Actuarial Panel:
Impact of Lowering Your Assumptions

NCTR 89th Annual Convention
2011 Annual Conference

October 10, 2011
2:30 to 3:30

Larry Langer, FCA, ASA, EA, MAAA
Principal, Consulting Actuary

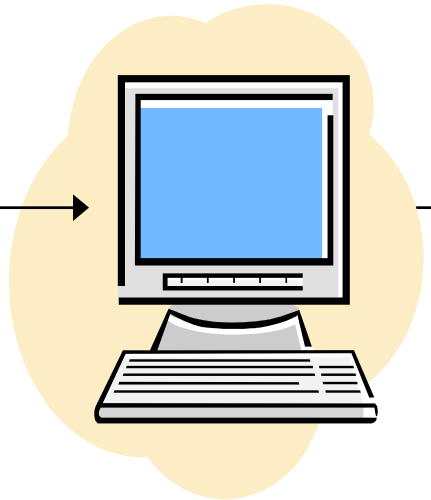
Why the Sudden Interest?

- The 2008 market downturn has led most public retirement systems to require larger contributions at the same time that state and local government revenues have fallen
- This led to increased scrutiny of public retirement systems in general and funding assumptions in particular
  - Surveys of expected return on assets (EROA) assumptions in use among public retirement systems continue to show an average or median of about 8%
  - Suggestion is often made these days that 8% is “unreasonable,” and return assumptions must be lowered (although no consensus on how much)
- Debate on rate-of-return assumption is clouded by debate over basis for financial disclosure (EROA or something else?)

The Valuation Process

INPUT

- Membership Data
- Asset Data
- Benefit Provisions
- Actuarial Assumptions
- Funding Methodology



RESULTS

- Actuarial Value of Assets
- Net Gain or Loss
- Pension Benefit Obligation
- Funded Status
- Contributions

Actuarial Assumptions

- Used to forecast future events that impact amount and value of future benefit payments
- Should be a realistic “best guess” based on:
  - Past history
  - Future expectations
- Appropriately conservative given the Board’s fiduciary responsibility
- Should be explicit - each assumption individually reasonable
- Setting of assumptions is a blend of art and science

Actuarial Assumptions

Two Types:

Demographic

- Service retirement
- Disability
- Optional service purchases
- Death in active service
- Withdrawal
- Sick leave service
- Death after retirement

Economic

- Interest rate
- Salary increase
- Severance pay
- Payroll growth
- Inflation

Experience Reviews

- A single package of assumptions will not suffice throughout the existence of a retirement system
- Selection of assumptions is one of the most important duties of the Board
- To aid in the selection of assumptions, the actuary will prepare an experience review that compares the assumptions to the actual experience of the plan over a period of time
- The actuary may recommend changes in the assumptions as a result of the study
- Experience reviews should be undertaken:
  - Every 3 to 10 years depending on size of plan
  - If system experiences unexplained changes in funded status
  - After major changes in benefit programs when enough experience has been accumulated

Experience Reviews

- Selection of assumptions does not determine the final costs of the plan
  - Final costs are dictated by the actual experience of the fund
  - Assumptions that are too “aggressive” can result in costs being pushed to future generations
  - Assumptions that are too “conservative” can result in higher costs today at the detriment of other priorities

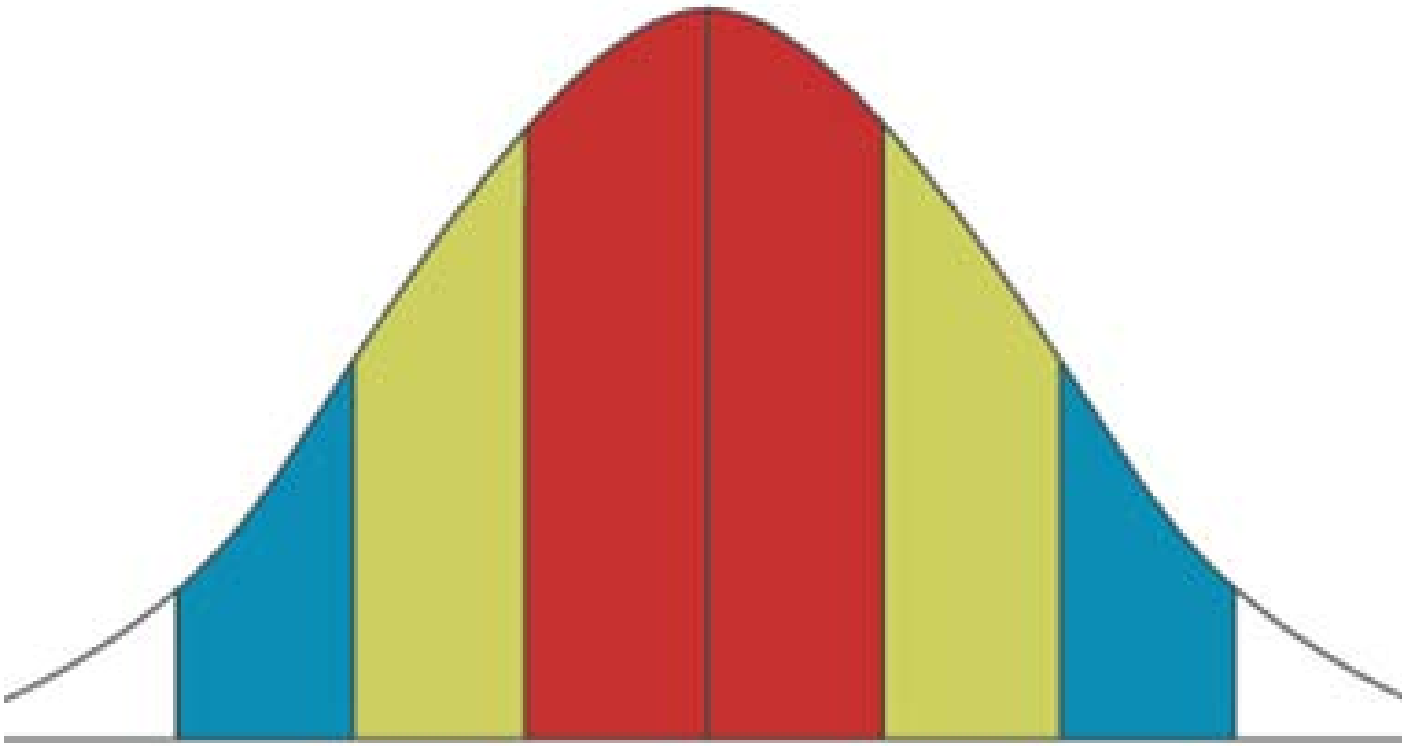
Considerations When Setting Investment Return Assumption

- Inflation should be consistently applied to:
  - Investment return
  - Salary increases
- Real returns should reflect asset mix
  - The majority of the return is the result of asset allocation
- Assumptions should
  - Reflect benefit payment period (i.e., long-term over 30-50 years)
  - Consider recent trends
  - Consider future expectations

Considerations When Setting Investment Return Assumption

- **Peer Returns**
  - Vast majority of Large Systems using 8% investment return
- **Single point estimate methods** produce a single result based on some combination of historical data or forward looking inputs
- **Monte Carlo methods**, or forward looking models, model asset returns over numerous scenarios to produce a range of possible outcomes
  - Outcomes can be described in terms of probability of occurrence
  - Asset class behavior descriptive statistics such as mean, variance, kurtosis and skew can be used to define or describe asset class returns

Development of Investment Return Assumption



Rate of Return:	**2.9%**	**6.1%**	**7.3%**	**8.2%**	**9.0%**	**10.0%**	**12.4%**
Percentile:	**5th**	**25th**	**40th**	**50th**	**60th**	**75th**	**95th**

(Actuarial Standards of Practice currently allow for range of 25% to 75%)

Impact on Liability Due to 100 Basis Point Increase (Decrease) in Investment Return Assumption

- Impact on Liabilities
  - In payment liability 7% - 8% decrease (increase)
  - Active liability 20% - 25% decrease (increase)
  - Term vested liability 7% - 20% decrease (increase)
  - Total system 10% - 20% decrease (increase)
- Normal cost 20% - 25% decrease (increase)
- Impact on contribution can be highly leveraged

Illustration of Impact on Liability Due to 100 Basis Point Change in Investment Return Assumption

State of Nirvana Teachers' Retirement System
Development of Unfunded Actuarial Accrued Liability at Assumed Investment Returns of 8% and 7%

Development of Unfunded Actuarial Accrued Liability	Investment Return of 8%	Investment Return of 7%	Percent Change
1. Actuarial Accrued Liability			
a) For member in payment	$ 4,000,000,000	$ 4,320,000,000	8%
b) For member with a right to a deferred benefit	1,000,000,000	1,150,000,000	15%
c) For Current Actives	5,000,000,000	6,250,000,000	25%
d) Total (a + b + c)	$ 10,000,000,000	$ 11,720,000,000	17%
2. Actuarial Value of Assets	9,000,000,000	9,000,000,000	0%
3. Unfunded Actuarial Accrued Liability: (1 - 2)	$ 1,000,000,000	$ 2,720,000,000	172%
4. Funded Status: (2÷1)	90.00%	76.79%	

Illustration of Impact on Employer Rate due to 100 Basis Point Change in Investment Return Assumption

State of Nirvana Teachers' Retirement System
Development of State Contribution Rate at Assumed Investment Returns of 8% and 7%

Development of State of Nirvana Contribution Rate	Investment Return of 8%	Investment Return of 7%	Percent Change
1. Total Normal Cost	12.00%	15.00%	25%
2. Member Contribution Rate	7.00%	7.00%	0%
3. State Normal Cost: (1 - 2)	5.00%	8.00%	60%
4. Payment for Unfunded Actuarial Accrued Liability	3.55%	8.77%	147%
5. Total State of Nirvana Contribution Rate	8.55%	16.77%	96%

Thank you.

Larry Langer, FCA, ASA, EA, MAAA
Principal, Consulting Actuary

Buck Consultants
123 North Wacker Drive, #1000
Chicago, IL 60606

Work: (312) 846-3669
Mobile: (630) 632-8668

larry.langer@buckconsultants.com