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FACTORS CONTRIBUTING TO HEALTH OF STATE EMPLOYEE PENSION FUNDS

An assessment, and comparison, of the health of Connecticut's State Employees Retirement System and the pension systems of peer states

January 2018

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Contents

Introduction

The purpose of this report is to identify the key factors that contribute to the health of state employee pension systems, and use these key factors to assess and compare the health of state employee pension systems in Connecticut with other peer states. In fiscal year 2000, the national average funded ratio of state pension plans was over 100 percent.[1] However, a downturn in stock markets caused the funded ratio of state pension plans nationwide to decline.[2] The Great Recession, which officially began in 2007,[3] exacerbated this trend and the funded ratio of state pension plans has continued to decline. Actual rates of return on investments of pension assets routinely fell short of projected rates of return, which caused annually required contributions to pension systems to increase.[4] The Great Recession also negatively impacted overall tax revenues causing many states to have trouble making the annually required contributions to their pension systems.[5] Despite difficult economic conditions, some pension systems have maintained healthy funded ratios, while others – including Connecticut – have not.

Glossary

In order to compare and discuss state pension plans, there are a number of terms that must be disambiguated. These are defined below:

Funded Ratio: One commonly used metric to determine the degree to which pension systems are funded is called the funded ratio. The funded ratio is the level of assets a retirement system has in proportion to the system's total accrued liability.[6] The total accrued liability is the actuarial accrued liability of the plan, and is comprised of the sum of all the payments the pension system must pay in the present and future, including the liability currently funded by assets in the pension system.[7] Although the funded ratio is not the only measure of the health of a retirement system, it is widely used to provide a uniform method to understand and compare pension systems. While it is optimal that pension systems have funded ratios of 100 percent, meaning the system has enough funding to pay for its current and future benefits, the U.S. Governmental Accountability Office, considers pension systems with funded ratios of 80 percent or higher to be well-funded.[8] It is important to note, however, that just because a pension system is over 80 percent funded does not necessarily mean it is sustainable or healthy.[9] Other important factors to consider are the size of the pension obligation relative to the size of the employer, the investment strategy of the pension plan, and the financial health of the plan sponsor.[10]

Unfunded Accrued Actuarial Liability (UAAL): The UAAL is the difference between the actuarial value of all the assets in a pension system and the system's total accrued liability.[11] In short, the UAAL is the amount of money that needs to be added to a system to pay all debts, which are comprised of the benefits pledged in employee contracts over time.[12]

***Legacy Costs*:** The accumulated liabilities in a pension system from previous years.[13]

GASB 67 and GASB 68: In 2012, the Government Accounting Standards Board (GASB), which sets accounting rules for public pension plans, issued GASB Statement No. 67 and GASB Statement No. 68, which contained updated standards for accounting practices in pensions,[14] and went into effect in June 2013 and June 2014, respectively.[15] These standards eliminated the practice knowns as "asset smoothing," which allowed governments to average the performance of pension investments over five years, thereby smoothing ARC payments. Instead GASB 67 and 68 require the use of market valuation, which is a more accurate means of assessing the value of pension assets.[16] The new standards also imposed certain restrictions on how states set their discount rates. Instead of allowing pension systems to set assumed rates of return for all assets, GASB 67 requires a blended discount rate, wherein the unfunded portion of the liability must be based on a lower-risk return on tax-exempt bonds.[17] Furthermore, the calculation of the annually required contribution (ARC) toward pension systems was replaced with the actuarially determined contribution (ADC). It is important to note GASB requires pension plans to calculate the ARC but does not require them to pay the full ARC.[18] It was originally projected that pension plans would see a precipitous drop in their funded ratios due to the new reporting standards. However, early analyses show a combination of improving market conditions and flexibility still allowed total reported

pension liability to increase roughly five percent, and plan funded ratios decreased nationwide, in 2014 under GASB 67 and 68.[19] In addition, Moody's Investor Service concluded in 2016 that enhanced pension disclosures under GASB 68 improve credit analysis, but the underlying credit risks remain unchanged.[20]

Annually Required Contribution (ARC): The ARC is the funding amount needed to pay both the normal cost, which is defined as the cost of benefits attributed to the current year,[21] and an amortization payment for the unfunded accrued actuarial liability (UAAL) over the next 30 years.[22] The size of a system's ARC in a given year is variable. Different assumptions on returns, mortality rates, and wage growth will lead to different ARC calculations.[23] Less conservative assumptions of these variables decrease the calculated ARC, leading to underfunding if the assumptions were overly optimistic.[24]

Actuarially Determined Contribution (ADC): The ADC, required under GASB 67 and GASB 68, is either a target contribution determined using the Actuarial Standards of Practice or, if one exists, a statutorily set contribution.[25] Despite the different definitions, the ARC and the ADC are both intended to represent the amount the government should be contributing to the pension system and, in practice, are nearly identical.[26] However, governments that relied on the prior GASB definition of an ARC had to develop their own formal funding policy.[27] [A]

***Pension Contributions*:** The payments made into a pension system to be invested and later withdrawn as retirement benefits. Pension contributions are categorized into employee and employer contributions, although in some cases there may be more than one source of employer contribution (such as in cases where both the state and municipal governments contribute to the pension plan).[28]

***Normal Cost*:** The portion of the actuarial present value of retirement benefits in a pension plan, attributable to active employees for the current year.[29]

Realized Rate of Return: The realized rate of return is the actual percent increase or decrease of a system's total pension funds due to investments. Realized rates of return can be expressed as the percent increase or decrease in a single year but are often averaged over a longer period of time to assist in setting the assumed rate of return.[30]

***Discount Rate*:** The discount rate is used in calculating the present value of the future payments of a pension plan, and in allocating the cost of future benefits over time.[31] Common discount rates include setting an assumed rate of market return over a period of years, the rate of return on tax-exempt bonds, or market-sensitive return projections that change based on current market conditions.[32]

[A] For consistency and to avoid confusion, the term Annually Required Contribution (ARC) will be used throughout this memo, even in systems that have recently moved to using an Actuarially Determined Contribution (ADC) calculation.

***Assumed Rate of Return*:** The assumed rate of return is a common type of discount rate, used by actuaries to set the amortization tables of a pension plan, which is based on the estimated future investment returns of fund assets.[33]

Amortization: Amortization is the actuarial projection of the cost of a pension plan for up to 30 years into the future. Amortization tables set the ARCs for pension systems, and are calculated using a number of assumptions, which, if changed, will adjust the annual cost up or down. There are two main amortization procedures: level dollar amortization and level percent of payroll amortization. The most common amortization method is level dollar, which requires equal dollar payments over the amortization period.[34] Rather than using equal payments, the level percent of payroll amortization method pays a percentage of the projected payroll over the amortization period.[35] The initial costs are lower using this method than the level dollar method. However, the level percent of payroll method will often not cover the full interest in the initial payments, causing an increase in a system's UAAL and resulting in ballooning payments toward the latter stages of the amortization period.[36]

Asset Smoothing: Asset smoothing is the practice of taking an average of the values of a pension system's assets over a period of years.[37] Asset smoothing is used to reduce the volatility of ARC payments due to market conditions.[38]

***Cost-of-Living Adjustment (COLA)*:** COLAs are a form of retirement benefit that increase the current costs of pension systems by increasing payments to current retirees. COLAs may be negotiated into pension systems through collective bargaining agreements at certain rates and intervals, or can be automatically linked to economic indicators, such as the rate of inflation. COLAs are intended to protect the value of pension benefits from inflation during retirement.[39]

***Early Retirement Incentive Program (ERIP)*:** ERIPs are programs designed to decrease the size and payroll of the current workforce by encouraging older employees to retire before they reach full retirement age. ERIPs decrease the current payroll for public employees but increase the amount of time retirees collect benefits, all while decreasing the number of employees paying into the system.[40] This results in an increase in the total cost of an employee's retirement benefits.[41]

Practices Contributing to Pension System Health

There are several key factors that contribute to the health of state employee pension systems:

1. ***Contributions.*** Public pension systems are generally funded by employee and employer contributions, with the employer portion coming from state revenues, local revenues, or both, depending on the state and for which government entity the employee works. The distribution of these costs between state and local government differs from state to state.[42] The lower the employee contribution, the higher the employer contribution must be. However, because employee contributions are automatically deducted from the salaries of employees, these contributions are not often the source of inadequate contributions made to pension plans. States with well-funded pension systems are more likely to have a combination of employer and employee contributions that are adequate to fund both the normal cost and UAAL payments.[43] In some states, employer contributions are split between local and state governments. This type of cost sharing acts as an incentive for local governments to keep the cost of their employees' pensions down and reduces the total liability owed by the state government.[44]

   States with poorly funded pension systems have most often failed to make their full ARC payments to the pension system over a period of many years.[45] Chronic underfunding causes a pension system's UAAL to compound over time, increasing annual pension costs in future years.[46] Contributions to state pension plans are invested, and therefore, grow over time. Thus, the earlier and larger a contribution is made, the smaller future contributions will need to be. When contributions are too low, ARCs will increase in later years. Conversely, states that have well-funded state employee pension systems are more likely to have made their full ARCs.[47]

2. ***Investment Assumptions.*** Overly optimistic assumptions of investment returns contribute to underfunding of state employee pension plans.[48] There are two primary methods for setting discount rates for public pension systems. GASB standards state a system's discount rate should be based on the long-term expected rate of return. Most pension systems set a traditional assumed rate of return, based on long-term investment assumptions, in order to project amortization of the UAAL and ARC payments over time.[49] When the assumed rate of return is higher than actual investment returns, the UAAL increases, causing the system's ARC to be higher in later years than previously calculated.[50]

   Other pension systems use the current rate of return on tax-exempt bonds or treasury notes as the discount rate, known as market valuation of liabilities. This practice is based on the economic theory that discount rates should be set in a way that reflects the likelihood of payment. Because governments tend to have a high level of commitment, sometimes backed by state constitutional protections, advocates for this method believe discount rates should be based on fixed-income investments that have an equal likelihood of being paid.

Because rates of return on bonds are usually lower than equities in the long term, this discounting method is more conservative, as most pension systems invest assets in a diversified portfolio.[51] Lower discount rates increase the amortized UAAL, causing higher ARCs, but they also allow the system's assets to better weather market downturns and prevent UAAL growth.[52]

It is also important to note that discount rates are interdependent with assumed rates of inflation. Setting a higher inflation rate will increase the calculated UAAL, thereby increasing a system's ARC. Therefore, the positive impact of a conservative discount rate can be counteracted by setting an assumed inflation rate that is lower than the actual rate of inflation.[53] No matter the discount rate, it is imperative for states to pay the full amortized ARC, which increases a pension fund's assets and allows the system to offset possible losses resulting from lower than expected returns in subsequent years.[54]

Other practices that impact the calculation of a pension system's ARC include annually discounting the calculated ARC based on investment and demographic experience.[55] This practice ensures pension liabilities are accurately assessed but leads to volatility in employer contributions from year to year, and can weaken a pension system if not paired with a scrupulous effort to pay the full ARC, even if it has increased exponentially over the previous year.[56]

3. ***Amortization Method.*** The amortization methods and schedules of pension systems are a factor in the overall health of a pension system. Using a level-percent of payroll amortization model can often lead to the underfunding of pension systems, as the ARC payments in the initial period of amortization will not cover the full interest on the UAAL, leading to a set of balloon payments during the final portion of the amortization.[57] Additionally, the practice of setting a longer amortization period can have long-term costs. A longer amortization period lowers the ARC because payments are spread out over many years. This practice has both costs and benefits. Similar to refinancing a mortgage, this can reduce ARC payments in the short term, but increases the number of years into the future that current debts will be paid, and increases the total cost of those payments. [58]

4. ***Benefits structure.*** The ways pension benefits are structured also contribute to the health of state pension systems. The purpose of COLAs is to allow retirees to maintain their standard of living despite inflation.[59] However, COLAs increase the cost of maintaining a well-funded state employee pension system. When these benefit increases are contractually required, it means annual contributions to pension funds must also increase to cover the cost of the COLAs.[60] ERIPs can also increase the cost of pensions by reducing the number of employees contributing to the system and increasing the length of time retirees draw from the pension system. The purpose of ERIPs is to lower current state employee payroll, which can save money in the short term but increase the cost of pension payments in the future.[61] In order to avoid incurring additional liabilities from more inactive members in the future, a state with an ERIP would need to maintain a moratorium on restoring eliminated positions even when economic conditions

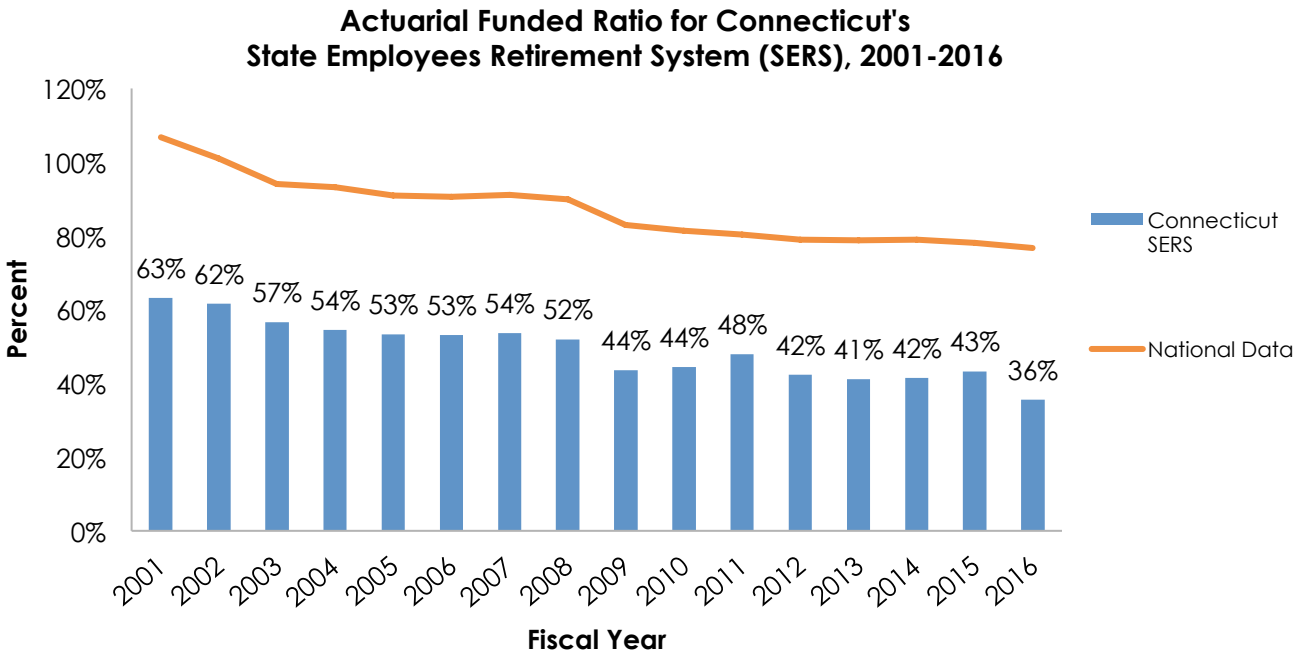
improve. Alternatively, the state could increase contribution rates for these members or increase the state's contribution amount to the pension plan to offset the effects of ERIPs on pension systems.[62] The age of full retirement can also increase pension costs. The lower the retirement age, the more expensive it is to pay retirement benefits to the retiree. As life expectancy increases, retirees are living longer and therefore will draw more benefit payments, which increases the total cost per retiree over time.[63] Well-funded pension systems may have lower COLAs and fewer ERIPs, or account for them properly with higher contribution rates.[64]

5. ***Collective Bargaining Practices.*** Pension system health can be affected by which aspects of the system are written in contracts with employee representatives. Assumed rates of return based on projections of investment revenues must be sensitive to anticipated market conditions, which can change substantially from year to year.[65] When assumed rates of return are set in contracts it may be more difficult to amend them as market conditions change. Additionally, in most states, employee contribution rates, as a percent of gross salary, are set in statute; although some states determine them through collective bargaining agreements. Although this practice does not directly affect pension health, it does make it more difficult to increase employee contributions after contracts are enacted.[66] In addition, full ARC payments should be made each year, based on the most accurate actuarial projections available. When ARC payment amounts are set in contracts, they are often the subjects of concessions agreements, which can allow the state to renege on its commitment to make its full ARC payments in favor of short-term savings.[67]

Connecticut State Employees Retirement System

Connecticut's State Employees Retirement System (SERS) had a funded ration of 35.5 percent in fiscal year 2016.[68] SERS also had the fourth-lowest funded ratio of any state pension system in 2015 according to a report by S&P Global Ratings.[69] The only states with worse funded ratios in 2015 were Kentucky, Illinois, and New Jersey. SERS' UAAL grew from $2.5 billion in 1985 to $21.7 billion as of the system's 2016 actuarial valuation report.[70] This outcome is the cumulative result of the state employing a number of poor pension system practices for decades, dating back to the inception of the fund in 1939.[71] The funded ratio for SERS dropped from an all-time high of 63.1 percent in fiscal year 2001 to 35.5 percent in fiscal year 2016.[72] Although there have been recent efforts to mitigate the poor health of SERS, costs related to maintaining the system continue to rise, and comprise an increasing portion of the state's budget.

Figure 1[73,B]



Contributions

Connecticut does not require any local contributions to SERS. The employer contribution is paid entirely by the State because only Connecticut state employees are members of SERS. Municipal employees contribute to other systems, including teachers who contribute to a separate, state-managed system called the Teachers' Retirement System, for which the State also pays the entire employer contribution.[74]

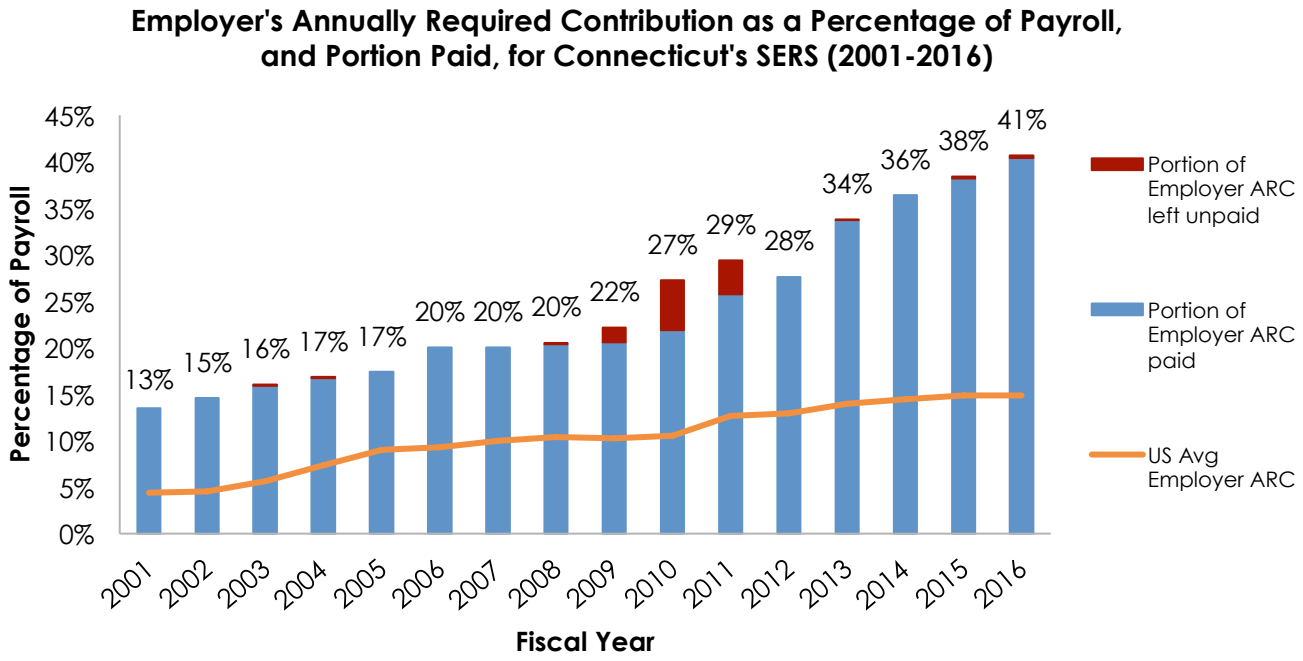
[B] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

From 1939 to 1971, Connecticut did not pre-fund its pensions, meaning the State did not make any long-term contributions to offset future pension costs.[75] Instead, the state used a pay-as-you-go system, whereby it only paid for the retirement benefits of current retirees.[76] From 1971 to 1985, Connecticut began making contributions to SERS with the intention to phase in contribution amounts and eventually make the full ARC payment by 1985.[77] By the time Connecticut began making its full, ARC in 1985, SERS had accumulated $2.5 billion in UAAL.[78] These legacy costs account for $5.2 billion, or approximately 35 percent, [C] of SERS' total UAAL today.[79]

Connecticut made its full ARC in 1985, but the State's commitment to making its ARC lasted only a few years. In 1989, the State entered into a 30-year contract with the State Employee Bargaining Agent Coalition (SEBAC) that allowed the State to reduce its ARC to SERS, while committing to pay set benefits to retirees, decades into the future.[80] Despite the SEBAC Agreement of 1989 creating a second tier of employees with slightly reduced benefits, the SERS' UAAL continued to grow. Connecticut again negotiated with SEBAC to allow contributions below the ARC in the amended SEBAC concessions agreements of 1992, 1995, and 1997.[81] This exacerbated the underfunding of the system. Since 2001, the average contribution made by the State to SERS has been 90 percent of the ARC.[82] This marks a significant increase from previous decades but is still insufficient to prevent growth of the UAAL. Making contributions lower than the ARC made up $3.2 billion, or 26 percent, of the growth in SERS' UAAL from 1985 to 2014.

[C] Portions of SERS' UAAL attributable to various practices are drawn from calculations by Jean-Pierre Aubry and Alicia Munnell of the Center for Retirement Research at Boston College, in their 2015 report on Connecticut's pension systems, which was commissioned by the Connecticut Office of Policy and Management.
Source: Aubry, J., & Munnell, A.H. (2015). *Final Report on Connecticut's State Employees Retirement System and Teachers' Retirement System*. Chestnut Hill, MA: Center for Retirement Research at Boston College. Retrieved from http://crr.bc.edu/wp-content/uploads/2015/11/Final-Report-on-CT-SERS-and-TRS_November-2015.pdf.

Figure 2[83,D]



Amortization Method

However, even if the State had made the full ARC payments every year, the UAAL would have grown. This is because the calculated ARC was consistently less than what would have been required to prevent UAAL growth. A primary factor in calculating the ARC at a level that was too low to prevent UAAL growth was the method Connecticut used in its amortization tables. From 1985 to 2000, SERS used a level dollar method of amortizing its UAAL, and the calculated ARC was close to the minimum payment required to prevent UAAL growth. However, during this same period, the state did not make its full ARC payments. Then, in 2001, Connecticut switched from a level dollar method of amortization to a level percent of payroll method of amortization.[84] This change reduced the calculated ARC, causing it to fall significantly short of the amount necessary to prevent growth of the UAAL.[85] Approximately $2.3 billion, or 19 percent, of the growth in UAAL from 1984 to 2014 is attributable to calculated amortization payments being too low to prevent UAAL growth.[86]

Investment Assumptions

Although most systems experience years where actuarial assumptions result in increased liabilities, these assumptions are expected to align with the pension system's actual experience over the long term. Remarkably, from 1990-2014, SERS' actuarial experience resulted in UAAL growth in all but three years,[87] which indicates poor

[D] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

actuarial practices were employed over a long period of time. Approximately $4.1 billion, or 33 percent, of the UAAL growth from 1985 to 2014 was attributable to poor actuarial experience.[88]

SERS' set assumed rate of return was 8.5 percent from 1990 to 2008.[89] Returns regularly exceeded expectations in the 1980s and 1990s, with an average rate of return of 11.3 percent from 1983 to 2000, and Connecticut's assumed rate of return during this period was higher than the national average. The high rates of return mitigated the impact of Connecticut's inadequate ARC payments and contributed to a modest increase in the funded ratio in the 1990s.[90,91] However, from 2001 to 2016, the average rate of return was 5.4 percent — well short of the system's assumed rate of return. As a result, the difference between the assumed rate of return and actual investment experience contributed to UAAL growth.[92] Connecticut has reduced its assumed rate of return in modest increments in recent years, and currently the assumed rate of return is set at 6.9 percent. Approximately $1.3 billion of the $4.1 billion in UAAL growth from 1985 to 2014 attributable to poor actuarial experience is derived from the difference between assumed rates of return and realized rates of return, or 10 percent of the total UAAL growth.[93]

Benefits Structure

Compounding inadequate annual contributions and optimistic investment assumptions are sizeable benefits packages known as Tier I, Tier II, and Tier IIA. Employees hired prior to fiscal year 1985 receive Tier I benefits, while each new tier — introduced in subsequent SEBAC agreements — is associated with increasingly less generous benefit structures.[94] Ninety-three percent of employees eligible for Tier I benefits are currently retired, meaning the State is now paying for the costs incurred through contracts for employees hired prior to 1985. Connecticut is one of only three states, along with California and Rhode Island, spending an average of over $35,000 per annuitant, largely a result of the costs incurred from employees with Tier I benefits.[95]

Other benefit structures that have contributed to the poor health of SERS are ERIPs and COLAs. Connecticut pays a COLA that is calculated based upon the consumer price index, with the adjustment ranging from a minimum of two percent to a maximum of either six or 7.5 percent, depending on the tier, to all employees receiving benefits.[96,97] However, Aubry and Munnell (2015) do not attribute a meaningful portion of the growth in SERS' UAAL from 1985 to 2014 to COLA increases, primarily because they have been the subject of concession agreements that have limited their total impact over time.[98]

Conversely, ERIPs have had a significant impact on SERS' UAAL. ERIPs were created in the SEBAC Agreements of 1989, 1992, 1997, 2003, and 2009 as a method of reducing payroll and saving money in the short term. Unfortunately, the long-term future costs of ERIPs were not accounted for during the decision-making. ERIPs altered the retirement patterns of employees, resulting in retirement rate projections that erred significantly. Assumptions on retirement patterns were not revised to account for the effects of ERIPs, causing the UAAL to increase.[99] Approximately $1.5 billion, or 12 percent of the growth in unfunded liability from 1985 to 2014, can be attributed to ad-hoc ERIPs, as measured by deviations in retirement patterns from actuarial projections.[100] The Connecticut

General Assembly's nonpartisan Office of Legislative Research estimated the 2003 ERIP alone, with 4,725 SERS participants, increased the long-term unfunded liability for the system by over $500 million.[101]

Collective Bargaining Practices

Connecticut sets its assumed rates of return and ARC payments in contract, while in other states these are set by the state treasurer, the state comptroller, or legislative committees. [102] This means these types of actuarial assumptions are negotiated with the SEBAC, the collective bargaining unit for all state employee unions. This practice does not, in and of itself, lead to poor pension outcomes, but it is important to understand Connecticut's method for setting these assumptions in order to better understand the history of SERS.

Setting actuarial assumptions through contracts makes it more difficult for the General Assembly to change assumed rates of return and ARC payments unilaterally. In theory, this could result in protecting the rights of pension members, if the collective bargaining unit refused to agree to allow the legislature to reduce the State's ARC payments below the fully required payment amount. However, according to Aubry and Munnell (2015), in the case of SERS, approximately $2 billion, or 16 percent, of the growth in SERS UAAL since 1985 is a direct result of negotiated agreements with collective bargaining units,[103] which indicates the practice of negotiating ARC payments does not always lead to greater fiscal accountability. This practice can also can lead to a lack of flexibility when attempting to set assumed rates of return based on actual projected market conditions, employee contribution rates, or benefit structures. In Connecticut, there has been a pattern over the past few decades of setting optimistic assumptions in initial contract negotiations, followed by a series of concession agreements that recalibrate certain portions of the original agreement.[104]

Mitigation Efforts

Recently, Connecticut has taken some steps to reform its underfunded pension system. Connecticut has incrementally lowered the SERS assumed rate of return, increased its annual contributions, and negotiated concessions with SEBAC to lower pension benefits. All of these actions are intended to help the State to cover the accumulated liabilities in SERS.

While the current pension funding crisis is largely a result of chronic underfunding and poor assumptions made prior to 1985, it is important to note these preexisting conditions were compounded by the State not making its full ARC payments, as well as poor amortization methods in the 1990s while Connecticut was experiencing rapid economic growth. This period would have been an appropriate time to invest in pension systems in ways that may have avoided the poor health of SERS today. In recent years, poor practices have been largely rectified through a series of mitigation efforts and concessions agreements with collective bargaining units. However, Connecticut is still contractually obligated to pay the costs associated with agreements made decades ago.

The assumed rate of return was revised downwards to 8.25 percent for fiscal year 2008, lowered again to 8.0 percent for fiscal year 2012, and most recently lowered to 6.9 percent for fiscal year 2016 with the ratification of the February 2017 SEBAC Agreement[105] by the General Assembly in the 2017 legislative session.[106] However, 6.9 percent is still higher than the average of SERS' actual rate of return, which averaged 5.4 percent over the past 10 years. Setting the rate of return this low, however, would result in an even higher increase to ARC payments in the next years.

Benefits were reduced in fiscal years 1985, 1998, and 2012, creating Tiers II, IIA, and III, respectively.[107,108,109] Each subsequent tier offers fewer benefits than the previous tier. Following the financial crisis of 2009, Connecticut lowered the cost-of-living adjustments, via negotiations with SEBAC, it pays employees in all tiers.[110] The SEBAC Agreement of 2011 raises requirements to receive retirement health care, reduces the minimum COLAs, introduces new caps on certain salary amounts used in the calculation of pensions, and makes a number of other benefits adjustments, including the creation of a new benefit tier for new employees.[111]

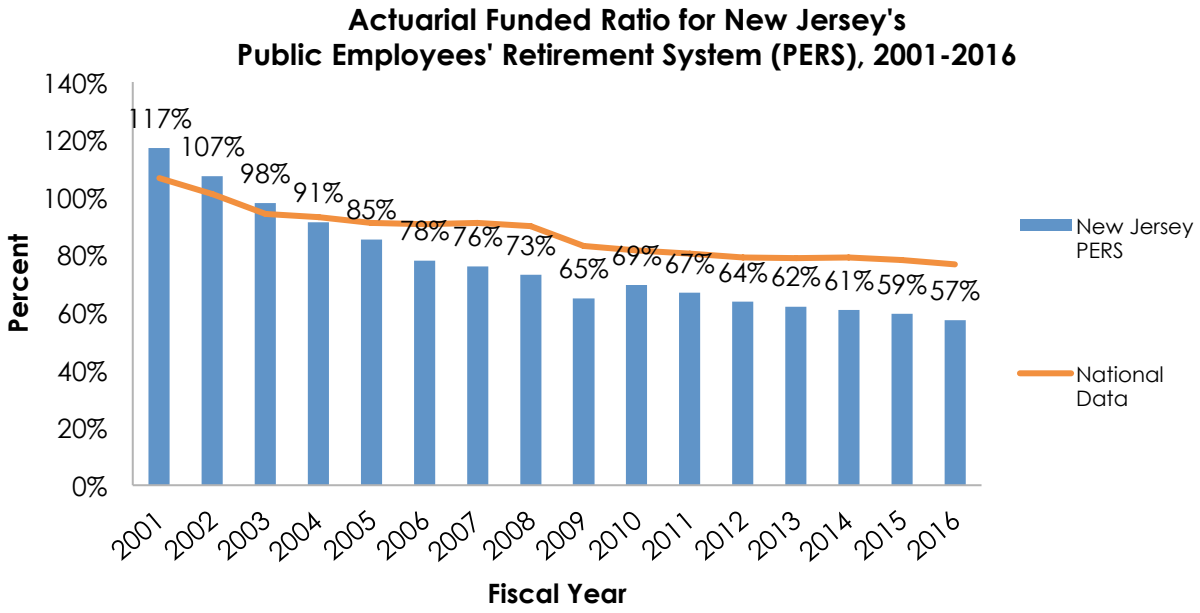
The SEBAC Agreement of July 2017 raised the employee contribution rates by two percent over the next two years, defers COLAs for retirees after 2022, instituted a wage freeze, and also introduced a new tier of lower benefits for new employees.[112] Additionally, the July 2017 SEBAC Agreement eliminated the minimum COLA for employees retiring on or after the start of fiscal year 2023.[113] This most recent SEBAC concession agreement also created a Tier IV for employees hired in or after fiscal year 2018.[114] Employees in this tier will retire under a hybrid defined-benefit and defined-contribution plan, rather than a solely defined-benefit plan like all previous tiers.[115] While, this agreement saves the State billions of dollars in pension liabilities,[116] and the reductions in benefits and transition to defined-contributions significantly lower future pension costs, ARCs for SERS are projected to continue to increase significantly over the next five years, and the total UAAL amortization of past debts is not projected to be paid until 2035.[117]

The funded ratio for all non-Tier I employee benefits in 2014 was 62.4 percent.[118] Although this figure is still far from being considered well-funded, it is a marked improvement over the overall funded ratio of SERS of 35.5 percent. However, efforts employed by the State, to mitigate the costs of SERS, since the SEBAC Agreement of 2011 have not succeeded in averting sharply increasing annual pension costs. Eighty percent of the State's current annual payments toward SERS are to cover the funding inadequacies of previous years.[119] In short, the cost the retirement of today's workers is not the source of the fiscal strain on the State.

New Jersey Public Employees' Retirement System

The New Jersey Public Employees' Retirement System (PERS) had an overall funded ratio of 57.2 percent in fiscal year 2016.[120] PERS is funded by both employee and employer contributions, with the employer contributions paid jointly by state and local governments. Because of this, New Jersey calculates a separate funded ratio for the state and municipal portions of the system's UAAL. The State's funded ratio was 37.8 percent and the local employers' funded ratio was 71.4 percent in 2016. New Jersey's PERS ranks among the most poorly-funded pension systems in the country, with only Kentucky having a lower funded ratio, according to S&P Global Ratings.[121] According to the Urban Institute, the average annual benefits paid per annuitant in New Jersey in 2014 was just over $30,000.[122] This amount is less than Connecticut, but still high enough to rank eighth in the nation.[123] However, as recently as 2003, New Jersey's pension systems were considered well-funded, when PERS had a funded ratio of 90.7 percent[124] for state contributions and an overall funded ratio of 97.9 percent.[125] Today, PERS' total UAAL has grown to $20.7 billion, of which $13.9 billion is owed by state sources and $8.7 billion by local sources.[126]

Figure 3[127,E]



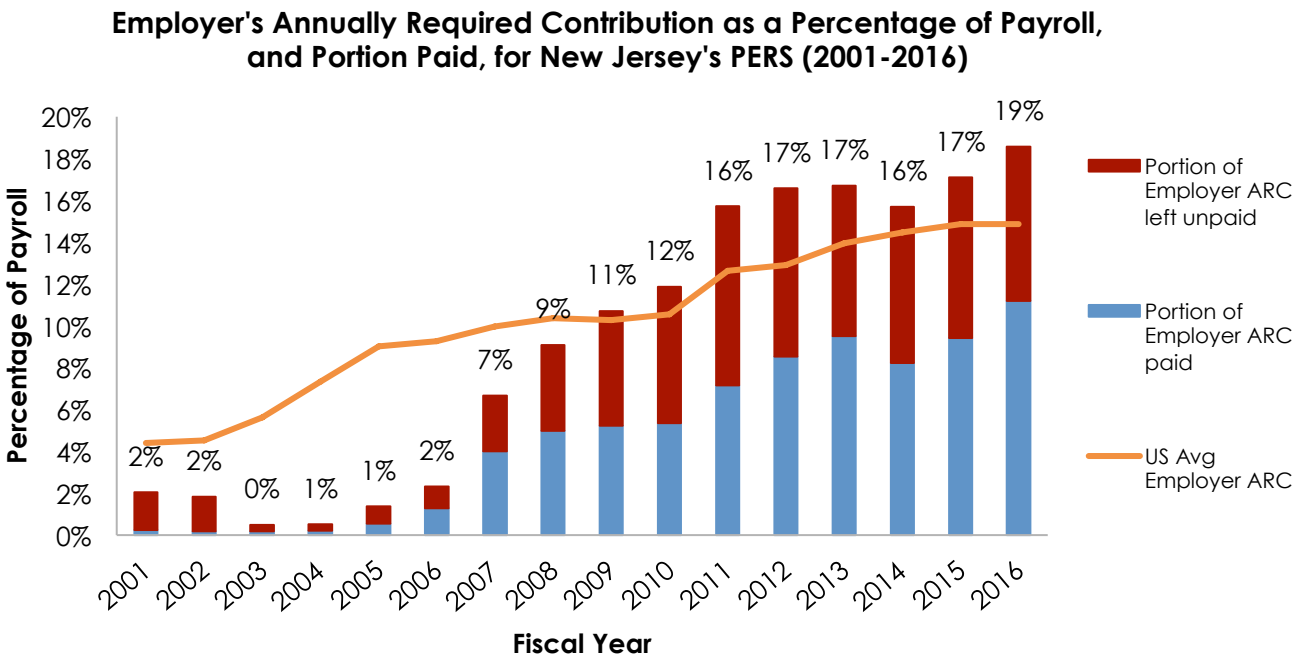
Contributions

The preponderance of PERS' UAAL is due to the State not making its full ARC payments, and sometimes not making payments at all.[128] New Jersey obligates local municipalities to cover roughly 60 percent of the total employer cost of ARC payments to PERS, and

[E] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

the State is supposed to pay the other 40 percent.[129] However, the state government of New Jersey did not make any payments into PERS from 1998 to 2004.[130,131] When the State resumed making contributions to PERS in 2005, the contribution amounts fell far short of the ARC. After the financial crisis in 2009, the New Jersey legislature allowed continued underfunding of ARCs until 2016 in order to reduce the short-term financial stress on the state.[132] The State constructed a phase-in plan, wherein the State payed only one-seventh of its ARC in the first year. This amount was to be increased by 14.3 percent annually until the full ARC was paid in 2016.[133] However, in fiscal year 2016, the State of New Jersey still only made about 30 percent of its ARC payment.[134] The underfunding of PERS has over time increased the calculated ARC. For fiscal year 2017, the State's portion of the ARC was $1.3 billion, but the legislature authorized the state treasurer to pay $505 million toward the ARC instead. From 2008 to 2016, the average percent of the ARC paid by the State was only 15.6 percent. During the same period, local governments contributed, on average, 96.7 percent of their ARCs to PERS.[135]

Figure 4[136,F]



Investment Assumptions

In New Jersey, the assumed rate of return for pensions is set by the state treasurer.[137] The assumed rate of return for PERS was 8.75 percent until 2003. The treasurer has incrementally reduced the PERS' assumed rate of return to a current rate of 7.65

[F] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

percent.[138] However, the annualized realized rate of return over the past 10 years was only 5.9 percent, and 6.6 percent over the past five years.[139]

Amortization Method

New Jersey used a 30-year level percent of payroll amortization method until 2011, when it shifted to a 20-year level dollar amortization method, which increases ARC payments in the short term but decreases ARC payments over time. However, New Jersey has failed to keep up with the state portion of the new amortization table, which has negated the anticipated benefits to PERS' pension health.[140]

Benefits Structure

In New Jersey, benefit terms for PERS are set by statute rather than by collective bargaining. During the period from 1998 to 2004, when New Jersey did not make the State's portion of its ARCs, PERS increased benefits to employees in the form of COLAs,[141] which increased the overall cost of the plan, until 2011 when COLAs were suspended. New Jersey also has a system, set in statute, to create ERIPs for employees.[142] The number of active employees paying into PERS per annuitant has decreased from 2.7 in 2001 to 1.5 in 2015.[143]

Mitigation Efforts

New Jersey began to make changes to PERS in 2004, after a period of not making ARC payments. In 2004, the assumed rate of return was lowered to 8.25 percent.[144] The assumed rate was again lowered in 2011 to 7.95 percent, in 2012 to 7.9 percent, and in 2016 to 7.65 percent. The independent actuary for PERS noted in 2015 that 7.9 percent is on the high-end of the acceptable range and should be revised downward to reduce the risk of future contributions falling short of the projection, which would increase the system's UAAL.[145]

Because of the rapid rise of the UAAL and the precipitous decrease in the funded ratio of PERS, the New Jersey legislature enacted an amendment to the state's pension legislation in 2011, which included a number of reforms intended to shore up its state pension system.[146] These changes included the indefinite suspension of COLAs for current and future retirees, increased employee contribution amounts, and enhanced employee eligibility requirements for new members;[147] until the State had funded its pensions to what it determined was an adequate level in an effort to reduce the total UAAL.[148] The legislation also changed the amortization method from level percent of payroll to the more conservative level dollar method, and imposed a 7-year phase-in plan intended to require the State to make its full ARC payment by 2016.[149]

Despite the 2011 legislation, the State has continued to fail to meet its pension funding obligations, which has resulted in a number of lawsuits on behalf of state employees. In 2014, *Burgos v. State of New Jersey* was filed with the litigants arguing the State failed to meet its contractual obligations under the new pension law. However, the New Jersey Supreme Court found the governor did not have the authority to enact an enforceable, legally binding financial agreement through statute, and the Debt Limitation Clause of the New Jersey Constitution rendered the legislation a statement of

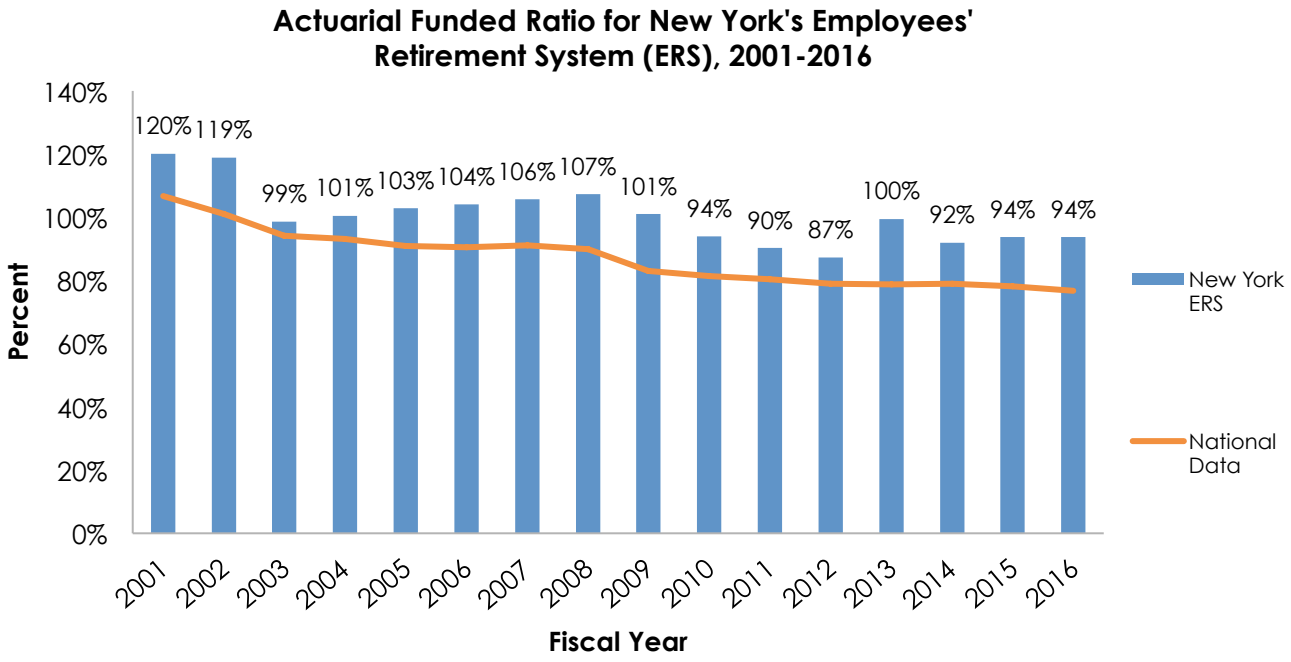
the need to appropriate funds, without the consequence of making that intent a reality.[150]

Likewise, the New Jersey Supreme Court's precedential ruling, *Spina v. Consolidated Police, Etc., Pension Fund Comm'n* (1964), found the legislature may revise pension plans that governmental employees are required to join, and that the terms and conditions of public service are legislative rather than contractual in nature.[151] This arrangement is different than what occurs in states such as Connecticut, where workers have contractual rights to the assets in the pension systems.

New York Employees' Retirement System

Unlike Connecticut and New Jersey, the New York Employees' Retirement System (ERS), which is part of the New York State and Local Retirement System, is one of the best-funded public pension plans in the country.[152] New York's employer contribution is paid jointly by state and local governments.[153] ERS has a high funded ratio and is considered well funded. Nevertheless, the system's funded ratio declined from 106.7 percent in 2001 to a low of 87.2 percent in 2012, but has since rebounded and was 93.8 percent in 2015.[154,155] According to the Urban Institute, the decrease in the funded ratio throughout the early 2000s can largely be attributed to poor market performance.[156]

Figure 5[157,G]



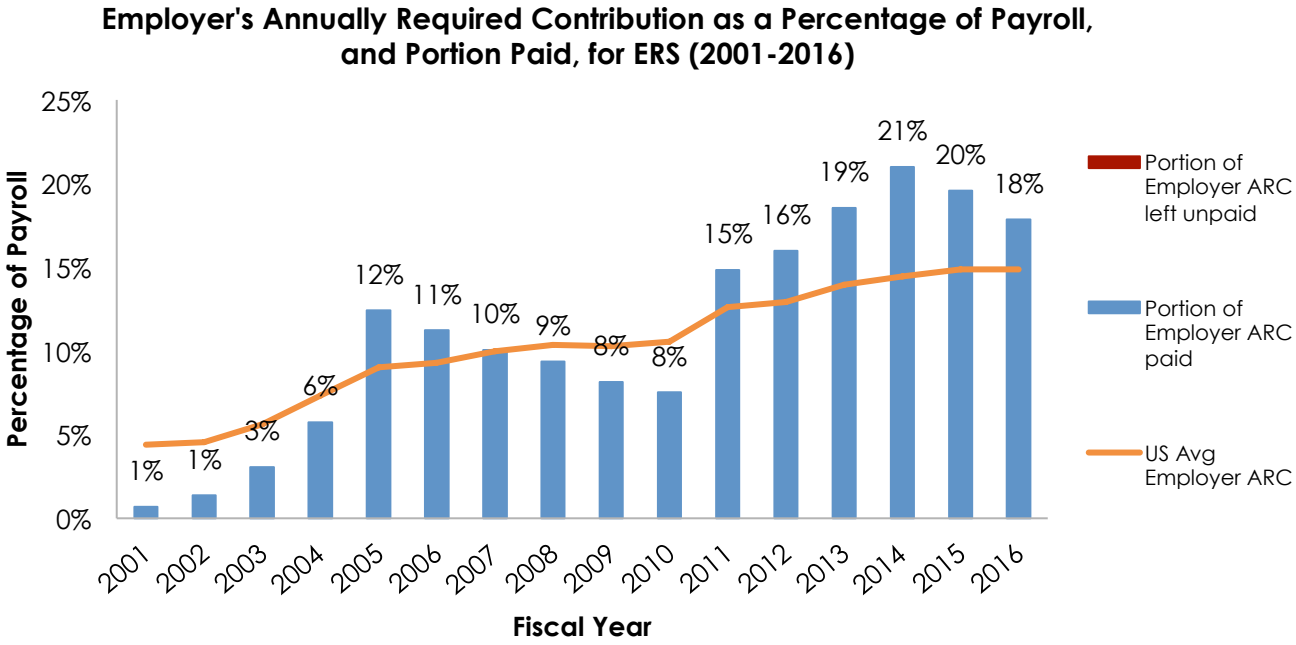
Contributions

New York has been diligent in making its ARC payments, even during times of fiscal constraint. New York's Comprehensive Annual Financial Reports show the State has made its full ARC to ERS every year since 2001.[158,159] New York's ERS contributions mostly come from employer contributions, while the average annual employee contribution was only $1,104 in 2014.[160] Only Oregon, Utah, and Nevada have lower average employee contributions.[161] The government's contribution per employee is third highest in the country with only Connecticut and Alaska having higher contribution rates in 2014.[162] New York has the sixth highest average benefits paid per annuitant, but can

[G] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

afford to offer generous retirement benefits because of its relative wealth and its commitment to making its ARC.

Figure 6[163,H]



Investment Assumptions

New York uses a variable method of calculating its ARC based on realized investment returns of the preceding fiscal year. In this method, income from past investments and appreciation of assets comprise a larger portion of the total required contribution in years where market returns are high, thereby reducing the employer contribution.[164] Employer contribution rates as a percentage of payroll drop in long periods of high market returns. However, the downside of this funding strategy is that when market returns fall short of projections, ARC payments increase — sometimes drastically — leading to a lack of predictability for state and local governments.[165] For example, employer contributions as a percentage of payroll rose from 7.5 percent in 2010 to 14.9 percent in 2011, peaking at 21 percent in 2014.[166] New York's state comptroller sets the assumed rates of return for ERS.[167,168] New York's expected rate of return was 8.75 percent from 1985-1996. From 1997 to 2000 the assumed rate of return was reduced to 8.5 percent.[169] From fiscal year 2001 through 2010, New York's ERS had an assumed rate of return of eight percent.[170] This assumption was revised downward in fiscal year 2011 to 7.5 percent, and again in September 2015 to seven percent.[171] New York's assumed

[H] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

rate of return was consistently lower than both New Jersey's and Connecticut's assumed rates of return for nearly 20 years (until 2015, when Connecticut revised its assumed rate to 6.9 percent).

Amortization Method

New York's ERS uses a mix of amortization practices for various types of debt, but in aggregate, the amortization method is considered to be level percent of payroll.[172] Prior to 2013, the ERS asset valuation method considered the fund's asset allocation as the most relevant characteristic for determining the fund's expected investment income. In 2013, ERS began using a revised asset valuation method, which was intended to reduce volatility in ARC payments. This method uses forward-looking asset class capital market assumptions, as opposed to a less rigorous calculation using general historical returns for equities and fixed incomes. The goal of this methodology is to develop a best estimate range for the investment rate of return over a 30-year period. Multiple groups of 30 simulations provide a range of projected annualized returns over the amortization period.[173] The new valuation method expects a gain for the assumed rate of return on the plan's net position and fiscal year cash flows, and uses a 5-year asset-smoothing period, without a market value corridor.[174]

Benefits Structure

New York's ERS includes COLAs which are automatically determined by a formula calculation set in statute.[175] The COLA in a given year is half of the rate of inflation as published by the U.S. Bureau of Labor Statistics and only applies up to the first $18,000 of an individual's yearly pension.[176] Furthermore, the COLA cannot be less than one percent or greater than three percent.[177] This cap on COLA increases is significantly lower than that of Connecticut's SERS and the pension systems of many other states.

New York implemented an ERIP in 2010 to help the state government withstand the fiscal stress of the Great Recession. However, New York implemented limits on the use of ERIPs, which helped to ensure the program would not cause long-term damage to the financial stability of ERS. These stipulations required that positions targeted for early retirement must either remain eliminated or achieve a minimum cost savings of at least half the targeted employees' salaries.[178] These requirements minimized the long-term cost of the ERIP and serve as an example of the responsible implementation of ERIPs to avoid increasing the UAAL of a pension system.

Mitigation Efforts

The decrease in the funded ratio between 2008 and 2012 was largely due to the financial crisis of 2009, but New York made several reforms to ensure ERS would be able to withstand another market downturn.[179]

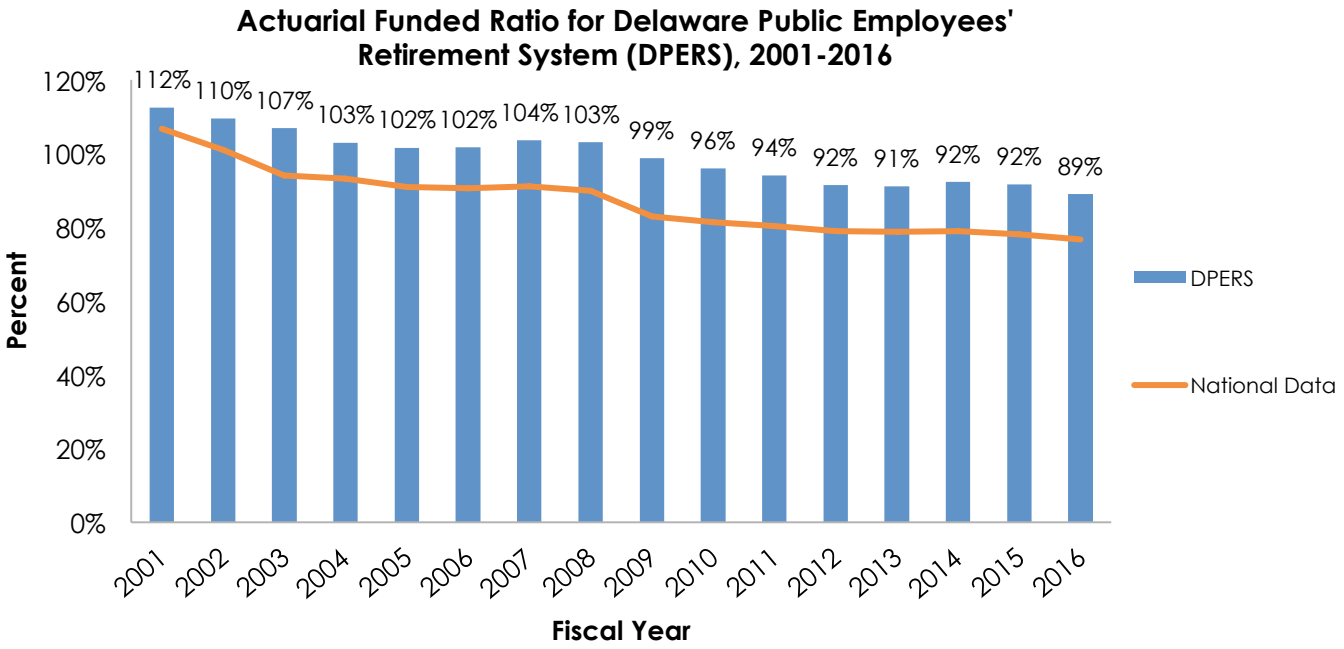
New York moved quickly to make reforms following the sharp increase in liabilities due to underperformance of the market in the early 2000s. The State began allowing local governments to choose to amortize their employer contributions over several years rather than be fulfilled in a single year. However, if this option is selected by local governments, they are obligated to implement a future contribution floor, which remains in place regardless of market returns. This has the effect of reducing the rapid

climbs and falls in contribution rates seen in the 1990s and 2000s by requiring municipalities to make stable contributions, even when experiencing favorable market conditions.[180]

Delaware Public Employees' Retirement System

Delaware's Public Employees' Retirement System (DPERS) has a funded ratio of 89 percent, [181] which is considered a well-funded pension system.[182] The State has met a number of best practices for pension funding, although DPERS is showing signs of stress as evidenced by the funded ratio decreasing from a high of 112.4 percent in 2001 to its current level of funding.[183] In addition, DPERS has seen a steady increase in its ARC payment as a percent of payroll, from 1.6 percent in 2001 to 9.6 percent in 2016.

Figure 7[184,I]

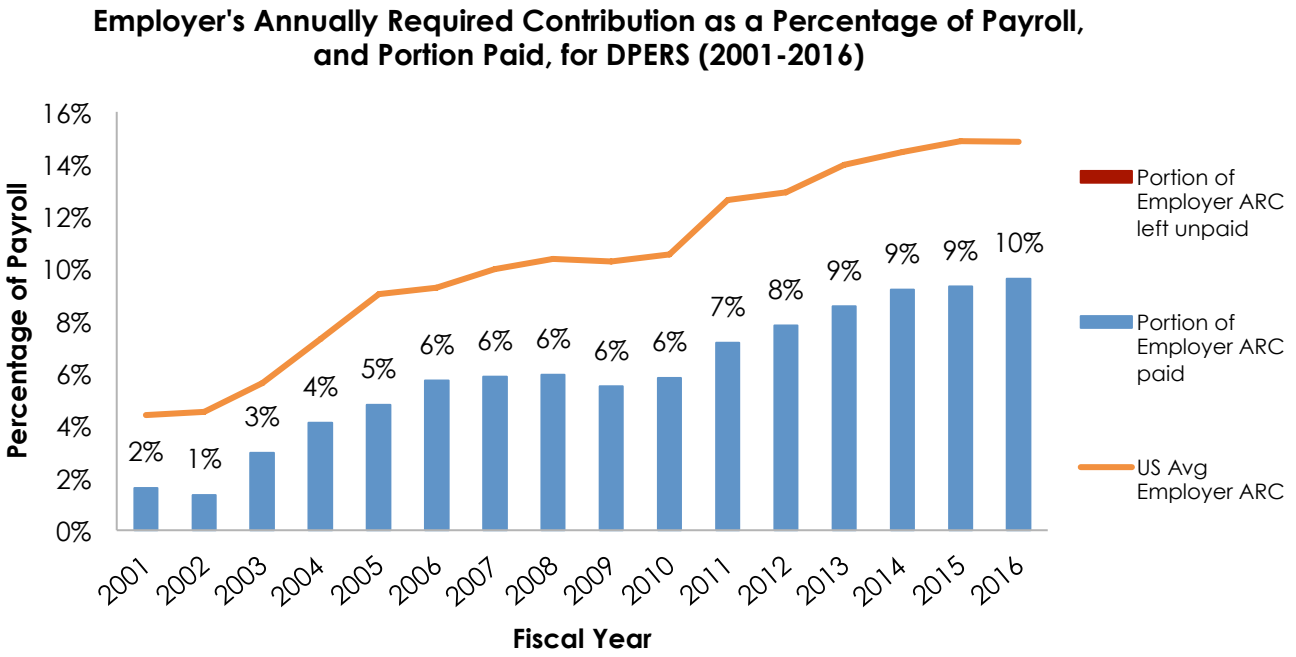


Contributions

Delaware has been consistent in meeting its ARC for DPERS. The State made the full ARC each year since 2001, even in years of fiscal stress, despite the fact that its ARC payments have increased substantially during the same time period.[185] The state government is responsible for 86 percent of the employer contribution,[186] while roughly nine percent of the employer contribution is paid by the University of Delaware, Delaware State University, and the Delaware Department of Transportation. The remaining five percent is paid by a multitude of different charters, offices, and government associations. There is no municipal contribution to the retirement system.[187]

[I] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

Figure 8[188,J]



Investment Assumptions

Delaware's Pension Board of Trustees is responsible for general administration of DPERS, including setting actuarial assumptions such as discount rates.[189] Delaware has regularly revised its expected rate of return since 2001, when it was 8.5 percent.[190] In 2003, the assumed rate of return was revised downward to eight percent. This trend continued in 2011 when the rate was revised to 7.5 percent, and in 2014 when it was lowered again to 7.2 percent.[191] However, DPERS' realized rate of return, annualized from 2006 to 2016, was only 6.3 percent, which shows that revised assumed rates of return have failed to make up the difference between expected rates of return and market experience. However, in the past five years, Delaware's annualized rate of return was higher than average, at 8.3 percent. Because Delaware has consistently made its full ARC payments, the primary cause for the decrease in DPERS funded ratio since 2001 is related to poor investment experience. Delaware's assumed rate of return was lower than New York, New Jersey, and Connecticut until 2015.

Amortization Method

Delaware uses a 20-year level percent of payroll amortization method.[192]

[J] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

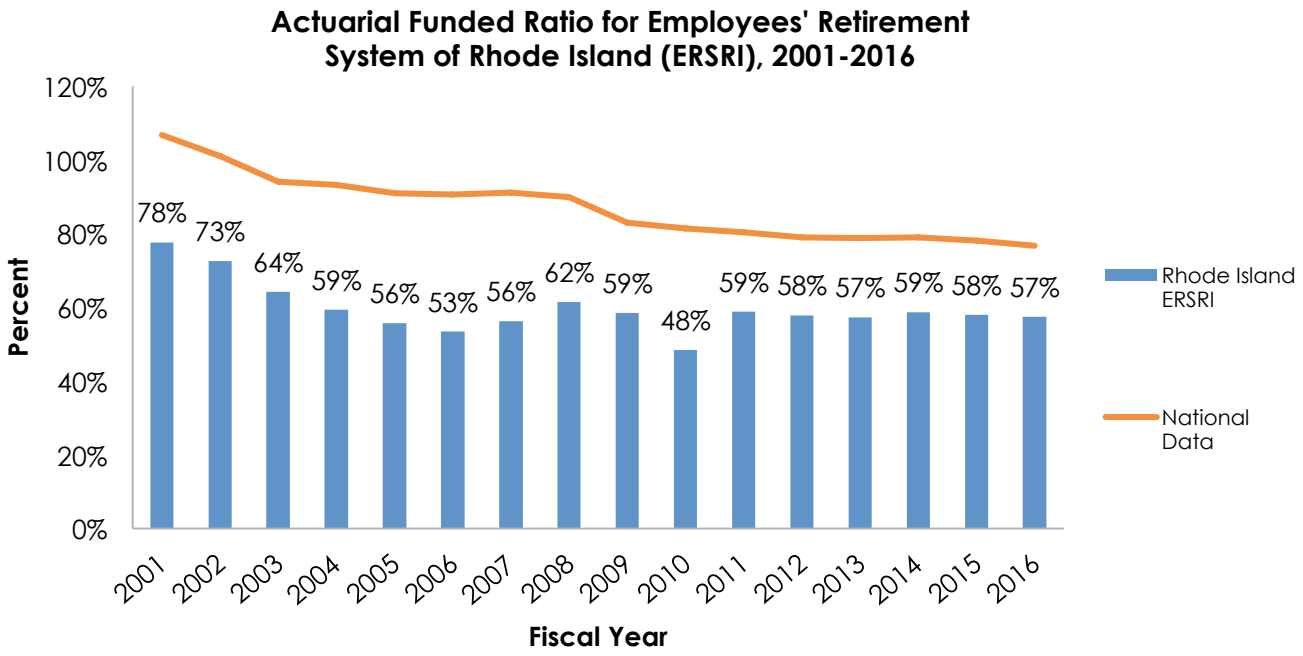
Benefits Structure

DPERS' benefits structure contains COLAs, which it offers only on an ad hoc basis,[193] and are taken up annually by the legislature.[194] The legislature has the power to immediately suspend COLAs because they are not guaranteed by contract or statutory formula. This flexibility allows DPERS to maintain a higher funded ratio during periods of financial stress. Delaware does not have an ERIP for its state workers, although some politicians have advocated for introducing an ERIP as a method to cut down on government spending.[195]

Employees' Retirement System of Rhode Island

The Employees' Retirement System of Rhode Island (ERSRI) is a poorly funded pension plan with a funded ratio of 56 percent in 2016. However, ERSRI was considered well-funded relatively recently, as it had a funded ratio of 81.6 percent in fiscal year 2000.[196,197] However, the funded ratio declined to a low of 48.4 percent in 2010, prompting the State to enact major reforms in 2011 intended to ensure ERSRI became sustainable in the long term.[198] These reforms were contested in court by state employees, and the case was settled in 2015, leading to fewer reforms than were originally enacted by the legislature and governor.[199]

Figure 9[200,K]

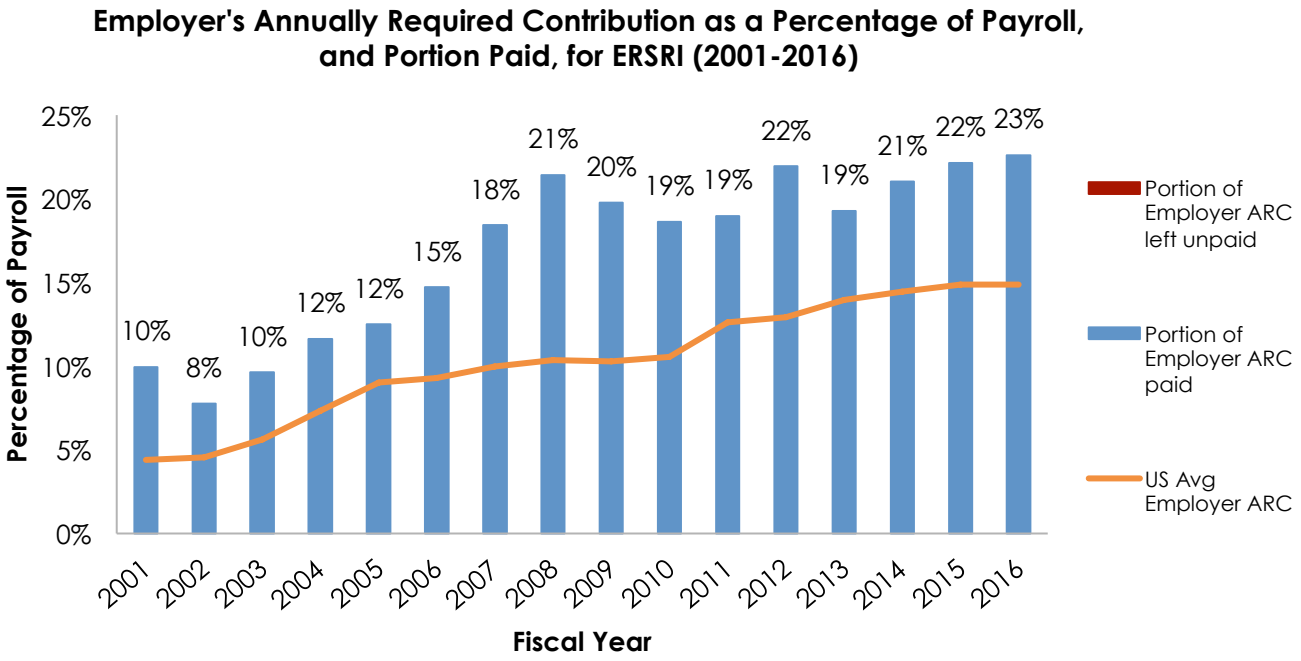


Contributions

From 1936 to 1986, Rhode Island did not pre-fund ERSRI.[201] Although as early as 1974, actuarial analysis indicated that increased investment in ERSRI was necessary, Rhode Island did not begin funding ERSRI on an actuarial basis. From 1986 to 1992, Rhode Island made a portion of its ARCs, but from 1992 to 1994, during a period of fiscal stress, the State ceased contributing to ERSRI again. In addition, when the State began making full ARC payments again in 1995, it began the practice of "marking to market," or increasing the valuation of assets during a period of high investment returns, which depressed the calculated ARC, causing contributions to decrease.[202]

[K] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

Figure 10[203,L]



Investment Assumptions

In Rhode Island, the state treasurer has the power to approve and enact proposed revisions to the expected rate of return as voted on by the Retirement Board.[204] ERSRI had an assumed rate of return of 8.25 percent until 2011.[205] In contrast, Rhode Island's average realized rate of return from 2001 to 2010 was only 2.8 percent, which was below the national average and well below the applied actuarial assumptions. In 2012, the assumed rate of return was revised downward to 7.5 percent, which resulted in an increase to the calculated UAAL.[206] It is important to note that, in this case, the increased UAAL did not indicate that ERSRI's pension health worsened, but rather the new UAAL calculation better represented the actual liabilities of ERSRI. Even so, in 2011, actuarial analysis predicted a 42 percent likelihood of ERSRI realizing a 7.5 percent rate of return in 2012.[207] In addition, after 2009, ERSRI again began the practice of asset smoothing, which extended the number of years the Great Recession impacted UAAL growth.[208]

Amortization Method

In 1999, the Rhode Island General Assembly extended the existing amortization period to 30 years, which further reduced ARC payments and increased the system's UAAL by extending debt payments further into the future.[209] This amortization table used a level

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[L] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

percent of payroll amortization method, which often results in lower ARC payments in the early years of amortization and increased UAAL toward the end of the amortization period.[210]

Benefits Structure

From the 1960s to the 1980s, pension benefits were increased for state employees and teachers, before Rhode Island began pre-funding its pensions. For example, in 1960, full retirement was after 38 years of service, but from 1970-1990 full retirement was reached after only 28 years of service, no matter the age of the retiree. This benefit structure allowed for annuitants to draw from the pension system for decades, despite the fact the State had not contributed to its future liabilities in ERSRI until 1986. In addition, prior to 2011, ERSRI operated as a defined-benefit plan with annual COLAs and employees at the Schedule A level of benefits receiving a guaranteed three percent compounded COLA each year.[211]

Mitigation Efforts

In 2011, Central Falls, a small city in Rhode Island, filed for bankruptcy, which destabilized the state's economy[212] and made pension reforms more politically palatable.[213] In 2011, Rhode Island enacted a large package of reforms to ERSRI called the Rhode Island Retirement Security Act (RIRSA), which was proposed by then-governor Lincoln Chafee and then-treasurer Gina Raimondo. RIRSA transitioned ERSRI into a hybrid plan, which was part defined benefit and part defined contribution. Of the 8.75 percent employee contribution, 3.75 percent would go toward a defined contribution, fully vested after five years. The defined contribution portion of the benefit is portable, meaning the employee can take the funds to a new retirement account if they move of Rhode Island or leave state service. The State would contribute one percent to this account. The other portion of the employee contribution would go to a defined benefit plan. In addition, COLAs were suspended until the funded ratio once again rose to 80 percent, and the retirement age was raised for all employees. RIRSA also increased the amortization period, again to a 30-year period, in order to smooth the sharp increase in amortized UAAL that the State was responsible.

After the Rhode Island General Assembly passed RIRSA, public employees challenged the law in a number of suits, which were consolidated into a class-action complaint.[214] A settlement was reached with most of these groups in 2015, which resulted in a more generous benefits package than was in the original statute. The settlement agreement was ratified by the General Assembly as a part of the fiscal year 2016 state budget.[215] Employees who retired under a COLA-eligible plan were granted a one-time COLA of two percent, to be added to their base benefit. Stipends were granted to annuitants that retired after the date of the settlement agreement. Plan participants whose benefits were less than 80 percent funded became eligible for a COLA every four years, until the plan reaches a funded ratio of 80 percent. Employees with greater than 20 years of service only paid two percent toward their defined benefit plan, and were not required to participate in the defined contribution portion of the new, hybrid system. Employer contribution rates to the defined contribution plan were increased to 1.5 percent for employees with 15 to 20 years of service and 1.25 percent for employees with 10 to 15 years of service. The settlement also included an ERIP that allowed

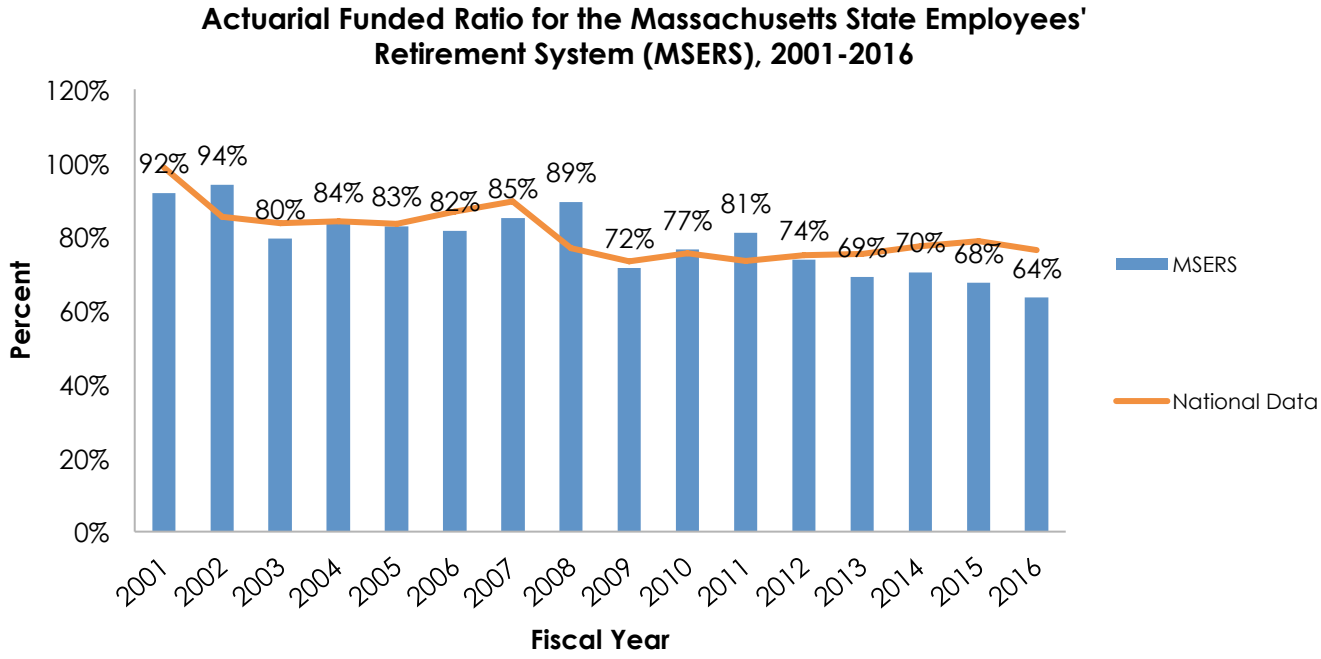
employees with 20 or more years of service to retire within five years, even if they have not reached the increased retirement age. However, taking this option resulted in a reduction in the benefit rate of between seven and nine percent.[216]

Rhode Island is an interesting case study, because it underwent some of the most dramatic pension reforms of any state since the Great Recession. However, the Rhode Island General Assembly was able to make these changes by enacting a statute, because employee benefits in the state pension system are not guaranteed under contract.[217] Even so, the affected public sector unions successfully litigated to the point the State conceded to a settlement agreement. Thus, it is debatable whether the process Rhode Island went through to enact reforms is preferable to a collective bargaining process without legislative or court intervention.

Massachusetts State Employees' Retirement System

The Massachusetts State Employees' Retirement System (MSERS) had a funded ratio of 63.5 percent in 2016, which is considered a poorly-funded pension system. MSERS' funded ratio has declined from a high of 94 percent in 2002. In addition, MSERS' funded ratio has declined each year since 2012, when its funded ratio was 73.4 percent.[218] MSERS' UAAL has also quintupled since 1990, from $7.5 billion to $38.3 billion in 2016.[219]

Figure 11[220,M]

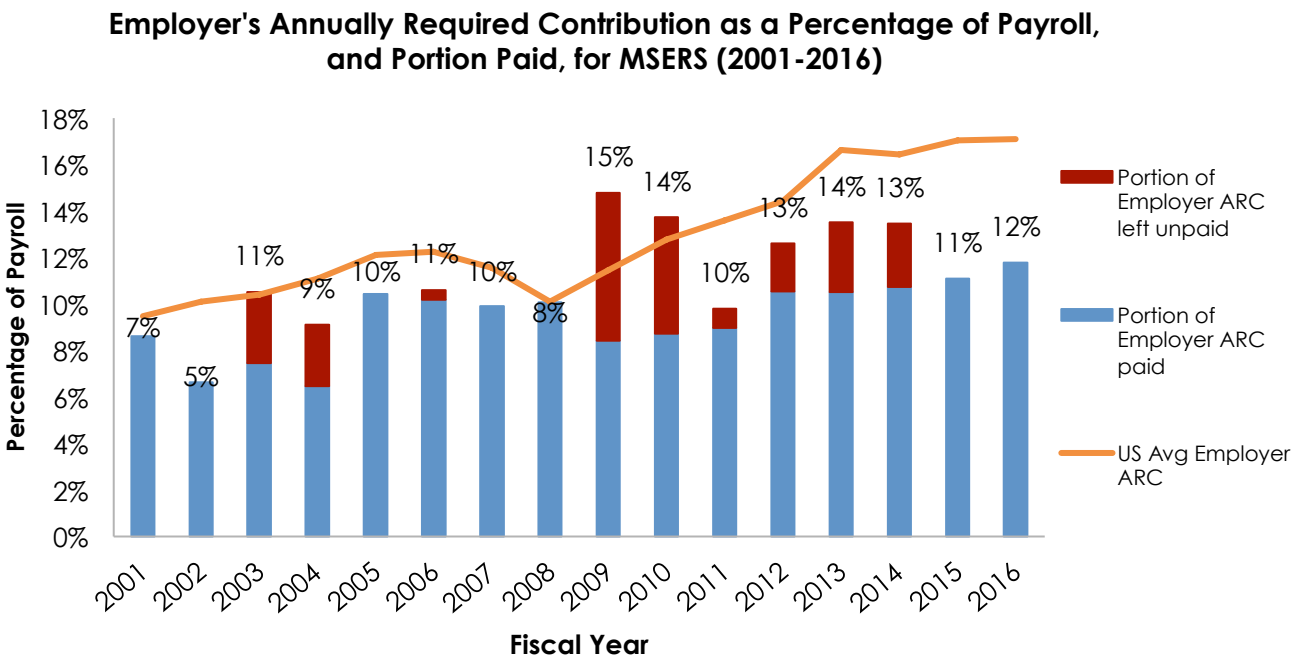


Contributions

In Massachusetts, the employer contribution for MSERS comes entirely from state sources, but there are a number of state-administered pension plans to which local governments make employer contributions.[221] Employee contribution rates currently range from five percent to 12 percent of an employee's salary.[222] However, as employee contribution rates increased in more recently created benefit tiers, the State lowered its ARC payment accordingly and did not use the increased employee contribution to improve the health of the pension system.[223] In addition, public sector workers in Massachusetts are not eligible for Social Security, which justifies a higher employee contribution[224] but limits retirees' access to more diversified retirement income.

[M] National Data reflects the average for plans of similar type and Social Security coverage. National Data averages are weighted by plan size.

Figure 12[225,N]



The Massachusetts pension system is the oldest in the country, and has been operating since 1911.[226] Until 1988, Massachusetts did not pre-fund its retirement system, which resulted in significant legacy costs the State is still making payments on today.[227] Massachusetts only made its full ARC payments three times from 2004 to 2013. After the Great Recession in 2009, Massachusetts made between 57 and 92 percent of its ARC each year, until 2015 when the State began making 100 percent of its ARC. However, occasionally the State contributed more than its ARC. In 2005, 2007, and 2008 the State made more than 100 percent of its calculated ARC in an effort to offset years when the State made contributions lower than the ARC.[228] The inconsistency in meeting the ARC contributed to the decrease of MSERS' funded ratio.[229]

Investment Assumptions

In Massachusetts, actuarial assumptions are set by the Massachusetts State Retirement Board, as advised by the Pension Reserves Investment Management Board, [230] which is responsible for managing the state's pension assets.[231] The assumed rate of return for MSERS was set at 8.25 percent from 2001 until lowered to eight percent in fiscal year 2013. Since 2009, MSERS has applied a number of new actuarial assumptions that have had the effect of decreasing the system's funded ratio. However, this does not reflect

[N] The employer's ARC as a percent of payroll is calculated by dividing the dollar amount reported in the schedule of employer contributions by the covered payroll reported in the schedule of funding. The U.S. average employer data reflects the average for plans of similar type and Social Security coverage to the plan presented on this page. National data averages are weighted by plan size.

declining pension health, but rather a more realistic estimation of the assets and liabilities in the system. These modified assumptions include three adjustments of assumed rates of return and multiple adjustments to the mortality assumption, ending in the current use of a fully generational mortality assumption. Assumed rates of return were adjusted downward to 7.75 percent in 2015 and 7.5 percent in 2016.[232] The current assumed rate of return is a long-term assumption based on capital market expectations by asset class, historical returns, and professional judgement.[233,234] However, the annualized 10-year return for MSERS was only 5.7 percent from 2007 to 2016, and the 5-year average rate of return was 7.1 percent — both are lower than the national averages for the same time period.[235]

MSERS applies the practice of asset smoothing to determine its ARC payments and realized rates of return over time,[236] but the actuarial value of assets is not allowed to be less than 90 percent or greater than 110 percent of market value year to year.[237] This has caused some volatility in calculated ARCs from year to year.

Amortization Method

Massachusetts did not adopt an amortization method until 1987, when it adopted a 40-year amortization table.[238] MSERS currently uses a 20-year level dollar amortization table. The ARC payment for fiscal year 2017 was $2.39 billion, and under the amortization table, this payment will increase 8.94 percent each year until fiscal year 2036.[239]

Benefits Structure

MSERS members effective prior to 2012 are fully vested after 10 years of service and have a minimum retirement age of 55. Members who joined the plan after 2012 must have 10 years of service and be 60 years old before they can draw benefits from the system. The maximum retirement allowance for members effective prior to 2012 is 80 percent of a member's highest 3-year average annual rate of regular compensation. For members hired after 2012, the maximum retirement allowance is based on a 5-year salary average.[240] A COLA is determined based upon the Consumer Price Index used for Social Security benefits but cannot exceed three percent on the first $13,000 of a retiree's benefit.[241]

Massachusetts approved an ERIP in 2002 to reduce the size of its workforce and create short-term savings, which allowed employees to add five years of creditable service, age, or a combination of both to reach retirement eligibility. However, Massachusetts did not implement hiring controls, and instead restored the eliminated positions when its economy began to recover.[242] This had the effect of increasing the overall liabilities of MSERS. The resulting effect of ERIPs in MSERS was an increase in the pension liability by tens of millions of dollars.[243] In 2014, the Massachusetts General Assembly authorized an ERIP for certain employees of the Massachusetts Department of Transportation due to the elimination of manned tollbooths. The increase in system's UAAL, due to the 2014 ERIP, was approximately $9.9 million.[244]

Mitigation Efforts

In 2011, the Massachusetts General Assembly passed *An Act Providing for Pension Reform and Benefit Modernization*, which contained a number of reforms to the

Massachusetts pension system. These reforms included updates to the governance and oversight of retirement boards, investment regulation, procurement reform and enforcement, as well as reductions to member benefits, which were intended to increase the long-term financial stability of the pension system.[245] Reforms were also included that imposed limits on contracts made by the Retirement Board with vendors.[246] The Act did not include language regarding employer contributions, ARC payments, or actuarial assumptions. However, it did require the secretary of the Executive Office for Administration and Finance to commission a comprehensive, independent analysis of the costs and benefits of further structural changes.[247]

Benefits changes included: amending the definition of regular compensation to exclude certain types of earnings, requiring retirees in groups two and four to have worked for at least 12 months immediately preceding retirement, requiring members who reenter state service to make a "make-up" contribution to the system, increasing the minimum retirement age from 55 to 60 years old, changing the rate of compensation used to calculate benefit allowance, creating new age factors in order to receive the maximum allowable benefit, and a number of smaller changes to certain classes of employees. The statute also contained "anti-spiking" measures, which are intended to stop the practice of manipulating salary amounts during the years of service that are used to calculate the member's benefit amount. Anti-spiking measures in the act include that compensation increases of more than 100 percent in any two consecutive years of the five years of service used to calculate a retiree's benefit allowance are eliminated from the calculation. In addition, the average rate of regular compensation is not to include any amounts in excess of 10 percent of the rate in the two preceding years, unless these pay increases are included in a salary schedule agreed upon in a collective bargaining agreement. Members who re-enter service after 2012, and were formerly members of a previous benefit class, must take a pro-rated benefit and join the benefit class associated with their most recent service.[248] Benefits were also extended to the spouses of members in same-sex marriages.[249]

Summary Table

Pension System	Funded Ratio, 2016[250]	Number of Years Full ARC Made Since 2001[251]	Assumed Rate of Return, 2016[252]	Amortization Type	Last Year COLAs Were Offered	Last Year ERIPs Were Offered
Connecticut State Employees Retirement System	35.5%	7	6.9%	Level dollar[253]	2017[254]	2009[255]
New Jersey Public Employees' Retirement System	57.2%	0	7.65%	Level dollar[256]	2011	2016
New York Employees' Retirement System	93.8%	16	7.5%	Level percent of payroll[257]	2017[258]	2010[259]
Delaware Public Employees' Retirement System	89%	16	7.2%	Level percent of payroll[260]	2015[261]	1991[262]
Employees' Retirement System of Rhode Island	57.4%	16	7.5%	Level percent of payroll[263]	2015[O]	2017[264]
Massachusetts State Employees' Retirement System	63.5%	7	7.5%	Level dollar[265]	2017[266]	2014[267]

[O] 2015 is the last available Annual Financial Report for the Employees' Retirement System of Rhode Island.

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