



# Funding Policy and Actuarial Cost Methods

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# Agenda

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- ◆ Definition of Funding Policy
- ◆ Actuarial Cost Methods
- ◆ Comparison of Actuarial Cost Methods
- ◆ Other Funding Policy Techniques



# New GASB Standards are drawing more attention to Funding Policy

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- More and more Plans and employers are now drafting funding policies because:
  - ◆ There will no longer be an ARC, a current de facto funding standard
  - ◆ Required Supplementary Information (RSI) section of the CAFR will include the disclosure of an Actuarially Determined Employer Contribution (ADC), if one is calculated, and compare it to the actual employer contribution made. This will become the source for researchers to find out whether a plan's funding policy requires contributions that are reasonable, systematic and actuarially based
  - ◆ The funding policy is the primary driver of whether and when there is a "cross-over" date (Fund runs out of money) for lowering the discount rate in the GASB blended discount rate process
  - ◆ Just because it is the right thing to do



# Funding Policy

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- ◆ The “Funding Policy” of a Pension Plan is a systematic set of procedures used to determine the contributions which will be made in a specific year and series of years
- ◆ It is much broader in scope than most people think
- ◆ It must address how the contributions will be made for ongoing benefits as well as how to finance gains or losses as experience occurs



# Elements of a Funding Policy

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- ◆ Actuarial Cost Method\*
- ◆ Asset Smoothing Method\*
- ◆ Amortization Methods\*
  - ▶ Level dollar vs Level Percentage of Payroll/Budget
  - ▶ For initial liabilities
  - ▶ For changes in assumptions
  - ▶ For changes in benefit provisions
  - ▶ For gains and losses (deviations from expectation) that naturally occur
- ◆ Contribution stabilization techniques
- ◆ Procedures for Plans with lower funded ratios
- ◆ Surplus management

\* *Already included in TMRS' funding policy*



# Current TMRS Policy

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- ◆ TMRS does have a current policy
  - ▶ Mostly defined in statute
  - ▶ Some defined further by Board rules
- ◆ Employers must contribute the normal cost plus a closed amortization of any UAAL that exists
- ◆ Ad hoc benefit enhancements are amortized over a shorter period and on a level dollar schedule
- ◆ Small plans have accelerated schedules
- ◆ For the new GASB disclosures, these policies will need to be written in a summarized, concise format



# Determining the GASB Discount Rate

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- ◆ The premise...
  - ▶ The pension plan is primarily responsible for paying pension benefits to the extent the plan has sufficient assets
    - Assets invested with long-term investment horizon
  - ▶ The employer is primarily responsible for paying benefits to the extent the plan does not have sufficient assets
    - From the general fund or bond revenues
- ◆ By having a stronger funding policy, the cross-over date is pushed back, which will increase the blended discount rate and lower the NPL (net pension liability) on the balance sheet
- ◆ TMRS' current strong funding policy precludes the likelihood of using the lower discount rate



# General Outcomes in GASB Procedure

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## ◆ *Like TMRS, many plans contribute:*

- Normal cost PLUS *closed* amortization payments
- These probably have discount rates = LTeROR (Long Term Expected Rate of Return)

## ◆ *Many plans contribute:*

- Normal cost PLUS *open* amortization payments
- These almost always have discount rates less than LTeROR

## ◆ *Other plans:*

- A flat statutory percent of pay, or
- Target cost methods, or
- Pursuant to a more complex model
- These might have discount rates lower than LTeROR





# Actuarial Cost Method

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- ◆ There are several policies that could be utilized to fund the expected benefit payments
  - ▶ Pay-as-you-go
  - ▶ Lump sum at hire
  - ▶ Fully funded at time of vesting
  - ▶ Various career accrual strategies
- ◆ Like TMRS, almost all retirement systems utilize a career accrual strategy
  - ▶ Contributions are made throughout the career to fully fund the benefit at the time of retirement
- ◆ We are going to discuss a few of these strategies today, but first we need to define some terms



# First, some definitions

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- ◆ Present Value of Benefits (PVB)
- ◆ Normal Cost
- ◆ Actuarial Accrued Liability (AAL)
- ◆ Unfunded Actuarial Accrued Liability (UAAL)
- ◆ Funded Ratio
- ◆ Annual Required Contribution (ARC)
- ◆ Amortization Period/Policy



# Example

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- ◆ A City hires an employee and agrees to pay the employee \$1,000 the day he retires in 20 years
- ◆ No investments are available
  - ▶ (earnings = \$0)
- ◆ The City would like to save up for this payment throughout the 20 years instead of having to come up with \$1,000 at the end of the agreement
  - ▶ The \$1,000 is the **Present Value of Benefits (PVB)**
  - ▶ With interest,  $PVB = \$1,000 / (1+I)^{(RetAge-Age)}$



# Normal Cost

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- ◆ Therefore, the City would save \$50 per year to accumulate the \$1,000
  - ▶  $\$1,000 / 20 \text{ years} \Rightarrow \$50 \text{ per year}$
  - ▶ The \$50 can be defined as the **Normal Cost**
- ◆ The Normal Cost can be defined as:
  - ▶ The cost of accruing next year's benefit
  - ▶ The cost of providing benefits to a new employee
  - ▶ What the contribution requirement would be if everything always had been and everything always will be perfect



# Actuarial Accrued Liability

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- ◆ Therefore, 10 years into the arrangement the City should have saved \$500
  - ▶ \$50 each year for 10 years
  - ▶ The \$500 can be defined as the **Actuarial Accrued Liability (AAL)**
- ◆ The Actuarial Accrued Liability represents the *target value of assets* at a specific point in time based on the funding objectives
  - ▶ AAL at time 5 = \$250
  - ▶ AAL at time 20 = \$1,000



# Unfunded Actuarial Accrued Liability

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- ◆ What if the City had only saved \$400 by year 10?
  - ▶ AAL (target assets): \$500
  - ▶ Actual asset level: 400
  - ▶ UAAL \$100
  - ▶ The \$100 can be defined as the **Unfunded Actuarial Accrued Liability (AAL)**
- ◆ The **Funded Ratio** is the actual asset value as a percentage of the target asset value
  - ▶  $\$400 / \$500 = 80\%$



# Amortization Payment

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- ◆ Additional contributions will be made so that the UAAL will be amortized over a desired period of time
  - ▶ In this example, let's assume 5 years
  - ▶ Amortization payment =  $\$100 / 5 = \$20$
- ◆ Therefore, the total contribution requirement for year 11 will be the normal cost plus the amortization of any UAAL
  - ▶  $\$50 + \$20 = \$70$



# Annual Required Contribution (ARC)

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- ◆ The contribution is set to be the sum of:
  - ▶ The normal cost for the year and
  - ▶ The amortization of the UAAL
  
- ◆ Another way to look at it:
  - ▶ The contribution for the current year  
plus
  - ▶ The contribution to make up any shortfall that may have occurred due to past experience or plan changes





# Comparing Cost Methods

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- ◆ There are several cost methods which all have the same ultimate goal: make sure there is enough money available to pay the benefits when they come due
- ◆ However, each funding method has characteristics which may make one more appropriate than others in certain situations
  - ▶ Front load (EAN)
  - ▶ Back load (PUC)
  - ▶ Level payroll (TMRS, except Ad Hoc)
  - ▶ Level contributions (TMRS Ad Hoc)
  - ▶ Cover termination liability at all times



# Projected Unit Credit (PUC)

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- ◆ Projected Unit Credit attempts to fund the “true” present value of the benefits as it accrues, no spreading of costs
  - ▶ Considered a “benefit accrual” method
  - ▶ Creates lower costs early in an employee’s career
  - ▶ Costs increase as retirement nears (larger accruals and shorter discount period)
  - ▶ Used to be the most common method in private sector valuations



# PUC: Numerical Example

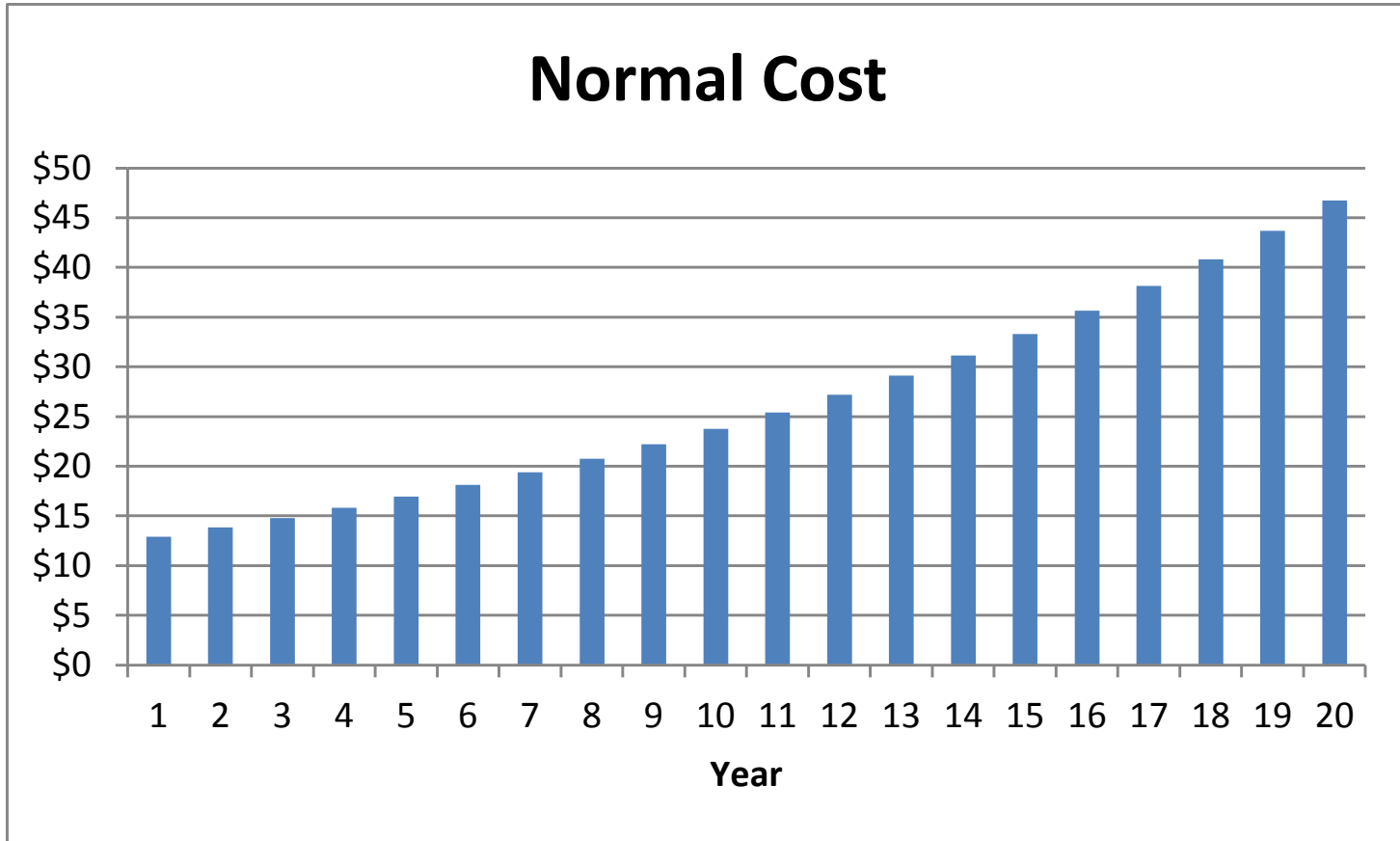
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- ◆ Using 7% interest in our prior example:
  - ▶ PVB at hire =  $\$1,000 / (1.07)^{20} = \$258$
- ◆ Normal Cost for Year 1 will be:
  - ▶  $\$258 / 20 = \$13$
  - ▶ Thus, the employer would contribute \$13 in year 1
- ◆ This calculation occurs every year with exponent reduced by one year
- ◆ At year 10
  - ▶ PVB =  $\$1,000 / (1.07)^{10} = \$508$
  - ▶ Normal Cost =  $\$508 / 20 = \$25$
  - ▶ AAL =  $\$508 * 10 / 20 = \$254$
- ◆ In the final Year
  - ▶ Normal Cost =  $\$935 / 20 = \$47$

*The above calculations assume beginning of year payments*



# PUC Normal Costs over time





# Entry Age Normal (EAN)

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- ◆ Entry age normal attempts to create level contributions throughout the working career of the employee
  - ▶ Considered a “contribution accrual” method
  - ▶ Can be level dollar or a level percentage of payroll
  - ▶ By far the most utilized funding method in the public sector
  - ▶ More costly early in the career of an employee
    - Pay higher contributions early to not have a spike in contributions as the member nears retirement

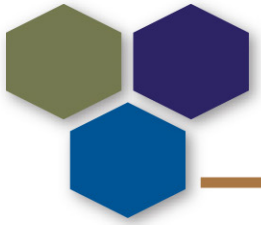


# EAN: Numerical Example

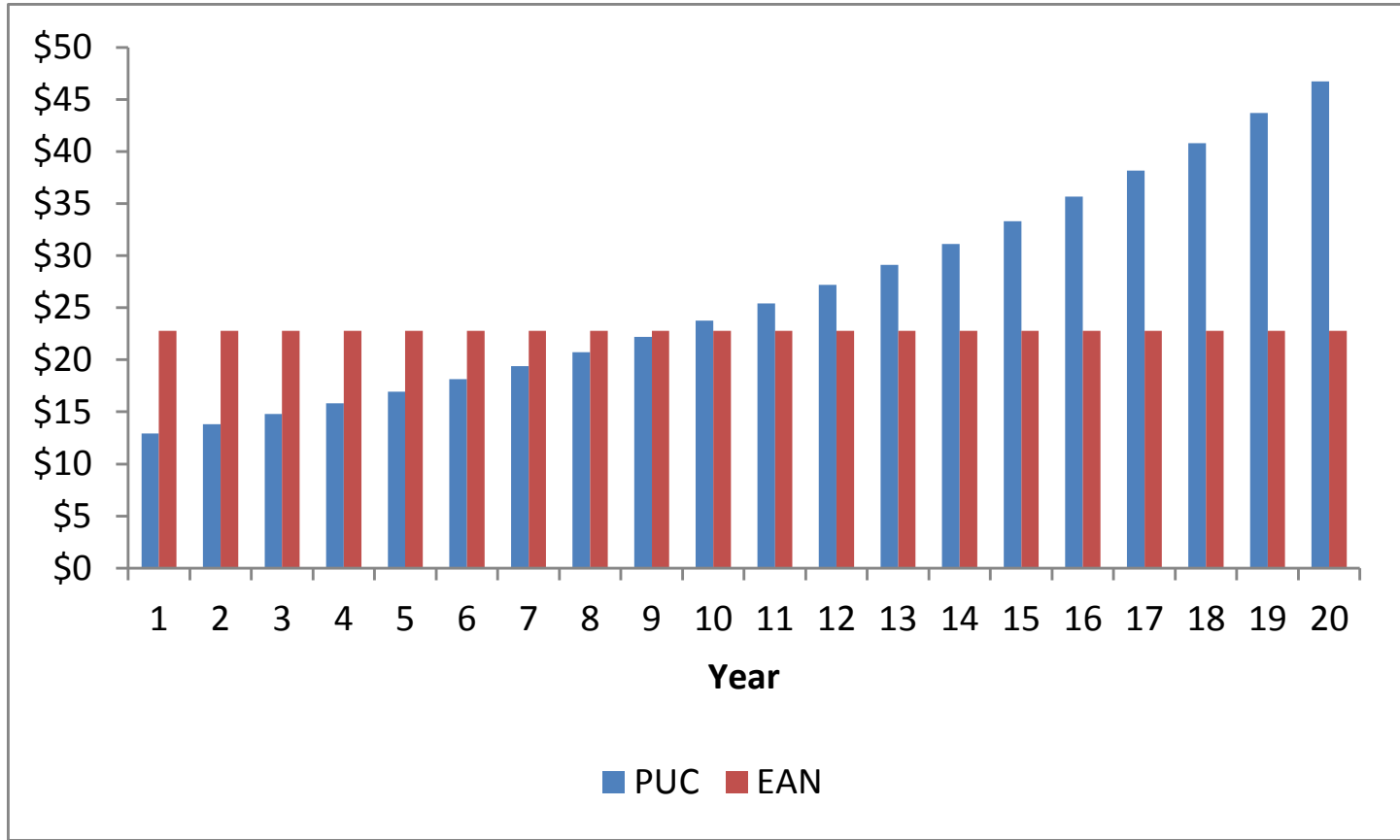
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- ◆ Using 7% interest in our prior example:
  - ▶ PVB at hire =  $\$1,000 / (1.07)^{20} = \$258$
- ◆ Normal Cost will be the 20 level payments that will accumulate to \$1,000 with interest at retirement
  - ▶ Similar to a mortgage
  - ▶ A 20 year PV factor at 7% = 11.34
  - ▶  $\$258 / 11.34 = \$23$
  - ▶ Thus, the employer would contribute \$23 each year
- ◆ At time 10
  - ▶ PVB =  $\$1,000 / (1.07)^{10} = \$508$
  - ▶ Normal Cost = \$23 from above
  - ▶ AAL = accumulated value of 10 payments of \$23 = \$337
- ◆ In the final Year
  - ▶ Normal Cost still equal \$23

*The above calculations assume beginning of year payments*



# Comparison of Normal Costs over time



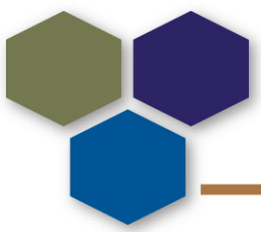


# Percentage of Payroll Contributions

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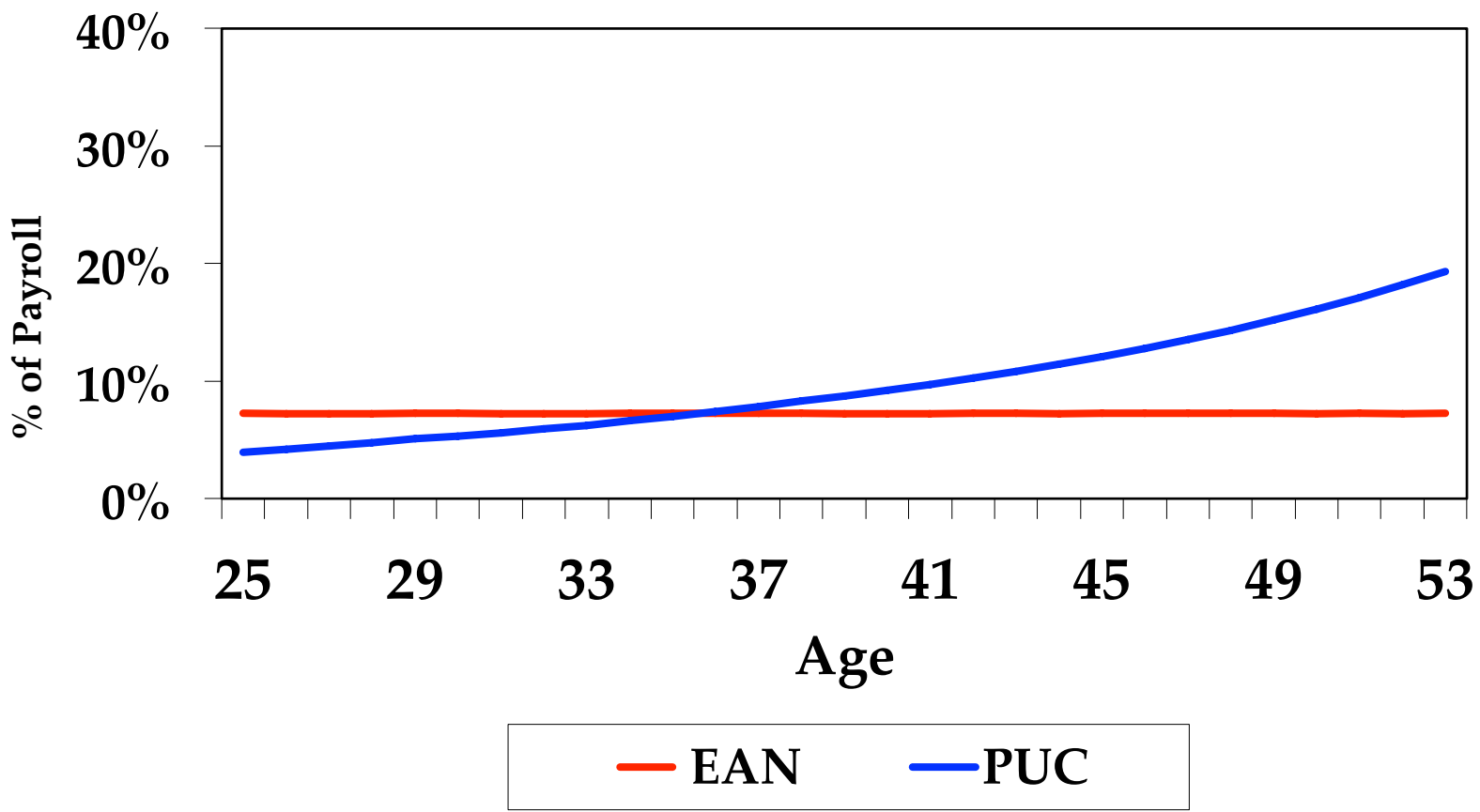
- ◆ Instead of using the simplistic, fixed dollar example from before, the calculations get a little more complicated when the ultimate benefit and the contributions are based on a growing salary and termination assumptions are applied
  - ▶ The same attributes hold, but actually become more amplified
  - ▶ The Normal Cost under PUC will increase substantially as a percentage of the salary as the employee ages
  - ▶ The Normal Cost under EAN will be calculated so that the contribution is a level percentage of salary instead of a level dollar amount

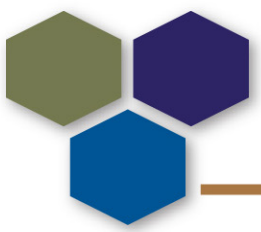




# Comparisons of Funding Methods: Normal Cost as a Percentage of Salary

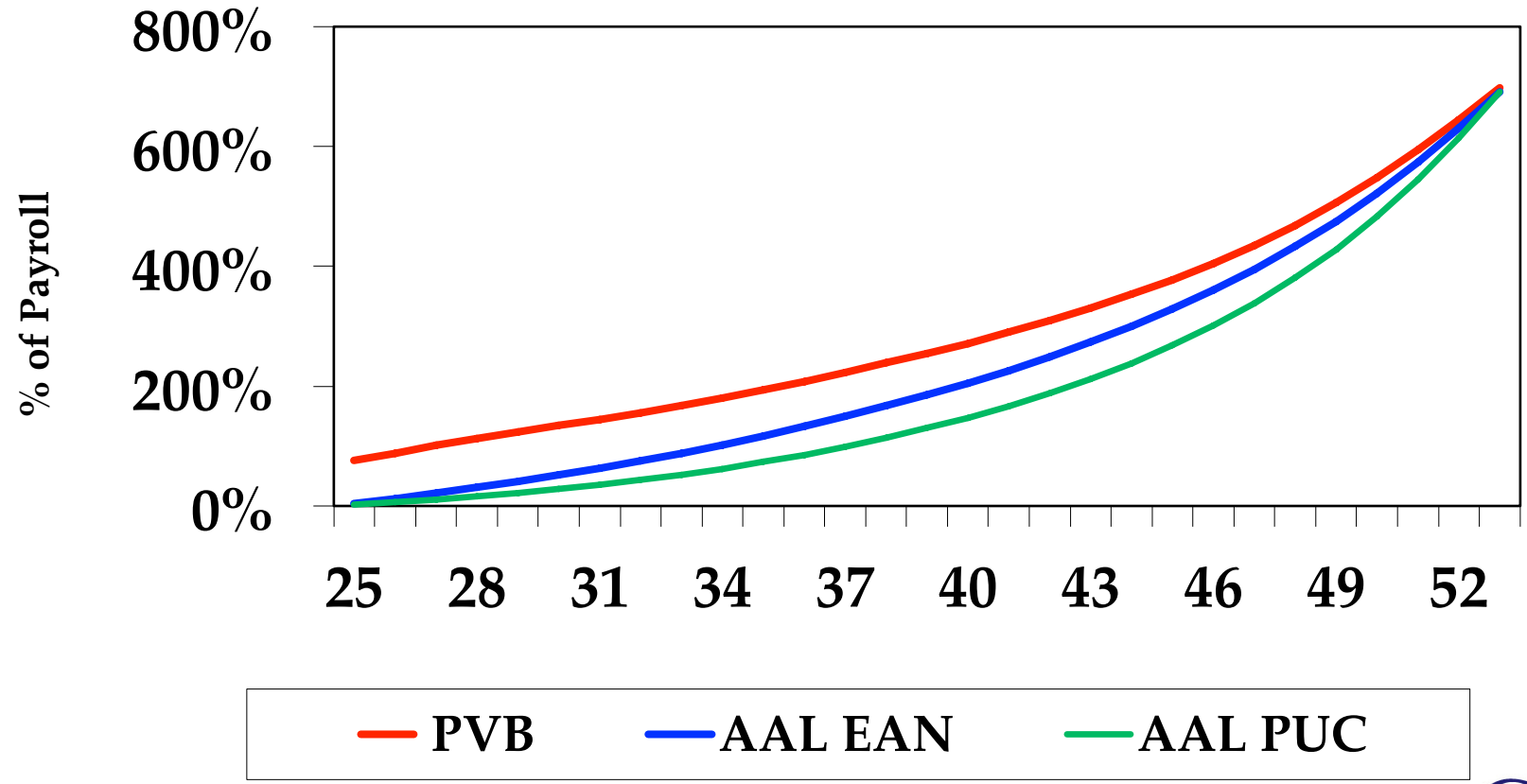
## New Member: Entry Age 25





# AAL accrues over the entire career of the member

**New Member: Entry Age 25**





# Total Group

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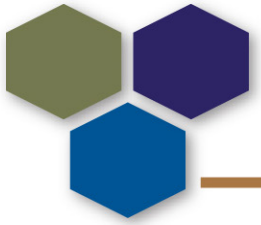
- ◆ The valuation uses the sum of the normal costs and accrued liabilities of each member in the population
  - ▶ By design, the AAL under EAN is ALWAYS larger than the AAL under PUC
    - Thus, EAN compared to PUC will have a larger UAAL and a lower funding ratio



# Total Group Contributions

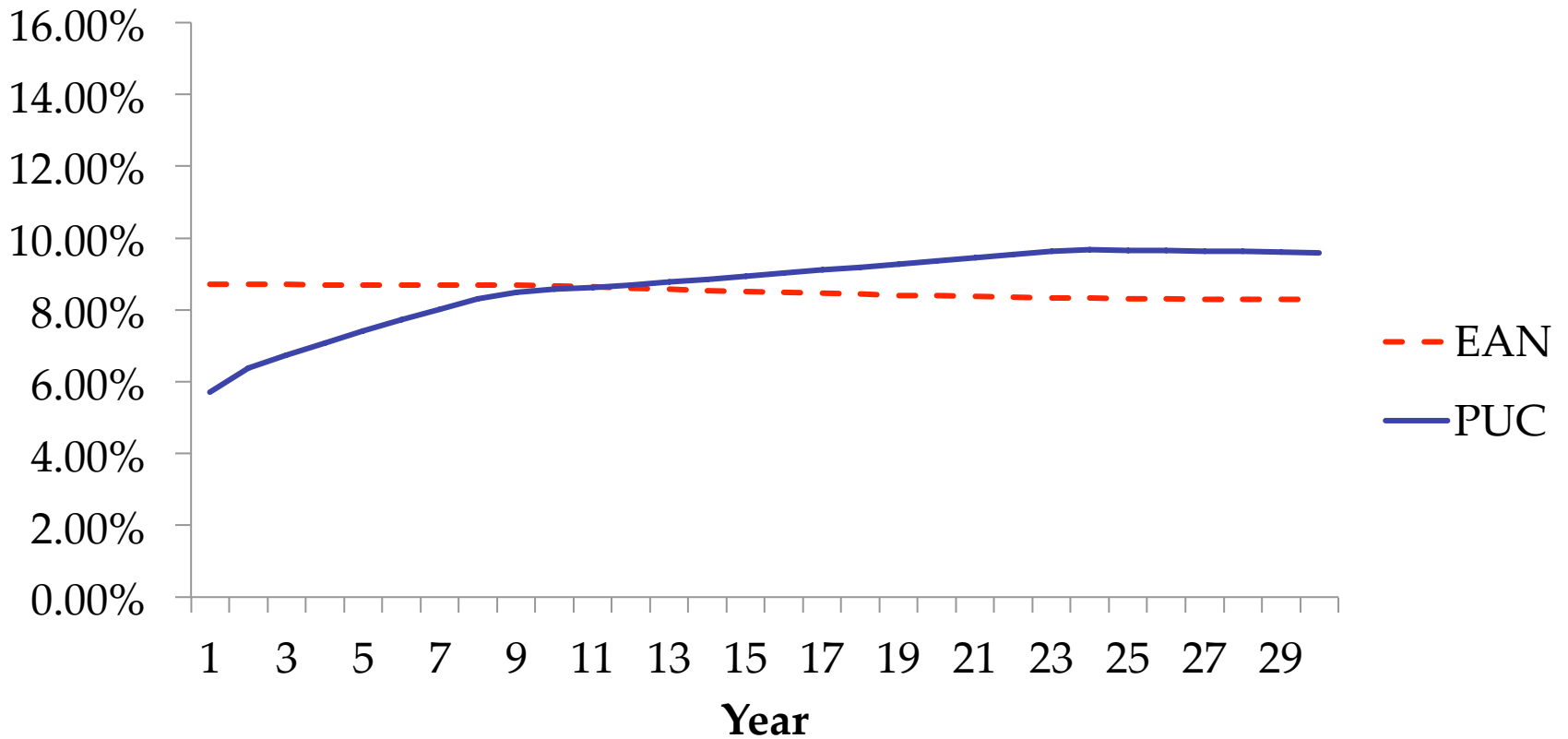
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- ◆ Younger populations will have lower contribution requirements under PUC than EAN
- ◆ Typically, growing or stable, non-aging population will have lower contribution requirements under PUC than EAN
- ◆ However, as the population ages, the contribution requirements under EAN will remain more stable and PUC will drift up
- ◆ If the population matures, ages, and/or stops growing, the contribution requirements under PUC will eventually pass the EAN
  - ▶ They have to since both methods are funding to the same benefit at retirement



# Normal Costs as a Percentage of Payroll

## Open Group of New Entrants





# Example TMRS City under EAN and PUC

(Illustrative based upon December 31, 2011 results)

	EAN	PUC
	(1)	(2)
1. Present Value of Benefits	\$ 140,186	\$ 140,186
2. Less PV Future Normal Costs	(23,860)	(31,457)
3. Total actuarial accrued liability (1 - 2)	\$ 116,326	\$ 108,729
4. Actuarial value of assets	(107,232)	(107,232)
5. UAAL (3 - 4)	\$ 9,094	\$ 1,497
6. Funded ratio (4 / 3)	92.2%	98.6%
7. UAAL/Payroll	45.3%	7.5%
<hr/> <b>FY2013 Contribution Rate</b> <hr/>		
8. Full retirement rate		
a. Normal cost	8.31%	9.52%
b. Amortization Payment	2.85%	0.47%
c. 25 Year ARC	11.16%	9.99%
9. Estimated Contributions	\$ 2,241	\$ 2,005

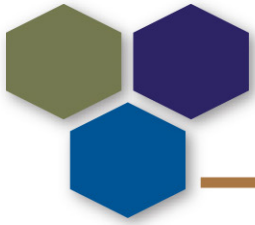
\$ in thousands



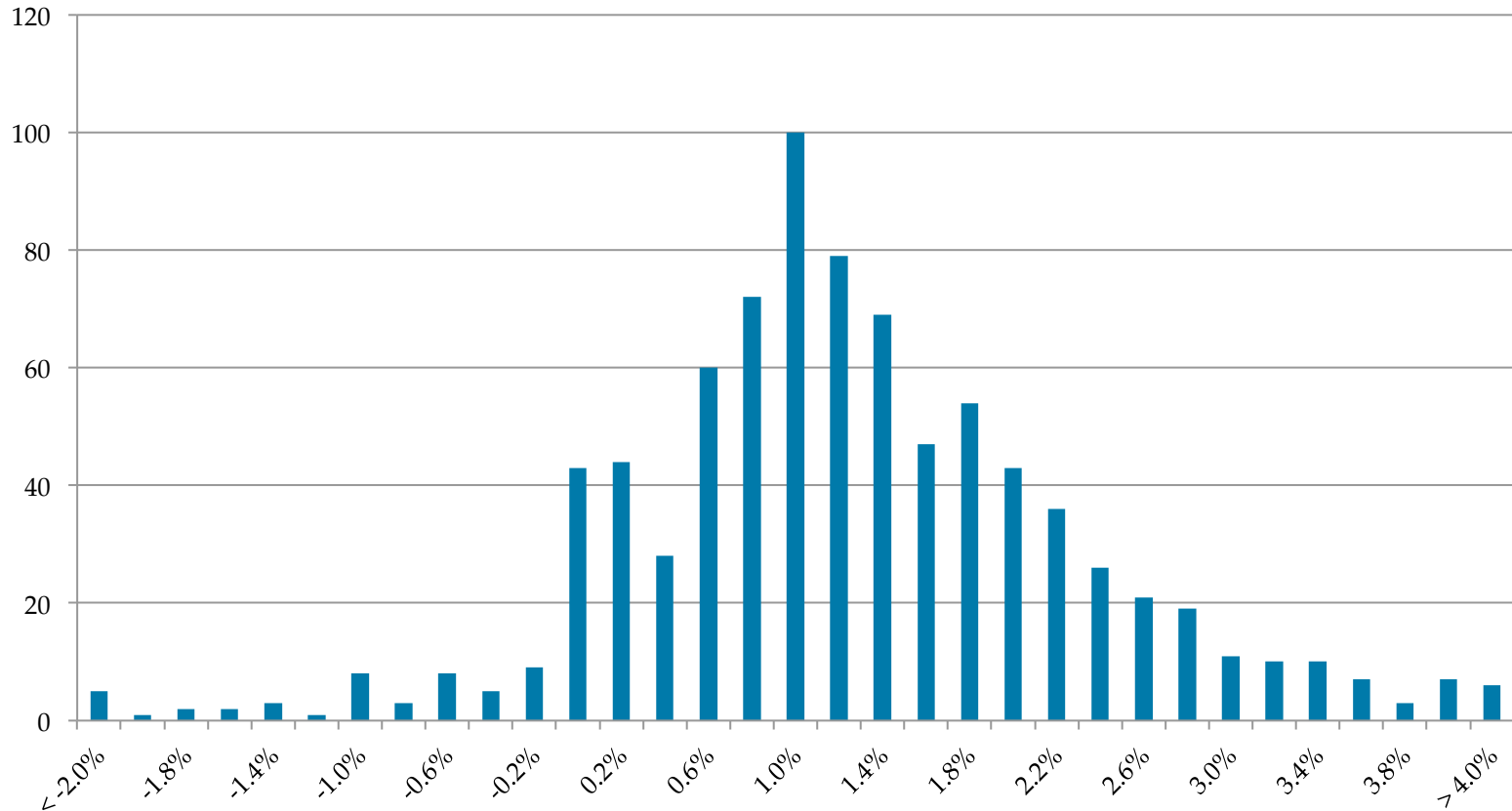
# Comparison of Plan-wide Funded Status

	PUC	EAN
Present Value of Benefits	\$29,183	\$29,183
Actuarial Accrued Liability	\$21,563	\$23,490
Actuarial Value of Assets	<u>\$18,347</u>	<u>\$18,347</u>
Unfunded Actuarial Accrued Liability	\$3,216	\$5,143
Funded Ratio	85.1%	78.1%
Full Retirement Rates:		
Straight Average	8.35%	9.61%
Payroll Weighted Average	13.22%	14.19%

\$ amounts in millions

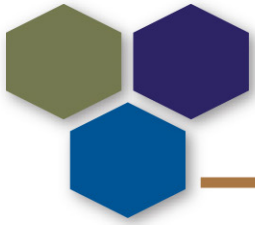


# Distribution of Impact on Rates (All Cities)

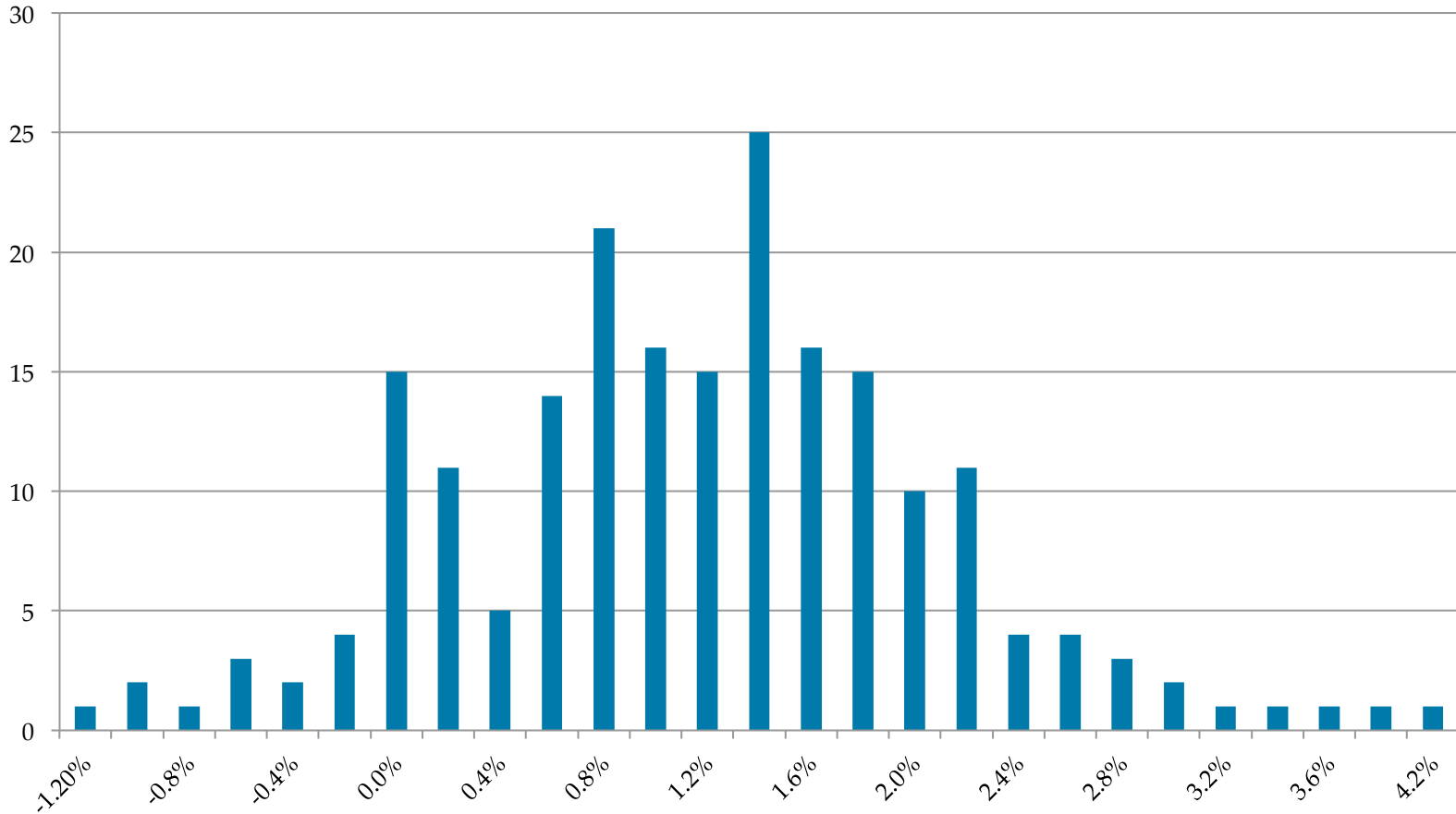


The above comparison only includes a difference in the actuarial cost method (PUC vs EAN), all other assumptions, methods, and policies are unchanged.





# Distribution of Impact on Rates for Cities with 100 or More Actives



The above comparison only includes a difference in the actuarial cost method (PUC vs EAN), all other assumptions, methods, and policies are unchanged.



# Comparison of Volatility

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Actuarial Cost Method	Normal Cost Volatility	UAAL Volatility*	Total Contribution Rate Volatility
Aggregate	+++++	-	+++++++
Unit Credit	++++	++	+++++++
Projected Unit Credit	+++	+++	+++++++
Individual EAN	+	+++	++++

\* Depends on amortization policy

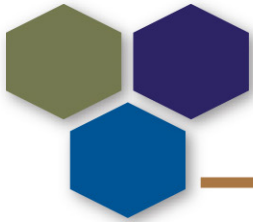
Aggregate and Unit Credit are two other actuarial cost methods.



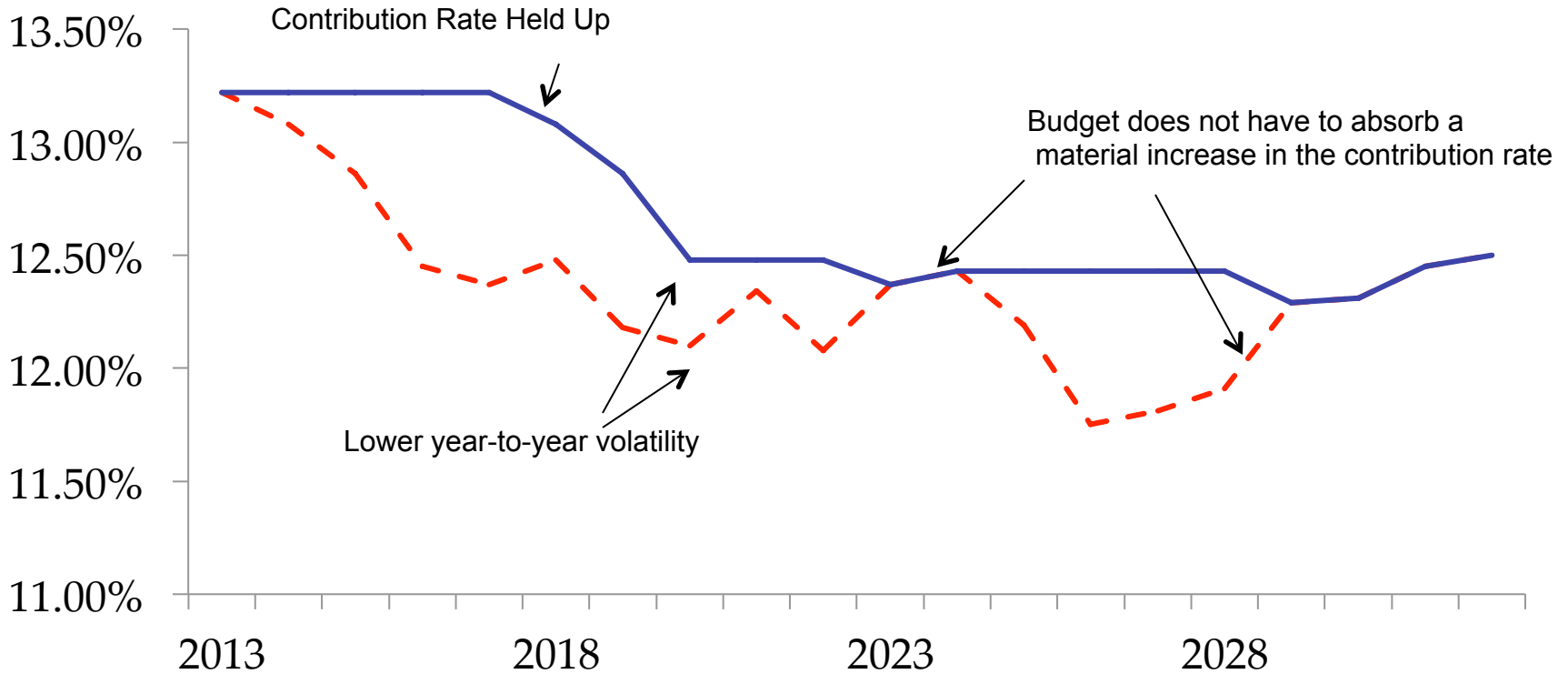
# Contribution Rate Stabilization Techniques

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- ◆ It is important for employers to recognize there will be some level of natural volatility in the contribution rate
  - ▶ Could be +/- 0.10% or as much as +/- 0.20% on an annual basis
- ◆ To combat this expected volatility, some plans have implemented stabilization techniques
- ◆ Examples
  - ▶ Fixed Rate Plans, whether permanent or reset every few years
  - ▶ +/- corridors: Rate stays the same until the actuarially determined rate reaches a certain level above or below, then the rate moves in that direction
  - ▶ +/- limitations in a given year: rates can't go up or down more than X% in 1 year
- ◆ Another way is to slow the pace the contribution rate is allowed to decrease in a given year
- ◆ Examples include:
  - ▶ Not allowing the actual contribution decrease by more than 0.10% in a year, even if the actuarially determined rate would allow for more than that
  - ▶ A simpler and more direct method would be to adopt a look back period and always contribute the highest contribution rate determined during the period
    - Example, always contribute the highest rate from the last 3 or 5 valuations
  - ▶ Or, don't let the contribution rate decrease until X% funding is reached



# Illustrated Scenario



-- Actuarial Determined Contribution Rate

— Actual Budgeted Contribution Rate Equal to Highest of Last 5 years

*The above scenario is not a projection of expected results  
The year-to-year returns were randomly generated to illustrate the strategy*



# Plans with an Unfunded Liability

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- ◆ Some Systems have implemented a more accelerated funding policy if the Plan's funded ratio has fallen below a certain level
  - ▶ A more extreme situation is a plan that is getting close to pay-as-you-go would be considered "in distress"
- ◆ Usually, it means a little less flexibility for contribution and/or benefit policies
  - ▶ For example, a City's contribution rate cannot decrease until its Plan reaches 80% funding
  - ▶ Some Plans' are precluded from any ad hoc benefit enhancements at this time, as well
    - Under TMRS statutes, the Board probably does not have the authority to not allow a City to grant an ad hoc enhancement. However, the amortization period could be shortened to ensure contributions are coming in to the Plan fast enough to improve the funding status
  - ▶ The Pension Protection Act (for private sector plans) has several triggers that occur when a Plan is less than 80% funded



# Surplus Management Techniques

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- ◆ After the run up in the 90's followed by the lower market returns in the last decade, many Plans have realized that they would be in a better position today if “surpluses” from the 90's weren't spent on benefit enhancements and contribution decreases
- ◆ Individual employer plans can use their asset allocation to de-risk the Plan in times of surplus
- ◆ However, that is more difficult for a multiple employer System that has some plans that are “overfunded” and others that are “underfunded”
- ◆ Thus, the surplus management falls to the contribution strategies



# Surplus Management Techniques

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- ◆ If a TMRS city has a surplus (UAAL less than zero), then their contribution requirement is decreased from the normal cost equal to a 25 year amortization of the current surplus
- ◆ There are 217 Plans in TMRS with a surplus, and 37 have eliminated their contribution requirement entirely
- ◆ While this is substantially better than, for example, allowing a City to offset its contribution by the entire surplus, this policy, by design, pushes a City's funded status back towards 100% and thus eliminating the surplus
- ◆ Several Plans have put policies in place to make the hurdle higher
  - ▶ For example, in the private sector, the normal cost (new accruals) must always be contributed and no credit is given
  - ▶ In Utah, the credit does not begin until a Plan is 110% funded, basically acting like a reserve



# Combination of Techniques

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Funding Ratio	Funding Policy
<80%	Employer rate cannot decrease until reaching 80% funding target Any ad hoc enhancements amortized over a five year period
80-90%	Employer rate is equal to the highest of the last 5 calculated annual rates
90-100%	
100-110%	Employer rate equal to the highest of the last 5 calculated annual normal cost rates
>110%	Employer rate equal to the highest of the last 5 calculated rates with amortization credits back to 110% based on 25 year rolling schedule

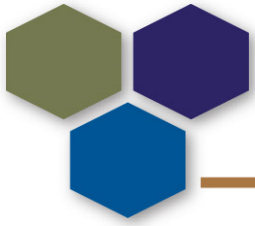




# In Summary

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- ◆ The current TMRS funding policy is already ahead of most of its peers
- ◆ With the new GASB Standards, TMRS should consider consolidating in one place its written funding policy
- ◆ In consolidation, this may be a good time to look at the different provisions and see if some changes make sense, such as further rate stabilization and other management techniques



# Other questions?

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*Thank you for the opportunity  
to meet with you today*