

Government Pension Plans in Focus: Is the Plan Actuarially Sound?



“Actuarially sound” can be a source of confusion for government entity stakeholders

If stakeholders in a government entity’s pension plan were told that the plan is actuarially sound, they would probably believe that a simple, clear definition of actuarial soundness is known and understood by all actuaries and that every actuary would agree that the plan is in good financial shape. But a word or phrase can have different meanings depending on the context, and actuarially sound is no exception. This article examines how the simple phrase “actuarially sound” can be a source of confusion for government entity stakeholders, and it provides more specific questions to follow the first critical follow-up question: In what context?

Actuarial soundness

Every stakeholder in a governmental pension plan—from the city or state finance director to the plan participants to the plan trustees to the individual taxpayer—wants their plan to be actuarially sound. But what does that mean? To actuaries, who are subject to Actuarial Standards of Practice, the first standard (ASOP 1) defines actuarial soundness as follows:

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The phrase “actuarial soundness” has different meanings in different contexts and might be dictated or imposed by an outside entity. In rendering actuarial services, if the actuary identifies the process or result as “actuarially sound,” the actuary should define the meaning of “actuarially sound” in that context.

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Therefore, any actuary looking at a particular plan may define actuarial soundness differently. This is not as haphazard as it sounds. An actuary may determine that a plan is actuarially sound from the perspective that future benefits will be funded as they come due; however, the plan may not be sound if it were to terminate today and all benefits had to be paid immediately with assets on hand. In addition, a governmental entity that is fiscally strong but has funded a very small percentage of its pension plan liabilities may still have a sound plan, while a well-funded plan of a fiscally weak entity may be unsound. Context matters.

We try to define the context and meaning of the term within the report containing that opinion as well as the factors that can change that opinion. Typically, the term actuarially sound, particularly with regard to government pension plans, refers to the long-term ability of the plan and sponsoring government to pay all future benefits. An important aspect of this is that it generally presumes the government entity is fiscally strong enough to make contributions in the future based on our actuarial recommendations. Clearly, an opinion that a plan is actuarially sound is not a guarantee that the plan will continue to be so in the future: future contributions may not be made, plan investments may suffer big losses, and plan provisions may change.

An opinion of actuarial soundness is thus a point in time assessment judged on the quality of the inputs to the actuarial valuation. These inputs include:

- Clarity of the plan provisions
- Completeness of the participant data
- Risk level of the plan assets
- Reasonableness of the actuarial assumptions regarding future events
- Appropriateness of the actuarial funding method

**THIS PAPER CONFINES ITSELF TO THIS
LAST ITEM—THE APPROPRIATENESS OF
THE ACTUARIAL FUNDING METHOD.**

**What do Findley
actuaries mean
when we say
something is
actuarially sound
(or unsound)?**

Actuarial funding method

An actuarial valuation of a pension plan determines the dollar value of the plan's liabilities. This is based on the benefits provided by the plan, the participant data, and a number of assumptions about future contingencies. A pension plan valuation typically considers only the current participants in the plan (a closed valuation), but a valuation can include assumptions about future participants (an open valuation). The determination of overall liabilities is independent of the actuarial funding method employed. The funding method allocates the liabilities, and the funding of those liabilities, to specific periods of time. Unlike private sector plans that are subject to federal minimum funding requirements, government entities can use open or closed valuation methods along with a range of funding method choices.

A funding method divides liabilities attributable to a participant into three buckets:

- Normal cost, which is the liability attributable to the current year
- Accrued liability, which is the accumulation of the theoretical normal costs for all prior years
- Future liability, which is the accumulation of future normal costs

One extreme method is to allocate all unfunded liabilities (accrued and future liabilities) to the current year; thus, requiring immediate full funding of the plan. Few plan sponsors have this level of ready cash. The other extreme is to allocate the liability for a benefit payment to the year the benefit is paid. Referred to as "pay-as-you-go" funding, this method backloads plan funding. The result is very low contribution requirements in early years of the plan but rapidly escalating funding requirements.

Most government entities choose a funding method designed to satisfy two basic criteria:

- 1 The cost should remain relatively stable as a percentage of pay.
- 2 A generation of taxpayers should be paying (with their tax dollars) for the current pay and benefits of the governmental employees who are providing services to those taxpayers.

Components of an actuarial funding method

In theory, every sound actuarial funding method will, over time, reach the goal of funding the plan; however, there are several components of a method that determine how well it satisfies these two criteria.

The first component is how the method determines the normal cost. Most methods develop an array of normal costs for each participant from hire to retirement. Under a sound method, the present value of past and future normal costs equals the total liability for the participant, and there should be a reasonable basis for allocating normal cost to a particular year.

The next component of the method is the calculation of the unfunded accrued liability. To make this determination, a value must be placed on the assets held to fund these liabilities. Most actuaries employ some smoothing mechanism for assets to recognize that pension plan funding is a long-term process that should not be severely impacted by short-term fluctuations in investment markets. This smoothed asset value used in the actuarial funding method is typically referred to as the actuarial value of assets, and the smoothing mechanism is called the asset valuation method.

Once the unfunded accrued liability is determined, a decision must be made as to how it should be funded. Other than a pay-as-you-go method, this liability is typically amortized over some period of years, referred to as the amortization method, with payments reducing the unfunded accrued liability similar to your home mortgage. There are many other pieces to an actuarial funding method, for example, the assumed timing of contributions and how these are adjusted for interest or the establishment of a range of funding rather than a single value.

BUT THE SIGNIFICANT COMPONENTS OF THE METHOD ARE:

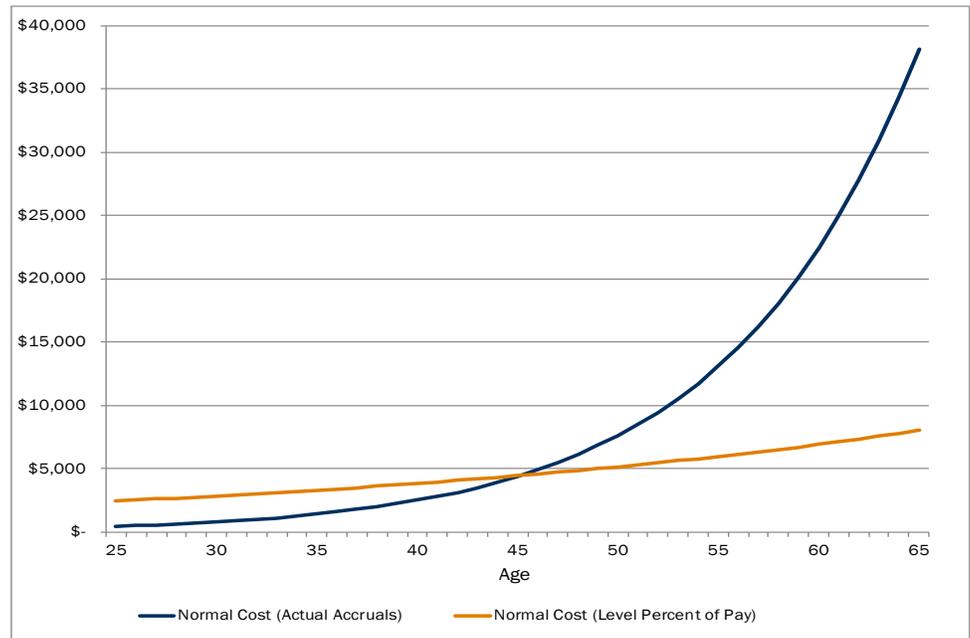
THE DETERMINATION OF NORMAL COST

THE ASSET VALUATION METHOD USED TO CALCULATE THE UNFUNDED ACCRUED LIABILITY

THE AMORTIZATION METHOD

Determination of normal cost

There are two primary methods for the calculation of normal cost. One approach is to determine the participant's normal cost for a year based on the value of the benefit actually accruing in that year. Another approach is to determine normal cost for an individual such that theoretic past and future normal costs increase in the same way that salary is assumed to increase for that individual. The following graph shows how the normal cost for an individual might vary between these two approaches.



Both approaches result in increasing normal cost, but generally, the cost associated with the benefits actually accruing method will increase more rapidly than the percentage of pay method. It should be noted that the accumulation of normal cost for all active plan participants (there is no normal cost for inactive members), should not increase dramatically assuming that, as they retire or otherwise terminate employment, older, higher-paid participants will be replaced with younger, lower-paid individuals.

Judging actuarial soundness: Questions to ask about the normal cost

Government entity stakeholders looking to gain a deeper understanding of their plan's actuarial soundness should ask these questions about the normal cost:

Is the purpose of the valuation to evaluate the current solvency of the plan or the long-term funding of the plan?

The purpose of the valuation is the single most important question to ask in judging the funding methods used and assessing actuarial soundness.

Is the annual normal cost determined in the valuation based on the actual benefit accrual for the year?

This may be appropriate when measuring the current solvency of the plan, but it is generally not appropriate for calculating long-term funding for a plan with benefits based on future pay.

Does the annual normal cost recognize the effect of future salary increases? How are expected future salary increases and associated benefit accruals allocated to the current year?

A normal cost method that recognizes these expected future events is actuarially sound for valuations focused on the long-term funding of the plan, typically results in more stable costs, and does a better job of ensuring equity among generations of current and future taxpayers.

ASSET VALUATION METHOD

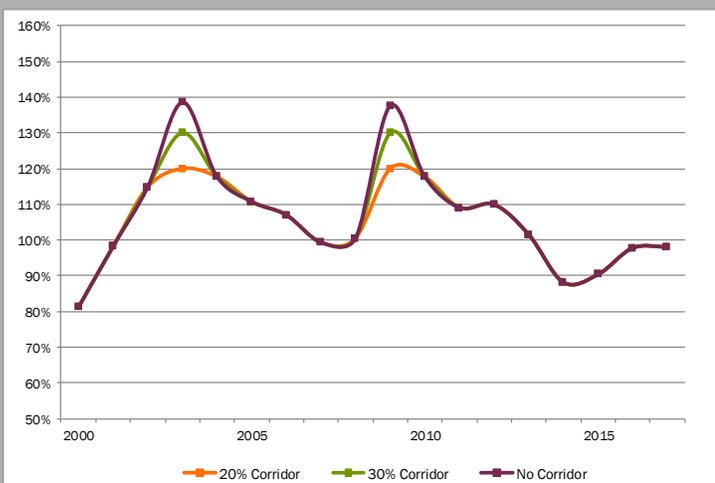
For accounting purposes, a government entity must use the market value of assets to determine its plan's unfunded accrued liability, and market value may also be used in the actuarial funding method. Market value represents a value at a specific point in time (the market value of an asset just changed as you read this sentence). The purpose of an actuarial funding method is to develop a reasonable, stable, long-term funding pattern for a stream of future benefit payments. For some, the use of anything other than market value is an enigma. But should a fluctuation in an asset on a particular day—when the asset value is expected to revert to something close to the current level in some reasonably short timeframe—greatly affect the long-term funding of a plan?

Typically, an asset valuation method has two components: the length of the smoothing period and the corridor around the market value in which the resulting actuarial asset value must fall. The length of the smoothing period should reflect the length of the typical market cycle and the volatility of the assets. The width of the corridor should correspond inversely to the smoothing period (i.e., the shorter the smoothing period, the wider the permissible corridor).

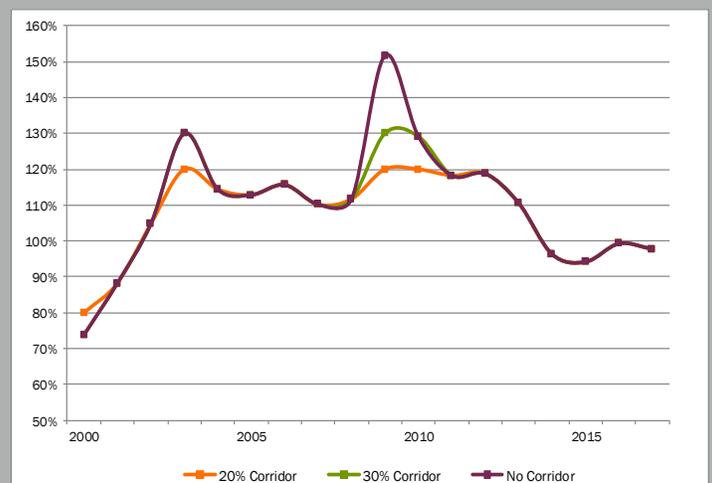
The National Bureau of Economic Research, which determines the beginning and end of business cycles, has determined since 1945 to 2009 that there were 11 cycles with the average cycle lasting just under 6 years. The longest cycle was approximately 10 years.

The following graphs demonstrate 5-year and 10-year smoothed asset values, relative to Market Value (i.e., as a percentage of Market Value), with 20 percent and 30 percent corridors and no corridor.

5-Year Asset Smoothing



10-Year Asset Smoothing



Judging actuarial soundness: Questions to ask about the asset valuation method

Is the purpose of the valuation to evaluate the current solvency of the plan or the long-term funding of the plan?

If the purpose is to evaluate the current solvency of the plan or to provide standardized accounting disclosures, then market value is often the appropriate choice. It may also be the appropriate choice for plan funding if assets are not expected to return to the current level or if stakeholders are looking to achieve certain short-term funding goals.

Does the asset valuation method allow the actuarial asset value to vary significantly from market value or be consistently greater than or less than market value?

As stated earlier, the goal is to smooth ongoing market fluctuations yet track market value closely over time and through investment market cycles. Generally, a smoothing period of 10 or fewer years is sound if the actuarial asset value is contained within a reasonable corridor around market value. Longer smoothing periods may be appropriate if the corridor around market value is relatively small. Other factors may add further context around the selection of smoothing periods and corridor width.

Has the asset valuation method been changed in prior years? If so, how frequently has it been changed, when was the most recent change made, and what were the circumstances?

The smoothing period and corridor should be established as a long-term asset valuation method, and changes, if any, should be infrequent. If the asset valuation method is changed, the reasons for the change should be based on achieving a more appropriate measurement rather than generating a better outcome for the valuation.

AMORTIZATION METHOD

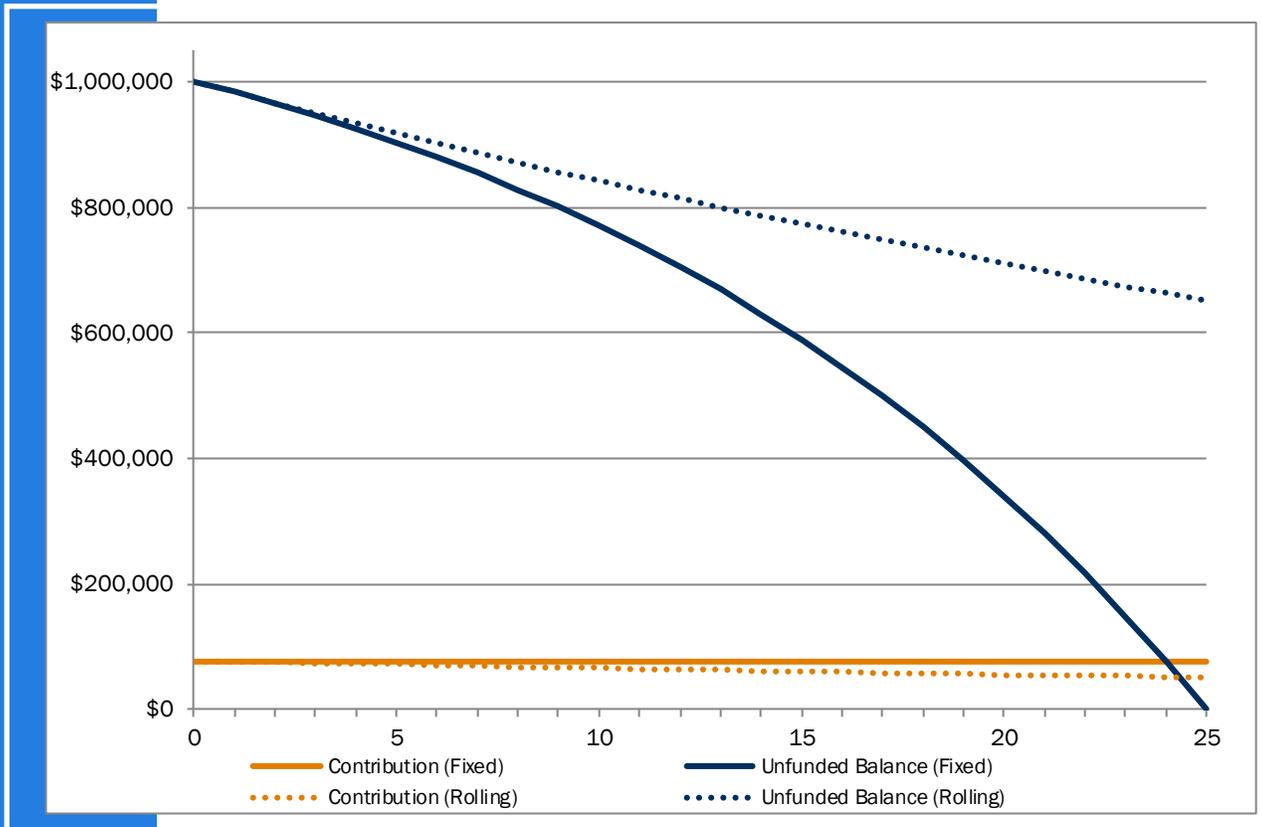
The amortization method used to determine the funding of any unfunded accrued liability can be a significant part of the long-term funding level generated by the actuarial funding method. The choice of amortization method can generate tremendous tension between the desired funding stability versus the goal of allocating pension plan funding fairly among generations of taxpayers. There are three distinct decisions regarding the amortization method:

1. Is the amortization period “rolling” or “fixed”
2. Is the amortization payment level-dollar or level-percentage of payroll
3. Is there a single amortization period for unfunded accrued liabilities in total, or are there different periods based on the source of the liability?

Rolling versus fixed

Under a rolling amortization, the unfunded amount is recalculated every year (or at each valuation date) and amortized over the same number of years (e.g., 25 years); therefore, absent offsetting actuarial gains, the unfunded amount is never fully amortized. Under a fixed amortization, there is a clear ending date when the liability will be paid in full.

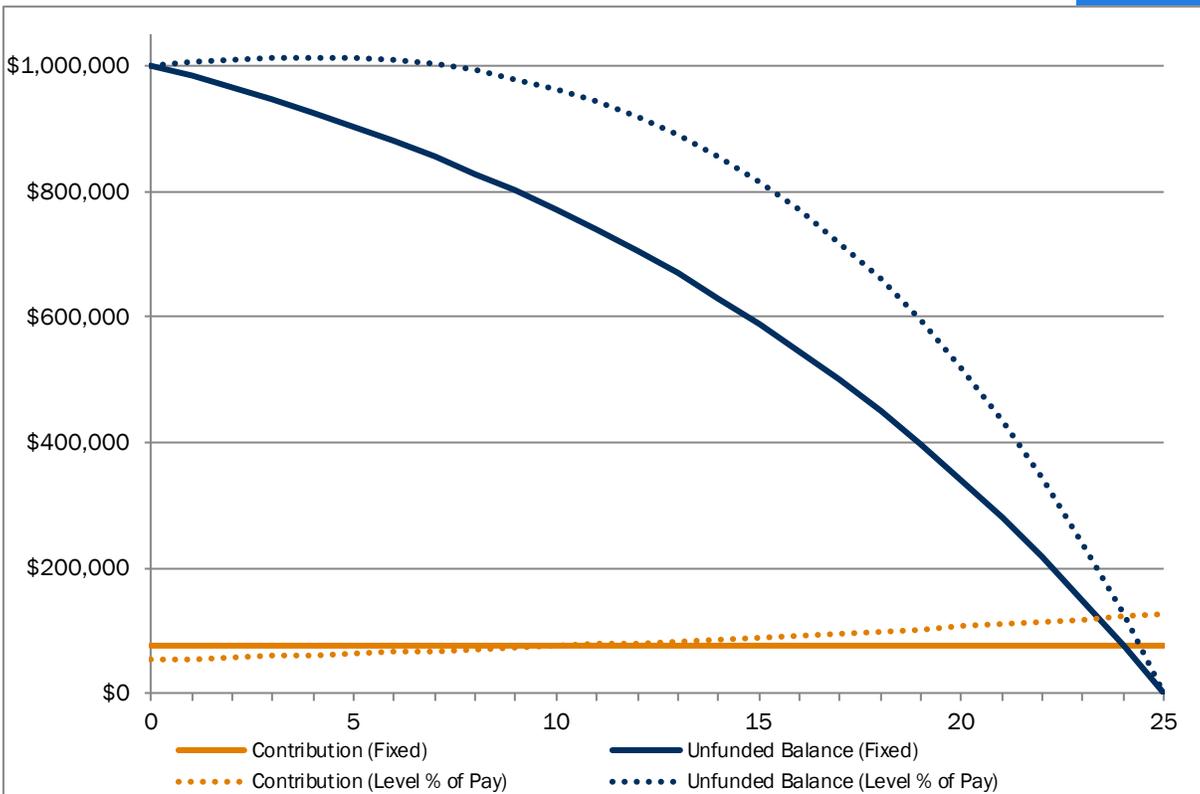
The following graph shows the remaining balance of an unfunded amount being amortized over 25 years under both a rolling and fixed approach.



Level-dollar versus level-percent of pay

The typical home mortgage payment is generally structured as a level dollar amortization—each required mortgage payment is the same amount. But as noted previously, it is common for government entities to want pension funding to remain relatively stable as a percentage of payroll, thus it could be desirable to design an amortization method that increases payments in the same manner that payroll is expected to increase. This level percent of pay approach, however, can result in a “negative” amortization—that is, an amortization payment that does not cover the interest on the remaining liability.

The following graph shows the annual payment and the remaining balance using a 25-year level amount amortization and a 25-year level percent of pay amortization of a \$1 million liability, assuming a 6½ percent interest rate and a 3½ percent rate of payroll increase. Note that using level percent of pay results in a negative amortization for the first 4 years (i.e., the remaining balance is growing), and the balance does not drop below the initial \$1 million amount until year 8.



Amortization period

As stated earlier, there is a natural tension between using a longer period to dampen volatility in the amortization cost versus using a shorter period to assure each generation pays its own costs. To suggest an amortization period is actuarially sound can depend on many ancillary factors, such as whether or not the plan is open to new participants, the demographics of the group, the forms of benefit payment, and the funded status of the plan.

In addition, it can be instructive to consider the source of the liability when selecting an appropriate amortization period. An unfunded accrued liability can originate from four distinct sources:

- 1** **Accrued liabilities at the establishment of a plan—it is typical for benefits to be provided to current employees based on their service to date at the outset of the plan.**
- 2** **Increases or decreases in the unfunded accrued liability due to plan amendments.**
- 3** **Increases or decreases in the unfunded accrued liability due to changes in actuarial methods or assumptions.**
- 4** **Increases or decreases in the unfunded accrued liability due to actuarial gains or losses.**

Many plans use a single amortization period for the entire unfunded accrued liability, regardless of source. This is typically true if a rolling amortization period is employed but we generally do not believe this approach is sound unless the amortization is short. Examining the liability by source not only provides a plan sponsor with good information as to the cause of changes in unfunded accrued liabilities, it also allows liabilities to be amortized over periods that are appropriate to the source.

If the plan is relatively young, indicated by a plan that is open to new participants with a large active versus inactive plan population, the initial liability associated with the establishment of the plan might be amortized over a long period, such as 30—or even 40 years—to recognize it as a one-time liability and to keep the plan affordable. A shorter amortization period is generally considered more fair, however, when discussing the allocation of costs among generations of taxpayers.

Amendments generally occur infrequently and are often amortized over a single generation of taxpayers (e.g., 20–30 years) unless the demographics of the group affected by the amendment indicate a shorter period is more appropriate.

Actuarial methods and assumptions are seen as reacting to long-term economic and demographic trends, and therefore change periodically but more frequently than plan provisions. This suggests a shorter amortization period (e.g., 15–20 years).

Actuarial gains and losses occur every year, but if assumptions are appropriate, gains and losses should balance each other out over some relatively short period of time. This suggests a shorter amortization period of 5–15 years for consistency with investment markets and the business cycle.

Judging actuarial soundness: Questions to ask about the amortization method

Does the plan use rolling amortization of its unfunded accrued liability?

A rolling amortization period is designed to never fully fund the liability.

Does the plan use a level percent of pay approach in amortizing its unfunded accrued liability??

A level-percent of pay approach is more likely to result in negative amortization than a level-dollar approach. Negative amortization can be avoided by having a shorter amortization period or establishing a minimum amortization payment equal to the annual interest payment.

What are the current demographics of the active plan population versus the inactive plan population? Is the active plan population increasing, decreasing, or remaining relatively stable? Is the plan open to new participants, or is it closed?

Each of these questions helps define the maturity of the plan, which in turn should impact the choice of amortization periods for all or only portions of the unfunded accrued liability.

Summary

It is difficult for a pension plan to be actuarially sound if the actuarial funding method is not also sound, and for a method to be sound, each component of the method must be appropriate. One weak link can destroy the soundness of a plan. While government entities and taxpayers want to keep plan funding levels low, a fair allocation of cost among generations of taxpayers demands that contributions to the plan be large enough to not defer costs to future generations of taxpayers.

While each component must be appropriate, this can span a range from being conservative (i.e., resulting in higher liabilities and cost) to aggressive (i.e., lower liabilities and cost). The components of the actuarial funding method must, therefore, be considered holistically. A method where the majority of the pieces are on the aggressive end of the spectrum is likely to be operating on thin ice.

More Conservative		More Aggressive	
Asset Valuation Method			
Less than 5 year smoothing		10 year or more smoothing	
10% or less corridor		30% or more corridor	
Amortization Method			
Fixed		Rolling	
Level dollar		Level percent of pay	
15 year or less period		30 year or more period	

As actuaries and fellow taxpayers, we encourage our governing bodies and interested stakeholders to engage in thorough and ongoing reviews of all the factors that affect the funding of a pension plan, to assure the selection of methods that provide the greatest chance for long-term plan sustainability.

To learn more about governmental pension plan risk, visit our website at www.findley.com



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