Public Plans Database* (2001-2014).

The actual returns for SERS were studied over two distinct periods: 1983-2000, which included the stock market boom of the 1990s, and 2001-2014, which included the 2002 market downturn and the 2008-2009 financial crisis. Figure 9a compares the actual and assumed returns for SERS from 1983-2000. Over that period, SERS' actual investment return was almost 3.0 percentage points above its assumed return. As a result, prior to 2000, investment experience *reduced* the unfunded liabilities by \$1.9 billion.

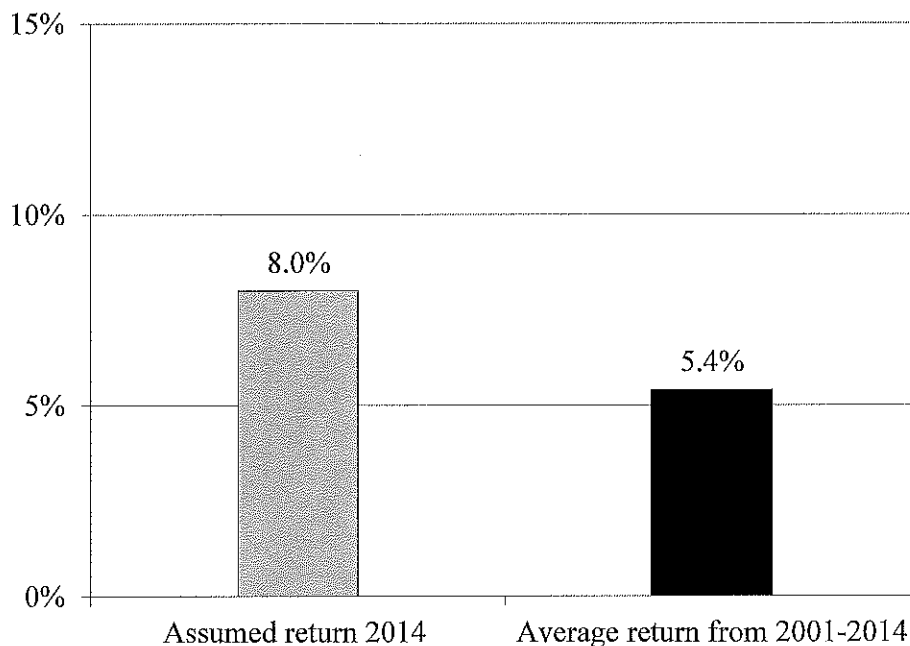
Figure 9a. *Actual and Assumed Investment Return for SERS, 1983-2000*



Sources: CRR calculations based on various actuarial valuations for Connecticut SERS; PENDAT (1990-2000); *Public Plans Database* (2001-2014); and U.S. Census Bureau (1983-2000).

Figure 9b compares the actual and assumed returns for SERS from 2001-2014. Unlike the earlier years, SERS' average return during this period was more than 2.5 percentage points below its assumed return. This investment experience added \$3.2 billion in unfunded liabilities.

Figure 9b. *Actual and Assumed Investment Return for SERS, 2001-2014*



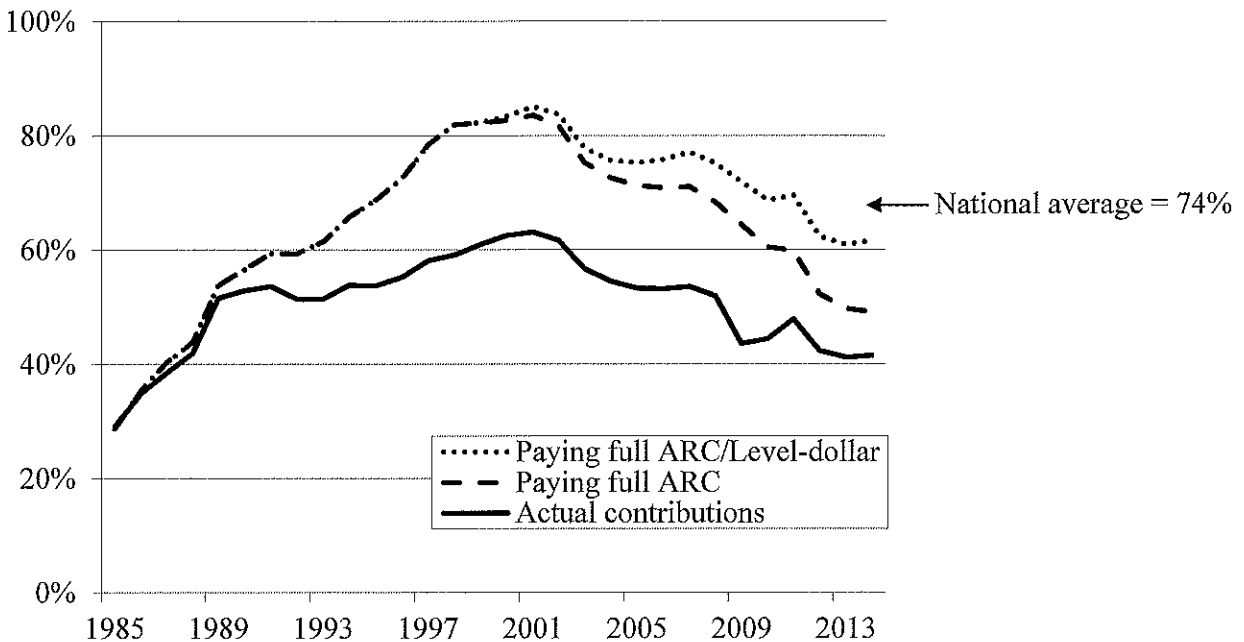
Sources: CRR calculations based on various actuarial valuations for Connecticut SERS; PENDAT (1990-2000); *Public Plans Database* (2001-2014); and U.S. Census Bureau (2001-2014).

C. An Alternate History for SERS: Controllable vs. Uncontrollable Factors

The majority of today's underfunding for SERS stems from the legacy of unfunded benefits, inadequate contributions throughout the State's history of pre-funding, low investment returns relative to the assumed return since 2000, and poor actuarial experience. Some of these factors mentioned above are more controllable than others. Nothing could be done about the initial legacy costs, other than to have had the State pre-fund benefits since SERS' inception. The poor investment and actuarial experience were difficult to fully control. However, calculating the appropriate contribution was definitely within the control of the State, and the State often knowingly underpaid the required contribution.

What would SERS' funded level be today if the plan had: a) fully paid the ARC from 1985-2014; and b) maintained a level-dollar amortization method throughout? To answer this question, we recalculated SERS' funded ratio over time under these two assumptions (see Figure 10).

Figure 10. *SERS' Funded Ratio under Various Funding Regimes, 1985-2014*



Source: CRR calculations based on various actuarial valuations for Connecticut SERS.

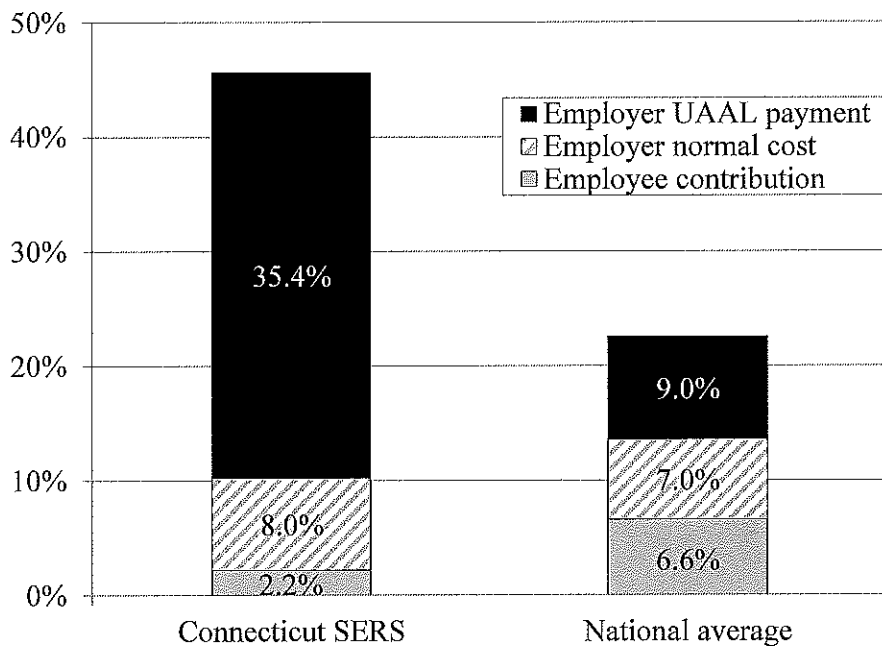
The figure shows that, if SERS had simply paid its full ARC, today's funded ratio would be about 10 percentage points higher. If the plan had also maintained a level-dollar amortization method after 2000, its current funded ratio would be 20 percentage points higher, jumping from 40 to 60 percent. Interestingly, the funded ratio for SERS would be below the national average even if the State contributed adequately, highlighting the importance of legacy costs, investment returns, and actuarial experience.

D. Projections of SERS' Finances

This section will project the funded ratio for SERS and the State's required contributions under the current agreement. Data points underlying the projection figures can be found in the Appendix tables.

The main cost driver for SERS is the unfunded liability from legacy costs and funding shortfalls, not overly generous benefits to members. The total normal cost as a percent of payroll (employee contributions plus employer normal cost) is a good way to compare plan generosity among plans. Figure 11 presents a breakdown of normal costs and amortization payments for SERS compared to the national average for similar plans. The figure shows two things. First, the majority of pension costs for the State is due to the unfunded liability. Second, the cost of benefits provided to current employees (the total normal cost) is actually below average. And, with the reduction in benefits for Tier III members, normal costs are projected to decrease from today's rate of 10.2 percent of payroll to about 9.2 percent of payroll once the Tier III members make up most of the workforce.

Figure 11. 2014 Actuarial Costs as a Percent of Payroll for SERS Compared to the National Average, by Element



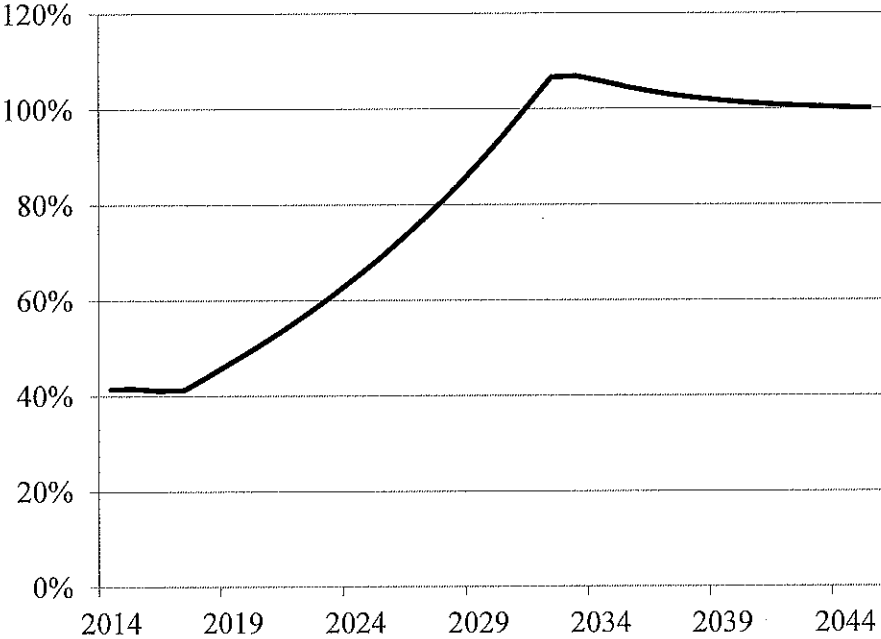
Source: CRR calculations based on 2014 actuarial valuations for Connecticut SERS, projections by the SERS actuary, and *Public Plans Database* (2014).

Two factors determine the annual payments needed to pay down the UAAL. First is the payment schedule (or amortization method): level-dollar payments vs. payments that are a level percent of payroll. Second is the type of amortization period: closed period (setting a fixed date for the plan to be fully funded) or open period (setting a perpetual time horizon for paying down the UAAL). If an open method is chosen, the perpetual time horizon over which to pay down the UAAL is also an important factor. The pros and cons of each are listed below.

- Level-dollar: front-loads payments compared to level-percent-of-payroll, but improves funded levels more quickly and is often easier for budgeting because payments stay fixed in dollar terms.
- Level-percent-of-payroll: back-loads payments compared to level-dollar, as payments increase in step with expected payroll growth. The funded level improves more slowly and budgeting may be tricky as the schedule calls for increasing payments each year.
- Closed period: has the attractive quality of setting a clear date by which the plan will be fully funded. Unfortunately, it can also invite dramatic cost volatility if the system experiences any shocks near the full funding date because the State must make up for those shocks over a short period.
- Open period: perpetually delays full funding, but allows for easier management of unfunded liabilities by maintaining a set number of years over which any shocks (new unfunded liabilities) must be amortized.

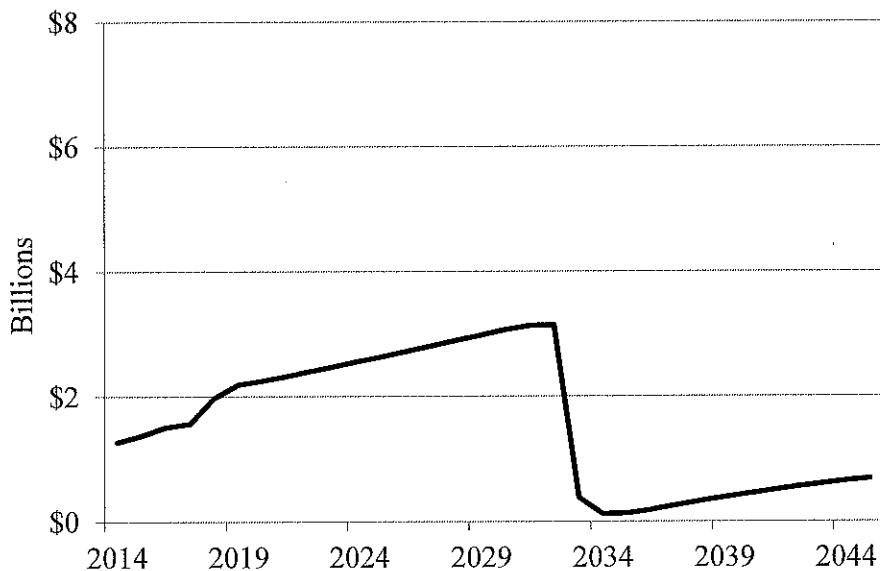
Under the current agreement, SERS' unfunded liability is to be paid off by 2032 (a closed period) using the level-percent-of-payroll amortization method. Figure 12 shows the funded ratio and Figure 13 shows the ARC (normal cost plus amortization payment) under the current agreement from 2014-2045. The projections assume the full ARC is paid each year and SERS achieves its assumed return of 8 percent. The funded ratio climbs each year to full funding by 2032. The ARC, primarily as a result of the amortization method, steadily rises each year from \$1.3 billion in 2014 to \$3.1 billion in 2032. Once the UAAL is paid off, costs drop precipitously to \$380 million in normal cost payments.

Figure 12. *Projected Funded Ratio for SERS under the Current Agreement, 2014-2045*



Source: CRR calculations.

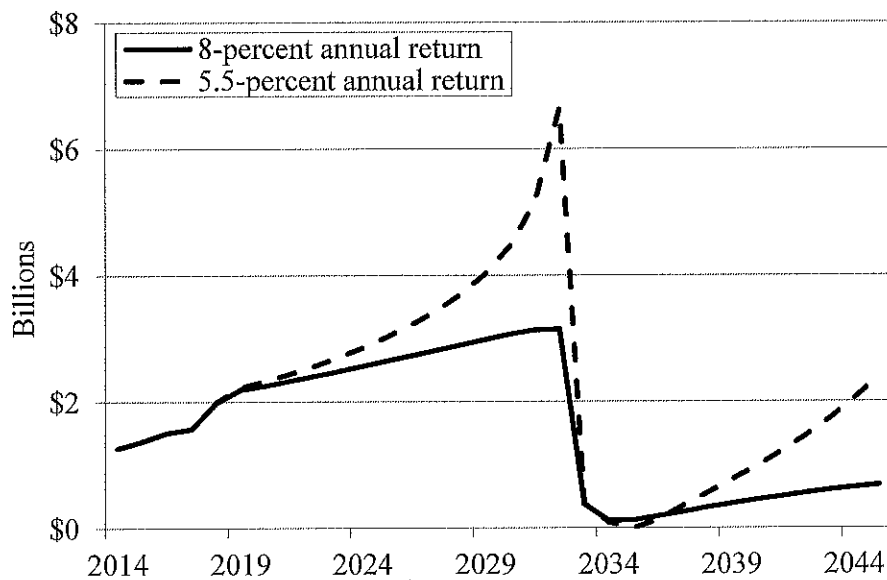
Figure 13. *Projected ARC for SERS under the Current Agreement, 2014-2045*



Source: CRR calculations.

The investment return is critical to the cost projection. If, instead of realizing the assumed return of 8 percent, the investment return for SERS is similar to the past decade, the ARC will rise from \$1.3 billion in 2014 to \$6.7 billion in 2032 (see Figure 14).

Figure 14. *Projected ARC for SERS under the Current Agreement with a 5.5-Percent Return, 2014-2045*



Source: CRR calculations.

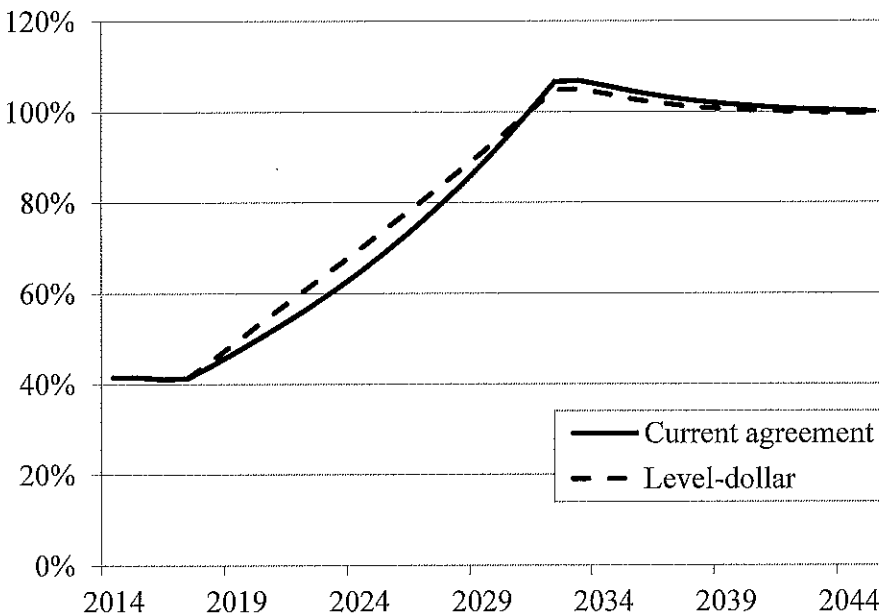
F. Alternatives to SERS' Current Funding Methods

Alternative 1. Switch to a Level-Dollar Amortization of the UAAL

To limit the scheduled cost increases that result from using the level-percent-of-payroll method for amortizing the UAAL, one alternative for SERS is to switch back to the level-dollar method, which it used prior to 2000.

Figure 15 shows a projection of SERS' funded ratio under the level-percent-of-payroll and level-dollar amortization methods, maintaining the full funding date of 2032. Due to the backloading of amortization payments, the funded ratio under the level-percent-of-payroll method falls below that of the level-dollar method. However, because the 2032 full funding date is only 18 years away, the path of the funded ratio differs very little between the two methods.

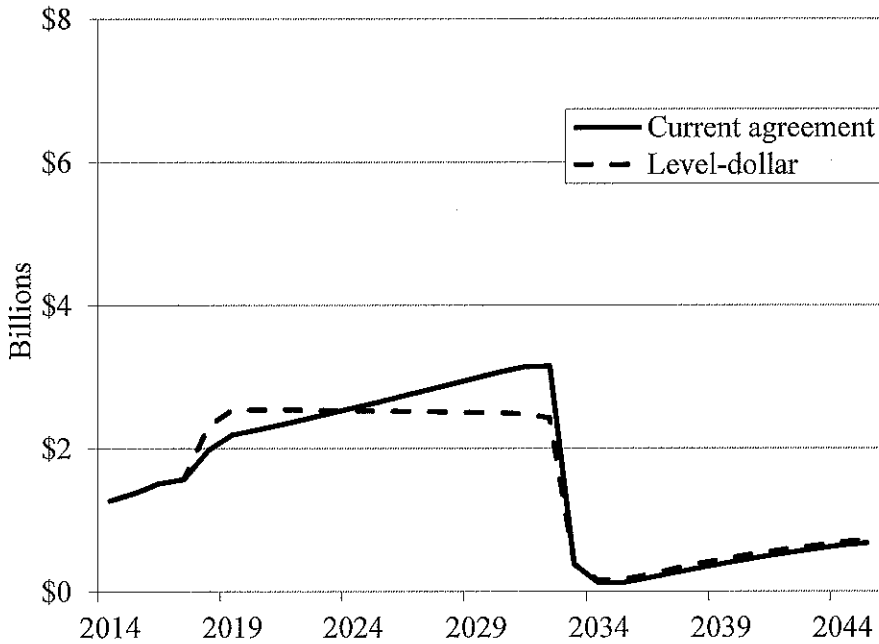
Figure 15. *Projected Funded Ratio for SERS under Alternative Funding Methods, 2014-2045*



Source: CRR calculations.

Unlike the funded ratio, the State's required contributions under a level-percent-of-payroll and level-dollar method have noticeably different trajectories (see Figure 16). Contributions under the level-percent-of-payroll method begin at \$2 billion in the early years, but soon exceed the level-dollar payments, ultimately peaking at \$3.1 billion in 2032. On the other hand, contributions under the level-dollar method remain relatively steady at just about \$2.5 billion annually. In both cases, the State's costs drop dramatically once the plan achieves full funding.

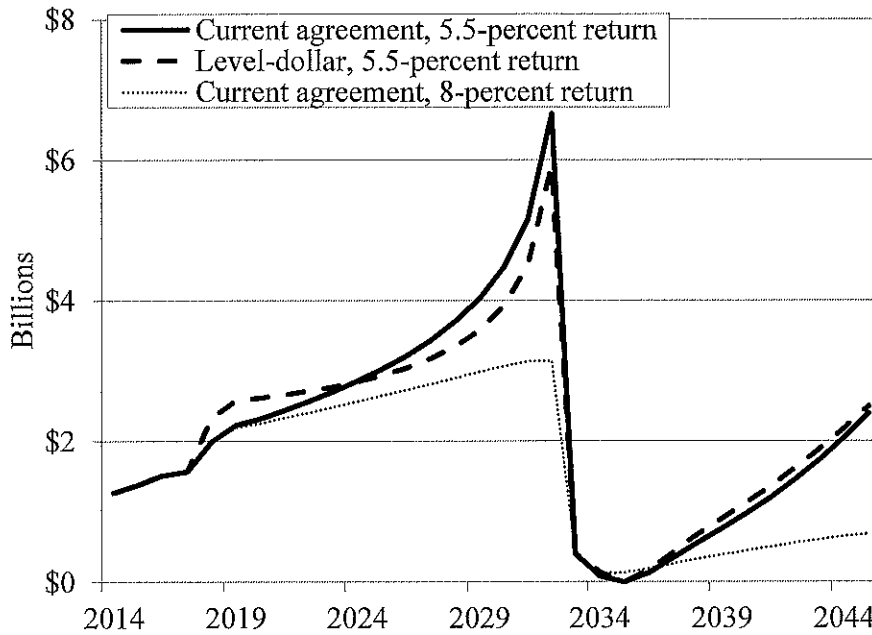
Figure 16. *Projected ARC for SERS under Alternative Funding Methods, 2014-2045*



Source: CRR calculations.

Once again, investment returns are integral to the cost projections. Figure 17 shows employer costs under the two amortization methods with a 5.5-percent return going forward. Under both funding methods, costs could rise to \$6-\$7 billion before dropping once the plan reaches full funding. For visual comparison, the light line in the figure shows projected costs under the current agreement and under an 8-percent return.

Figure 17. *Projected ARC for SERS under Alternative Funding Methods and a 5.5-Percent Return, 2014-2045*



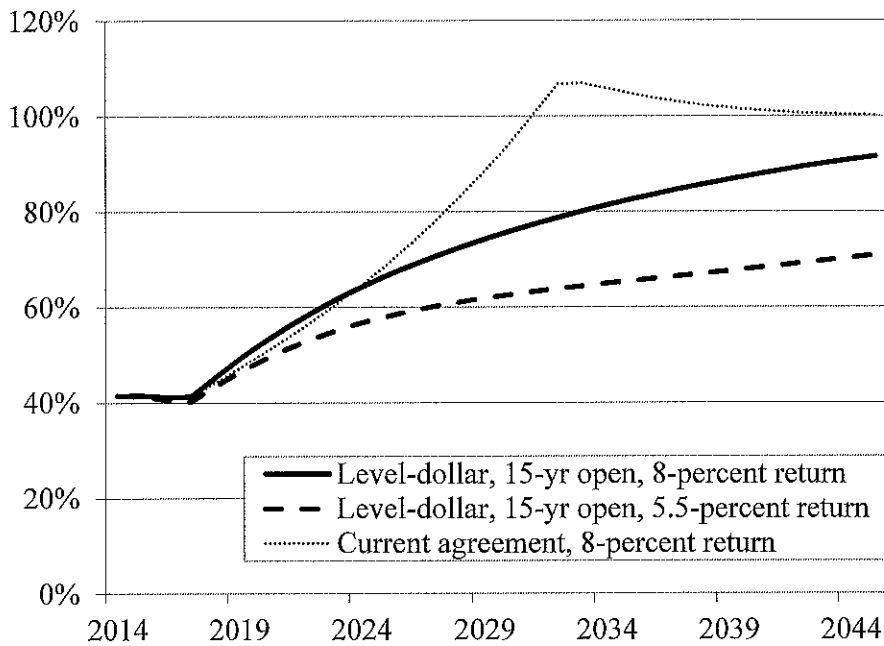
Source: CRR calculations.

Alternative 2. Switch to a Level-Dollar and 15-year Open Amortization of the UAAL

As the above figures show, maintaining the status quo may be quite costly for the State, especially if SERS does not realize its assumed 8-percent return. Switching to a level-dollar method provides little relief, as required contributions rise immediately. Additionally, in terms of budgeting, the precipitous drop in contributions once the plan reaches full funding is not practical. As such, it may be preferable to relax the 2032 full funding date in addition to using the level-dollar approach.

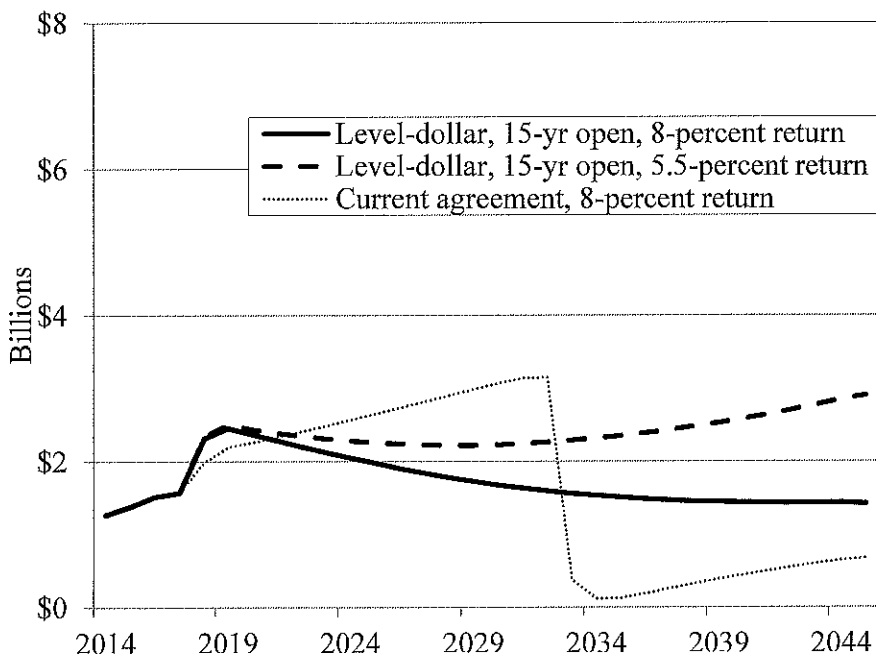
Figures 18 and 19 show the results of this approach under SERS’ assumed return – 8 percent – and a 5.5-percent return (similar to the average return since 2000). The actual outcome will likely fall in between. While the 15-year open amortization approach does mitigate costs, it also delays full funding. This delay can be especially meaningful if returns are below expectations.

Figure 18. *Projected Funded Ratio for SERS under Level-Dollar, 15-yr Open Amortization, 2014-2045*



Source: CRR calculations.

Figure 19. *Projected ARC for SERS under Level-Dollar, 15-yr Open Amortization, 2014-2045*



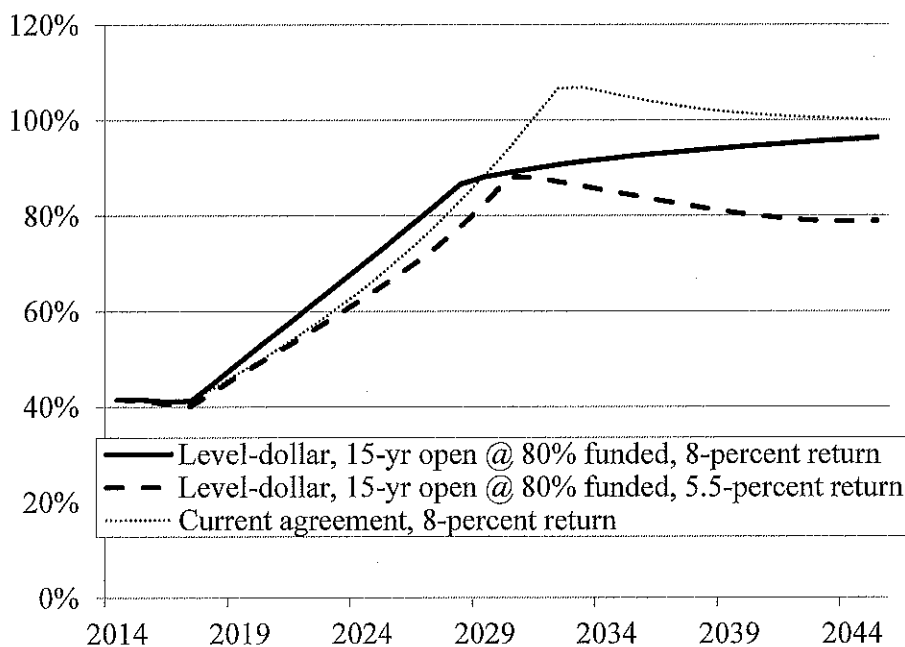
Source: CRR calculations.

Alternative 3. Relax 2032 Full-funding Date When 80 Percent Funded

Whether under a level dollar or level-percent amortization, the 2032 full-funding date presents real risks to the State of dramatic contribution rate volatility as the date approaches. Yet, shifting to a 15-year open amortization significantly delays funding improvements. One other approach is to maintain the 2032 goal until the plan reaches a lower funding threshold deemed to be adequate. At that point, relaxing the full-funding date may provide contribution rate relief, while not greatly risking the plan’s fiscal health.

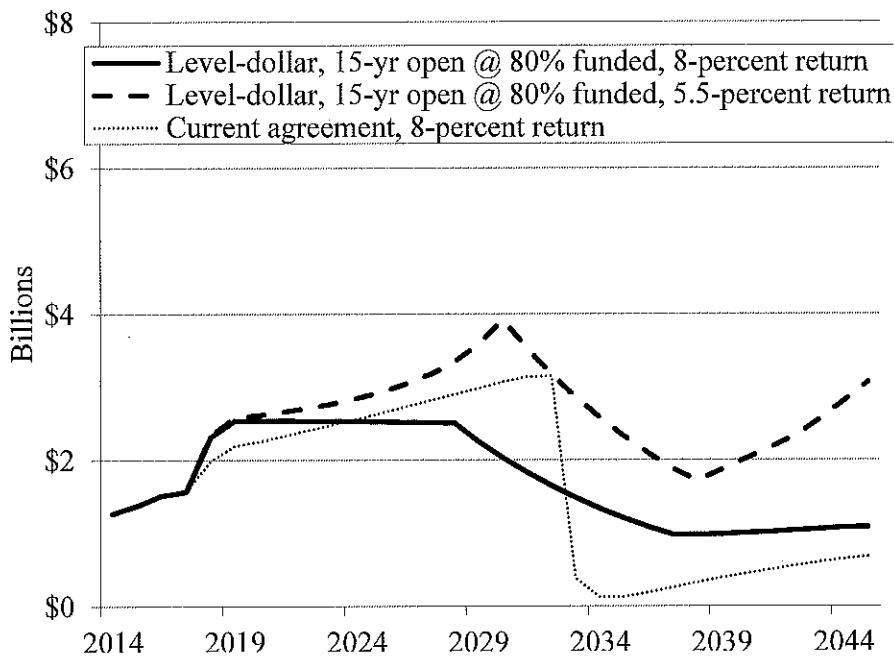
Figures 20 and 21 (below) show the funded ratio and State required contributions under a level-dollar amortization approach that maintains the 2032 full-funding date until SERS is 80-percent funded and then shifts to an open 15-year amortization. As the figure shows, under both the 8-percent and 5.5-percent return scenarios, funding improves quickly in the early years under the 2032 full-funding date and, when the plan shifts to an open amortization, contribution pressure is reduced, while maintaining reasonable funding.

Figure 20. *Projected Funded Ratio for SERS under Level-Dollar and 15-yr Open Amortization at 80-percent Funded, 2014-2045*



Source: CRR calculations.

Figure 21. *Projected ARC for SERS under Level-Dollar and 15-yr Open Amortization at 80-percent Funded, 2014-2045*

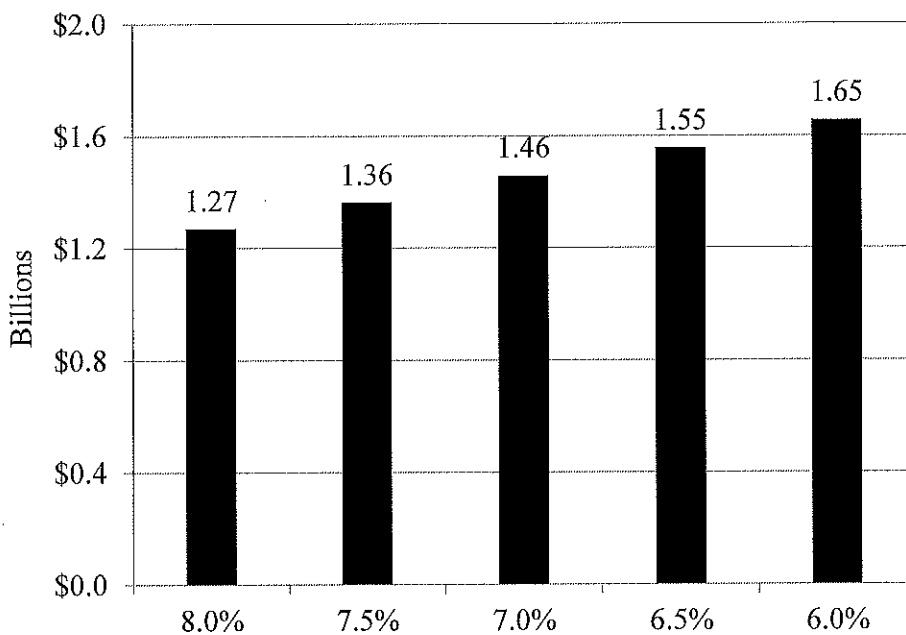


Source: CRR calculations.

Lowering the Discount Rate/Long-Term Assumed Return

The decision to change the long-term assumed return involves a clear trade-off. Reducing the assumed return means paying more into the system (to make up for lower expected returns). But, it also lowers the likelihood of paying amortization payments in the future for unfunded liabilities that arise due to investment performance that is below the assumed return. Conversely, increasing the assumed return means paying less up front, but it increases the likelihood of having to pay more to make up for unfunded liabilities that accrue if investment experience falls short. Figure 22 shows the impact of various discount rates on the 2014 ARC for SERS. It reflects the change in up-front costs from discount rate changes, but does not include the change in the likelihood of paying UAAL payments down the road if returns do not meet expectations.

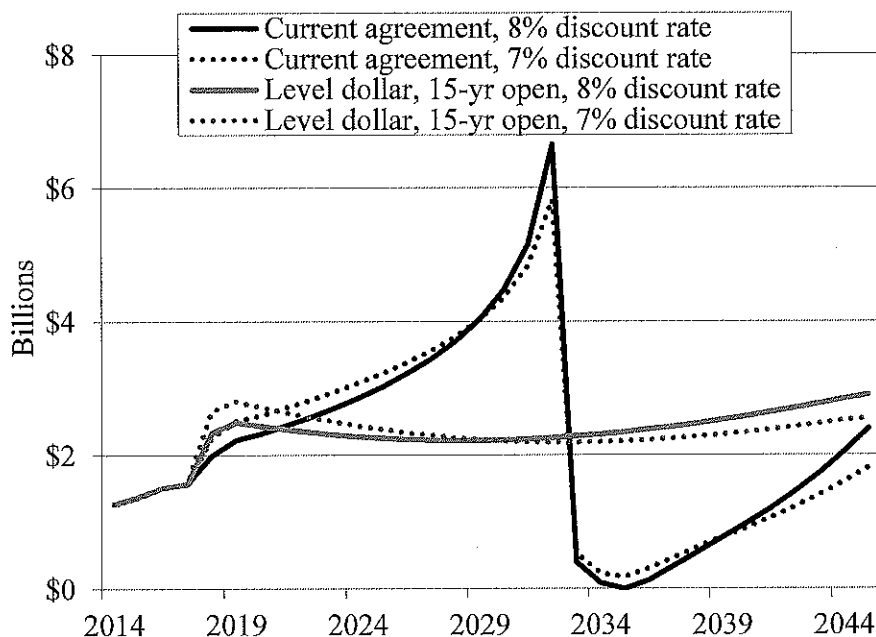
Figure 22. 2014 ARC for SERS under Various Discount Rates/Long-term Assumed Returns



Source: CRR calculations.

Figure 23 shows the trajectory of costs for SERS under an 8-percent and 7-percent assumed return, given an actual return of 5.5 percent. The figure illustrates the trade-off described above. When compared to the 8-percent assumed return, the 7-percent assumed return requires greater contributions in the early years and less in the later years.

Figure 23. *Projected ARC for SERS under Various Discount Rates and a 5.5-percent Return, 2014-2045*



Source: CRR calculations.

Separately Finance Liabilities for Tier 1 Members

When considering alternatives for addressing SERS unfunded liability going forward, the separate financing of legacy costs, particularly for unfunded Tier 1 benefits, should be considered. As stated above, Tier 1 benefits were totally unfunded prior to 1971 and only partially funded from 1971-1985. However, accurately apportioning the *current* unfunded liability to each tier requires a detailed account of how each Tier has been funded over time. A tier-specific funding history is difficult to determine as all pension assets and contributions are commingled in a single retirement trust to finance benefit payments to *all* members, not individual tiers. Getting some sense of each Tier’s individual funded status requires recreating the funding history for SERS as if each Tier were separately funded, with assets held in its own trust.⁵ As shown in Table 1, the majority of SERS current unfunded liabilities are, in fact, for Tier 1, while the more recent Tiers are relatively well funded.

⁵ We estimate annual liabilities and benefit payments for Tier I assuming a straight-line growth in liabilities and annual benefit payments from the SERS total levels (all Tier 1) in 1983 to the 2014 levels specifically for Tier 1 provided by the SERS administrators and actuaries. For Tier 1 employer normal cost contributions, we use the annual employer normal costs reported in the actuarial valuation. Tier 1 employee contributions are based on the reported payroll for each tier in the actuarial valuation and the member contribution rate. Investment returns for Tier 1 are assumed to be equal to the returns experienced by SERS as a whole. We back into the assets, liabilities, and unfunded liabilities for the remaining Tiers by subtracting Tier 1 estimates from the totals for SERS liabilities, assets, unfunded liabilities, and contributions reported in the annual valuations. Tier 1’s amortization payment is proportional to SERS total amortization payment based on the proportion of the UAAL that Tier 1 represents two years prior.

Table 1. 2014 Assets, Liabilities, Unfunded Liabilities, and Funded Ratio for SERS, by Tier

Tier	Assets (billions)	Liabilities (billions)	Unfunded liabilities (billions)	Funded ratio
Tier I	\$3.7	\$14.4	\$10.7	25.4%
Tiers II, IIA, III	6.9	11.1	4.2	62.4
Total	10.6	25.5	14.9	41.5

Source: CRR calculations based on data from SERS Actuary and Connecticut SERS 2014 Valuation.

Today, the majority of Tier 1 members are retired, and nearly 85 percent of Tier 1 liabilities are for retirees (see Table 2). Thus, the current unfunded liability is primarily the product of benefit promises made to existing retirees (Tier 1) that were never properly funded. In contrast, benefits for most current employees (Tier II, IIA, and III) have been relatively well funded as they have accrued.

Table 2. 2014 Membership and Liabilities for SERS, by Tier

Tier	Actives	Retirees	Active liability (billions)	Retiree liability (billions)
Tier I	2,281	29,214	\$1.3	\$13.1
Tiers II, IIA, III	47,695	16,589	6.1	5.0
Total	49,976	45,803	7.4	18.1

Source: CRR calculations based on data from SERS Actuary and Connecticut SERS 2014 Valuation.

Separately financing the liabilities associated with Tier 1 members recognizes the historical difference in the funding of benefits for Tier 1 members when compared to other Tiers. Benefits for Tier I members have been consistently underfunded (even after pre-funding began), and today are only 25 percent funded. Benefits for members of Tiers II, IIA, and III have been more dutifully funded, and today are about 62 percent funded.

The two main policy arguments for separately financing Tier 1 liabilities are intergenerational equity and the perception of costs for current employees. First is intergenerational equity. The unfunded liability for Tier 1 has been accumulated over multiple generations, and the services provided by those members are no longer being enjoyed by current generations because most Tier 1 members are now retired. As such, it is not fair to place the entire burden of funding the remaining Tier 1 benefits on a single generation (as under the current agreement). A longer time horizon for amortizing Tier 1 liabilities that better spreads the costs over multiple generations would be more appropriate. The second argument is that the cost of Tier 1 benefits place an undue burden on current employees. The funded status of benefits for more recent Tiers is estimated to be about 62 percent. And the cost of ongoing benefits for these Tiers is only about 10 percent of payroll, below the national average. In contrast, the funded status of Tier 1 benefits is only about 25 percent and Tier 1 retirees receive more generous benefits than those in more recent Tiers. Separating the financing of Tier 1 benefits from other Tiers allows for a more

accurate accounting of pension costs for current employees, while clearly defining the costs attributable to a closed system that, for the most part, services retired state employees.

F. Conclusion

SERS faces rapidly rising pension costs over the next 18 years if it continues with its current plan to fully fund the system by 2032. The majority of these costs are a result of the relatively short time period over which SERS has chosen to pay down its large UAAL. SERS' UAAL is mainly the result of underfunding benefits for Tier 1 members, those hired prior to pre-funding. Although unfunded liabilities occurred after the system started to pre-fund – due to inadequate contributions, investment returns (since 2000) less than assumptions, and poor actuarial experience – benefits earned by members of the more recent tiers (Tiers II, IIA, and III) have been relatively well funded. This report identifies four adjustments to the current funding plan both to address the large costs associated with underfunded Tier 1 benefits, and to prevent future funding shortfalls for the more recent Tiers II, IIA, and III.

To address the costs associated with underfunded Tier 1 benefits:

- separately finance – over a long time horizon – the liabilities for Tier 1 members.

To prevent funding shortfalls for ongoing benefits:

- shift to level-dollar amortization of unfunded liabilities;
- replace 2032 full-funding date with a reasonable rolling amortization period; and
- lower the long-term assumed investment return

Implementing these changes will more fairly distribute the costs associated with underfunded Tier 1 benefits and better secure ongoing benefits for current employees.