The Connecticut Teachers' Retirement System: How can it be stabilized?

By Eric Halpern

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Letter from the Yankee Institute

The teachers' retirement system took center stage this year after Gov. Dannel Malloy's budget called upon municipalities to pay one-third the price of maintaining the system – at a cost of $400 million to cities and towns. Although this move was startling to municipal leaders and residents across the state, it highlighted the true expense and unsustainability of the retirement system. Even after the state put $2 billion on its credit card to give the system an infusion of cash, lower than expected returns on investments and shrinking student populations have created a system that is more poorly funded today than it was in 2008 – despite the state having made its full required payments every year since then.

This study, written by Eric Halpern, a Connecticut resident and actuary, highlights important reforms the state could make to strengthen the pension system. Suggestions include:

- **Requiring additional reporting on the system's risks to improve transparency;**
- **Increasing teacher contribution rates to the national average of 8%;**
- **Eliminating or reducing cost of living adjustments;**
- **Including new teachers in the Social Security program;**
- **Requiring defined contribution plans for new teachers to increase portability and reduce taxpayer risk; or, offering hybrid defined benefit/ defined contribution plans for new teachers, similar to those adopted by other states.**

As the state struggles to pay its pension contribution year after year, more tax dollars are pouring into the pension system – instead of into our schools' classrooms. The flow of money needs to be redirected to students, but that will necessitate the reform of the state's teacher retirement program.

Introduction

Few Connecticut residents are aware that public school teacher pensions are administered by the state rather than local districts. This centralization, under the Connecticut State Teachers' Retirement System, means that taxpayers from across the state are accountable for any underfunding and shortfalls. As of 2016, the system was only 56% funded, with an outstanding gap of over $13 billion – an amount which has grown considerably in recent years and is likely to continue its upward trajectory if interest rates stay low. These ballooning costs threaten to crowd out other state spending priorities – including spending on present educational needs – as current taxpayers shoulder financial burdens for promises made long ago.

Governor Malloy has recently observed that the highest benefits have accrued to teachers who have worked in some of the state's most wealthy communities, and has proposed that those localities pay more to help close the gap.[1] However, that approach fails to consider the fact that the cost of living in these areas is higher, and that most state income tax revenues already come from residents in those places. More importantly, this approach fails to address the systemic issues that created the crisis in the first place. Long-term stability of the plan – which should matter both to plan members (teachers) and plan funders (taxpayers) – requires addressing the system's structural problems.

Why Are State Contributions Going Up?

The CTRS is a defined benefit plan.[2] This means that participating teachers are entitled to a retirement benefit amount that has been defined in advance. The standard benefit is calculated by taking years of service, multiplying by 2%, and then multiplying that factor by the teacher's average salary over the prior three years, with a 75% of salary cap. A cost-of-living adjustment (COLA) is applied annually once a teacher begins receiving benefits. Benefits are actuarially adjusted for various factors, such as early retirement.

Teachers contribute 6% of salary toward the plan; the state is responsible for funding the rest, and manages the assets that are set aside to pay benefits when they come due.

Even by the standards of public employee plans, the CTRS is quite generous. Financial planners generally recommend a retirement income goal of approximately 70% of salary, achieved through a combination of Social Security benefits, employer pension, and personal savings. A teacher who spends his or her career in the system (say, from age 23 to age 60 1/2) will receive 75% of salary – without even considering any private savings. Moreover, the financial planners' rule of thumb is intended to account for the risks of inflation and health care costs, whereas in the case of Connecticut's teachers, they receive protection against these risks through COLA and retiree health benefits, respectively.

Participants in the CTRS do not receive Social Security, so it is reasonable that the CTRS should be more generous to compensate. Even so, Social Security participants pay 6.2% of salary into that system, and individuals may pay more into their employer pension programs. That Connecticut's teachers pay only 6% makes the system all the more generous, and compares favorably with what teachers pay in other similar state systems – 8% on average.[3]

The amount that the state needs to contribute each year depends on a number of factors. An outside actuarial firm produces a report every other year in which future benefits are projected and then discounted with interest to find their present value. In other words, any contributions made today

1 Marc E. Fitch, "Malloy proposes 'colossal cost transfer' onto towns for Connecticut teacher pensions". *Yankee Institute for Public Policy*, February 3, 2017. http://www.yankeeinstitute.org/2017/02/malloy-proposes-colossal-cost-transfer-onto-towns-for-connecticut-teacher-pensions/

2 An overview of benefits can be found at the website of the Connecticut Teachers' Retirement Board, http://www.ct.gov/trb/taxonomy/v4_taxonomy.asp?DLN=41319&trbNav=%7C41319%7C

3 Johanna Somers, "Average Connecticut teacher retires with $47,000 pension". *The Day*, January 14, 2014. http://www.theday.com/article/20140114/NWS12/301149943

should grow with interest, so that there will be enough available to pay benefits when they come due. The actuarial analysis includes calculation of a level contribution percentage that the state must make each year in order to fund the benefits. As of June 30, the present value of liabilities was calculated at $29,840 million, while the market value of assets was $15,585 million.

The biennial analysis incorporates important assumptions about the future. These include demographic and mortality assumptions, which affect the future benefits to be paid; salary and payroll growth, which affect both future income to the plan and future benefits the teachers earn; and the investment income on assets. If past investment returns or teacher contributions were below the assumption, or plan benefits exceeded projections, the required state contribution could increase significantly.

In theory, if the assumptions are approximately correct over the long term, the program's financing will be stable. Reality, however, is rarely stable, and this has deleterious consequences for defined benefit plans. With regard to the CTRS, there are three areas in particular where a failure to match assumptions have put the system's funding under pressure. As a result, the state's annual contributions have ballooned, even as the program's solvency has worsened – and as we shall see, the standard solvency measure may understate the extent of the problem.

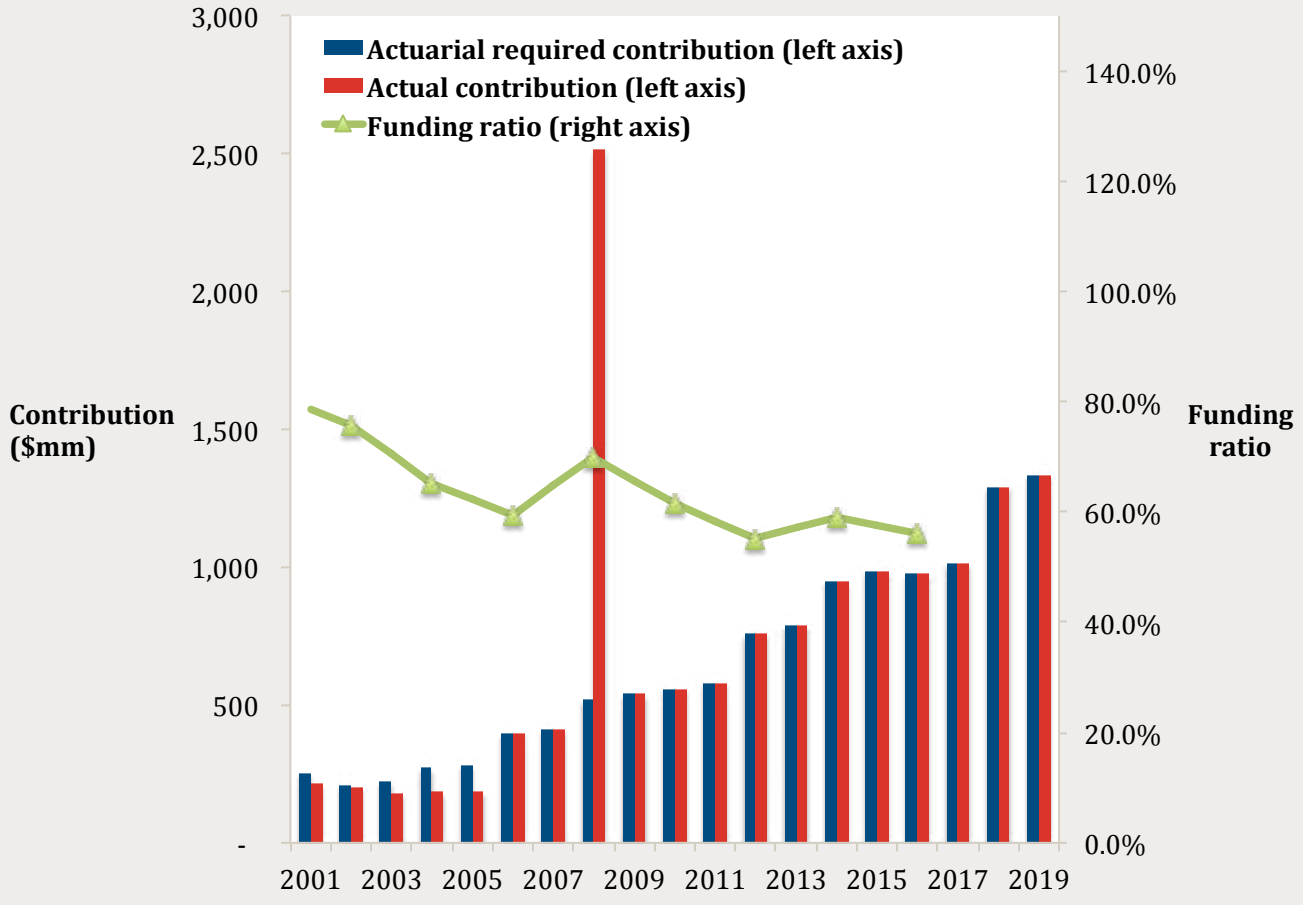


Figure 1. CTRS contribution levels and funding ratios. Funding ratios (plan assets as a percentage of plan liabilities) have fallen even as required contribution levels have risen. In 2008, a $2 billion state bond offering shifted future obligations from retirees to bondholders.

Problem 1: Paying Today For Past Mistakes

The CTRS was established in 1917, and this is not the first time the system's solvency has come under scrutiny. Indeed, even in the recent past, state officials have tried to put the system on a stable trajectory with more or less level annual state contributions.

In 1979, legislators passed a number of reforms. Before then, the state did not set aside money to pay a teacher's benefits until that teacher retired. This approach resulted in large and variable state contributions, because the state passed up the benefits of earning investment income on obligations accrued while the teacher was working. The new law funded liabilities while teachers were still working. There were also adjustments in 1992 to the COLA formula – though limited to newly hired teachers only – which had previously been over-generous.

Unfortunately, the 1979 law did not result in the desired stability for two main reasons. First, the law phased in funding of active member liabilities over a 30- to 40-year schedule. This schedule was not fast enough to keep up with the pace at which liabilities have grown – the state would still be paying down such a schedule today even under ideal conditions. And conditions have not been ideal: Connecticut fell short of its funding obligations in nearly all the subsequent years, paying its required contribution consistently only since 2006. In that time, while the liability grew, the state continued to pass up the ability to earn investment income on a corresponding amount of assets. Each year the gap persists, it compounds, increasing the costs of future remediation.

In 2008, Connecticut floated a $2 billion bond offering to help shore up the system. Since the CTRS has no borrowing authority, the state borrowed from the financial markets with the goal of reducing the outstanding CTRS unfunded liability. Although lawmakers hoped to earn more from the CTRS investment portfolio than was paid in interest on the bonds, this has not been the case over the past few years (illustrating the phenomenon, noted below, that higher rates are earned only by assuming commensurately higher risk). In effect, the bond offering shifted $2 billion of the state's future obligations from retirees to borrowers, and without any financial benefit so far. The bond offering did, however grant CTRS members some security: a covenant in the offering commits the state to paying the annual actuarially determined employer contribution in full each year.

Problem 2: Slowing Workforce Growth

The CTRS was designed assuming that the workforce would grow at a stable rate. Under this assumption, contributions (both employee and state) can be set at percentages of payroll, and the percentages will not fluctuate much over time. However, in recent years, as the state's population has declined,[4] the number of active teachers has leveled off. Payroll growth has thus fallen short of assumptions.

If the system were fully funded and investment returns matched assumptions, this would not be a problem. In that case, lower teacher contributions would correspond to lower future liabilities for teacher pensions.

Unfortunately, though, slow payroll growth compounds the underfunding problem. Current obligations to retirees and beneficiaries are paid first, meaning current teacher contributions are being used to pay for past promises. When the number of retirees grows faster than the number of active teachers, the slowing teacher contributions put additional strain on an underfunded system. Also, when expressed as a percentage of current payroll, state contributions necessarily increase because the payroll figure is lower. And because the required state contributions are calculated as a level percentage of expected future payroll, they too fall short of the amounts required to stabilize the system.

4 Marc E. Fitch, "Connecticut loses population for third year in a row, according to Census Bureau". *Yankee Institute for Public Policy*, December 21, 2016. http://www.yankeeinstitute.org/2016/12/connecticut-loses-population-for-third-year-in-a-row-according-to-census-bureau/?gclid=CLiFwvmml9ICFYmKswodA3wEqA

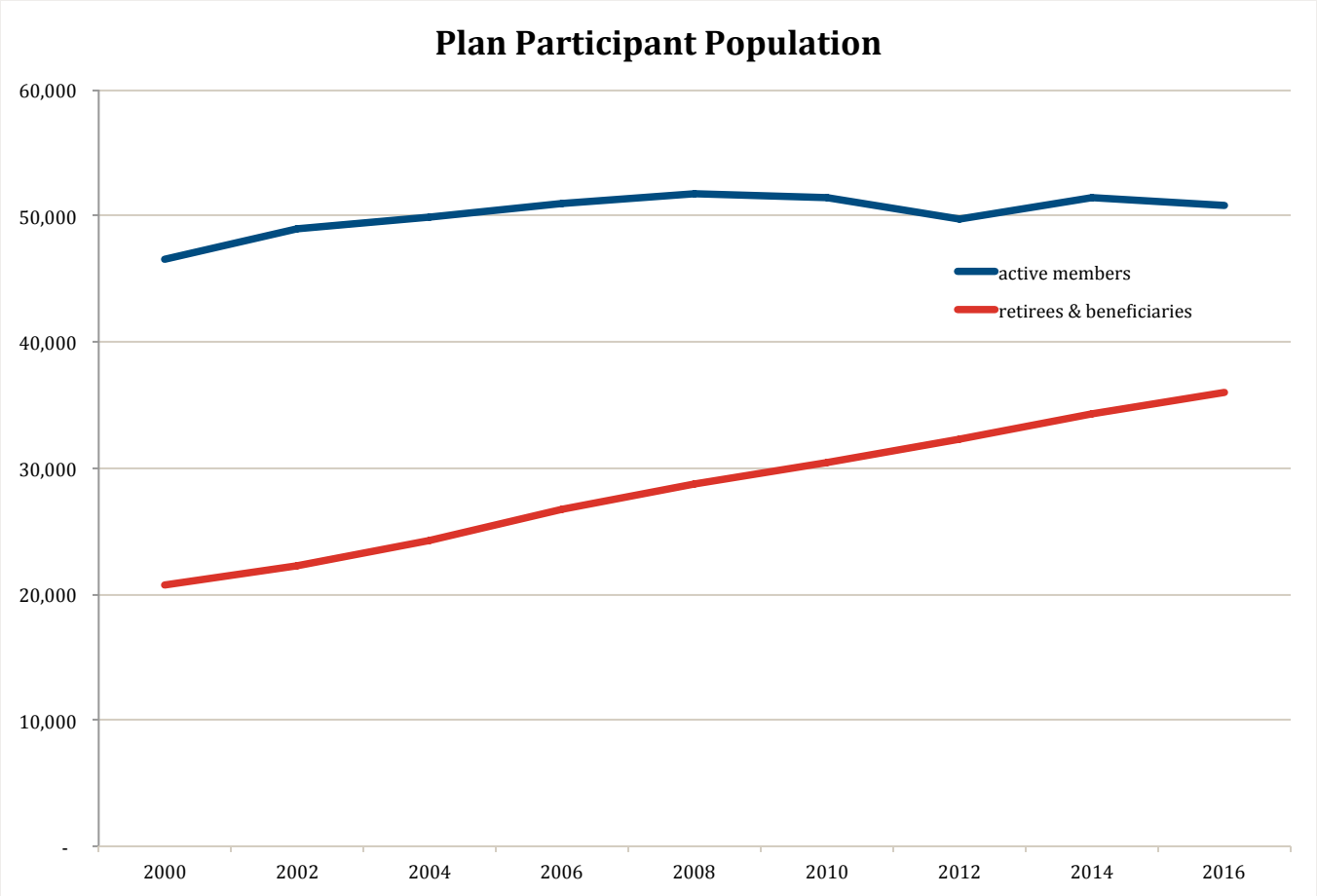


Figure 2. Plan Participant Population. The number of retirees and beneficiaries has grown, while the number of active members has remained flat.

Problem 3: Assumed Investment Returns

The most significant problem driving the growing gap between assets and liabilities, however, is the difference between assumed and realized investment returns.

The 2016 actuarial valuation discounts future obligations at an 8% interest rate, revised downward from the 8.5% assumption used for many years. This rate is intended to reflect the expected long-term average earned rate on the asset portfolio. Investment income on the asset portfolio helps fund future benefits. But if actual earned rates are below those assumed, required state contributions must be higher to make up the difference.

In recent years, investment earnings have fallen well below the 8.5% assumption, and even below the revised 8%. Although 2016 earnings were 8% overall, the 10-year return on the assets is only 4.8% (see Table 2). Figure 3 shows the difference in compounded returns between the assumed rate and actual earnings; since 2000, the portfolio has yielded only half of the assumption.

As a result, the current reported funding status understates the extent of the problem. If liabilities were discounted at more realistic rates of interest, their present value would be even higher, and the assets available would cover much less than 56% of

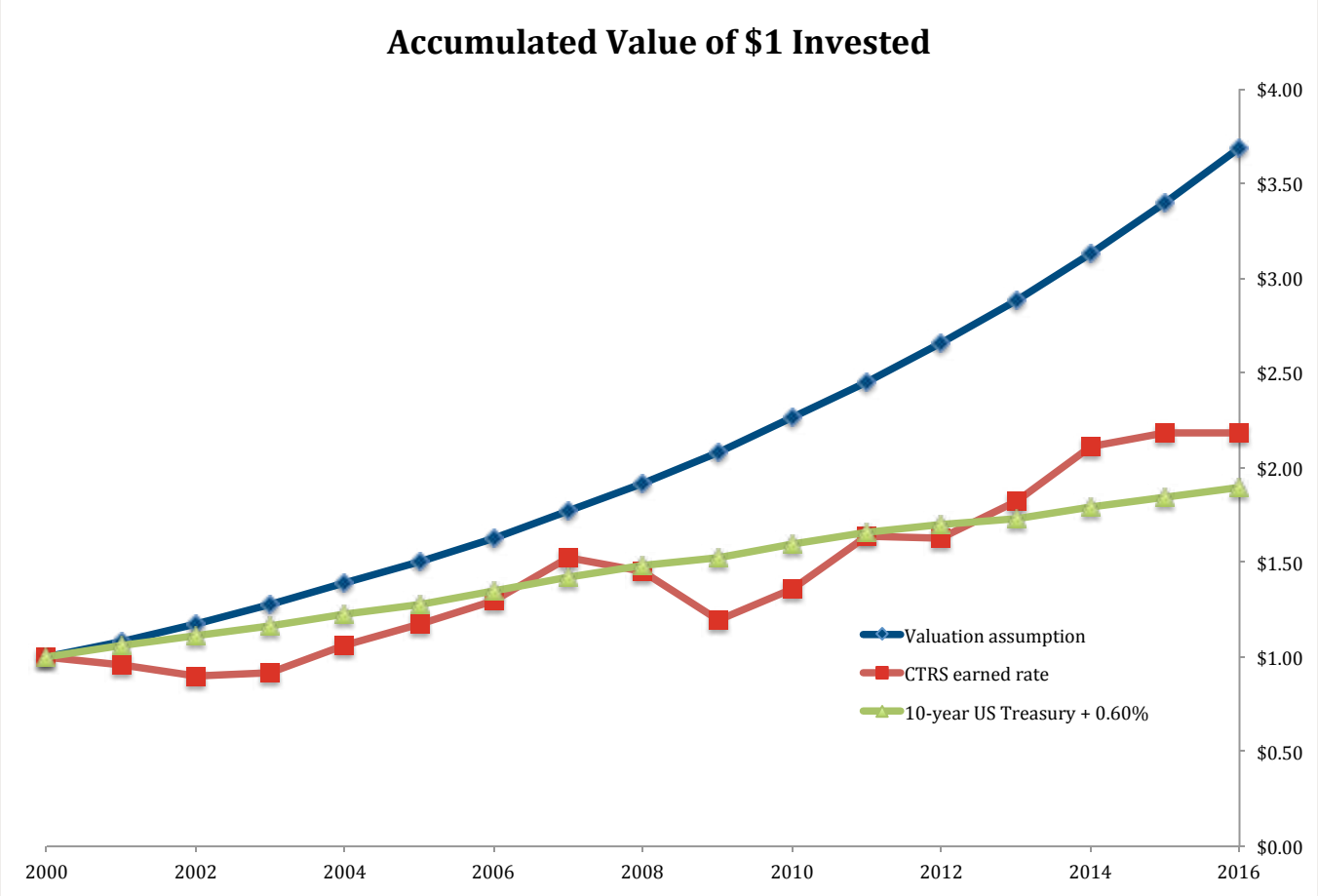


Figure 3. Accumulated value of $1 invested. The actual fund earnings have been well below the long-assumed 8.5% average annual return, and have been considerably more volatile.

them. According to a 2015 research report[5] by the Center for Retirement Research at Boston College, each percentage point reduction in the valuation rate translates to a 12% increase in the liability and a 22% increase in normal cost. Table 1 shows what this would mean for the plan's funding status.

5 Jean-Pierre Aubry and Alicia H. Munnell, "Final Report on Connecticut's State Employees Retirement System and Teachers' Retirement System". *Center for Retirement Research at Boston College,* November 2015. http://crr.bc.edu/wp-content/uploads/2015/11/Final-Report-on-CT-SERS-and-TRS_November-2015.pdf

Interest rate	*Liability value ($mm, est.*	*Funding ratio (est.)*	*Normal cost ($mm, est.)*
8%	$29,840	56%	$1,332
7%	33,421	50%	1,625
6%	37,002	45%	1,918
5%	40,583	41%	2,211
4%	44,164	38%	2,504
3%	47,745	35%	2,797
2%	51,326	33%	3,090

Table 1. Effect of lower valuation rates. Note that approximations are linear, and may underestimate increases from lower rates.

Although the state's method for determining the proper discount rate is consistent with traditional actuarial practice, actuarial thinking on the matter has evolved in recent years.[6] Rather than basing valuation rates on investment returns, modern financial theory indicates that valuation rates should correspond to the likelihood of payment. In other words, the state's promises to retirees should be treated similarly to the state's promises to bondholders. Two plans – one investing conservatively, the other aggressively – should not have the same promises valued differently. Rather, it is the creditworthiness of the plan sponsor that should matter.

Changes enacted under then-President George W. Bush, reflecting this approach, require corporate pension plans to use interest rates corresponding to high-quality corporate bonds; 2012 legislation allowed those plans to use average bond rates over a longer time horizon. Even so, public pension plans were not affected. Consequently, Connecticut still values its CTRS liabilities using an assumed rate on investments.

To boost investment returns, Connecticut invests in diverse asset classes with greater expected returns, including private equity, emerging market stocks, hedge funds, and so on. But the higher returns are not free. They are compensation for taking additional risk – and risk swings both ways. As Figure 3 shows, the CTRS investment fund has not only underperformed the valuation assumption, its performance has been considerably more volatile.

Regardless of how Connecticut invests plan assets, a discount rate that reflected Connecticut's creditworthiness (approximately US Treasury rates + 0.6%, shown in Figure 3) would be considerably lower than the current valuation rate. It would indicate a much greater value of promises made, and point to a worse funding situation than is being reported. A discount rate assumption of 3%, for example, would indicate that today's assets are adequate to meet only 35% of the state's true obligation to teachers.

6 Lawrence N. Bader and Jeremy Gold, "Reinventing Pension Actuarial Science". Working paper. http://users.erols.com/jeremygold/reinventingpensionactuarialscience.pdf

What Can Be Done?

These problems took many years to develop. Consequently, it is not possible to address them either easily or quickly. Regardless of what steps are taken to stabilize the system, doing so will be costly – and it may take years before the system reaches equilibrium.

Possible solutions fall into a number of categories. Not all of them are mutually exclusive, and a number of them can be implemented concurrently.

1. DO NOTHING

If no action is taken, the current demographic strains on the program are likely to continue. As a result, required state contributions will continue to increase. Moreover, although it is possible that a stock market boom and/or higher interest rates could boost investment returns, relying on such a large increase is not realistic. What's more likely is that returns will continue to lag overly aggressive assumptions, putting ever-larger strains on state budgets. Pension costs will crowd out other spending, or lead to tax increases. Notably, the financial drain created by the CTRS will reduce the available resources for meeting the educational needs of current students.

2. TRANSPARENCY/REPORTING CHANGES

Changing the valuation interest rate to match the interest rate on Connecticut bonds,would be theoretically justifiable. If this were implemented, however, the sharply lower rates would increase liability valuations significantly (see Table 1). By law, the state would then need to make commensurately higher contributions – perhaps double what it pays today. So although such an approach might be justifiable in theory, it may be impractical at present.

Regardless of the minimum disclosures required by law, though, plan actuaries can be directed to offer additional data alongside the information they currently provide. The plan's funding status should be reported under alternative sets of assumptions, including more realistic scenarios and worst-case ones. In particular, the plan value should be calculated using a discount rate assumption equal to

the yield on Connecticut general obligation bonds. It should also be presented using more conservative assumptions on payroll growth and mortality.

Separately, investment managers should be directed to provide greater disclosure of investment risks. Regardless of whether risk-return tradeoff is reasonable, it should be disclosed. Both plan trustees and plan participants should be informed of potential volatility that could affect funding levels.

These changes should be fairly inexpensive to implement. However, such changes are merely a preliminary step. They do little beyond raising awareness of the potential magnitude of the state's true obligation and risks.

3. INVESTMENT CHANGES

It is common for plans to try to close the gap by investing more aggressively to increase investment income. However, as noted above, the increases in income under such a strategy are not free; they are actually compensation for additional investment risk. Such risk may actually reduce funding levels by introducing volatility and a mismatch between assets and liabilities. Even when long-term assumptions are realized, the path that investments take may cause contributions to be higher and more volatile. (For example, consider a year in which emerging market stocks and interest rates both fall.) For this reason, more aggressive investing is not recommended. If anything, investments should be better tailored to the interest rate sensitivity and benefit payment patterns of the plan, even if it lowers the long-term expected returns.

4. FUNDING CHANGES

A straightforward change that would reduce the strain on state finances would be to increase teacher contribution levels. Perhaps the current contribution rate was reasonable when it was first established, in light of the investment environment and demographic trends. But given what we know now, 6% is not sufficient to keep the system in equilibrium. Bringing the system in line with other states would require a contribution level of 8% of payroll. The state could consider even greater increases, in light of the 50% state income tax exclusion for teacher pension income. All told, however, the benefits of such a strategy would be modest, since the state's annual contribution exceeds 30% of payroll.

Asset Class	*Percent Holdings 12/31/2016*	*1-year return*	*10-year return*
Mutual Equity	22.9%	12.0%	6.4%
Developed Markets Equity	19.7%	5.3%	2.7%
Emerging Markets Equity	8.7%	12.9%	1.5%
Core Fixed Income	7.0%	3.3%	4.1%
Emerging Markets Debt	5.3%	11.6%	5.2%
High Yield Fixed Income	5.8%	15.8%	6.6%
Inflation-Linked Fixed Income	3.5%	3.6%	4.0%
Liquidity Fund	5.4%	1.1%	1.1%
Real Estate	7.2%	8.7%	2.6%
Private Equity	8.3%	6.7%	10.2%
Alternative Investments	6.3%	0.9%	*
Total Fund		**8.0%**	**4.8%**

* Insufficient history for 10-year returns. Five-year return is 3.64%.

Table 2. Teacher's Retirement Fund Asset Allocation. Allocations to volatile asset classes result in highly variable annual returns, while long-term returns lag valuation assumptions.

Governor Malloy and Connecticut's Democrats have focused on stabilizing the system by increasing revenue from new sources. Specifically, the governor's proposal seeks a contribution from towns of 10% of payroll, which would reduce the state contribution by about one third in the short run.

Making towns partners in pension funding does have some structural advantages, by helping to align incentives on teacher pay. Towns that pay

greater salaries would no longer entirely escape the consequences of the resulting higher pensions. However, this proposal – though couched in the language of "fairness" – introduces new inequities into the system. Towns across the state are just recovering from the 2008 financial crisis, and would need to tax their property owners to make up the new strain on their budgets. Since less wealthy towns already receive state aid, they would not need to pay; rather, the burden would fall on towns whose residents are already funding the bulk of state spending through their income taxes. At best, the proposal would act similarly to an increase in state income taxes, only less efficiently collected; at worst, it will chase overtaxed property owners out of state, exacerbating Connecticut's retiree exodus.

The 2015 CRR report recommended a number of funding changes, such as switching to a level dollar cost rather than level percentage of payroll, rolling amortization of the funding of pre-1979 liabilities, and segregating pre-1979 liabilities – the bulk of the underfunding – into a separate trust to protect current teachers. These changes are sensible and should be considered. But these changes merely affect the timing of payments. They make future payments more predictable, and improve the current funding status by moving backloaded payments closer to the present time. The CRR's recommendations do nothing to make it easier to meet the state's generous past and present commitments.

5. BENEFIT CHANGES

Ultimately, the benefit structure of the CTRS may exceed the resources available to the state and its capacity to pay. It may be necessary, therefore, to consider changes to what the state promises its teachers.

One approach would be to tweak the existing structure. Instead of paying 2% of salary for each year of service, a lower amount could be considered. The state might also consider eliminating cost-of-living adjustments, which are expensive to guarantee.

Alternatively, the state might think bigger. Over the past 100 years, we have learned much about retirement security, and the solutions devised in 1917 may be inferior to more modern ones.[7] Most corporate retirement plans are defined contribution plans, like a 401(k) or 403(b) plan. This means that the plan sponsor's contributions are fixed.

Although DC plans shift investment risk to each employee, it would give teachers portable accounts that would, by definition, be fully funded as the match is paid with each paycheck. A teacher would not be left to wonder whether Connecticut, which has never fully funded the CTRS in the system's 100 years, is actually capable of making good on its commitments.

Teachers who leave the workforce early, for whatever reason, are also often better served by a DC plan,[8] because much of a DB plan's benefit accrual is backloaded into the later years. (Although CT's teachers can withdraw their own contributions with interest when they leave, CTRS benefits vest only after 10 years, and the vesting schedule is much less generous in the early years, ramping up sharply toward retirement age.) And a DC plan would facilitate better integration and alignment with towns, which could be induced to offer their own plans and/or matching systems in place of state contributions.

The state might also consider hybrid DB/DC plans. These are less common in the private sector, but have shown some success in the public sector and in teachers' plans in other states. Hybrid plans share many of the characteristics of DC plans, including more rapid accrual of benefits in the early years, greater portability, and a more predictable contribution schedule for the plan sponsor. Investment decision making, however, remains in the hands of the plan sponsor. This type of plan can be popular among members who are less comfortable managing investment risk on their own.

7 Chad Aldeman, "Teacher Retirement Plans Are Among the Worst in the Country". *EducationNext*, February 8, 2017. http://educationnext.org/teacher-retirement-plans-are-among-the-worst-in-the-country/

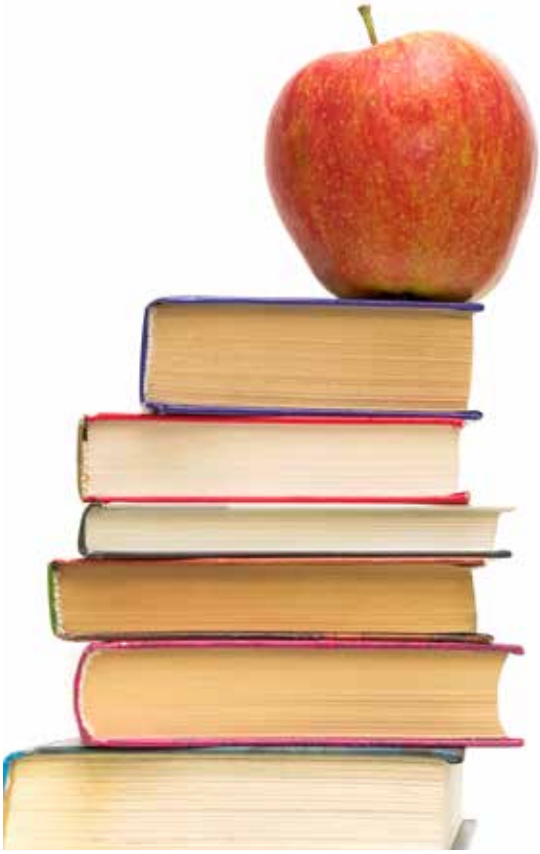
8 Kathryn M. Doherty, Sandi Jacobs and Martin F. Lueken, "Lifting the Pension Fog". *National Council on Teacher Quality*, February 2017. http://www.nctq.org/dmsView/Lifting_the_Pension_Fog

Shifting to a DC plan or a hybrid DB/DC plan would be a large and complex effort. The CTRS would either need to be frozen – entitling current participants to what they have earned, but not allowing them to accrue future benefits in it – or, alternatively, it would need to be closed – allowing current hires to stay in the old plan but placing all new hires in a new plan. But the short-term pain should be balanced against the benefits of a predictable, sustainable system for teachers and taxpayers alike.

Looking Forward

The challenges facing the CTRS are significant. Absent reform, the system will place increasing financial strain on the state and its taxpayers, and reduce the funds available for addressing today's educational needs. Placing additional financial burdens on towns, without addressing the structural challenges, is unlikely to serve as much more than a band-aid. Indeed, such a move is likely to make the state less attractive either to individuals or businesses, ultimately creating greater stresses on the system and the state. Connecticut already implicitly recognizes this truism, by exempting 50% of teacher pension income from state taxes in order to induce retired teachers to retire in-state.

Ultimately, teachers and taxpayers share interest in making the teacher pension system more sustainable and financially secure. Reform will be neither easy or quick, especially in light of past policy. But viable options exist that will allow Connecticut's lawmakers to reform the teacher pension system in a fair and responsible manner.



About the Author

Eric Halpern is a financial risk management professional with more than 20 years of experience in insurance, retirement products, and corporate finance. He holds a B.S in Mathematics from Yale University and is a Fellow of the Society of Actuaries. He lives in West Hartford. *Disclaimer: The author is not a pension actuary and this analysis should not be considered actuarial work product.*

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