Interest Assumptions in Public Sector Plans

Keith Brainard
Research Director
National Association of State Retirement Administrators
Georgetown, Texas

Larry F. Langer, FCA, ASA, EA, MAAA
Principal and Consulting Actuary
Buck Consultants, a Xerox Company
Chicago, Illinois
The Universal Retirement Equation

\[ C + I = B + E \]

- Contributions plus Investment Earnings equals Benefits plus Expenses
- Over the life of the pension plan, the money that goes out must equal the money that comes in
- Investment earnings typically account for the majority of revenue for a public pension fund
- This fact illustrates the important role the investment return assumption plays in financing a pension plan
Over the short term, contributions are determined by the actuarial valuation based upon estimated investment return, benefits and expenses using assumptions and methods recommended by the actuary and adopted by the Board. Over the long term, contributions are adjusted to reflect actual investment return, benefits and expenses.
The Actuarial Valuation

- An actuarial valuation is the mathematical process of determining a pension plan’s liabilities, cost and condition
- The investment return assumption is one of many projections of future events used in an actuarial valuation
- Other assumptions include how long plan participants will work, how long they’ll live, and at what rate salaries will grow
- The investment return assumption typically is the single most consequential of all assumptions
### Immediate Impact of Change in Return Assumption

#### Illustrative Impact of Decrease in Interest Rate Assumption - not fully funded

<table>
<thead>
<tr>
<th></th>
<th>7.50%</th>
<th>6.50%</th>
<th>%</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employer Contribution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Normal Cost</td>
<td>8.7</td>
<td>10.7</td>
<td>23%</td>
<td>2.0</td>
</tr>
<tr>
<td>2. Amortization Payment for UAAL</td>
<td>21.0</td>
<td>26.7</td>
<td>27%</td>
<td>5.7</td>
</tr>
<tr>
<td>3. Member Contribution</td>
<td>5.5</td>
<td>5.5</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Employer Contribution (1. + 2. - 3., minimum 0)</td>
<td>24.2</td>
<td>31.9</td>
<td>32%</td>
<td>7.7</td>
</tr>
<tr>
<td>5. Projected Payroll</td>
<td>82.2</td>
<td>82.2</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>6. Employer Contribution as a % of Payroll</td>
<td>29.44%</td>
<td>38.81%</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Actuarial Accrued Liability</td>
<td>1,000</td>
<td>1,097</td>
<td>10%</td>
<td>1,097</td>
</tr>
<tr>
<td>8. Actuarial Value of Assets (AVA)</td>
<td>750</td>
<td>750</td>
<td>0%</td>
<td>1,000</td>
</tr>
<tr>
<td>9. Unfunded Actuarial Accrued Liability (UAAL) (7. - 8.)</td>
<td>250</td>
<td>347</td>
<td>39%</td>
<td>97</td>
</tr>
<tr>
<td>10. Funded Ratio (8. / 7.)</td>
<td>75.00%</td>
<td>68.37%</td>
<td>-9%</td>
<td></td>
</tr>
</tbody>
</table>

The above illustrates the impact of a one-percent decrease in the assumed rate of return. The immediate impact is quite large. Reductions in the assumed return tend to range from 25 to 50 basis points.
# Immediate Impact of Change in Return Assumption

## Illustrative Impact of Decrease in Interest Rate Assumption - fully funded plan

<table>
<thead>
<tr>
<th>Employer Contribution</th>
<th>7.50%</th>
<th>6.50%</th>
<th>%</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Normal Cost</td>
<td>8.7</td>
<td>10.7</td>
<td>23%</td>
<td>2.0</td>
</tr>
<tr>
<td>2. Amortization Payment for UAAL</td>
<td>0.0</td>
<td>7.5</td>
<td>∞</td>
<td>7.5</td>
</tr>
<tr>
<td>3. Member Contribution</td>
<td>5.5</td>
<td>5.5</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Employer Contribution (1. + 2. - 3., minimum 0)</td>
<td>3.2</td>
<td>12.7</td>
<td>297%</td>
<td>9.5</td>
</tr>
<tr>
<td>5. Projected Payroll</td>
<td>82.2</td>
<td>82.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Employer Contribution as a % of Payroll</td>
<td>3.89%</td>
<td>15.45%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Actuarial Accrued Liability</td>
<td>1,000</td>
<td>1,097</td>
<td>10%</td>
<td>1,097</td>
</tr>
<tr>
<td>8. Actuarial Value of Assets (AVA)</td>
<td>1,000</td>
<td>1,000</td>
<td>0%</td>
<td>1,000</td>
</tr>
<tr>
<td>9. Unfunded Actuarial Accrued Liability (UAAL) (7. - 8.)</td>
<td>0</td>
<td>97</td>
<td>∞</td>
<td>97</td>
</tr>
<tr>
<td>10. Funded Ratio (8. / 7.)</td>
<td>100.00%</td>
<td>91.16%</td>
<td>-9%</td>
<td></td>
</tr>
</tbody>
</table>

For a fully funded plan, the decision to reduce the interest rate assumption can result in a much larger percent and even dollar increase in contributions.
The expected impact of lowering the interest rate assumption on contributions and return over the longer term – 20 years here – is demonstrated below.
Discounting Pension Liabilities

- A discount rate is the interest rate used to determine the present value of future cash flows.
- The lower the investment return assumption, or discount rate, the higher the liabilities (and cost).
- The higher the discount rate, the lower the liabilities (and cost).
Discounting Pension Liabilities

• Public pension plans generally discount their liabilities using the expected, or assumed, rate of investment return.
• The purpose for using the expected investment return to discount liabilities is to promote budget stability and predictability.
• Each one percent reduction in a public pension investment return assumption increases liabilities by approximately 11 percent.
Discount Rates: Public Plans

• For GASB reporting purposes, plans that are projected to run out of money must discount their liabilities post-fund exhaustion using a rate based on high-grade municipal bonds
Discount Rates: Corporate Plans

• Corporate pension plans discount their liabilities differently than public plans
• Unlike public plans, corporate plans are governed by ERISA, which prescribes the use of current interest rates to discount liabilities
• This method makes required contributions more volatile: as interest rates rise, plan costs drop; as rates fall, plan costs rise
Discount Rates: Corporate Plans (continued)

- Congress has provided relief to corporate pension plans to ameliorate the effects of low interest rates.
- For example, in 2012, Congress permitted corporations to base their pension costs using an interest rate based on a 25-year average.
Yields on 10-year government-issued bonds; Wall Street Journal
The Public Pension Investment Return Assumption

- The process for setting the investment return assumption is prescribed in Actuarial Standards of Practice No. 27: Selection of Economic Assumptions for Measuring Pension Obligations
- ASOP 27 directs the actuary to consider a range of economic and financial factors: inflation, interest rates, historic and project asset class returns, etc.
Many public pension plans are required by law or board rule to periodically conduct an experience study. An experience study compares the actuarial experience of a pension plan with the plan’s assumptions. Experience studies often produce recommended changes to actuarial assumptions.
Creating the Actuarial Review Framework

• GFOA Best Practice: Enhancing Reliability of Actuarial Valuations for Pension Plans
• Describes steps pension plan fiduciaries should take to enhance the reliability of actuarial valuations
• Suggested measures include a regular actuarial experience review/study
Nominal vs. Real Rate of Return

• The investment return assumption typically contains two components: inflation, and the real rate of return.
• The real rate of return is the return above the rate of inflation; the return produced by taking investment risk.
• This is the “building-block” approach.
• The sum of inflation and the real return is the nominal rate of return.
Nominal vs. Real Rate of Return

• ASOP 27 says the return assumption should be consistent with
  – Other actuarial assumptions and methods, and
  – The plan’s investment policy
Each economic assumption has two or three components, which should be applied consistently.
The return assumption is based on the plans investment policy. ASOP 27 allows for a provision for adverse deviation, which allows for a discount rate that is lower than the expected return that is expected for a plan with a long time horizon, selecting a return of 7.00% suggests a provision for adverse deviation of 0.92%
A ranking of projected returns based on the asset allocation can be helpful in determining the amount of deviation as well as give an indication of any stress testing that may be helpful for decision makers.
Long Term Impact “If Wrong”

Assume 7.50%/actual 6.50%

Assume 6.50%/actual 6.50%
Long Term Impact “If Wrong”

Assume 7.50%/actual 6.50%  Assume 6.50%/actual 6.50%

- UAAL
- Contribution
- Returns

PE1-23
Asset Allocations: Public vs. Corporate Pension Funds

Public Fund Survey; Wilshire Associates, based on 2015 data
Change in Distribution of Public Pension Investment Return Assumptions

Change in Distribution of Public Pension Investment Return Assumptions, FY 01 to present

Public Fund Survey, NASRA Sep-16

PE1-25
Public Pension Average Inflation Assumption and Real Rate of Return

Public Plans Database

PE1-26
Session #PE1

Interest Assumptions in Public Sector Plans

• Public pension plans discount their liabilities using the expected investment return
• The assumed return is the single-most consequential of all actuarial assumptions
• Lower interest rates and lower projected investment returns are pressuring public plans to reduce their return assumptions
• Lower return assumption = Higher cost
2017 Educational Programs
Public Plans

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October 22-25, 2017  |  Las Vegas, Nevada
www.ifebp.org/usannual

Public Sector Benefits Institute
Held in conjunction with Trustees and Administrators Institutes
February 20-22, 2017
Lake Buena Vista (Orlando), Florida
www.ifebp.org/psbinstitute

Benefits Conference for Public Employees
System Highlight: Ohio Public Employees Retirement System (OPERS)
April 25-26, 2017  |  Columbus, Ohio
www.ifebp.org/publicemployee

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Part I and Part II, June 13-16, 2017
San Jose, California
Part II Only, October 21-22, 2017
Las Vegas, Nevada
www.ifebp.org/cappp

Fraud Prevention Institute for Employee Benefit Plans
July 17-18, 2017  |  Chicago, Illinois
www.ifebp.org/fraudprevention

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