

Actuarial 101 and LACERS Funding Policies

LACERS
Board of Administration
Tuesday, January 26, 2010

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★ SEGAL | LACERS January 2010 Board Workshop

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Outline of Upcoming Decision Issues

1. Overview of Actuarial Valuation & Funding Policies
January 26 Regular Meeting – Discussion Only
2. Focus on Cost Method and Amortization Policy
February 11 Board Offsite – Discussion Only
3. Cost Method and Amortization Policy:
Discussion and Possible Action
February 23 Regular Board Meeting

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Basic Questions

- Purposes of an actuarial valuation
 - Primary:
 - Contribution requirements
 - Funded status
 - Secondary:
 - Disclosure requirements
 - Basis for pricing plan changes
 - Analysis of demographic experience
 - Analysis of financial experience

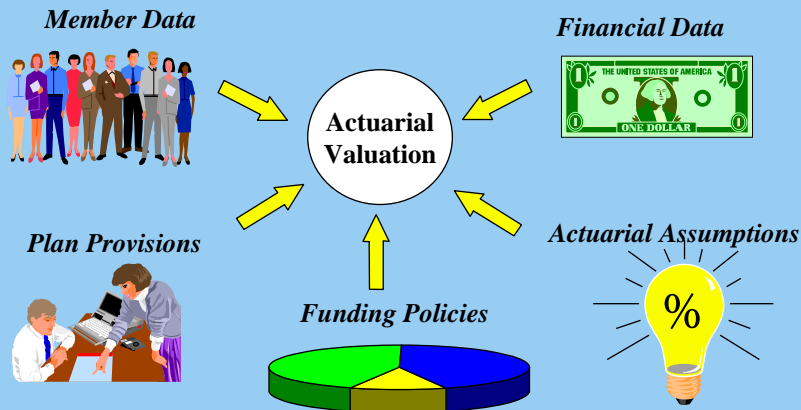
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Basic Questions

- Why fund?
 - Legal requirements
 - Security of benefits
 - Allocation of cost to appropriate time period
 - Inter-generational equity
 - Includes pattern of cost
 - Reduction in pension costs

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Valuation Input



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Valuation Input

- Member Data
 - Member Status
 - Sex
 - Date of Birth, Date of Hire
 - Pay, Contributions
 - Beneficiary Data
 - Benefit Amount
 - Payment Form/Duration

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Valuation Input

- Financial Data
 - Statement of Account
 - Reconciliation from Prior Year
 - Employer Contributions
 - Member Contributions
 - Benefit Payments & Expenses
 - Investment Return
 - Market Value
 - Actuarial Value

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Valuation Input

- Plan Provisions
 - Who Can Get Benefits
 - Under What Conditions
 - How Much, and
 - For How Long

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Valuation Input

- Actuarial Assumptions
 - Demographic – what benefits will be paid
 - Economic - how assets and salaries grow

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Valuation Input

- Demographic Assumptions
 - Rates of “Decrement”
 - Turnover, Disability, Retirement
 - Mortality:
 - before and after retirement
 - service, disability, beneficiary
 - Percent married
 - Member/Spouse age difference
 - Reciprocity

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Valuation Input

- Economic Assumptions
 - Inflation - component, plus COLA
 - Investment Return
 - Real return
 - Salary Increases
 - Real wage increases (“across the board”)
 - Merit and promotion
(included with demographic assumptions)

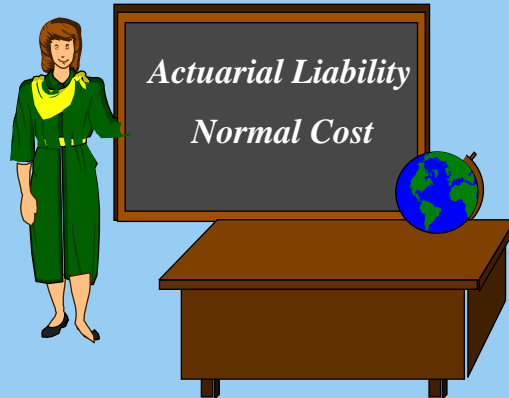
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Valuation Input

- Funding Policies – Three Components
 - Actuarial Cost Method - allocates costs to periods of service periods, past vs. future
 - Asset Smoothing Method - assigns a value to assets for determining contribution requirements
 - Amortization Policy - defines pattern and duration of payments to fund any difference between liabilities and assets

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Pension 101



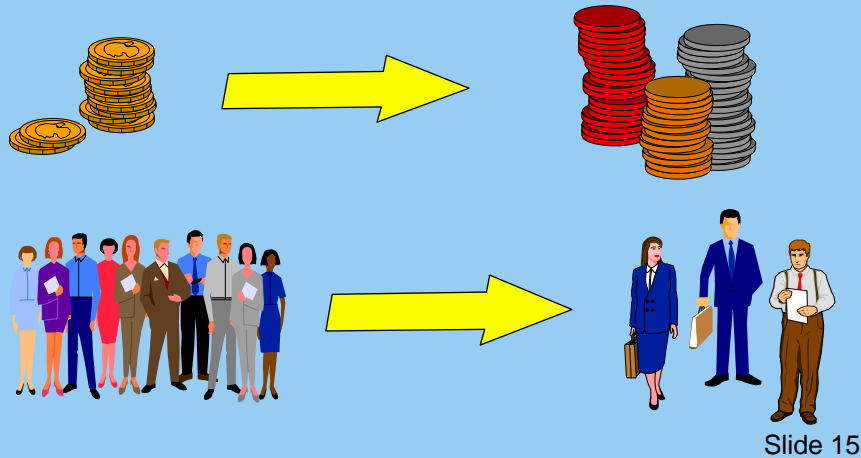
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Actuarial Concepts and Terminology

- Present Value (PV) of Future Benefits
- PV of Past Contributions (i.e., Assets)
- PV of Future Contributions
- PV of Future Normal Costs
- Actuarial Accrued Liability
- Unfunded Actuarial Accrued Liability (UAAL)
- Normal Cost
- **Amortization of UAAL/Surplus**
- Actuarial Gains and Losses

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Present Value (PV)



Present Value Example

- Promise to pay \$100 in ten years to each of 10 subscribers
- Investments will double in ten years (interest rate is 7.2%)
- 3 out of 10 subscribers will survive to collect

Present Value Example

- Consider Interest only
 - Collect \$50, invest it, pay \$100
 - We say \$50 is the “present value” of the \$100 “discounted at 7.2% interest” for 10 years
- Consider Survival only
 - Collect \$30 from each, use \$300 to pay each of the 3 survivors
 - We say \$30 is the “present value” of the \$100 “discounted at survivorship” for 10 years

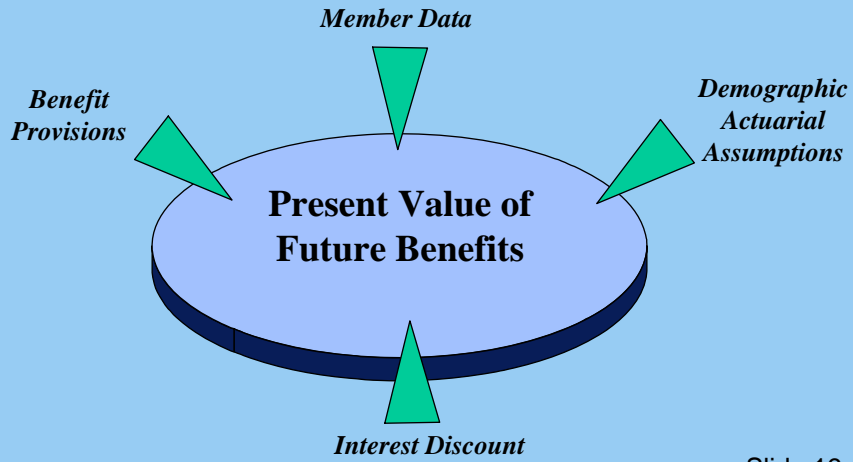
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Present Value Example

- Consider both Interest and Survival
 - Collect \$15 from each subscriber
 - Invest the \$150, have \$300 in 10 years
 - Pay \$100 to each of the 3 survivors
- We say \$15 is the “present value” of the \$100, “discounted at interest and survivorship” for 10 years

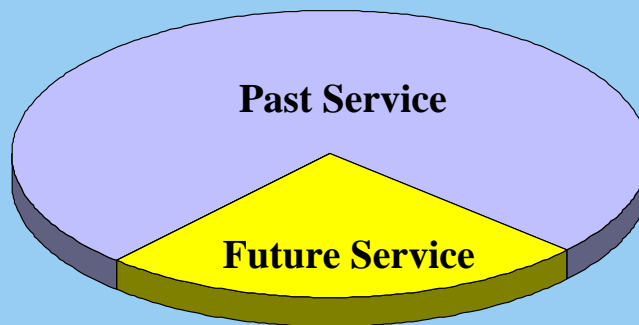
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PV of Future Benefits



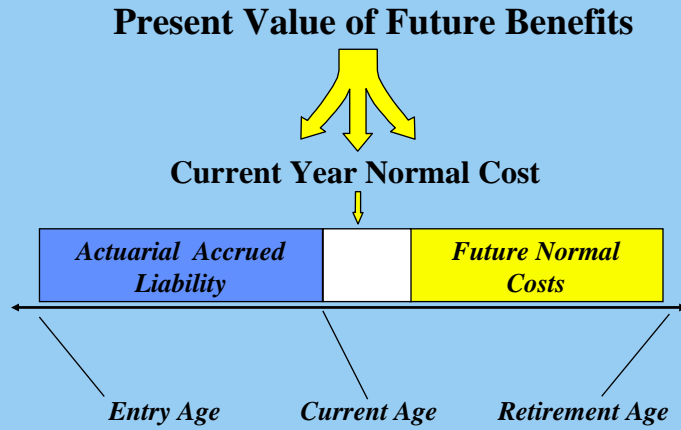
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Past Service vs. Future Service



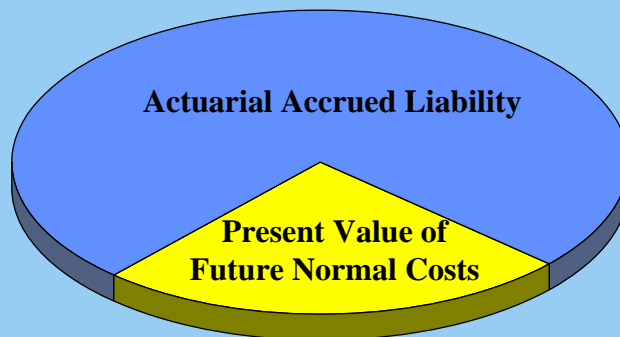
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Actuarial Cost Method



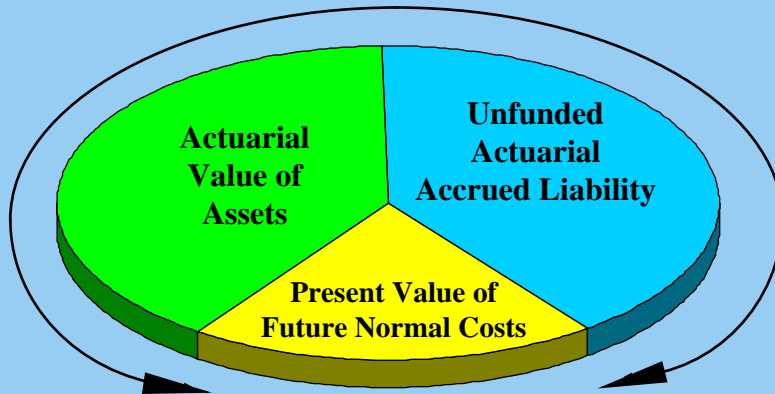
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Actuarial Accrued Liability



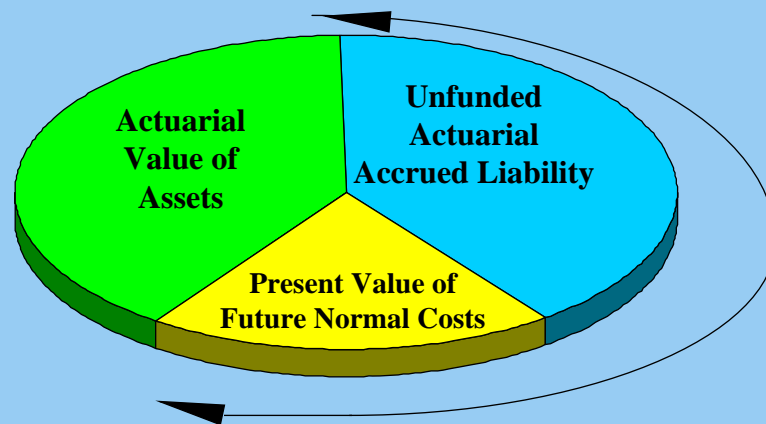
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Unfunded Actuarial Accrued Liability



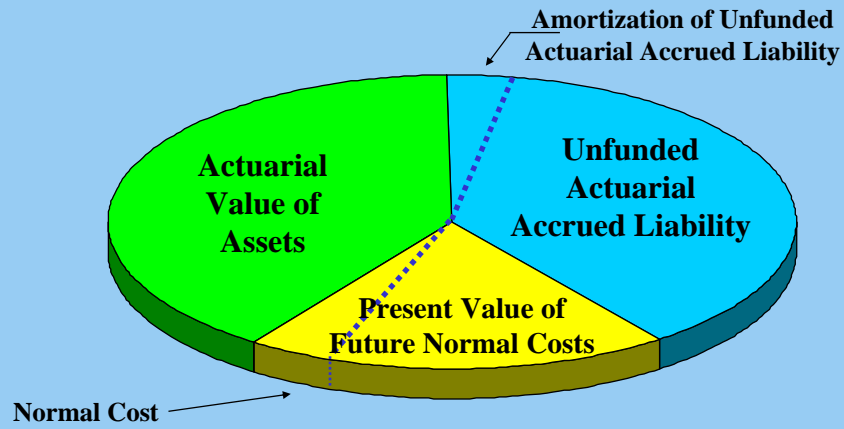
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PV of Future Contributions



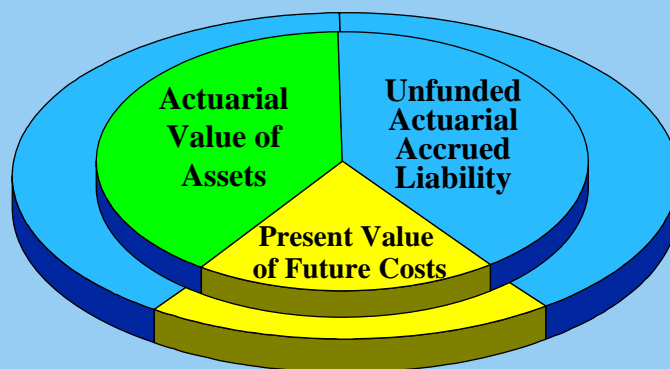
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Current Contribution



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Benefit Increases or Actuarial Losses



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Unfunded Liability Leverage

- For well funded plans, small increases in Accrued Liability can cause big (percentage) increases in UAAL

	Before Amendment	After Amendment	Percent Change
Accrued Liability	\$100 million	\$110 million	+10%
Assets	\$90 million	\$90 million	+0%
Unfunded Liability	\$10 million	\$20 million	+100%

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Actuarial Gains and Losses

- Gain - experience that is financially more favorable to the plan (e.g., more deaths than expected)
- Loss - experience that is financially less favorable to the plan (e.g., higher salaries than expected)
- Results in a larger (for a loss) or smaller (for a gain) UAAL than expected
- Cost is recognized through amortization of UAAL

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Funded Status

- Funded ratio = assets / liabilities
- Funded status = assets - liabilities

- Assets > liabilities ==> surplus
- Assets < liabilities ==> unfunded liability

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Funded Status

- Assets
 - Market value
 - Funding: Actuarial value (“smoothed” value”)
- Liabilities
 - Accrued Benefit Obligation
 - current service, current pay
 - Funding: Actuarial Accrued Liability
 - Allocated cost, Projected Unit Credit method

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The one thing to remember:

$$\mathbf{C + I = B + E}$$

Contributions + Interest Income
equals
Benefit Payments + Expenses

- Actuarial valuation determines the current or “measured” cost, not the ultimate cost
- Assumptions and funding methods affect only the timing of costs

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QUESTIONS

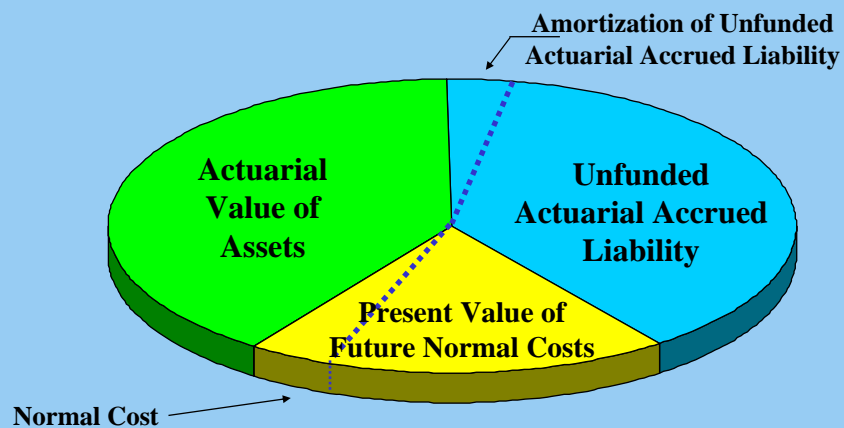
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Funding Policies – Three Components

- Actuarial Cost Method allocates Normal Cost and Actuarial Accrued Liability to years of service
 - Projected Unit Credit
- Asset smoothing method
 - Five-year smoothing
 - 50%-150% market value corridor
- **Amortization policy/periods**
 - 30 years for plan changes (except recent ERIP)
 - 30 years for assumption/method changes
 - 15 years for actuarial gains/losses

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Current Contribution



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Amortization of Unfunded Liability

- Source of Unfunded Liability
 - Plan changes [LACERS: 30 years]
 - Assumption or method changes [30 years]
 - Gains (credits) / losses (charges) [15 years]
- Amortization structure and period
 - Fixed period (closed) or rolling (open) [closed]
 - One layer [through 1997] or multiple [after 1997]
- Amortization method
 - Level dollar amount
 - Level percentage of pay [LACERS]

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Recent events at LACERS

- LACERS combined bases, reamortized in 1997 (15 years) and again in 2005 (30 years)
- Since then, new layers from gains/losses (annual) experience and assumption changes (see p. 22 of Pension actuarial report)
- Special issues for Health plan (p. 7 of Health report)
 - Restarted in 2005, same as Pension
 - GASB rules required combining in 2006, 2007
 - Harder to separate annual experience and assumption changes

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Recent events at LACERS

- Current Early Retirement Incentive Program (ERIP)
 - Current program started in 2009, actual retirement elections to be completed in early 2010
 - Retirement Board elected to use 15 years to amortize UAAL for this ERIP
 - Instead of current policy of 30 years for plan changes
 - After discussion of shorter periods based on ERIP specific benefit and cost structure

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Illustration of Amortization Methods

8.00% interest 4.25% salary incr.	30 years Flat dollar	30 years % of pay	25 years % of pay	15 years % of pay
Increase in AAL	1,000,000	1,000,000	1,000,000	1,000,000
Amortization factor (first year)	11.6648 0.085728	18.0562 0.055383	16.2068 0.061702	11.3665 0.087978
Amortization amount				
Year 1	\$ 85,728	\$ 55,383	\$ 61,702	\$ 87,978
Year 15	\$ 85,728	\$ 99,183	\$ 110,501	\$ 157,557
Year 25	\$ 85,728	\$ 150,383	\$ 167,544	\$ 0
Year 30	\$ 85,728	\$ 185,174	\$ 0	\$ 0
Total Amount Paid				
Principal	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Interest	1,571,833	2,239,083	1,657,926	794,718
Total	\$ 2,571,833	\$ 3,239,083	\$ 2,657,926	\$ 1,794,718

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Negative Amortization

- \$1,000,000 liability, 8.0% interest
- First year interest only is \$80,000
- With level dollar payments, payments are always greater than interest
- With level percentage payments, early payments can be less than interest
 - UAAL increases
 - Eventually larger payments cover interest plus increased UAAL
- Results when remaining period is over 18 yrs Slide 39

Selecting Amortization Periods

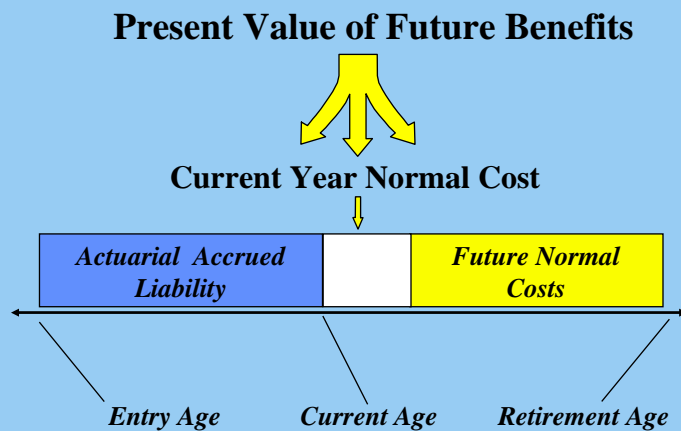
- Balance of multiple considerations
 - Also can depend on the source of the new UAAL
- Matching with period of benefit or service
 - Average future working lifetime
 - Average retiree life expectancy
 - Special considerations for ERIPs
- Reducing contribution volatility
 - Basis for CalPERS policy (April 2005)
 - Not relevant for plan changes
- Controlling negative amortization Slide 40

Funding Policies – Three Components

- **Actuarial Cost Method** allocates Normal Cost and Actuarial Accrued Liability to years of service
 - Projected Unit Credit
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Actuarial Cost Method



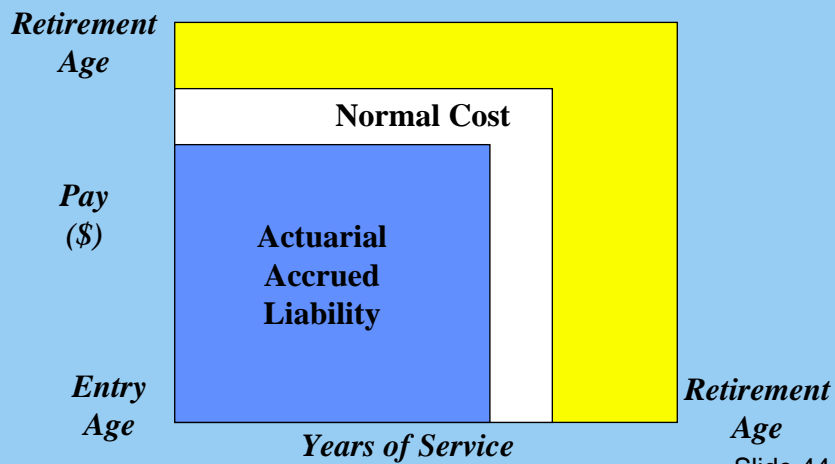
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Actuarial Cost Methods

- Unit Credit
 - Accrue costs as benefits are earned
 - Actuarial Liability = PV of accrued benefits based on past service and contributions.
 - Normal Cost = PV of benefits to be earned this year
- Used for FASB #35 Disclosure
 - Sometimes called “Accrued Benefit Obligation”
- Normal Cost increases as member gets older
 - Higher salaries increase benefit for all past service
 - Same benefit costs more as member ages

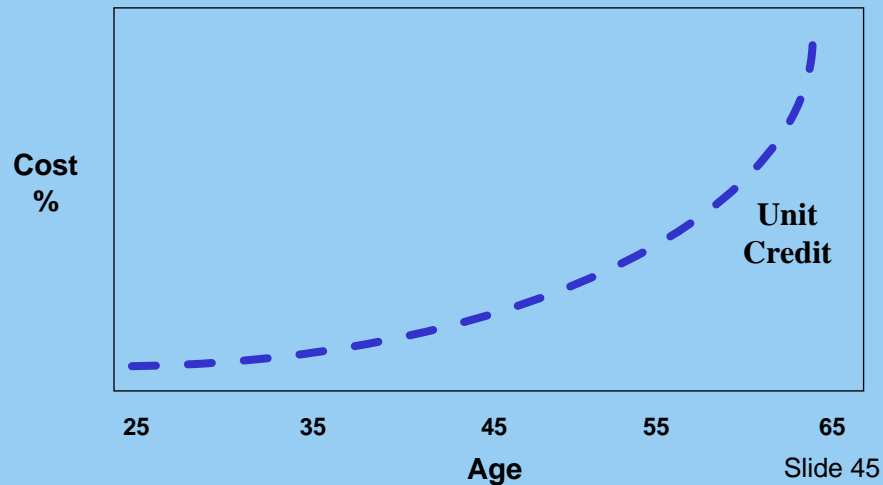
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Unit Credit Method



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Normal Cost as a Percentage of Pay



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Actuarial Cost Methods

- Projected Unit Credit: Costs based on allocated benefit
 - Accrue costs as benefits “earned”, but level out effect of future pay increases
 - Actuarial Liability = PV of accrued benefits based on past service and projected pay.
 - Normal Cost = PV of benefits to be earned this year based on projected pay.

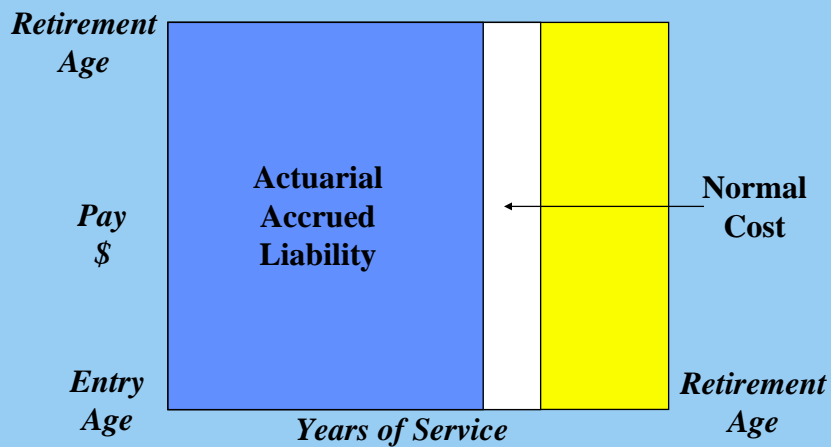
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Liability Cost Methods

- Projected Unit Credit (continued)
- Formerly required by GASB #5
 - Actuarial Accrued Liability called Projected Benefit Obligation (PBO).
- Can be used for funding (LACERS)
- Normal Cost increases as member gets older
 - Same benefit costs more as member ages
 - Especially important for new tier benefits
 - Ultimate normal cost will be higher than initial cost

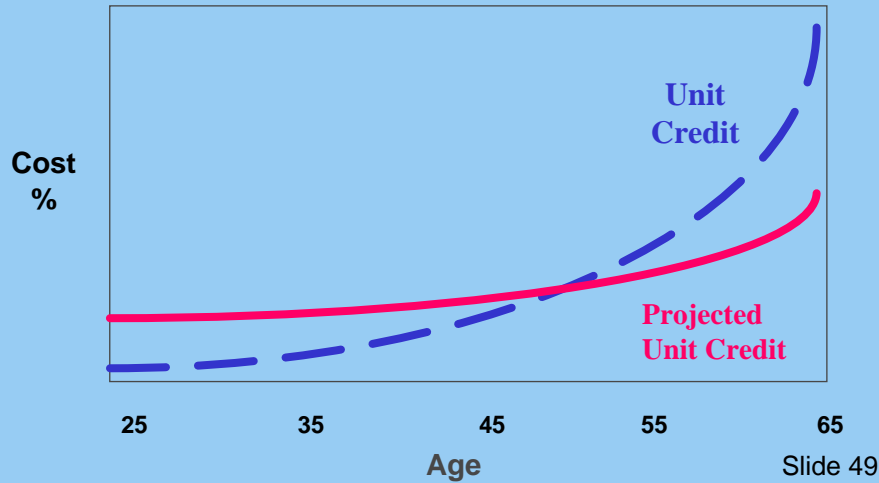
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Projected Unit Credit Method



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Normal Cost as a Percentage of Pay



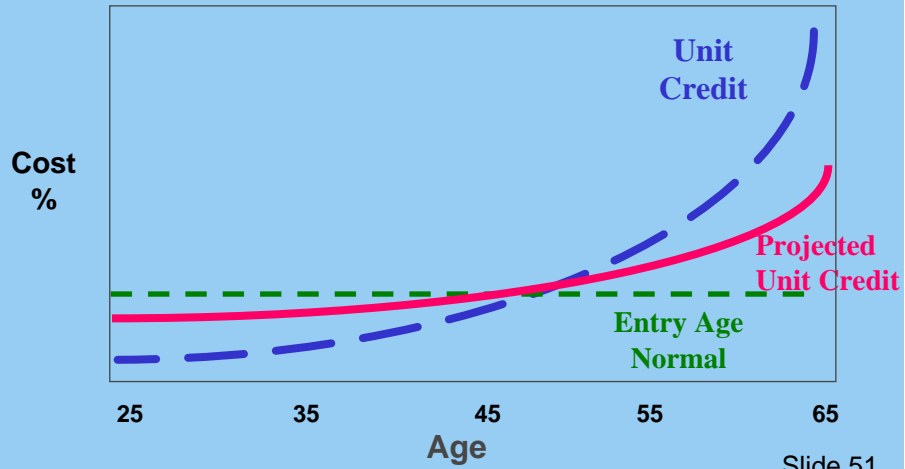
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Actuarial Cost Methods

- Entry Age Normal: Direct allocation of cost
 - Normal Cost Percentage = percentage of payroll over the working lifetime of active member that will provide for PV of projected benefits at retirement
 - Normal Cost = NC% times current pay
 - Actuarial Liability = Accumulated value of past normal costs
- Used for contribution calculation

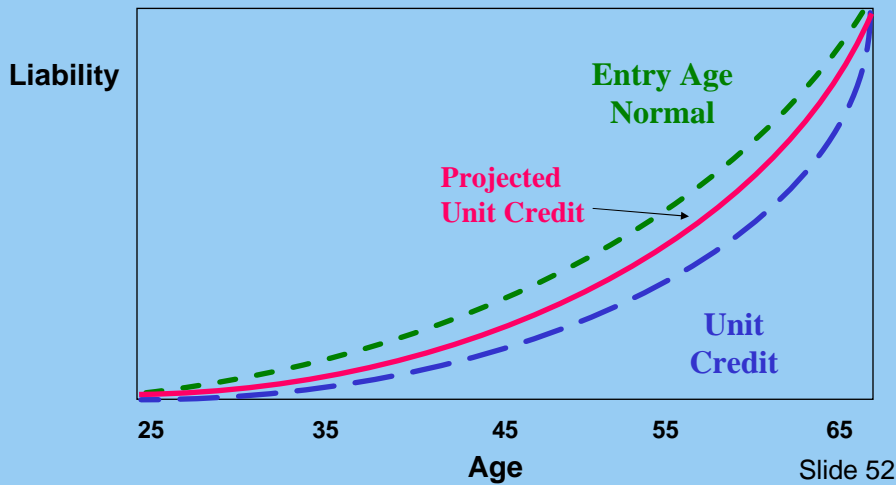
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Normal Cost as a Percentage of Pay



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Actuarial Accrued Liability



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Actuarial Value of Assets

- To reduce the impact of short term asset volatility, plans use an Actuarial Value of Assets (AVA) which “smooths” returns
 - Each year, take the difference between:
 - Actual return on Market Value of Assets (MVA)
 - Assumed return on MVA (currently 8.00%)
 - Difference is spread over (typically) five years
- Reduces volatility without reducing long term expected return

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Example: one good year

Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
MVA return	13%	8%	8%	8%	8%	8%
Deferred	(5%)					
Recognized	1%	1%	1%	1%	1%	
AVA return	9%	9%	9%	9%	9%	8%

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Example: one good, then one bad year

Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
MVA return	13%	3%	8%	8%	8%	8%	8%
Deferred	(5%)	5%					
Recognized	1%	1%	1%	1%	1%		
		(1%)	(1%)	(1%)	(1%)	(1%)	
AVA return	9%	8%	8%	8%	8%	7%	8%

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Asset Smoothing and UAAL amortization

- MVA volatility is greater than other experience
 - Needs its own shock absorber to get its volatility down to a level comparable to other experience
- MVA cost volatility is dampened twice
 - Much of the volatility is removed by asset smoothing
 - Only AVA volatility affects UAAL
 - AVA gain/loss is amortized with other gains/losses
 - UAAL says: Deferred MVA G/L “hasn’t happened yet”

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Asset Smoothing Mechanics

- When MVA return is **greater** than assumed
 - Smoothing “defers gains”
 - Smoothed value (AVA) is **less** than MVA
 - UAAL and contributions are **larger**
- When MVA return is **less** than assumed
 - Smoothing “defers losses”
 - Smoothed value (AVA) is **greater** than MVA
 - UAAL and contributions are **smaller**

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LACERS Actuarial Value of Assets

6/30/2008 Valuation (\$000s, Combined)

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-08	(\$1,549,293)	80%	(\$1,239,435)
Jun-07	\$1,054,377	60%	\$632,626
Jun-06	\$366,479	40%	\$146,592
Jun-05	\$132,848	20%	<u>\$26,570</u>
Net total LOSSES not yet recognized			(\$433,647)
Market Value of Assets (MVA)			\$10,372,194
PLUS LOSSES not yet recognized			<u>\$433,647</u>
Actuarial Value of Assets (AVA)			\$10,805,841
AVA/MVA Ratio			104%

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LACERS Actuarial Value of Assets

6/30/2009 Valuation (\$000s, Combined)

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-09	(\$2,964,832)	80%	(\$2,371,866)
Jun-08	(\$1,549,293)	60%	(\$929,576)
Jun-07	\$1,054,377	40%	\$421,751
Jun-06	\$366,479	20%	<u>\$73,296</u>
Net total LOSSES not yet recognized			(\$2,806,395)
Market Value of Assets (MVA)			\$8,142,989
PLUS LOSSES not yet recognized			<u>\$2,806,395</u>
Actuarial Value of Assets (AVA)			\$10,949,384
AVA/MVA Ratio			134%

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The one thing to remember:

$$\mathbf{C + I = B + E}$$

Contributions + Interest Income
equals
Benefit Payments + Expenses

- Actuarial valuation determines the current or “measured” cost, not the ultimate cost
- Assumptions and funding methods affect only the timing of costs

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Q U E S T I O N S

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