

**ARE ILLINOIS STATE AND LOCAL GOVERNMENTS
CONTRIBUTING ENOUGH TO THEIR PENSION PLANS TO PAY
DOWN THEIR DEBT?**

**WHITE PAPER 2020-01
JANUARY 2020**



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SUMMARY

In this paper, we examine various methods of determining how much Illinois state and local governments must contribute to their pension plans to pay off their unfunded liabilities. Unfunded liabilities are equivalent to a debt that should be paid down over time. Using a measure of required contributions that emphasizes a level payment over time, we find that current contributions are insufficient to pay off their unfunded liability debt in the timeframe that Illinois law requires. If Illinois' governments are to eliminate such liabilities, then payments will have to rise dramatically over time.

BACKGROUND

When are governments contributing enough to their employee pension plans contributing to ensure its sustainability over time?¹ This question has vexed public pension plan sponsors (state and local governments over the last several decades. Plagued by volatile investment returns, increasing benefit costs due to increased retiree longevity, and buffeted by economic and fiscal challenges, plan sponsors became increasingly unwilling or unable to pay contributions that actuaries working for the plans had suggested being paid. The result of these forces was an inevitable shortfall in contributions compared to estimated future benefits. The funded ratio of public pension plans has declined steadily since the early 2000s (Aubry, Crawford, and Wandrei, 2018).

During this period, a growing awareness developed of the sustainability challenges facing public pension plans. Plans and jurisdictions began to modify their strategies in order to reduce unfunded liabilities. Some plans created "tiers" of pension benefits in order to reduce the burden of benefits payments. Newer workers in a jurisdiction were enrolled in a plan tier that promised lower benefits relative to contributions. The excess contributions of the new tier go to pay for fund benefits promised to workers in earlier pension tiers. Some jurisdictions also changed the way which actuaries calculated required employer pension contributions to pay off unfunded liabilities. This white paper explores the implications of alternative calculations of required employer payments and shows some of the implications for Illinois.

CALCULATING THE PENSION FUNDING LEVEL

The jargon of public pension funding can be impenetrable, but a full understanding of the issue requires us to use a bit of this jargon. To start the discussion, we note that calculating the financial position of a

¹ We note at the start that there is not a firm definition of "sustainable" when applied to public pension plans. A 100% funded ratio as defined below is one goal. In past years, an 80% funded ratio was considered "adequate" but that guidance has been questioned. Other research indicates that sustainability (as defined by having stable and affordable employer contribution rates) is not guaranteed even if a plan has relatively good funding ratios (Boyd and Yin, 2016). However, other research (Lenney, Lutz, and Sheiner, 2019; Bruno, Kass, and Merriman, 2019) has suggested that a goal of paying off all unfunded liabilities and achieving a 100% funded ratio is not sound. Instead, they favor viewing pension system unfunded liability debt as only one type of debt and focusing on the ability to make annual pension payments using a variety of funding mechanisms. We take no position on this point and instead note the Illinois statutory requirements for paying down pension debt over time.

pension plan requires the forecast of many uncertain variables such as the number of retirees and workers in a given year, how many workers employed in a given year will retire, and how many retirees will pass away.

The challenge of calculating this flow of workers and the financial obligations created by retirees falls to actuaries. Actuaries are professionals trained in calculating the percentages of workers migrating from one stage of their work and retirement history at given points in time. They calculate for each year in the future the number of current workers and retirees that will be in the system. They then calculate the dollar value of payments that will be owed to retirees. Finally, they apply formulas to equate those future payments to a current value. That value is called the *actuarial accrued liabilities (AAL)* of the plan (Box 1 contains technical definitions of this and other italicized terms). They also calculate the current dollar value of projected future contributions. This added to the value of investments that the plan currently holds forms the resources available to make the current and future payments to retirees. This is called the *actuarial value of assets (AVA)*. The difference between the AAL and AVA is called the *unfunded actuarial accrued liability (UAAL)*.² There has been much discussion in the academic and professional literature regarding the assumptions made in calculating these values, but for now we assume that the values calculated for Illinois plans are done correctly.

CALCULATING REQUIRED CONTRIBUTIONS

Once actuaries determine the AAL, AVA, and UAAL, the last step is to calculate an amount that employees and their employers will have to contribute to the plan in future years to pay future benefits as well as pay off the UAAL. This contribution amount is vital in determining the funding status of the plan. Even relatively small shortfalls in contributions will allow the UAAL to grow over time. And once again, the assumptions about what this contribution rate should be are very important. This is what we will be examining for Illinois plans.

In order to motivate this discussion, let's use an example from personal finance. Let's say that you need to take out a loan. There are a couple of ways that the loan can be repaid. Most likely, the loan would be *fully amortized*. This means that you would pay an equal amount each period (typically a month) that includes interest on the amount you owe and a portion of the principal amount that you borrowed. In this loan structure most of your initial payments go to interest. The amount that goes toward paying off the principal starts small but increases over time. You continue to pay a fixed amount, but the principal amount increases over time until the loan is paid off. Another type of loan structure is called a *balloon payment* loan. Loans with balloon payments start off with low payments that goes mostly toward interest, just like an amortized loan. Over time the payments on a loan with a balloon payment either remain the same or go up slightly. The reason is that you are mainly paying interest throughout most of the life of the loan. Then at the very end of the loan the payments go up dramatically as you pay off the principal.

² More commonly, pension funds are assessed by their "funded ratio". This is the ratio of AVA to AAL. So a 100% funded plan would have AVA = AAL and a UAAL of 0. A 90% funded plan would have AVA = 0.9*AAL.

Now to return to pension funds, we first note that the UAAL is essentially a debt that is owed to the pension plan to pay future benefits. For decades, public pension funds have been allowed to treat that debt like a loan with balloon payment. This is because of what is known as the *level percentage of payroll* assumption. When actuaries have calculated the UAAL, they and plan trustees have then amortized it over a period of time and tried to set the annual required payments to pay it off to be a level percentage of payroll expenses.³ They have also assumed that payrolls will increase in the future. What results is a set of future payments that starts out low and increases dramatically over time, like a balloon payment loan. If the timeframe is long enough into the future (and in the worst case if plans have an “open amortization” period so the date when the UAAL will be paid off always shifts forward in time) then the current payment to amortize the debt will not be enough and will increase over time by necessity. By contrast, if a *level dollar* payment was used, the payments would resemble a fully amortized loan and be constant over time.⁴

Based in part on this problem, the pension funding experts at the Pew Charitable Trusts Public Sector Retirement Systems have developed a measure known as “*net amortization*”. Net amortization measures the contribution required to actually pay down a plan’s unfunded liabilities if assumptions for calculating the plan’s funding level are met. The net amortization measure includes the amount due for a plan’s *normal cost* (the amount necessary to pay benefits accrued during the next year) and an interest payment on the unfunded liabilities calculated as a level dollar payment using the plan’s assumed rate of return. This amount would be the contribution amount required for the plan to pay down its unfunded liabilities over time (Pew Charitable Trusts, 2019). The Pew measure indicates whether a plan was able to pay down any debt in a year. We amend the measure to require the plan to pay down 90% of their debt by the dates indicated in state statutes, in other words to pay off an equal amount of the debt over time. In the remainder of the paper, we compare the amounts contributed by plans in the state of Illinois to those required by actuaries and by state law and to the modified net amortization measure to produce a picture of whether and by how much plans are paying down their debts.

³ The reason for this assumption is somewhat quixotic. The use of it implies that the goal is to hold payments to a certain percentage of employee compensation. But most public sector employees pay a much smaller percentage of pension contributions than do employers (and therefore taxpayers).

⁴ For some Illinois plans, this problem of using the level percentage of payroll option is compounded by another assumption, the use of the *Projected Unit Credit* cost allocation method. This method essentially projects the benefits that will be earned by an employee into the future in order to calculate the normal cost of the plan (the amount of benefits earned in the next year) and the accrued liability (essentially the portion that has already been earned). If the plan is using unrealistic salary increase assumptions, then the plan’s normal cost will be understated compared to a method that uses a level dollar payment such as the *Entry Age Normal* cost allocation method. Our methodology takes the plan’s stated normal cost as one part of the required contribution, therefore our results may understate the amount of underfunding taking place.

The following terms are important in discussing pension funding and contributions (adapted from Randazzo, 2016 and Civic Federation, 2007):

- **Actuarial Accrued Liabilities (AAL):** Also known as the past service liability, it is the present value of projected future benefits based on a workers' service to date
- **Actuarial Value of Assets (AVA):** The value of a plan's total assets (investments and cash balances) that accounts for investment gains and losses on a smoothed basis
- **Unfunded Actuarial Accrued Liability (UAAL):** The amount of liabilities (or promised benefits) that are greater than assets of a pension plan. Calculated as the AAL less the AVA.
- **Balloon Payment Loan:** When a borrower will make payments throughout the lifecycle of borrowing that, once completed, will only pay off a portion of principal and interest due on the loan. The remaining amount will have to be paid off as a lump-sum payment.
- **Fully Amortized Loan:** When a borrower will make payments throughout the lifecycle of borrowing that, once completed, will have completely paid back all principal and interest on the loan.
- **Level Percent of Payroll Assumption:** A method of accounting for plan costs where unfunded liabilities can be amortized such that the plan expects to pay the same percentage of payroll each year of the schedule.
- **Level Dollar Assumption:** A method of accounting for plan costs where unfunded liabilities can be amortized such that the plan expects to pay the same dollar amount each year of the schedule.
- **Net Amortization:** A method of calculating a required payment for a pension plan that incorporates a level dollar assumption and produces a payment similar to a fully amortized loan.
- **Normal Cost:** The amount of unfunded liabilities that are determined by actuaries to be attributed to the next year of service.
- **Projected Unit Credit Cost Method:** A method of allocating pension benefit cost that allocates the present value of benefits for each individual attributable to service to date, using future compensation projected to retirement.
- **Entry Age Normal Cost Method:** A method of allocating pension benefit cost that allocates the present value of benefits for each individual on a level basis over the earnings of that member from the age of entry into the plan to the expected age at retirement.

Box 1. Definitions of Pension and Finance Terms Used in the Paper.

EXAMPLE – STATE EMPLOYEES RETIREMENT SYSTEM

Like most states, Illinois has been using a level percentage of payroll amortization assumption for all state plans as well as downstate police and fire plans. The assumption was incorporated into all major pension legislation of the past decades. We can see the implications of the assumption by looking at the fiscal year 2018 actuarial valuation report for the Illinois State Employees Retirement System (SERS). The plan's actuary had determined that the UAAL as of the end of fiscal year 2018 was \$30.4 billion. They further determined the contribution required to amortize the UAAL over a 20-year period would be \$2.2 billion (the 20-year amortization period was set to conform to guidance set forth in Governmental Accounting Standards Board Statements 67 & 68). By contrast, we calculate that the amount that would fully pay off the UAAL over 22 years under a level dollar payment is \$2.9 billion. So, using the level percentage of payroll method results in a contribution which is 23 percent below what would be necessary to fully pay off the UAAL in 20 years.⁵

Why is the contribution rate so low? Again, the funding policy implicitly assumes that the contributions will rise over time. Figure 1 shows this effect. The contribution required to pay off the UAAL under existing policy grows steadily over time, at an annual average growth rate of 3.6%. The net amortization required contribution remains the same over time, as its name suggests. Therefore, what the taxpayers of the state are buying into is a steadily increasing contribution level.⁶

The state of Illinois exacerbated this problem in two ways during the 1990s by passing a plan to make the plan 90% funded by 2045. First, they dropped the goal of plans being fully funded.⁷ Second, they set the period for the goal 50 years into the future, likely with the goal of reducing initial contributions. This sets up what is known informally as the "Edgar ramp" to adequate funding, as the chart of the required contributions "ramped up" over time. With these funding policies in place, the statutory minimum contribution for SERS detailed in the FY 2018 valuation that goes to paying off the UAAL is only \$1.66 billion, over 40% less than a fully amortized payment.

⁵ All calculations are available from the author. There are other assumptions that go into these calculations. Most importantly we assume that the plan achieves a rate of return on its assets and worker/retiree projections that match the assumptions that underlie the assumptions that went into calculating the UAAL. In all cases we accept the plan actuary's assumptions except for the level percentage of payroll assumption. Further, using the plan's assumptions the net amortization payment would require a payment of 9.44% of the unfunded liability each year for the next 20 years.

⁶ It's worth noting that once the UAAL is paid off, the required amount will drop to zero in either case.

⁷ The 90% desired funding level is again curious. Most pension experts agree that plans that are even 100% funded face risks in terms of future funding. To set an artificially low goal is not helpful in making plans solvent over the long-term.

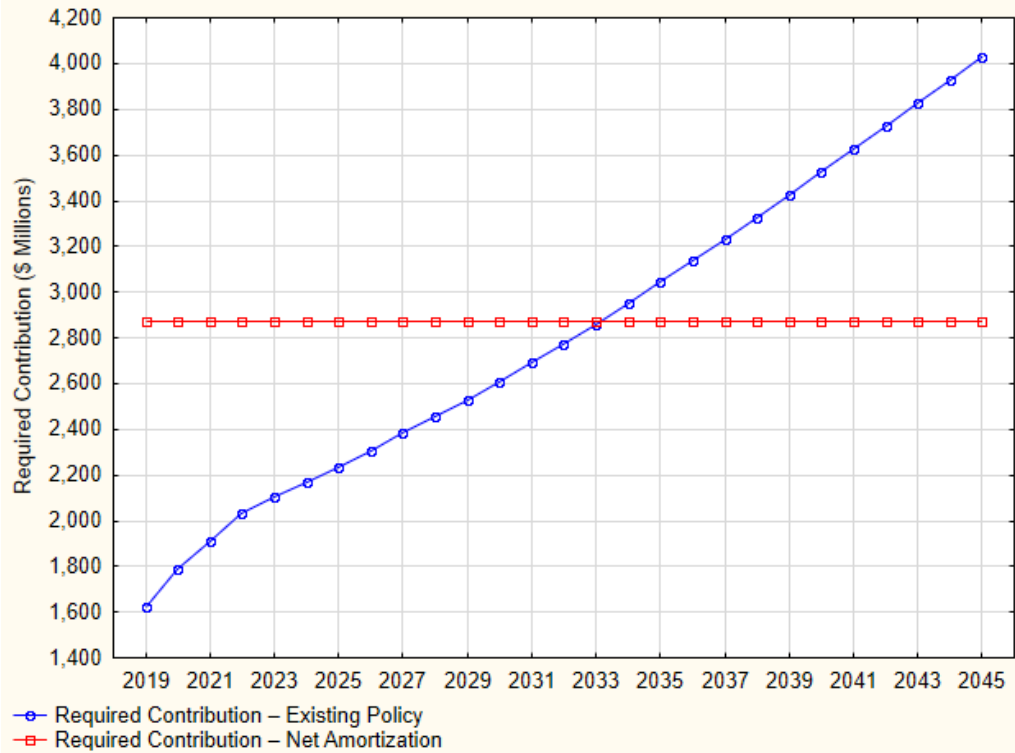


Figure 1. Required Contributions under Existing Policy and Net Amortization Measures, SERS.

CALCULATIONS FOR STATE PLANS

Using data for each state plan, we calculated the shortfall in contributions for FY 2018 (Table 1). We used the same assumptions as our earlier calculations, namely we accepted all the plan actuary’s assumptions and then compare it to the net amortization measure. The results are striking. No state plan contributes more than 70% of what would be required to fully pay off the UAAL by the date established under their own funding policy. The result is most dire for the Teachers Retirement System (TRS), the largest plan. This is because they have an effective 15-year amortization period, as they intend to pay off their UAAL by 2035. Their required contributions must rise dramatically as that date approaches. The funding policies for the two smallest plans, the Judges Retirement System (JRS) and the General Assembly Retirement System (GARS) provide contributions which are the highest compared to the net amortization amount, followed by the State Universities Retirement System (SURS).

MEASURE	SERS	SURS	TRS	JRS	GARS
EXISTING POLICY	\$1,658,445,104	\$1,404,789,000	\$3,646,363,942	\$106,149,175	\$23,247,077
ACTUARIALLY DETERMINED	\$2,201,556,560	\$1,940,253,000	\$6,711,456,955	\$135,693,550	\$31,903,887
NET AMORTIZATION	\$2,874,032,686	\$2,173,582,445	\$8,240,062,810	\$158,205,326	\$34,382,737
EXISTING POLICY/ NET AMORTIZATION	57.70%	64.63%	44.25%	67.10%	67.61%
ACTUARIALLY DETERMINED/ NET AMORTIZATION	76.60%	89.27%	81.45%	85.77%	92.79%

Table 1. Required Contributions under Various Measures, Illinois State Plans, FY 2018.

CALCULATIONS FOR DOWNSTATE POLICE AND FIRE PLANS

We also calculated contribution adequacy for downstate police and fire plans using detailed plan data from the Illinois Department of Insurance, Public Pensions (Illinois Department of Insurance, 2015 & 2017). Given the large number of plans (full data was not available on all plans, we have a final sample size of 275 fire and 349 police plans), we were unable to obtain actuarial valuations from each plan. Therefore, we used the data reported in the database on actuarially determined contributions. We also did not have data on assumed rates of return (which is a necessary assumption in calculating net amortization), so we used a conservative assumed rate of return of 6.0%. Finally, we used the same payoff period and level set forth in 40 ILCS 5/3-125 and 40 ILCS 5/4-118, namely that plans should be 90% funded by the end of fiscal year 2040.

Since there are so many plans, we present the results for fiscal year 2017 as a chart versus a table (Figure 2). The figure is a “boxplot”, indicating the distribution of contributions as percentages of the required contributions under each policy. The box in the middle of each plot indicates the range where 50 percent of all plans’ contributions fall. So, for the box on the left indicating existing policy, 50 percent of downstate plans contributed between 90 percent and 122 percent of what they should have using existing policies. The asterisk in the middle of the box indicates the median, just over 104 percent. This figure suggests that the “typical” plan was able to contribute enough to pay off 90 percent of their unfunded liability by 2040 under existing funding policies (61 percent of plans contributed their full required contribution). But when we instead calculate the required amount under a net amortization measure, the median value falls to 78 percent, indicating that the typical plan was not contributing enough to pay off 90 percent of their debt by 2040 (only 16 percent of plans contributed the entire amount required under the net amortization measure).

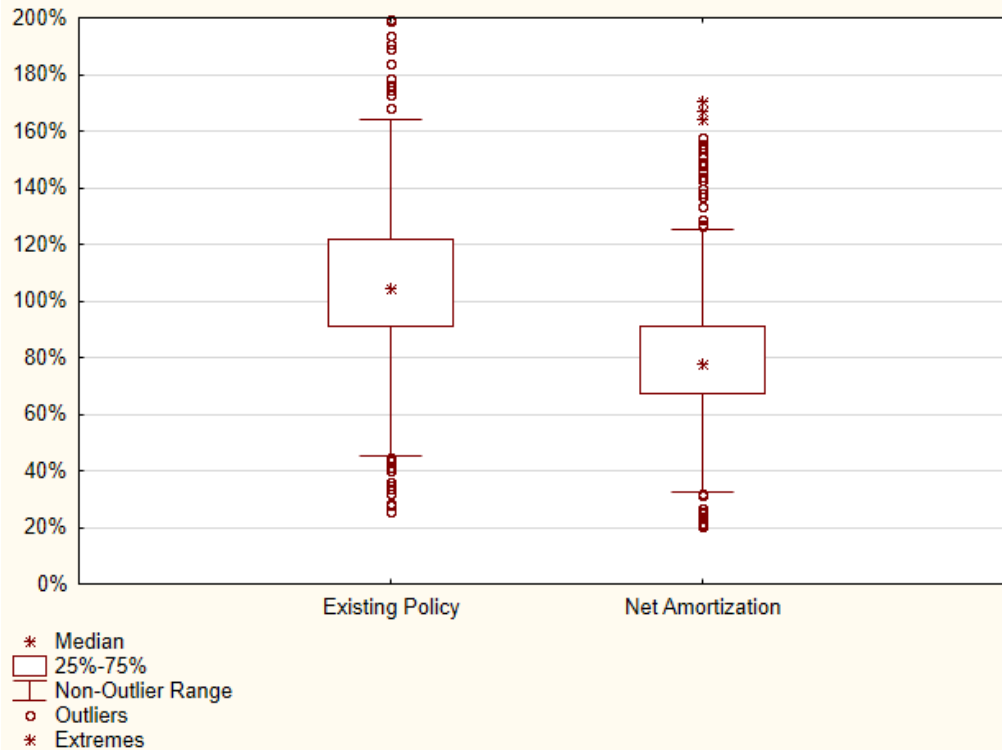


Figure 2. Contributions as % of Required Contribution, Existing Policy and Net Amortization Measures, FY 2017.

CONCLUSIONS

The title of this paper asks an important question, whether Illinois governments are contributing enough to their pension plans in order to keep them sustainable over the long-term, as defined in state law. The answer is somewhat nuanced. **If** one can assume that plans will achieve their target long-run rates of return, worker and retiree behavior and health assumptions, and meet other vital assumptions **and** one assumes that the plans will pay increasing amounts of contributions in the future as implicitly assumed by the level percentage of payroll assumption, **then** the plans appear to be contributing enough. However, if one cannot assume those things, then citizens and elected officials will accept higher amounts of taxes or lower services in the future and the answer to the question posed by this paper is clearly no. Given past behavior of jurisdictions, it seems relatively implausible that most plans will pay increasing amounts over time. To take one example, in the most recent state budget proposal the Governor proposed shifting out the date when state plans must be 90% funded to 2052 (Hinz, 2019). Only when additional revenues were realized by the state was this proposal retracted. This would have been a tacit admission that the state could not afford to pay the full amount required under the Edgar ramp. It is very plausible that the state and cities will look to do “end-runs” around any required repayment plan. In our minds, this suggests that oversight should be done using actuarial measures that reflect the actual cost of pension promises, which suggests net amortization or some type of measure that employs a level dollar repayment assumption.

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