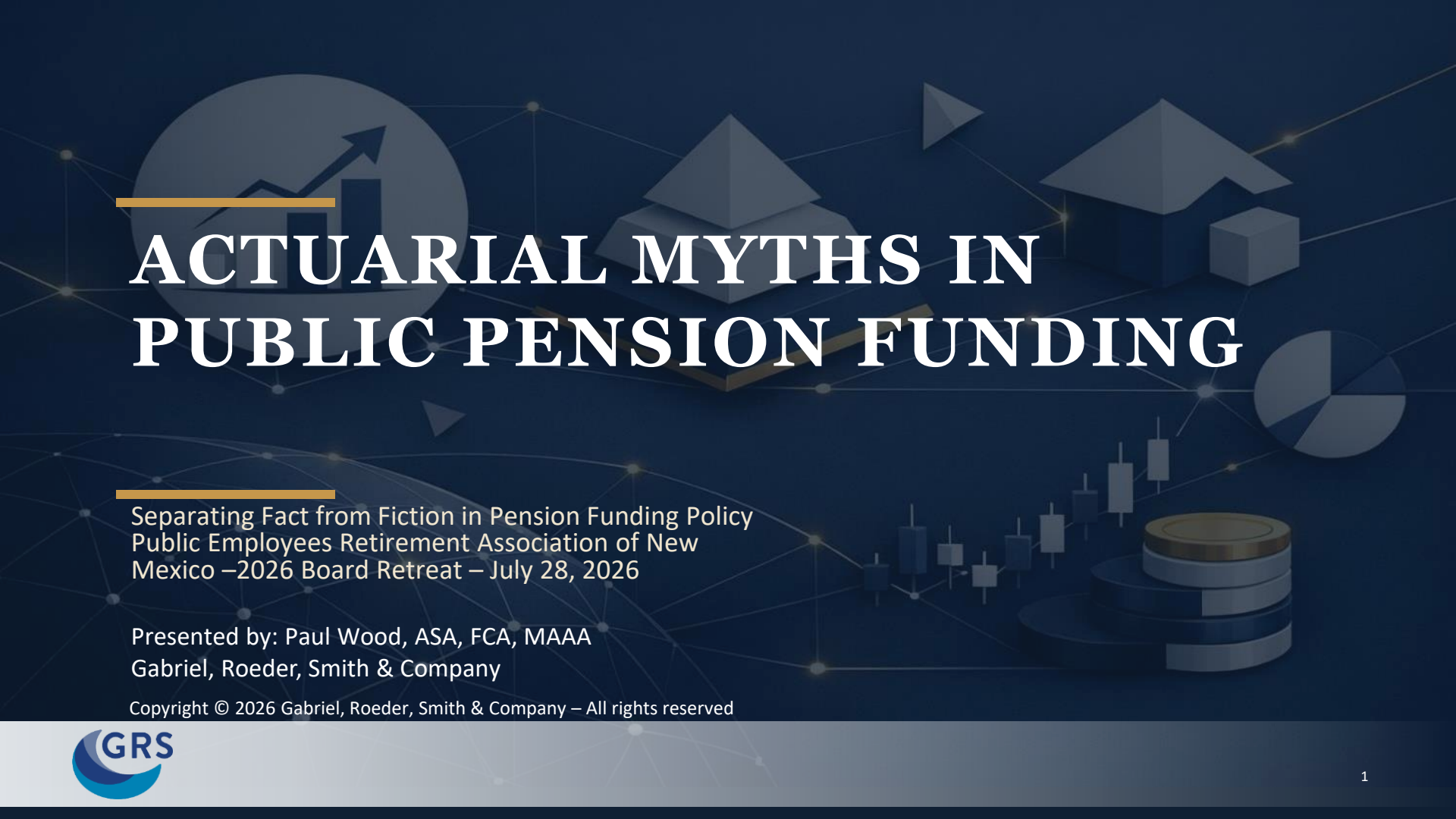




ACTUARIAL MYTHS IN PUBLIC PENSION FUNDING

Separating Fact from Fiction in Pension Funding Policy
Public Employees Retirement Association of New
Mexico –2026 Board Retreat – July 28, 2026

Presented by: Paul Wood, ASA, FCA, MAAA
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Learning Objectives



Identify common actuarial myths that influence public pension funding decisions



Understand the evidence and research that debunks each myth



Communicate complex actuarial concepts clearly to Boards and policymakers



Apply better funding practices grounded in actuarial standards and evidence

The Public Plan Funding Landscape

\$1.5T+

Estimated total
unfunded liabilities

Source: NASRA Public Fund Survey summary as of
December 2025 for the Fiscal Year ending 2024.

77%

Average funded ratio
for statewide pension plans

Source: NASRA Public Fund Survey summary as of
December 2025 for the Fiscal Year ending 2024.

15-20

Years many plans
target for payoff of
new unfunded liabilities

- Maturing demographics with growing retiree-to-active ratios
- Volatile investment markets and declining capital market expectations over the last two decades
- Legacy unfunded liabilities from decades ago
- Political pressure to maintain benefits without addressing costs

Discussion Question #1

Which of these myths have you heard from key stakeholders in the last year? (Select all that apply)

A

"80% funded status is good and/or the target"

B

"Lowering the assumed rate of return will make the plan more expensive"

C

"We cannot manage pension risk; we have to be at the mercy of the markets"

D

"Underfunding only hurts future taxpayers"

Three Pillars of Pension Funding

Every funding decision should balance these three objectives

1

Benefit Security

Ensuring promised benefits can actually be paid when due.

Often receives less consideration than the other two pillars.

2

Intergenerational Equity

Each generation of taxpayers should pay for the services it receives. Deferring costs shifts today's obligations to tomorrow's citizens.

3

Contribution Stability & Predictability

Budgets require predictable costs. Stable employer contributions support long-term fiscal planning and avoid disruptive rate spikes.

Key Insight: Generally, given the nature of public employee retirement systems (e.g., level contribution financing objective and perceived ongoing nature of the plan or plan sponsor), intergenerational equity and contribution stability and predictability have received more consideration than benefit security when contribution allocation procedures are selected.

The Typical Actuarial Valuation Process



Everything starts with PVFB — get this calculation wrong, and every downstream calculation inherits the miscalculation

Key Insight: PVFB uses economic assumptions (e.g., assumed rate of investment return or discount rate), demographic assumptions, benefit provisions and membership characteristics to project all future benefit payments back to present value. The PVFB is the single most comprehensive measure of a plan's total benefit obligation.

Understanding the Present Value of Future Benefits

Present Value of Future Benefits (PVFB)

The amount of assets needed today to pay all future benefits without any future contributions, assuming that all actuarial assumptions are met, including the plan earning its assumed investment return until each payment is due.

Actuarial Accrued Liability (AAL)

The portion of PVFB attributed to past service — benefits already earned under the plan's actuarial cost method.

Plan Assets

Current value of investments held to fund benefits already earned.

+

Unfunded Actuarial Liability (UAL)

The shortfall between the AAL and the assets on hand to pay for those benefits.

+

PV of Future Normal Cost

The portion of PVFB allocated to future service — the present value of benefits active members will earn going forward.

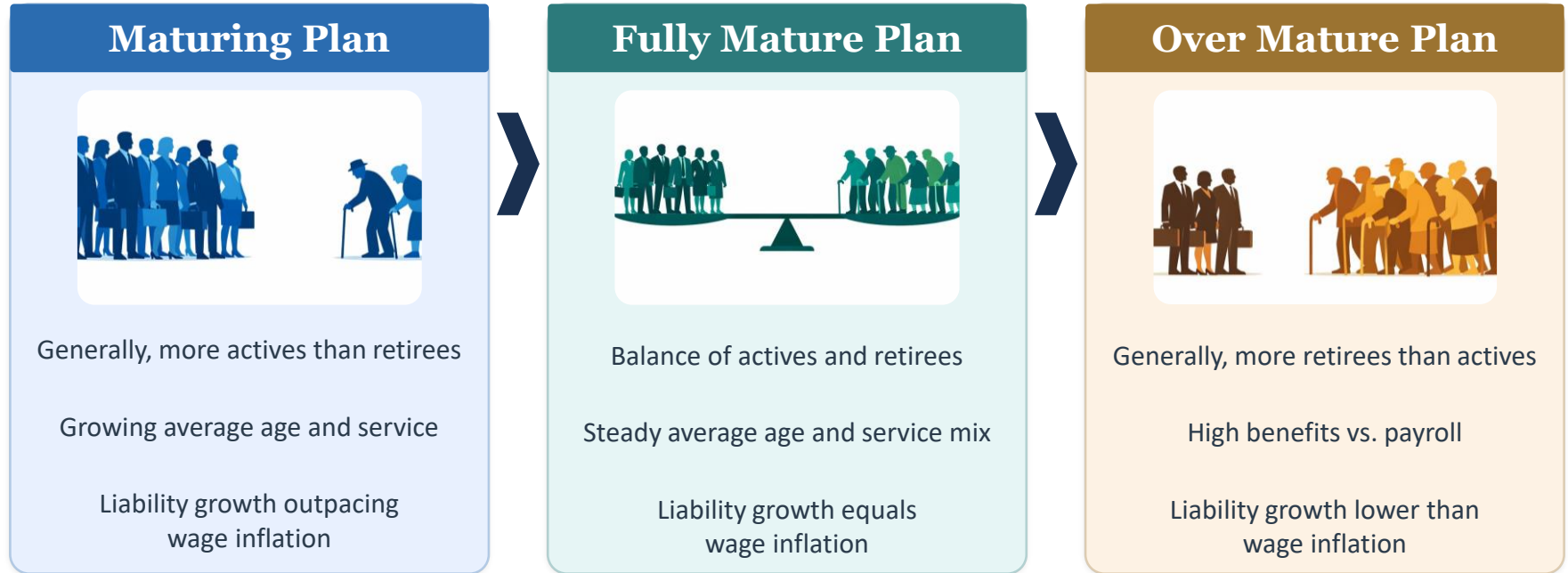
Key Relationships

$PVFB = AAL + PV \text{ of Future Normal Cost}$

$AAL = \text{Plan Assets} + UAL$

Defining Plan Maturity

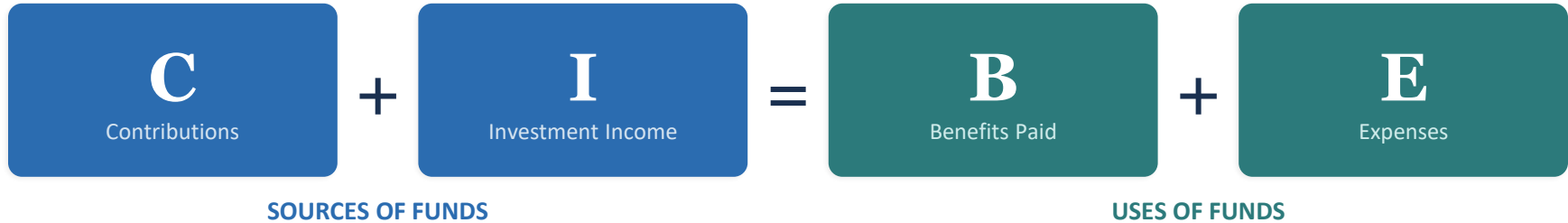
Where a plan sits on the maturity spectrum drives the right funding strategy



Key Insight: The same contribution strategy for a Maturing Plan may be inadequate for an Over Mature Plan. Understanding where your plan sits on this spectrum is essential for setting appropriate funding policy. **Most State-wide PERS today would be considered Fully Mature Plans.**

C + I = B + E in a Fully Mature Plan

At maturity, every component grows at the wage inflation assumption — regardless of the investment return assumption



At Maturity: All Components Grow at Wage Inflation

- ▶ In a mature plan where benefits are pay related, as the population and benefit structure stabilizes the Benefits paid (B) and Expenses (E) grow directly in proportion to wage inflation.
- ▶ Contributions (C) are set as a percentage of payroll and therefore grow at the same wage inflation rate.
- ▶ Both the PVFB and assets will grow at the wage inflation rate, meaning the Investment Income (I) too grows at the wage inflation rate.

Key Insight: The investment return assumption only determines how costs split between contributions and investment income — it does not change the plan's total cost or growth rate. Both sides of the equation ultimately grow at wage inflation.

The background of the slide is a dark blue gradient with various financial charts. On the left, there are blue vertical bars of varying heights. In the center, there is a line graph with a jagged blue line and a smoother yellow line. On the right, there is a candlestick chart with yellow and orange bars. The overall aesthetic is modern and professional, with a focus on financial data.

ASSUMED RATE OF INVESTMENT RETURN

Understanding what assumptions reveal — and what they hide

Discussion Question #2

Which statement best reflects your view of the investment return assumption? (select all that apply)

A

Lowering it makes the plan more expensive

B

Lowering it increases the actuarial liabilities of the plan

C

It impacts accounting and funding numbers, but not the actual cost of the plan

D

It is the target return of the retirement system

The Role of the Assumed Rate of Investment Return

The single most influential assumption in public plan pension valuations

1

Measures Plan Liabilities

Determines the Present Value of Future Benefits (PVFB) and directly affects calculated employer contribution rates in variable rate plans.

2

Appearance vs. Reality

A higher assumed return produces lower reported liabilities and contributions in variable rate plans, but does not change the actual cost of the benefit promise.

3

ASOP No. 27 Guidance

The investment return assumption should take into account the characteristics of the obligation to be measured (e.g., the pattern of plan payments over time).

MYTH 1

THE MYTH

*“Actuaries **created** our unfunded liabilities”*

THE REALITY

Actuaries do not create unfunded liabilities — they measure them.

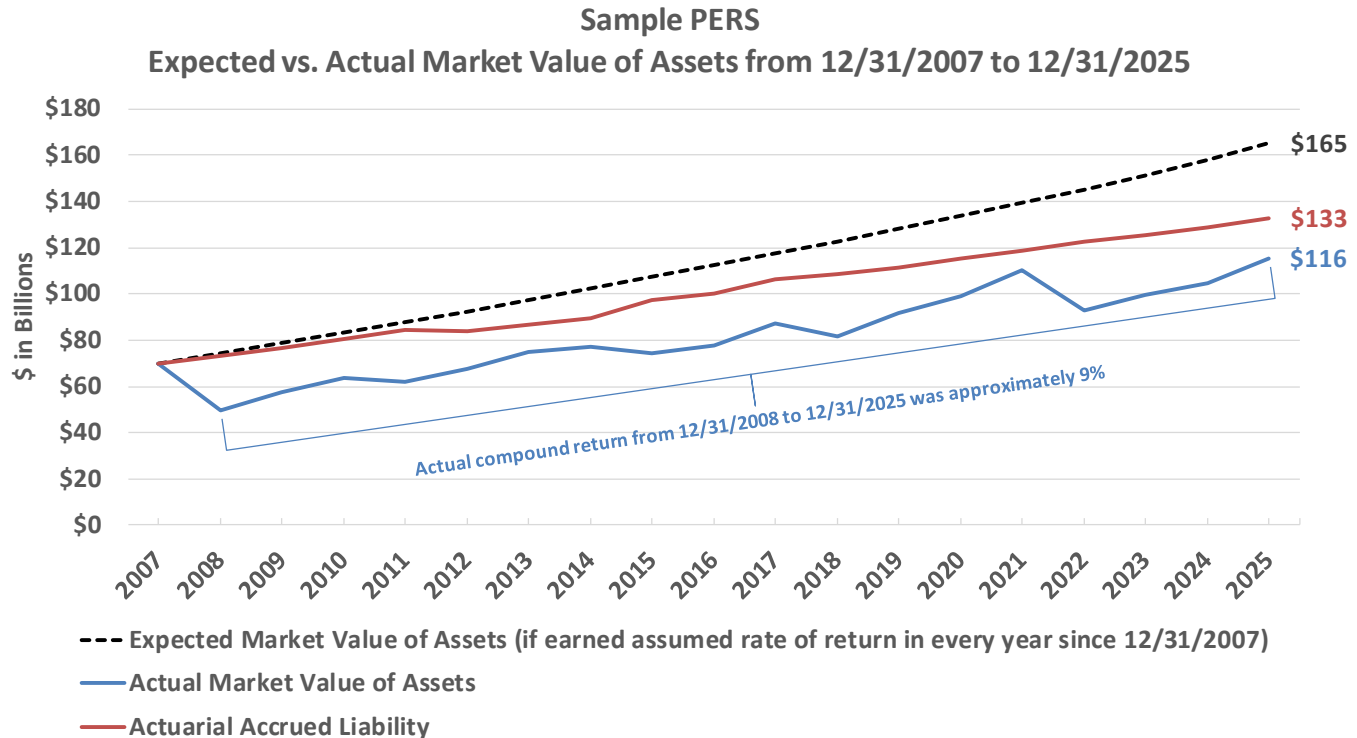
Unfunded liabilities arise from **experience losses, contribution shortfalls, and benefit changes** — not from the act of revising assumptions.

If an assumption is too optimistic, revising it results in making the funding picture more reasonable, not worse. Assumptions are **measurement tools, not cost drivers**.

Better assumptions may raise required contributions and liabilities, but that is the result of producing **a better measurement of the estimated cost of promised benefits**.

Actual vs. Expected Returns Since the GFC

While today may feel far removed from the 2008-09 Global Financial Crisis (GFC), its effects have been long lasting



MYTH 2

THE MYTH

“Lowering the assumed rate of investment return assumption makes the plan more expensive”

THE REALITY

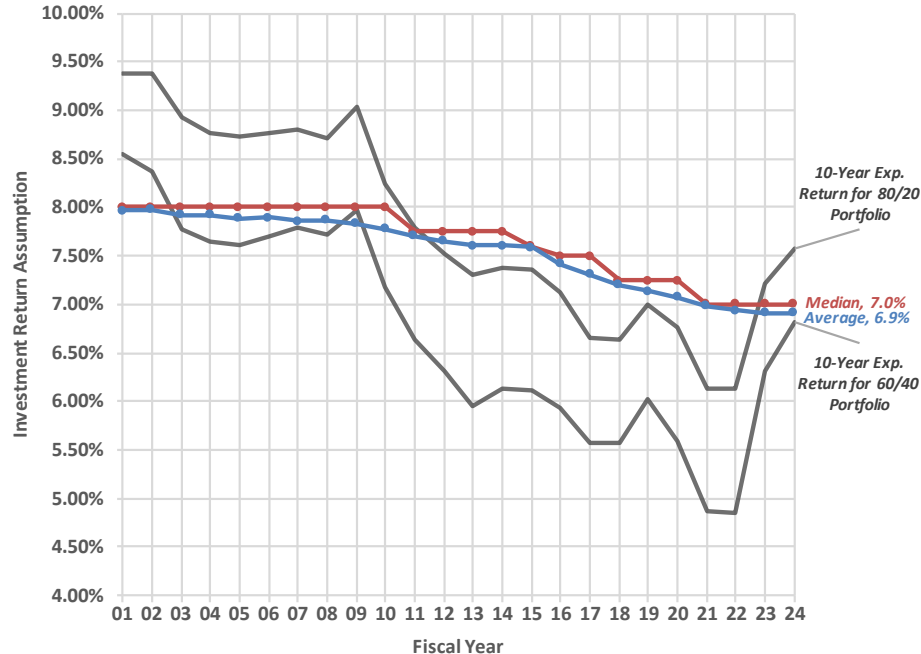
The investment return assumption should reflect what the plan expects to earn going forward.

If capital market expectations decline, lowering the assumed rate of investment return does not create any new costs — it results in a more reasonable measurement of the plan’s obligations that were hidden by overly optimistic assumptions.

The benefit promises of the plan remain unchanged. Aligning the assumption with future expectations leads to more reasonable contribution requirements and better funding outcomes over the long term.

The Uphill Battle of Declining Expectations

Percentile Distribution of Investment Return Assumptions
for Statewide Retirement Systems by Fiscal Year



Investment return assumption data from the Public Fund Survey as of Jan-2026
10-Year expected return based upon a sample investment consultant's capital market expectations from 2001-2024

Declining Expectations

Capital market expectations have declined significantly over the past two decades

Rate & Inflation Drivers

Driven largely by lower interest rates and inflation expectations

Portfolio Impact

A typical equity-bond portfolio has seen expected returns drop substantially

Shifting Allocations

Most systems have significantly changed their asset allocations during this period

Assumption Reluctance

Some plans have been reluctant to reduce their assumed rate of return to match lower expectations

MYTH 3

THE MYTH

“The assumed rate of investment return should dictate investment policy”

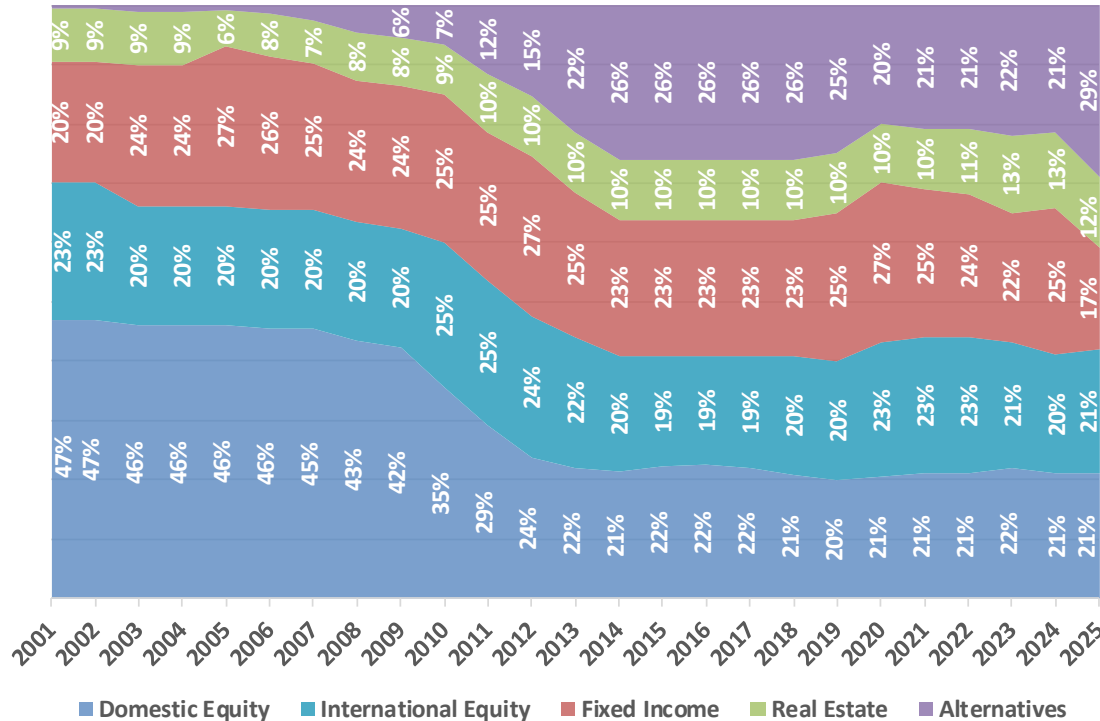
THE REALITY

In practice, the direction should be reversed: asset allocation and capital market expectations should drive the assumed rate of investment return, not the other way around.

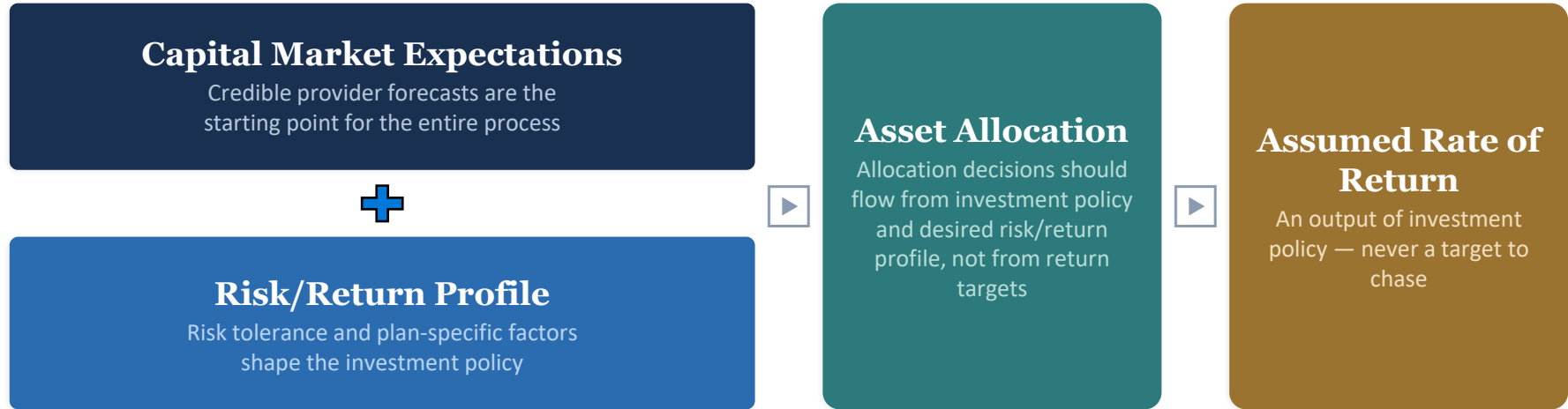
When the assumption is treated as a target, there is temptation to increase risk to justify a higher assumption and lower reported contributions — increasing downside risk.

Sample Actual Statewide PERS Target Asset Allocation

Declining capital market expectations over the last two decades resulted in a significant shift to alternative investments for many PERS to seek higher investment return, even as more of the liabilities of the System were shifting to retirees.



Assumption Selection: A Principled Framework



The correct direction: investment policy drives the assumption, not the other way around

Caution: Treating the assumed rate of investment return as a target creates temptation to increase risk to justify a higher assumption.

PAYROLL GROWTH

What level percent of payroll amortization means and what drives payroll expectations

MYTH 4

THE MYTH

*“Payroll growth less than your assumption is **bad** for plans funding based upon percent of payroll”*

THE REALITY

Lower payroll growth triggers offsetting effects often overlooked:

- ▶ **Active member liabilities lower than expected** — lower projected benefits reduce the AAL
- ▶ **UAL rate may rise, but UAL contribution dollars rise less than expected** — the rate appears higher against a smaller base
- ▶ **Normal cost % is generally unchanged** — per-member cost as % of pay stays the same

Low payroll growth is a greater risk for fixed-contribution rate plans, where UAL rates cannot adjust.



MYTH 5

THE MYTH

*“In a stationary population,
payroll growth depends
upon the salary increases of
active members”*

THE REALITY

Payroll growth depends upon one thing – wage inflation.

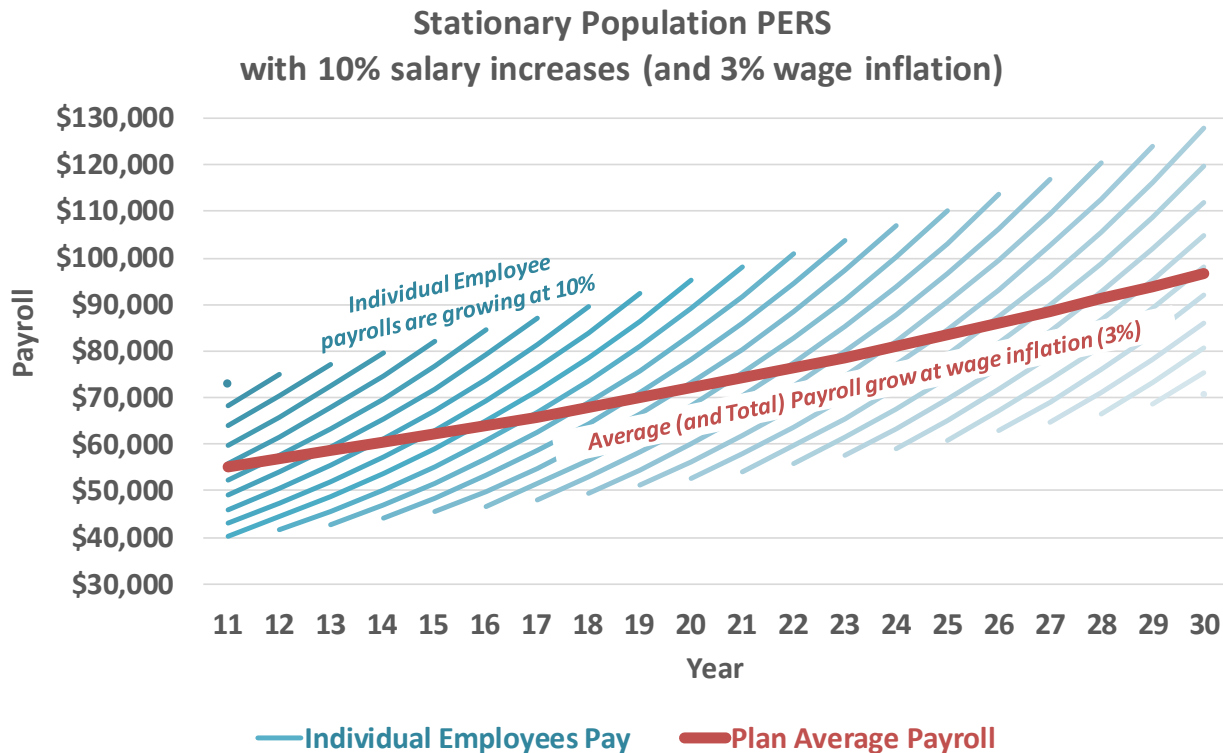
Each active members’ total salary increase is a red herring. It is the portion of the active members’ salary increase attributable to wage inflation that matters.

The reason is that the pay of a new hire joining the plan is expected to be higher than the previous year’s new hire by wage inflation.



Stationary Population – Where the size of the active population, average age and average service remains constant.

Salary Increases vs. Payroll Growth



Note: In a stationary population, the size of the population remains constant and average payroll and total payroll grow at the same rate.

While average payroll is shown for display purposes, payroll growth is typically measured on plan total payroll.



FUNDING POLICY MYTHS

Amortization methods, ADEC compliance, and the policies that determine whether pension debt gets paid

Discussion Question #3

What is the funding goal for your pension plan?

A Maintain solvency (i.e., anything above 0%)

B Maintain at least 80% funded

C Maintain 100% funded, no more, no less

D Maintain or exceed 100% funded

What is a Funded Ratio?

$$\text{Funded Ratio} = \frac{\text{Actuarial Value of Assets (AVA)}}{\text{Actuarial Accrued Liability (AAL)}}$$

Measures the proportion of promised benefits covered by current plan assets.

= 100%

Assets equal liabilities — this is generally what should be “targeted.” Each generation fully pays for the benefits it earns if all assumptions are realized.

< 100%

Unfunded liability exists — pension debt owed by future taxpayers that must be paid down over time.

Important caveats: Sensitive to assumptions — investment rate of return, asset smoothing, and actuarial methods all affect this number. A snapshot in time, not a comprehensive health indicator on its own.

MYTH 6

THE MYTH

“Funded ratio alone is an adequate measure of plan health”

THE REALITY

Funded ratio is informative only in context.

It is a point-in-time snapshot, sensitive to assumptions and market conditions.

Broader diagnostics including contribution effort, sponsor fiscal health, benefit design, risk profile, assumption reasonability, and cash flow trends are needed for a complete picture of plan sustainability.

MYTH 7

THE MYTH

“An 80% funded ratio is an acceptable long-term funding target”

THE REALITY

Any funded ratio below 100% represents pension debt that must be paid by future taxpayers, with interest, and generates intergenerational equity concerns.

Maintaining a permanent shortfall is expensive and shift costs to future generations.

The Cost of Targeting 80%

Targeting 80%

- Permanent 20% unfunded liability generates interest costs
- Interest on UAL compounds year over year
- Future taxpayers inherit costs for services already consumed
- Vulnerable to market downturns — a 20% drop in assets could push the funded ratio in the low 60s overnight, which may result in severe benefit cuts
- Creates false sense of security among stakeholders

Targeting 100%

- Assets fully cover promised benefits
- No compounding interest on unfunded liability
- Intergenerational equity — each generation pays its own costs
- Greater resilience to market downturns — a 20% drop in assets is still 80% funded
- Credibility with stakeholders, rating agencies, and participants

Negative Amortization

Negative amortization measures whether interest on the unfunded liability exceeds contributions to amortize the UAL.

Positive Amortization

Contributions are paying down principal on the UAL. The amortization payment exceeds interest on the unfunded liability, making real progress toward full funding.

Negative Amortization

Contributions don't even cover interest — the UAL is growing in nominal dollars. The unfunded liability increases year over year, which may result in a declining funded ratio, depending upon the level of negative amortization.

Contributions = Normal Cost + Amortization Payment

The amortization payment must exceed interest on UAL to make progress to fully amortize the UAL.

Plans should track this annually and project it forward.

Excerpt from ASOP No. 4:

"When selecting an amortization method, the actuary should select an amortization method that is expected to produce total amortization payments that are expected to fully amortize the unfunded actuarial accrued liability within a reasonable time period or reduce the unfunded actuarial accrued liability by a reasonable amount within a sufficiently short period."



MYTH 8

THE MYTH

*“Negative amortization
is always bad,
positive amortization
is always good”*

THE REALITY

Not necessarily.

Brief periods of negative amortization can be considered if it is the “price to pay” of adopting more reasonable assumptions.

Negative amortization is not synonymous with declining funded ratios. An amortization period of 30 years, which generally produces negative amortization, still results in improving funded ratios. However, intergenerational equity should always be considered.

MYTH 9

THE MYTH

“Underfunding only hurts future taxpayers, not current stakeholders”

THE REALITY

While underfunding creates pension debt, whose cost is borne by future taxpayers, its cost may also be borne by current employees and retirees through higher contributions or benefit reductions.

RISK MEASUREMENT & MANAGEMENT

Sponsors are not helpless — policy choices shape outcomes

Discussion Question #4

What is the largest risk to your pension plan?

- A** Contribution risk – insolvency from the source, etc.
- B** Longevity risk – membership living longer than anticipated, costing the plan more than expected
- C** Investment risk – losing assets in a large and sudden market drop
- D** Board governance – Boards making bad policy decisions

MYTH 10

THE MYTH

“We have to be at the mercy of markets; risk cannot be managed”

THE REALITY

Policy choices about benefits, funding, and investment materially shape risk outcomes.

Sponsors can meaningfully influence risk through asset allocation, contribution discipline, liability-driven investing, hedging instruments, etc.

Stress testing, scenario analysis, and stochastic modeling allow actuaries to quantify adverse outcomes to assist retirement boards in making decisions.

MYTH 11

THE MYTH

*“Standard deviation is
the best (or only)
measure of risk”*

THE REALITY

Risk measurement must emphasize downside and sponsor-relevant metrics, not just average volatility.

Two portfolios with similar standard deviations can have very different tail behavior and interact differently with plan cash flows.

Downside measures — value at risk, conditional tail expectation, probability of contribution spikes — are often more relevant.

Beyond Standard Deviation: Other Risk Metrics

Value at Risk (VaR)	Maximum expected loss at a given confidence level (e.g., 95th percentile)
Conditional Tail Expectation	Average loss in the worst scenarios beyond VaR — captures severity, not just probability
Probability of Low Funded Ratio	Likelihood of funded ratio falling below a critical threshold (e.g., 70%) over a time horizon
Contribution Spike Risk	Probability that required contributions exceed a budgetary ceiling in any given year
Funding Period Duration	Expected time to reach full funding under current policy — longer is riskier

Risk Management: Tools and Practices



Asset-Liability Modeling

Project funded status under thousands of economic scenarios



Stress Testing

Test portfolio and funding against severe historical or hypothetical downturns



Contribution Discipline

Policies that ensure full, timely payment of actuarially determined contributions



Liability-Driven Investing

Align asset duration and cash flows with benefit payment obligations



Risk Budgeting

Allocate and monitor risk across asset classes with explicit tolerance levels



Scenario Analysis

Evaluate outcomes under specific economic, demographic, and policy scenarios

KEY TAKEAWAYS & WRAP-UP

Core lessons for trustees, staff, and policymakers

Key Takeaways

- 1 Assumptions should reflect reality, not aspirations — lowering the assumed rate of investment return to match expectations reveals a more reasonable measurement, rather than create cost
- 2 Target 100% funded — anything less is pension debt with interest costs and intergenerational equity implications
- 3 A strong funding policy requires the foundation of reasonable actuarial assumptions — do not be tempted into thinking the plan is doing “well” by selecting optimistic assumptions
- 4 Risk can and should be managed — sponsors have meaningful control through policy, contributions, and investment strategy
- 5 Communication is key — translate actuarial complexity into clear, actionable information for decision-makers

Myths at a Glance

#	The Myth	The Reality
1	Actuaries created our unfunded liabilities	Actuaries measure, not create, liabilities
2	Lowering assumed rate of return raises costs	Reflecting actual expected future experience produces more reasonable actuarial results. It does not change the future benefit obligations of the plan.
3	Assumed rate of investment return should dictate investment policy	Asset allocation drives the assumption, not the reverse
4	Low payroll growth is always bad for percent of pay funding plans	Offsetting effects (e.g., liability gains); not necessarily bad
5	In a stationary population, payroll growth depends upon the salary increases of active members	Payroll growth depends upon one thing – wage inflation. Each active member’s total salary increase is a red herring.
6	Funded ratio alone = plan health	Only informative in context with broader diagnostics
7	80% funded is an acceptable target	100% is the target; 80% means pension debt and less benefit security
8	Negative amortization is always bad, positive amortization is always good	Appropriate assumptions matter more; funded ratio not necessarily declining
9	Underfunding only hurts future taxpayers	Current employees and retirees can be affected too
10	We are at the mercy of markets	Policy choices shape risk outcomes
11	Standard deviation is the best risk measure	Downside metrics provide more wholistic picture

Resources and References

Professional Organizations

American Academy of Actuaries

Issue Briefs on Pension Funding

Conference of Consulting Actuaries

Actuarial Funding Policies and Practices for Public Pension Plans Second Edition August 2024

NASRA

Public Pension Plan Issue Briefs

Actuarial Standards

ASOP No. 4

Measuring Pension Obligations and Determining Pension Costs

ASOP No. 27

Selection of Assumptions for Measuring Pension Obligations

Accounting Standards

GASB Statements No. 67 & 68

Accounting and Financial Reporting for Pension Plans

GASB Statements No. 74 & 75

OPEB Plan Reporting and Employer Accounting

THANK YOU

Questions & Discussion

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