

TENNESSEE PUBLIC PENSIONS:

A Model for Pension Reform

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A POLICY STUDY OF



Political Economy
Research Institute

MIDDLE TENNESSEE STATE UNIVERSITY

“Tennessee Public Pensions: A Model for Pension Reform”

A Policy Study by the Political Economy Research Institute at MTSU

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Abstract: Tennessee’s public pension system recent reforms passed in 2014 have helped make Tennessee one of the best public pension systems in the United States. This paper will first examine the reforms made by Tennessee. The sections that follow will examine how Tennessee’s public pension plans have fared compared to other states that have made reforms (i.e. Michigan and Wisconsin) and states where no reforms to defined benefit pension plans have been made (i.e. Alabama, Connecticut, and Illinois) in terms of contribution rates, funding ratios, and liability valuations. The second part of this paper will make recommendations for future reform that will help keep Tennessee one of the most competitive public pension plans in the United States.

JEL Subject Codes: H72; H75

Keywords: public pensions, Tennessee, pension reform

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Release: August 2020



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An Overview of the Tennessee Consolidated Retirement System

The Tennessee Consolidated Retirement System (TCRS) was established in 1972 by an Act of the Tennessee General Assembly. The Act consolidated seven existing retirement systems to provide retirement, disability, and death benefits to state employees, public school teachers, higher education employees, and employees of participating local governments.¹ The Board of Trustees consists of 20 members: nine *ex officio* members from the executive, legislative, and judicial branches of state government, nine active TCRS members, and two retired TCRS members. All members must be vested members of the TCRS.² By state law, the State Treasurer serves as chairman of the Board of Trustees and as a custodian of TCRS funds.³ Starting on July 1, 1981, the TCRS became noncontributory for most state employees. The State of Tennessee assumed the employee contributions to the TCRS on behalf of those employees of up to 5% of the employees' earnable contributions.⁴ State employees and retirees who became members of the pension system before July 1, 1981, had the employer-assumed contributions credited to their respective retirement accounts.⁵ State employees who became members of the TCRS after July 1, 1981, do not contribute to this pension plan.⁶

Two major changes occurred in 2014, one nationwide and the other in Tennessee.

Nationwide, the Government Accounting Standards Board (GASB) issued statements 67 and 68,

¹ State of Tennessee Department of Treasury. "Tennessee Consolidated Retirement System Comprehensive Annual Financial Report (CAFR) For the Fiscal Year Ended June 30, 2019." 30 June 2019. p. 81 Retrieved from: https://treasury.tn.gov/Portals/0/Documents/Retirement/CAFR%20Reports/2019/2019%20CAFR_Full%20Report.pdf

² State of Tennessee Department of Treasury. "Tennessee Consolidated Retirement System CAFR." p. 81.

³ State of Tennessee Department of Treasury. "Tennessee Consolidated Retirement System CAFR." p. 81.

⁴ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees." Retrieved from: <https://treasury.tn.gov/Retirement/Information-and-Resources/Forms-and-Guides>

⁵ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees."

⁶ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees."

affecting how pension liabilities were reported (discussed in detail in the next section). In Tennessee, all employees hired after June 30, 2014 (the end of fiscal year 2014) were enrolled in the new Hybrid Pension plans, and employees hired on or before June 30, 2014, remained in the traditional defined benefit plan (now known as the Legacy plans). The Hybrid plans consist of a defined benefit pension and a defined contribution portion (401(k) and 457 plans where an employee can make before or after-tax contributions and select their own investment options).⁷ Currently, members must complete five years of creditable service for both Legacy and Hybrid plans to a TCRS covered employer in order to become eligible to receive a pension (also known as vested).⁸

Calculation of Benefits for Defined Benefit Legacy Plans

TCRS plans are a traditional defined benefit plan, a plan that provides participants with a predefined benefit based on a formula that takes into account an employee's compensation, years of service (30 years of completed service), age (starting at 60), or a combination.⁹ The general formula for calculating the annual service retirement allowance (the benefits a retiree receives each year) is expressed in equation 1 below¹⁰:

$$(1) \text{ Annual Benefit} = \text{Benefit Accrual Factor} \times \text{AFC} \times \text{Years of Service}$$

⁷ State of Tennessee Department of Treasury. "TCRS Key Pension Terms." Retrieved from: <https://publicreports.treasury.tn.gov/>

⁸ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees."

⁹ State of Tennessee Department of Treasury. "TCRS Key Pension Terms." Retrieved from: <https://publicreports.treasury.tn.gov/>

¹⁰ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees." Sept. 2019. Retrieved from: <https://treasury.tn.gov/Portals/0/Documents/Retirement/Forms%20and%20Guides/Active%20Members/LegacyStateandHigherEdMemberGuide.pdf>

Tennessee state law sets the benefit accrual factor, which is currently 1.5%.¹¹ For public safety workers, instead of a Benefit Accrual Factor, a “Bridge Factor” of 0.75% is used to determine the Annual Benefit.¹² Divide the Annual Benefit by 12 to determine the member’s monthly retirement allowance. Any changes to the Tennessee Consolidated Retirement System must be made through the legislative branch. The Average Final Compensation (AFC) is the average of the member’s five highest consecutive years of earnable compensation (although federal law limits the maximum amount of compensation that can be recognized by a defined benefit plan) and the maximum annual base benefit payable at retirement is limited to 94.5% of the member’s AFC.¹³ Years of Creditable Service consist of membership service under the Legacy Plan and any other periods of public service under an employer participating in the TCRS.¹⁴ The TCRS also notes that members may establish creditable service time if they have previously withdrawn service, military, educational, or peacekeeping service that interrupted member’s public employment, and unused accumulated sick leave at retirement.¹⁵ A vested member becomes eligible for early retirement benefits when they reach age 55, but benefits are permanently reduced by 0.4% for each month the date of retirement precedes the service retirement eligibility (age 60 or 30 years of service).¹⁶ It is important to note that, in terms of the TCRS, early retirement is distinct from retirement due to disability. Disability retirement is defined as either

¹¹ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees.”

¹² State of Tennessee Department of Treasury. “TCRS Supplement for State Public Safety Officers-Legacy State Employees Guide.” Dec. 2019. Retrieved from:

<https://treasury.tn.gov/Portals/0/Documents/Retirement/Member/LegacyMemberSupplementGuideStatePublicSafetyOfficers.pdf>

¹³ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees.”

¹⁴ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees.”

¹⁵ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees.”

¹⁶ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Legacy Retirement Plans for State and Higher Education Employees.”

ordinary disability¹⁷ or accidental disability¹⁸ and it categorized and calculated separately in annual financial reports.

The general formula for calculating early retirement is expressed in equation 2 below:

$$(2) \text{ Annual Benefit} = \text{Benefit Accrual Factor} \times \text{AFC} \times \text{Years of Service} \times \text{Early Reduction Factor}$$

Utilizing these different benefit calculations is one way the TCRS is prepared to adequately fund Legacy pension plans. The Legacy plans also make cost-of-living adjustments based on the Consumer Price Index.¹⁹

Calculating Benefits for the TCRS Hybrid Pension Plans

The TCRS Hybrid Pension plans are a combination of a defined benefit plan and a 401(k) deferred compensation plan.

The benefit formula for the defined benefit plan is similar to the formula in the Legacy Pension plans but with a few key differences. First, the Benefit Accrual Factor in the hybrid plan is lower than the legacy plan, set to 1% (compared with 1.5% for the Legacy Plan). Second, a member becomes eligible for unreduced retirement benefits upon reaching age 65 (5 years older than the eligibility age for the Legacy Plan) and completion of five years of credible service or reaching the Rule of 90.²⁰ The Rule of 90 is when a member's age and years of credible service

¹⁷ When a member has at least five years of credible service and suffers from a total and permanent disability that existed at and since the member's separation from employment.

¹⁸ When a member suffers a disability that is the result of a job-related accident or incident that occurred without the negligence on part of the member while the member was on the job. No minimum service requirement is necessary but members must apply within one year of the member's last paid day of employment or within two years of the accident or incident causing the disability.

¹⁹ According to the Legacy Pension Plans description, any retired member who has received monthly retirement benefits for at least 12 full months on July 1 of each year is eligible to receive an increase in benefits if there is a Consumer Price Index of at least 0.5% for the preceding calendar year. The amount of increase will be 1% if the CPI increases 0.5% to just below 1%. If the CPI increases 1% or more in any year, retired members will receive an amount equal to the increase of the CPI but no greater than 3%.

²⁰ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers." April 2019. P. 6 Retrieved from: <https://treasury.tn.gov/Portals/0/Documents/Retirement/Forms%20and%20Guides/Active%20Members/HybridMemberGuide.pdf>

sum to 90 (i.e., a member age 55 with 35 years of credible service reaches the Rule of 90).²¹ In addition, a member becomes eligible for early retirement upon reaching age 60 (5 years older than the eligibility age for the Legacy Plan) and completion of five years of credible service or the Rule of 80 (similar to the Rule of 90 except member age and years of credible service sum to 80). There is also a permanent actuarial reduction determined by how far the member is away from service retirement at the date of early retirement (which could be larger than early reduction factor for the Legacy plan, depending on the member's particular circumstances).²² The Early Reduction Factor is calculated in equation 3 below²³:

$$(3) \text{ Reduction Multiplier} \times \text{Months Preceding Service} = \text{Early Reduction Factor}$$

Third, the maximum benefit accrual is limited to the lower of 90% of the member's AFC or the base benefit in effect at the time of the member's retirement (\$87,815.51 based on Tennessee law).²⁴ This limit is subject to adjustment based on the plans' cost-of-living adjustments, just like the Legacy Pension plans.²⁵ These differences from the Legacy defined benefit structure reflect demographic changes (i.e. increases in life expectancy) while keeping the defined benefit portion sustainable for future members.

²¹ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers." April 2019. P. 6 Retrieved from: <https://treasury.tn.gov/Portals/0/Documents/Retirement/Forms%20and%20Guides/Active%20Members/HybridMemberGuide.pdf>

²² State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers." p. 6

²³ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Hybrid Retirement Plans for Public Safety Officers." Dec. 2019. p. 6 Retrieved online: <https://treasury.tn.gov/Portals/0/Documents/Retirement/Member/HybridMemberSupplementGuideStatePublic%20SafetyOfficers.pdf>

²⁴ State of Tennessee Department of Treasury. "TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers." p. 6

²⁵ According to the Hybrid Pension Plans description, any retired member who has received monthly retirement benefits for at least 12 full months on July 1 of each year is eligible to receive an increase in benefits if there is a Consumer Price Index of at least 0.5% for the preceding calendar year. The amount of increase will be 1% if the CPI increases 0.5% to just below 1%. If the CPI increases 1% or more in any year, retired members will receive an amount equal to the increase of the CPI but no greater than 3%.

The defined contribution plan, as previously stated, allows members to invest pre-tax and after-tax dollars in investment options of their choice that are offered by the plan. A member is immediately vested in the 401(k) and can decide how the contributions should be invested given their specific goals, risk tolerance, and timeline. Upon retirement, members receive the payment based on the amount saved plus any accumulated earnings from investments.²⁶ In addition to the 401(k), state and higher education employees may enroll in the 457(b) defined contribution plan, allowing members to save and invest additional money for retirement.²⁷ The 457(b) option is also available for teachers whose employers have elected to offer the plan.²⁸ Members of the Legacy plans are also eligible to enroll into the 401(k) and 457(b) plans, but they must opt into the plans themselves.²⁹

GASB 67 and 68: Nationwide Changes for Calculating Pension Obligations

The Governmental Accounting Standards Board (GASB) statements 67 and 68 went into effect in FY 2014 and 2015, respectively. In addition to complying with GASB statements, the TCRS also utilizes a user-friendly website where employers and employees can easily access plan information, investment education, financial documents, and actuarial valuations of each pension plan.

The new information required by GASB 67 and 68 is reported in the “Required Supplementary Information” section at the end of each state’s comprehensive annual financial

²⁶ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers. p. 3

²⁷ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers. p. 3

²⁸ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers. p. 3

²⁹ State of Tennessee Department of Treasury. “TCRS Active Member Resource Guides for Hybrid Retirement Plans for State Employees and Teachers.” p. 11

report (CAFR) and in actuarial valuation documents for each pension plan.³⁰ These notes include a breakdown of the asset valuations and Fiduciary Net Position for all pension plans, Actuarially Determined Contribution (ADC), how the pension plan discount rate is calculated, and information about liability valuations. The net pension liability is shown in equation 4 below:

$$(4) \text{ Net Pension Liability} = \text{Actuarial Value of Assets} - \text{Actuarially Accrued Liabilities}$$

If the value of the Actuarially Accrued Liabilities is greater than the Actuarial Value of Assets, the Net Pension Liability will show that there are unfunded pension liabilities. Another important measure of the health of a defined benefit pension plan is the plan's funding ratio. That is expressed in equation 5 below:

$$(5) \text{ Funding Ratio} = \frac{\text{Actuarial Value of Assets}}{\text{Actuarial Accrued Liabilities}}$$

The larger the value of liabilities, the lower the funding ratio, and the less "healthy" a defined benefit pension plan becomes. As recommended by the American Academy of Actuaries, plans should strive for 100% funding ratio or greater.³¹

Under GASB 68, state and local governments were now obligated to report unfunded pension liabilities on state balance sheets as opposed to just the actuarial determined contribution or ADC (previously known as the Annual Required Contribution or ARC). The ADC is an annual payment made by employers that consists of the normal costs for the year and the amortization payment (a catch-up payment for any unfunded liabilities over the past 30 years).³²

³⁰ Weinberg, Sheila and Norcross, Eileen. "GASB 67 and GASB 68: What the New Accounting Standards Mean for Public Pension Reporting." Mercatus Center Policy Briefs. June 15, 2017. Retrieved from: <https://www.mercatus.org/publications/urban-economics/gasb-67-and-gasb-68-what-new-accounting-standards-mean-public-pension>

³¹ American Academy of Actuaries. "The 80% Pension Funding Standard Myth." American Academy of Actuaries Issue Brief. July 2012. Retrieved from: https://www.actuary.org/sites/default/files/files/80_Percent_Funding_IB_071912.pdf

³² Weinberg and Norcross. "GASB 67 and GASB 68: What the New Accounting Standards Mean for Public Pension Reporting."

Prior to GASB 68, state and local governments followed GASB 27 in disclosing pension funding information. GASB 27 advised state governments to list the ADC and the actual amount the employer contributed for that fiscal year. The difference between these two amounts was called the “net pension obligation.”³³

Improved reporting and more accurate estimates of state obligations have shed light on the actual value of unfunded pension liabilities. GASB 67 also provided guidance on how liabilities were to be valued. Prior to GASB 67, public pension plans used the expected return on pension assets to assess the value of liabilities. Economists objected to this valuation, stating that legally guaranteed pension promises should be valued with a lower discount rate. Weinberg and Norcross note that GASB 67 attempts to “split the difference” by valuing liabilities covered by pension assets with a higher discount rate and unfunded liabilities with a lower discount rate based on the low-risk return on tax-exempt municipal bonds.³⁴ Unfortunately, pension plan managers can still alter the actuarial value of assets (and with it, a plan’s funding ratio). GASB 68 allows pension plans to delay the recognition of any differences between the assumed and actual return on investments through a “deferred inflow of resources” occurring over a 5-year period. Weinberg and Norcross (2017) note that this allows pension plans to “smooth” assets by gradually recognizing market declines and gains. By introducing these market declines and gains gradually, the volatility of pension asset portfolios remains hidden and incentivizes plan managers to take greater investment risks.³⁵

³³ Weinberg and Norcross. “GASB 67 and GASB 68.”

³⁴ Weinberg and Norcross, “GASB 67 and GASB 68.”

³⁵ Weinberg and Norcross, “GASB 67 and GASB 68.”

TCRS Contribution Rates Compared to the Rest of the Country

In the TCRS system, employers and members of both the Legacy and Hybrid plans make contributions to the pension plans. In both the Legacy and Hybrid plans, employers make contributions based upon the ADC to cover normal costs and amortization payments of previously unfunded liabilities. Figure 1 below shows the employers have consistently made the full actuarial required contribution for all years of available data.

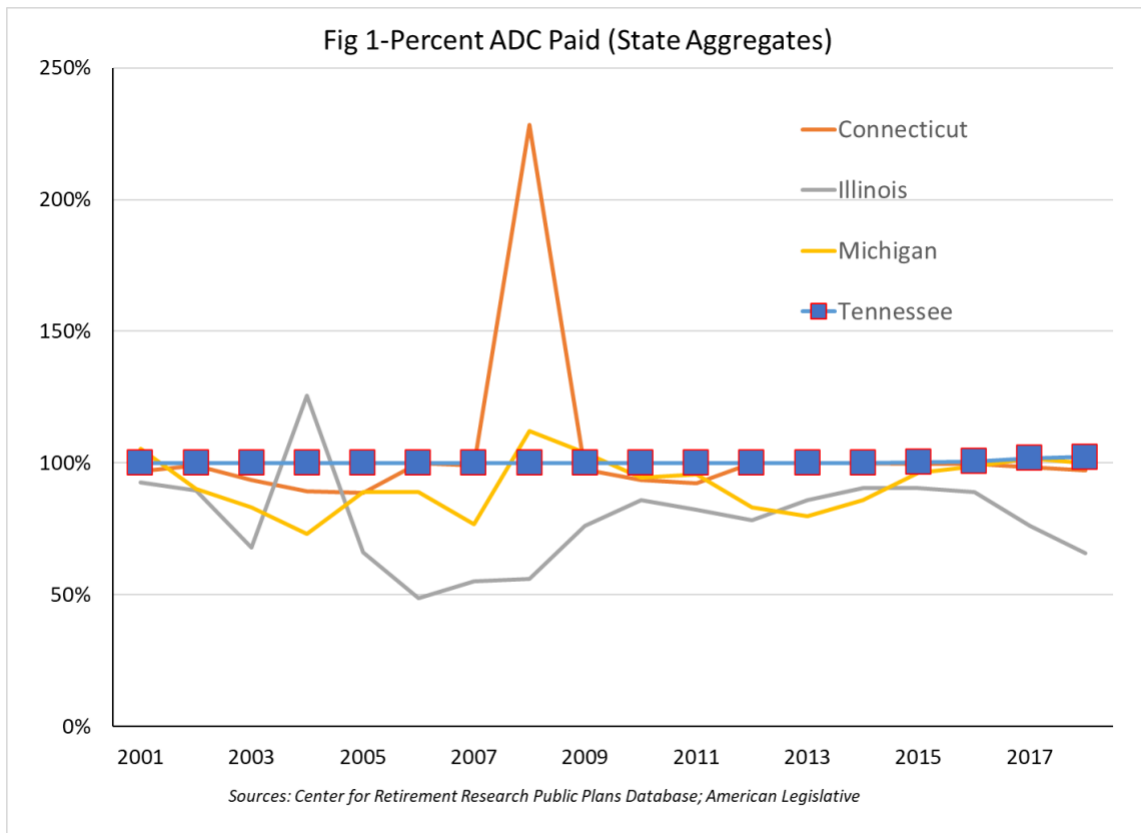


Figure 1 shows that Tennessee has consistently paid its full ADC payment for all available years of data, which helps prevent the rapid growth of unfunded liabilities. In addition, Alabama and Wisconsin also made their full ADC payments for all years available. It also shows a cautionary tale of improper pension funding. Note the spikes in the line graphs for Illinois in FY 2004 and for Connecticut in FY 2008. These spikes are the results of both states issuing pension obligation bonds. When a state issues pension obligation bonds, it takes the bond revenue and invests it into

the pension's asset portfolio. The goal for plan managers is to earn a rate of return on investments that is greater than the interest that is owed on the bonds. It is essentially like a household using a credit card to pay mortgages and utility bills.

In 2004, Illinois issued \$10 billion in general obligation bonds to be used for pension funding. The entire \$9.2 billion fund balance was sent to the state's retirement system in FY 2004, \$1.9 billion was put towards ADC payments, and the remaining revenue was allocated to all of the state retirement plan asset portfolios and invested.³⁶ To make matters worse for Illinois, state law (IL Public Acts 100-0023 and 100-0340) uses an actuarial valuation that does not conform with GASB standards, which means that state contributions to the pension system are always less than what is necessary to cover costs for the year and pay down unfunded liabilities.³⁷ Similarly, in 2008, Connecticut's Teachers Retirement System issued \$2 billion of general obligation bonds and used the bond revenue to invest in its pension fund.³⁸ In both cases, neither plans' investments were able to beat the interest rate owed on the bonds, and both pension systems are locked into making payments on those bonds. As of FY 2018, Connecticut and Illinois have two of the worst funded pension systems in the country.

While Michigan made similar reforms to Tennessee, state plans have not always made the full ADC, and thus, Michigan has consistently had larger unfunded liabilities than Tennessee.³⁹ Tennessee, Alabama, and Wisconsin have consistently made 100% of the

³⁶ Illinois Office of the State Comptroller. "Illinois Comprehensive Annual Financial Report for the Fiscal Year 2004." State of Illinois. June 30, 2004. P.34 Retrieved from: <https://illinoiscomptroller.gov/Ledger-Temp/assets/File/CAFR/CAFR%202004.pdf>

³⁷ Illinois Office of the State Comptroller. "Notes to Required Supplementary Information" Illinois Comprehensive Annual Financial Reports. June 30, 2018. Retrieved from: https://www.trsil.org/sites/default/files/documents/CAFR-FY2018_1.pdf

³⁸ Gabriel Roeder Smith & Company. "Connecticut State Teachers Retirement System Actuarial Valuation." June 30, 2008. Retrieved from: <https://portal.ct.gov/TRB/Content/Other-Resources/Statistics-and-Research/Actuarial-Valuation>

³⁹ Williams et al. *Unaccountable and Unaffordable*, 2019.

respective ADC payments. While that has helped make Wisconsin and Tennessee some of the best-funded pension plans in the country, it is not the only factor for success. As will be shown with Alabama, contributions alone will not save a pension plan.

For the TCRS Hybrid plan, both employers and members make contributions to the TCRS and 401(k) account as a percent of earnable compensation. The table below is recreated from the TCRS Hybrid Plan guide:

Plan	Employer Contributions	Member Contributions	Total Contributions
TCRS	4%	5%	9%
401(k)	5%	2%*	7%*
Total	9%	7%	Amount Equal to 16% of member earned compensation

Source: TCRS Hybrid Pension Plan Guide for State Employees and Teachers

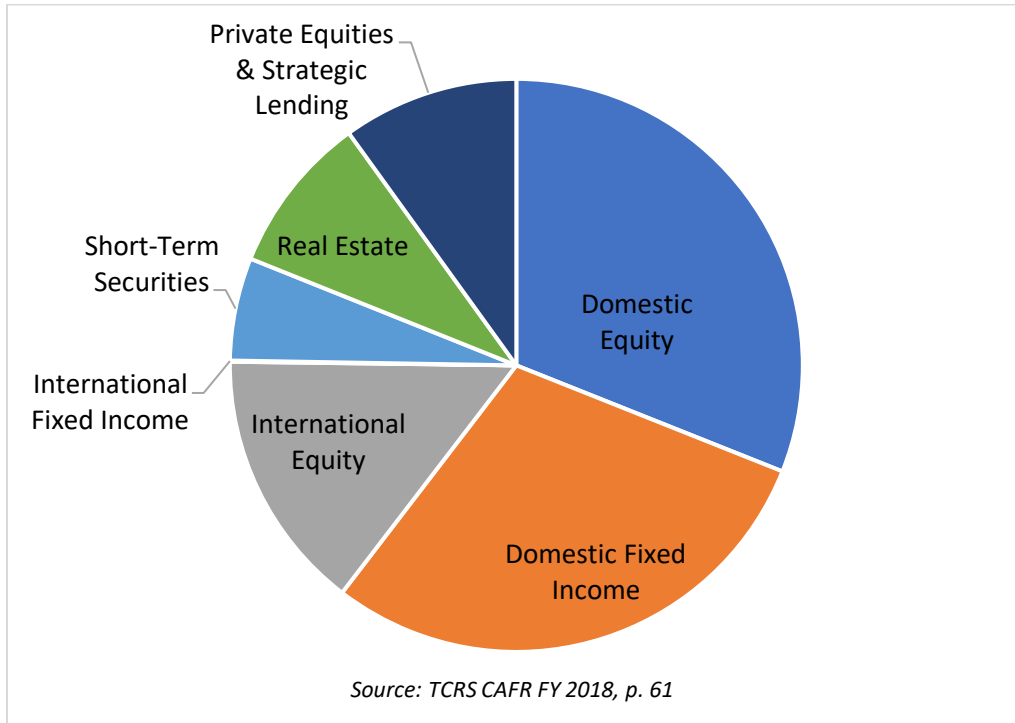
Note that members are automatically enrolled in the 401(k) plan to make member contributions of 2% of earnable compensation, and the member may opt-out or alter their contributions at any time. Members may make contributions greater than 2% up to the allowable amount by the IRS.

TCRS Actuarial Valuations

The Tennessee Retiree Group Trust (TRGT) was established in 2015 by a statutory enactment of the Tennessee General Assembly. This group trust pools funds from the various TCRS plans along with other assets in the custody of the State Treasurer solely for investment purposes. The stated primary investment objective is, “to establish a stable, diversified investment portfolio that, in the long term, will meet or exceed the assumed rate of return, as

adopted by the Board, in order to provide sufficient liquidity to pay beneficiaries in a timely manner.”⁴⁰

The figure and table below show the asset allocation of the TGRT as of the end of FY 2018:



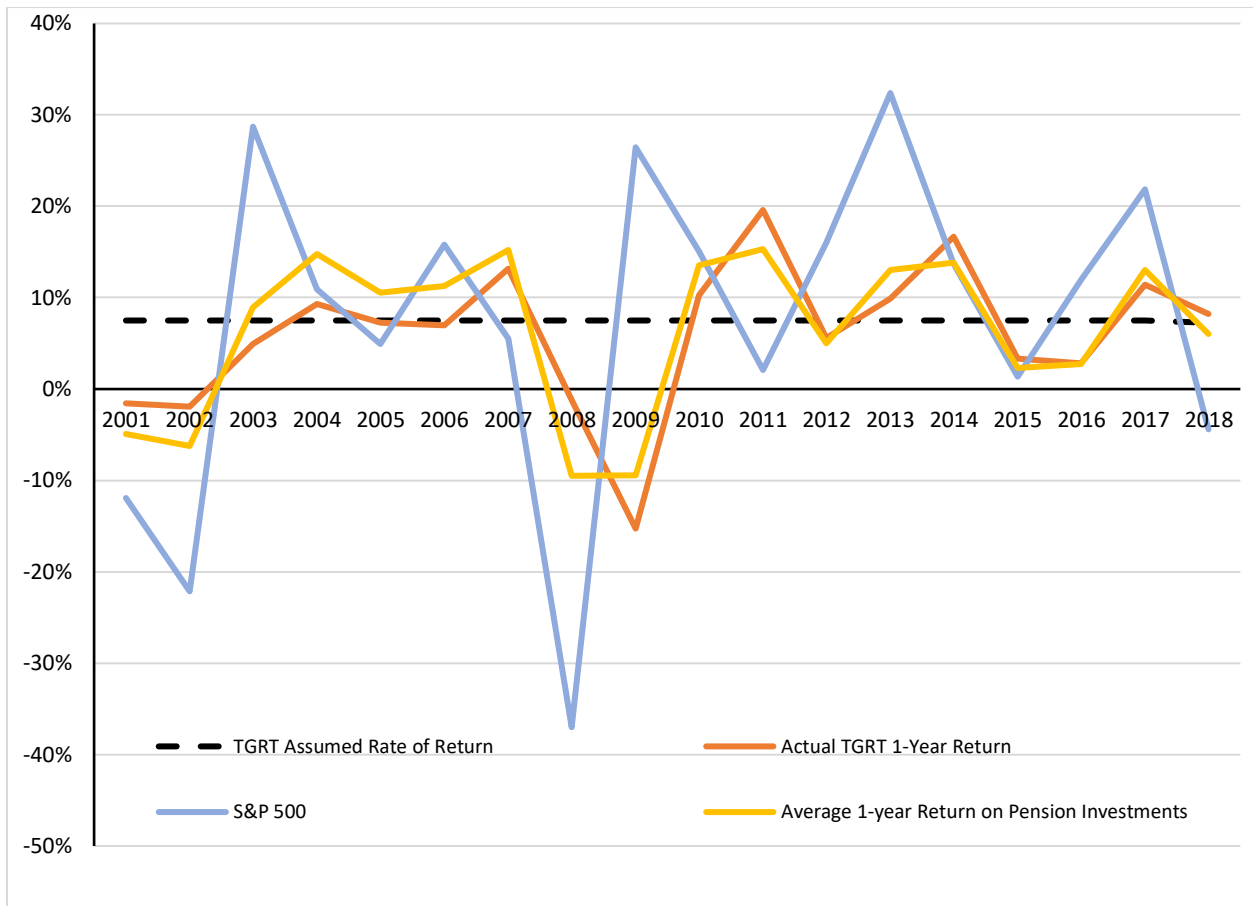
Asset Class	Fair Value	Percentage
Domestic Equity	\$15,382,953,801.00	31.04%
Domestic Fixed Income	\$14,558,721,699.00	29.37%
International Equity	\$7,333,130,584.00	14.79%
International Fixed Income	\$33,250,847.00	0.07%
Short-Term Securities	\$2,876,812,549.00	5.80%
Real Estate	\$4,452,048,359.00	8.98%
Private Equities & Strategic Lending	\$4,928,734,870.00	9.94%
Total	\$49,565,652,709.00	100.00%

Investment performance is another important aspect of fund stability as well. Investing in riskier assets means that the investment returns will be more volatile year over year. In years that

⁴⁰ State of Tennessee Department of Treasury. “Tennessee Consolidated Retirement System CAFR.” p. 59.

investment returns fall short, any shortfall will have to be covered by member and state contributions.

The figure below shows the assumed rate of return and the actual 1-year return on investments for the TGRT:



Sources: TGRT data came from the TCRS CAFR for FY 2018. Data on the S&P 500 was gathered from Yahoo Finance. Data on the average pension return was collected from the Center for Retirement Research's Public Plans Database and calculated by the author.

The TGRT has performed relatively close to the average return on pension investments, while the assumed rate of return has stayed at 7.5% until it was lowered to 7.25% in FY 2018.

Research from Andonov, Hochberg, and Rauh note that pension funds whose boards have high fractions of *ex officio* members or members appointed by a state official underperform the most,

followed by funds whose boards have a high fraction of members elected by participants.⁴¹ The Alabama Employee Retirement System and Judges Retirement System (both share the same Board of Control) and the Teachers Retirement System share a similar structure to the board of trustees for the TGRT (a 13-person board consisting of elected plan members and *ex officio* members).⁴² However, it is key to look at the role fiduciary responsibility plays in asset performance. The TGRT is focused on long-term investment, whereas Retirement Systems of Alabama (RSA) has different stated goals. Dove and Smith (2016) find the RSA has been shifting to riskier investment strategy, such as golf courses, luxury hotels, office buildings and print media.⁴³ The RSA is investing in private placements, specifically investments meant to encourage economic development in Alabama.⁴⁴ Dove and Smith (2016) note that while the Alabama Supreme Court ruled such investments are within RSA’s authority,⁴⁵ the increased risk has cost the RSA investment returns and left the RSA in a worse position than the TCRS. Ultimately, the RSA is more volatile than the TGRT due to its sporadic investment policies.

Methods for Liability Valuation

As noted in the section discussing GASB 67 and 68, most state pension plans, including the TCRS, use a “blended discount rate” to determine the present value of liabilities. However, using a risk-free discount rate would better reflect the state’s inability to default on liabilities.

⁴¹ Andonov, Aleksandar; Hochberg, Yael V; and Rauh, Joshua D. “Pension Fund Board Composition and Investment Performance: Evidence from Private Equity.” Hoover Institution Economics Working Papers. March 2016. Retrieved from: https://www.hoover.org/sites/default/files/research/docs/16104_-_pension_fund_board_composition_and_investment_performance_-_andonov_hochberg_and_rauh.pdf

⁴² Retirement Systems of Alabama. “Boards of Control for the TRS, ERS, and JRF.” 2020. Online. Retrieved from: <https://www.rsa-al.gov/jrf/board-of-control/> and <https://www.rsa-al.gov/ers/board-of-control/>

⁴³ Dove and Smith. “Alabama at the Crossroads.” p. 43.

⁴⁴ Dove, John and Smith, Dan. “Alabama at the Crossroads: An Economic Guide to a Fiscally Sustainable Future.” Mercatus Center at George Mason University. March 22, 2016. p. 42. Retrieved online: <https://www.mercatus.org/publications/urban-economics/alabama-crossroads-economic-guide-fiscally-sustainable-future>

⁴⁵ Dove and Smith. “Alabama at the Crossroads.” p. 43.

The Society of Actuaries' Blue-Ribbon Panel on Public Pension Plan funding recommends, "the rate of return assumption should be based primarily on the current risk-free rate plus explicit risk premium or on other similar forward-looking techniques."⁴⁶ This is similar to the blended discount rate recommended by GASB. The blended discount rate used by TCRS remained at 7.5% from 2000-2017 until it was lowered to 7.25% in FY 2018.

Because U.S. Treasury bonds are insured with the full faith and credit of the United States government, the rate of return for these bonds is the best proxy for a risk-free rate. A valuation of liabilities based on a risk-free rate contrasts sharply with the overly optimistic assumptions used by nearly every public sector pension plan. Rauh (2018) comments:

*The logic of financial economics is very clear that measuring the value of a pension promise requires using the yields on bonds that match the risk and duration of that promise. Therefore, to reflect the present value cost of actually delivering on a benefit promise requires the use of a default-free yield curve, such as the Treasury yield curve. Financial economists have spoken in near unison on this point. The fact that the stock market, whose performance drives that of most pension plan investments, has earned high historical returns does not justify the use of these historical returns as a discount rate for measuring pension liabilities.*⁴⁷

For this reason, it is recommended that states use the lower discount rate. In its annual pension report *Unaccountable and Unaffordable*, researchers at the American Legislative Exchange Council use a risk-free rate (based on U.S. Treasury bond yields) and a fixed discount rate (4.5%) in comparison to discount rates provided in state financial documents. For the 2019 report, a 15-year midpoint, using a hypothetical 15-year U.S. Treasury bond yield, is used to

⁴⁶ *Report of the Blue-Ribbon Panel on Public Pension Plan Funding*. Society of Actuaries. 2014. Retrieved from: <https://www.soa.org/brpreport364/>

⁴⁷ Rauh, Jonathan D. Testimony Before the Joint Select Committee on Solvency of Multiemployer Pension Plans. United States Senate & United States House of Representatives. July 25, 2018. <https://www.pensions.senate.gov/sites/default/files/25JUL2018RauhSTMNT.pdf>

derive an estimated risk-free discount rate of 2.96%. This is calculated as the average of the 10-year and 20-year bond yields.⁴⁸

The 15-year midpoint comes from the GASB recommendation that a pension plan take no longer than 30 years to pay off its pension liabilities. While state financial documents are not required to report their liabilities projected over a time series (i.e., reporting total liability due per year for the next 75 years), this report must assume the midpoint of state liabilities in order to recalculate state liabilities under different discount rate.⁴⁹ The floating risk-free discount rate is shown in the table below:

Risk-Free Rate by Year of Fiscal Year									
2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
3.69%	3.63%	3.20%	2.17%	2.74%	2.81%	2.35%	2.03%	2.49%	2.96%

Source: Savidge, et al. *Unaccountable and Unaffordable 2019*.

This methodology was developed by Bob Williams and Andy Biggs when this report was created by State Budget Solutions, which is now a project of the Center State Fiscal Reform at ALEC. It normalizes the liability values across plans and presents a more prudent valuation of liabilities than many state benefit plans with more rosy assumptions (such as higher discount rates). The inclusion of the fixed discount rate of 4.5%, was added by Thurston Powers in *Unaccountable and Unaffordable, 2018*.⁵⁰

Discount rates used for pension plans can vary even among plans within a state. The use of a risk-free discount rate normalizes discount rates across pension plans, providing the means to assess present value of liabilities across plans. This provides a basis of comparison for liabilities and funding ratios across the 50 states. Other variables provided by state financial

⁴⁸ Williams, et al. *Unaccountable and Unaffordable*

⁴⁹ Williams, et al. *Unaccountable and Unaffordable 2020*.

⁵⁰ Powers, Thurston; Smith, Christine; Williams, Bob; and Williams, Jonathan. *Unaccountable and Unaffordable 2018*. American Legislative Exchange Council. 2018. Retrieved from <https://www.alec.org/publication/unaccountable-and-unaffordable-2018/>

documents such as mortality rates, demographics and health care costs were assumed to be correct and not normalized across plans.

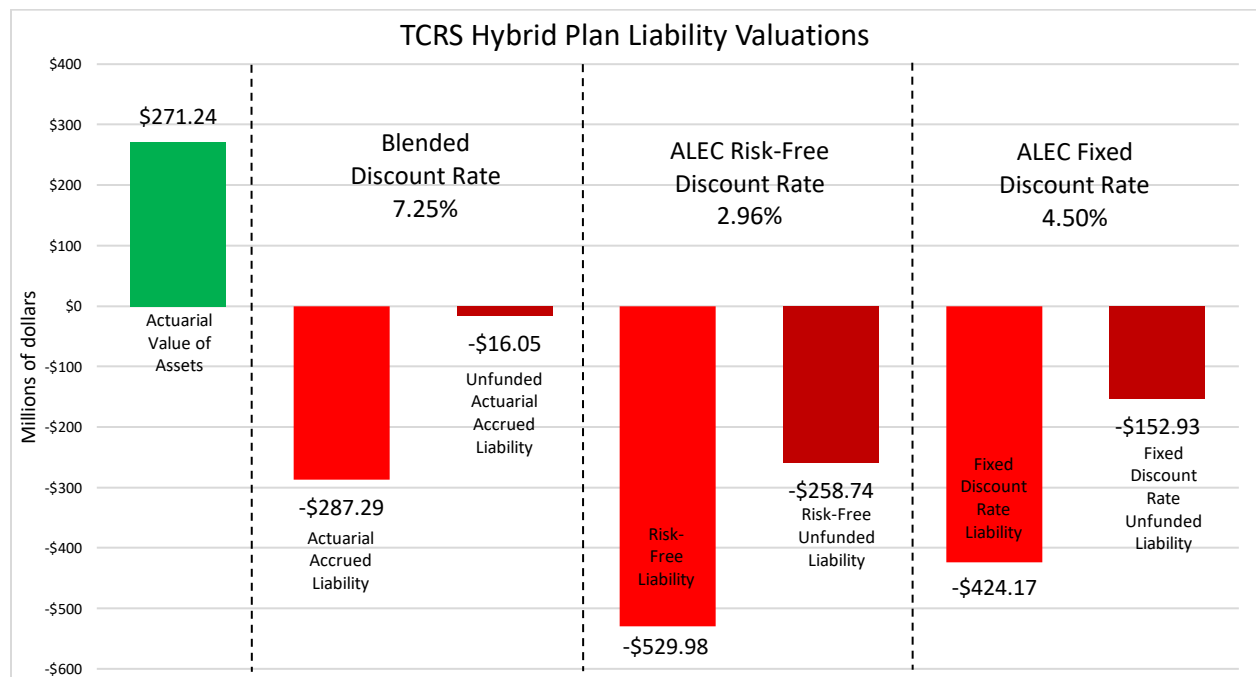
This is a more prudent discount rate than many plans offer. The formula for calculating a risk-free present value for a liability requires first finding the future value of the liability. That formula, in which “*i*” represents a plan’s assumed discount rate, is shown by equation 6⁵¹:

$$(6) \text{ Future Value} = \text{Actuarial Accrued Liability} \times (1 + i)^{15}$$

The second step is to discount the future value to arrive at the present value of the more reasonably valued liability. That formula is shown in equation 7 below, where “*i*” represents either the risk-free or fixed discount rates⁵²:

$$(7) \text{ Present Value} = \frac{\text{Future Value}}{(1 + i)^{15}}$$

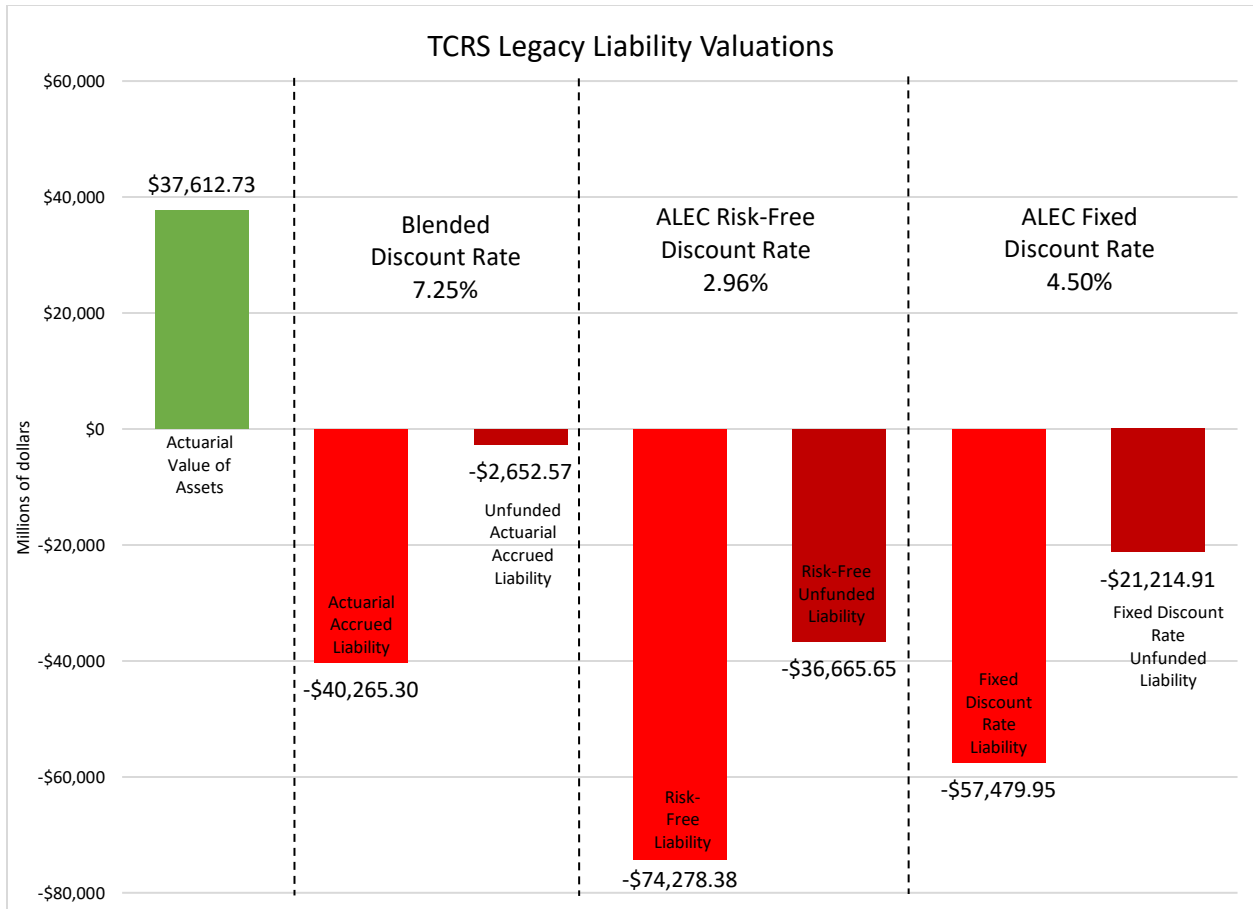
The differences in liability valuations for the TCRS Legacy and Hybrid plans (aggregated) in FY 2018 can be seen in the chart below:



Source: Savidge, et al. *Unaccountable and Unaffordable* 2019.

⁵¹Williams, et al. “Unaccountable and Unaffordable” 2020.

⁵² Williams, et al. “Unaccountable and Unaffordable” 2020.



Source: Savidge, et al. *Unaccountable and Unaffordable* 2019.

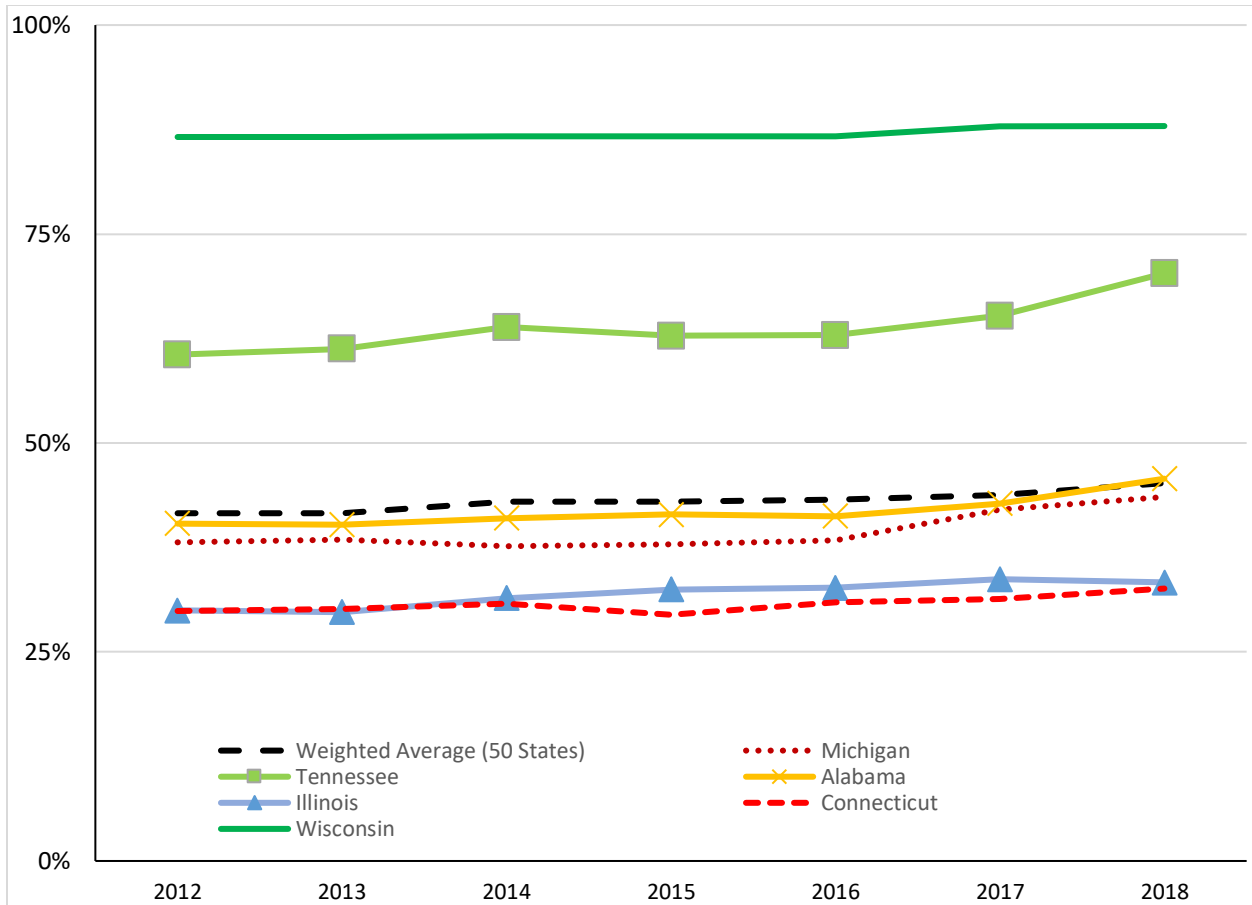
Note that these liability valuations vary greatly, even with relatively small changes to the discount rate assumptions.

Unfunded Liability Growth: How TCRS Compares Across the Nation

Most state government public pension systems are drastically underfunded. A report from the American Legislative Exchange Council Found that, when controlling for discount rates, unfunded pension liabilities from state pension plans reached \$4.9 trillion in Fiscal Year 2018.⁵³ Generally, public pension underfunding is due to a combination of four attributes: intentional underfunding, poor management, market conditions and volatility, and benefit design issues.

⁵³ Williams, et al. "Unaccountable and Unaffordable" 2020.

Intentional underfunding and poor management often go together. State policymakers consistently do not make the necessary actuarially determined contributions. Another important indicator of the health of a defined benefit pension plan is the funding ratio. The figure and table below show the funding ratios using the ALEC fixed discount rate of 4.5% to control for discount rates over time:



State	2012	2013	2014	2015	2016	2017	2018
Weighted Average (50 States)	41.60%	41.60%	43.00%	43.00%	43.20%	43.80%	45.20%
Wisconsin	86.61%	86.63%	86.66%	86.66%	86.67%	87.91%	87.92%
Michigan	38.11%	38.44%	37.65%	37.88%	38.34%	42.02%	43.55%
Tennessee	60.58%	61.25%	63.85%	62.84%	62.89%	65.23%	70.30%
Alabama	40.37%	40.23%	41.03%	41.43%	41.24%	42.76%	45.74%
Illinois	29.95%	29.76%	31.45%	32.49%	32.68%	33.71%	33.30%
Connecticut	29.88%	30.17%	30.80%	29.46%	30.97%	31.35%	32.59%

Source: Savidge, et al. *Unaccountable and Unaffordable 2019*.

The dark dotted line in the middle indicates a weighted average of all the state public pension funding ratios. Consistently, Wisconsin and Tennessee have performed well above average since 2012. Michigan, Illinois, and Connecticut have funding ratios below average. Alabama's funding ratio has hovered around the weighted average. While Alabama changed their pension plans to a two-tiered system in 2012, these reforms have not been enough to stave off the growth in liabilities.⁵⁴

It is important to note that while Michigan transitioned its State Employee Retiree System to a hybrid plan in 1996 and the Public School Employee Retiree plan in 2016, Michigan also made mistakes. By failing to make the full ADC payments consistently and properly funding retirement plans, unfunded liabilities still accumulated in both the hybrid plans and traditional defined benefit plans in Michigan. The situation in Michigan, however, could have been much worse. A study conducted by Dreyfuss (2011) found that Michigan's reforms saved taxpayers \$167 million in pension liabilities, \$2.3 billion to \$4.3 billion in unfunded liabilities, and improved the political incentives of pension funding.⁵⁵ Another study by Randazzo and Bui (2016) found that unfunded liabilities would have been \$2 billion greater. However, they also discovered that if management of the pension plans been improved (specifically making necessary contributions and matching assumed rates of return with actual rates of return), the Michigan State Retirement System would be roughly \$7.7 billion better off in 2016 than if no reforms were made.⁵⁶ By reforming the retirement system so that all new members are enrolled in a hybrid plan like Tennessee, Michigan can steadily improve its retirement plans and reduce

⁵⁴ Dove and Smith. "Alabama at the Crossroads." p. 25.

⁵⁵ Dreyfuss, Richard C. "Policy Brief: Estimated Savings from Michigan's 1997 State Employees Pension Plan Reform." Mackinac Center for Public Policy. 23 June 2011. Retrieved from: <https://www.mackinac.org/15672>

⁵⁶ Randazzo, Anthony and Bui, Truong. "Did Pension Reform Improve Sustainability of Pension Plans? Evidence from Counterfactual Analysis of Michigan and Alaska." Reason Foundation Policy Study No. 450. Mar 2016. Retrieved online: https://reason.org/wp-content/uploads/files/ps450_pension_reform_sustainability_effects.pdf

its unfunded liabilities. Meanwhile, Illinois and Connecticut have consistently had funding ratios well below the weighted average, with two of the worst risk-free funding ratios in the ALEC reports.⁵⁷ In addition, even when using the more prudent ALEC risk-free rate, Tennessee has consistently been ranked as one of the best-funded pension plans in the country.⁵⁸ In another study by the Pew Charitable Trusts listed the TCRS as one of the best-funded and managed pension systems in the country.⁵⁹

Keeping TCRS Competitive: Recommendations for Further Reform

One reform the TCRS could immediately adopt to remain competitive is lowering their discount rate to the private sector average of 4.00%⁶⁰, or better yet, to a risk-free rate. Given the variance in discount rates, the Powers et al. (2018) incorporated a fixed discount rate of 4.50%.⁶¹ The fixed discount rate provides a basis of comparison in years that see large changes to the risk-free discount rate.

A second reform is to vary benefit or contribution rates based on the funding of the plan, such as in Wisconsin and Maine. Wisconsin has the best-funded ratio of any public pension system in the country at 70.37%, controlling for difference in discount rates, because it has a variable benefit rate, meaning the disbursement varies over time. State retirees are entitled to a low, guaranteed pension payment paired with a variable payment based on the pension system's funding ratio.⁶² when tax revenue is lower during economic recessions, the fund lowers payments to retirees and allows the fund to recover rather than exhausting the fund or taking on

⁵⁷ Williams, et al. "Unaccountable and Unaffordable" 2020.

⁵⁸ Savidge, et al. "Unaccountable and Unaffordable" 2020 and Powers, et al. "Unaccountable and Unaffordable" (Multiple Years).

⁵⁹ "The State Pension Funding Gap: 2017." Pew Charitable Trusts. June 2019. Retrieved online:

<https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/06/the-state-pension-funding-gap-2017>

⁶⁰ "ERISA 4022 Lump Sum Interest Rates." Pension Benefit Guaranty Corporation (PBGC). Last updated Nov. 2019. Retrieved from: <https://www.pbgc.gov/prac/interest/vls#How-these-rates-are-used>

⁶¹ Powers, Thurston, et al. *Unaccountable and Unaffordable*, 2018.

⁶² Seyfert, Kerri. "The Wisconsin Retirement System Is Fully Funded." Reason Foundation. Jan. 2020.

debt to keep making payments.⁶³ While the plan has been criticized for diminishing benefits during economic downturns, it has succeeded in providing retirement security with few significant changes to the plan since 1975.⁶⁴

In 2016, Maine pursued a series of reforms to implement variable contribution rates for their state pension system.⁶⁵ Due to these reforms, in the past two years, Maine's unfunded pension liabilities have decreased by almost \$10 billion (about 50%). Normally, employer contribution rates fluctuate to meet the ARC or other contribution standards, whereas employee contributions are a fixed rate set by contract. Under a "risk-sharing" plan, changes in the ARC result in changes in contributions for both employer and employee.

The models share a key aspect: both Maine and Wisconsin have automatic "triggers," either on contribution rates, benefit rates, or cost of living adjustments. These triggers serve as an objective management tool to ensure pensions are funded. Automatic adjustments based on actuarial science are difficult to argue against, particularly when the potential deviation will underfund the pension system.

Ultimately, the best way to prevent the growth of unfunded pension liabilities is to transition to a fully defined contribution system for all new hires. As Smith and Al-Bawwab (2019) note, Keynesian economics overturned the historic tradition of maintaining balanced budgets.⁶⁶ With the "loss of that old-time fiscal religion," policymakers have promised public

⁶³ Seyfert, Kerri. "The Wisconsin Retirement System Is Fully Funded."

⁶⁴ Stein, Jason. "Wisconsin's fully funded pension system is one of a kind." Milwaukee Journal Sentinel. Sept. 26 2016. Retrieved from: <https://projects.jsonline.com/news/2016/9/26/wisconsins-fully-funded-pension-system-is-one-of-a-kind.html>

⁶⁵ Braun, Martin Z. "Public Pensions Adopt Cost Sharing Mechanisms to Stem Volatility." Bloomberg. July 17, 2018. <https://www.bloomberg.com/news/articles/2018-07-17/public-pensions-adopt-cost-sharing-mechanisms-to-stem-volatility>

⁶⁶ Smith, Daniel J and Al-Bawwab, Rania. "Breaking Bad: Public Pensions and the Loss of that Old-Time Fiscal Religion," *The Independent Review*. Forthcoming 2020. Retrieved online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2743279

workers retirement benefits without adequately funding these obligations and have circumvented traditional balanced budget requirements, undermining taxpayer constraints on spending. Smith and Al-Bawwab note that transitioning public pensions to defined contribution retirement accounts would help restore taxpayer constraint.⁶⁷ In addition, while defined contribution retirement benefits are not as generous as defined benefit plan, they are more portable. The 401(k) portion of the TCRS Hybrid plans require no vesting period, and members can opt-out or alter benefits at any time they wish. The money the employee contributes can also be withdrawn if the member leaves the TCRS. While Tennessee has managed to stay fiscally responsible by properly funding pension benefits without putting an undue burden on taxpayers, fiscal discipline can be easily lost and very difficult to restore. Transitioning to defined contribution could help the TCRS provide flexible benefits to members without placing a large tax burden on taxpayers.

Conclusion

In short, the TCRS took many positive steps, such as consistently making the full ADC payment and transitioning new hires to a hybrid plan, to make it one of the most competitive pension systems in the country. There are continued steps the TCRS can take, such as lowering the discount rate, vary benefit and contribution rates, and transition new hires to a fully defined contribution plan that can help make the TCRS better prepared for the future.

⁶⁷ Smith and Al-Bawwab. “Breaking Bad.”

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