Understanding the Actuary’s Role and Relevant Assumptions in Governmental Audit Engagements

A Governmental Audit Quality Center Web Event

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What We Will Cover

- Key actuarial assumptions in developing pension and other postemployment benefit (OPEB) amounts
- Auditing considerations for testing key assumptions
- How the roles of the actuary and auditor relate
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Agenda

Overview
Measuring total pension/OPEB liability
  • Projecting
  • Discounting
  •Attributing
Specific considerations
Resources available

Overview of Auditing Considerations

Auditing Total Pension/OPEB Liability – Variety of Audit Procedures and Evidence

- Design Audit Procedures to Address the Risk of Material Misstatement
- Understand the Plan (amendments, changes in benefits terms)
- Review and Assess Actuarial Valuation and Certification Letter
- Test Census Data (availability and completeness)
- Review Rollforward, if applicable
- Determine Appropriateness of Valuation Methods and Assumptions
- Evaluate the Professional Qualifications of the Actuary & Objectivity
- Evaluate Discount Rate
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AU-C Section 540
Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures

Requirements
Risk Assessment Procedures and Related Activities

When performing audit engagement procedures and internal control procedures as required by section 315, the auditor should obtain an understanding of the following in order to assess a basis for the communication and assessment of the entity’s internal control and the accounting estimates:

1. The accounting estimates and the data on which they are based,
   including the assumptions underlying the estimates;
2. Whether there has been or ought to have been a change from the prior period in the method(s) or assumption(s) for making the accounting estimates and, if so, why;
3. How management makes the accounting estimates and the data on which they are based, including the assumptions underlying the estimates;
4. The assumptions underlying the accounting estimates; data (par. .A.31–.A.35) is relevant that has been or ought to have been a part of the prior period or that relates to the assumptions or completeness of meeting the accounting principles. If no (this, and then par. .A.30)

Use of Specialists & Impact on Audit

Auditor’s Specialist
- Individual or organization possessing expertise in a field other than accounting or auditing, whose work in that field is used by the auditor to assist the auditor in obtaining sufficient appropriate audit evidence.
- An auditor’s specialist may be either an auditor’s internal specialist or an auditor’s external specialist.

Management’s Specialist
- An individual or organization possessing expertise in a field other than accounting or auditing, whose work in that field is used by the entity to assist the entity in preparing the financial statements.

Determining Whether Auditor Needs to Involve Internal Specialist and/or Use Work of Expert Engaged by Auditor

- Do you need skills, knowledge and experience related to a particular area of accounting or auditing, or related subject matter?
  - Yes
  - No
- Is there a firm specialist or firm resource that possesses the skills, knowledge, and experience?
  - Yes
  - No
- The engagement team may need to engage an expert.

- Does the engagement team possess the skills, knowledge and experience?
  - Yes
  - No
- No auditor specialist needed.

- The firm specialist and/or firm resource is included as a member of the engagement team.

No auditor specialist needed.
Overview of Measuring Liability

Measuring Total Pension/OPEB Liability

- Projecting future benefit payments
- Discounting projected future benefit payments to present value
- Attributing present value of projected future benefit payments to past and future periods

Measurement Approach: Illustrated

1) Project Benefits
2) Discount
3) Attribution

Present Value

Measurement Approach: Illustrated
Overview of Actuarial Experience Study

**Actuarial Experience Study**

Performed periodically
- Commonly, once every 5 years

Study of economic and demographic assumptions
- Mortality
- Compensation growth
- Disability retirement
- Retirement rates

Results are the basis for the actuarial assumptions and methods used in an actuarial valuation

**Mortality**

- Study of actual and expected death rates of retired members
- Retired members analyzed in groups

Different groups of retired members have different mortality profiles

Male, Female, Healthy, Beneficiary, Disabled, Hazardous occupation (e.g., public safety)
Step 1 – Projecting

**Projecting Future Benefit Payments**

- Includes:
  - All benefits provided through the pension/OPEB plan in accordance with the benefit terms and any other legal agreements to provide benefits in force at the measurement date
  - Automatic and ad hoc postemployment benefits changes and cost-of-living adjustments
  - Projected salary changes (if formula incorporates future compensation levels)
  - Projected service credits (if formula incorporates years of service)
  - Taxes or other assessments expected to be imposed on OPEB benefit payments using rates in effect at measurement date

Administrative costs associated with providing pension/OPEB should be excluded.

**Key Assumptions**

- Numerous assumptions are used – Only a few have significant effects on a valuation
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General Information on Assumptions

GASB has made Actuarial Standards of Practice (ASOPs) Generally Accepted Accounting Principles

- GASB 67/68 & 74/75 state: “Unless otherwise specified by this Statement, the selection of all assumptions used in determining the total pension/OPEB liability and related measures should be made in conformity with Actuarial Standards of Practice issued by the Actuarial Standards Board.”

Actuaries divide assumptions into two categories

ASOP 27-Selection of Economic Assumptions for Measuring Pension Obligations

ASOP 35-Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

The two ASOPs are consistent with each other and require:

- Disclosure of key assumptions and rationale behind assumption
- No significant bias, i.e. equal or near equal probability of being high or low
- Disclosure of specified assumptions i.e. assumptions the actuary was required to use

Remember

Employer management is ultimately responsible for the assumptions

- They should not blindly accept the assumptions provided by the plan or the plan’s actuary
- Assumptions should be reexamined for reasonableness each year including impact of environmental or legal changes on assumptions

Required actuarial communications do not all have to be in the certification letter

- Always inquire as to whether other required communications exist

Mortality: Pension & OPEB

Projected future benefit payments

- Pension
- OPEB

- Mortality
- Retirement
- Salary Scale (if benefit is pay related)

- OPEB
- Mortality
- Retirement
- Base Year
- Claims Cost
- Health Care Cost Trend Rate
- Participation Rate
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Mortality Development

Three step process:

1. Review member demographics
2. Choose base mortality tables
3. Select mortality improvement

- Unique to each plan
- All steps not performed each year

Appropriateness of mortality assumption needs to be considered each year, not just in year actuarial experience study is performed.

Base Mortality Tables: Three Scenarios

- Published mortality tables, unadjusted
- Published mortality tables, adjusted
- Custom mortality tables, own experience

Base Mortality Tables – Society of Actuaries

<table>
<thead>
<tr>
<th>Retirement Plans (RP)-2014</th>
<th>RP-2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee</td>
<td>Employee</td>
</tr>
<tr>
<td>Total (blue &amp; white collar)</td>
<td>Healthy annuitant</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>Disabled retiree</td>
</tr>
<tr>
<td>White Collar</td>
<td>Top 25% (based on salary)</td>
</tr>
<tr>
<td>Bottom 25% (based on salary)</td>
<td>Healthy annuitant</td>
</tr>
<tr>
<td>Healthy annuitant</td>
<td>Total (blue &amp; white collar)</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>White Collar</td>
</tr>
<tr>
<td>Bottom 25% (based on benefit)</td>
<td>Top 25% (based on salary)</td>
</tr>
<tr>
<td>Disabled retiree</td>
<td>Bottom 25% (based on benefit)</td>
</tr>
</tbody>
</table>

All tables are gender specific (i.e., male and female)
Collar Determination

Blue collar
• 70% of plan participants were either hourly or union
White collar
• 70% of plan participants were both salaried and non-union
Mixed collar
• Plans whose participants failed to satisfy either of the above blue/white collar conditions

Published mortality tables, unadjusted

Base Mortality Tables, unadjusted

• Table used should be representative of the plan population
• Factors to consider:
  - Collar (white, blue)
  - Income
  - Gender
  - Occupation
  - Status (active, disabled, etc.)
  - Geographic location
  - Presence of medical coverage
  - Employed vs. non-employed

Tables need to be adjusted if not representative of the group

Published mortality tables, adjusted

Base Mortality Tables, adjusted

Need to have at least partially credible data – professional judgement suggests at least 10,000 lives
Tables not representative of the plan
Adjusted based on plan's population and experience study
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Base Mortality Tables, custom

Custom mortality tables, own experience
- Need fully credible data
  - Need thousands of incidents (e.g., deaths) during an experience study to have credible data
- Create its own mortality table
- Only available to the largest plans
- Hundreds of thousands of lives needed to build a fully credible mortality table from scratch

Mortality Improvement

Accounts for projected improvement in mortality rates since base mortality table was originally published
Improvement scales published by Society of Actuaries
- Scale AA
- Scale BB
- MP-2014
- MP-2015
- MP-2016
Improvement scale used adjusted or unadjusted
Representative of the group

Auditing Mortality Assumption

Base mortality
Determine whether linkage between base mortality (tables and/or own experience) and group is reasonable and appropriate

Mortality improvement
Determine whether linkage between improvement scale and group is reasonable and appropriate

Measurement data
Determine whether existing base mortality and improvement is still appropriate for the group

Interaction with client’s actuary will be necessary
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Retirement: Pension & OPEB

Projected future benefit payments

Pension
OPEB

- Mortality
- Retirement
- Salary Scale
- Participation
- Cost Trend Rate
- Base Year
- Claims Cost

Retirement Assumption

The retirement assumption may be a single age or rates of retirement
- Rates of retirement have become more common
- 100% assumed retirement typically at age 65 or age 70

Retirement Assumption Considerations

- Occupation
- Union or Non-Union
- Work environment
- Hazardous conditions
- Member demographics
- Availability of unreduced benefits
- Subsidized benefits at early retirement
- Supplemental benefits paid to a specific age
Compensation Increases

Compensation at measurement date
- Based on census information received from employer
- Unique for each plan participant

Percentage increase per year
- Applied to each plan participant
- Reflects factors that affect wages

Inflation
Productivity
Seniority
Promotion
Job Description

Compensation Increases

Percentage increase per year (continued)
- Consider factors specific to plan and its participants

Current compensation practices
Anticipated changes to compensation practices
Compensation distributions by age and/or service
Historical compensation increases
Collective bargaining
Historical national wage and productivity increases
Seniority
Job description

Auditing Compensation Increase Rate

Compensation at measurement date
Test census data
Compensation increases
Determine if compensation increases are reasonable and appropriate based on factors at the employer and applied to plan members appropriately
Expected medical claims to be paid in retirement

- Usually separated by pre-Medicare (under 65) and post-Medicare (65 and older)
- Post-Medicare claims significantly less than pre-Medicare claims
  - Medicare becomes primary payer
  - Plan becomes secondary payer

Preferred is to use claims experience of the health plan if credible
- If not fully credible, consider health care premiums and/or manual rates
What is the Healthcare Cost Trend Rate?

Rate at which healthcare costs are estimated to increase
Determined for major categories of benefits (e.g., prescription drugs, medical, dental)
Select and ultimate rates
• Example assumption:

<table>
<thead>
<tr>
<th>Component</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical cost trend rate</td>
<td>9% decreasing by 0.5% to an ultimate level of 5%</td>
</tr>
<tr>
<td>Drug cost trend rate</td>
<td>9% decreasing by 1% to an ultimate level of 6%</td>
</tr>
<tr>
<td>Medicare Part B</td>
<td>6%</td>
</tr>
</tbody>
</table>

How is the Healthcare Cost Trend Rate Determined?

Short-term rates
• Reflects recent or near-term experience (e.g., next year’s rate change)

Long-term rates
• Ultimate rate that reflects a long-term view

Transitional rates
• Bridge the initial rate and ultimate rate. Ordinarily expressed in decrements (e.g., 1% per year)
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Considerations - National/Global Factors

**Inflation**
- Medical inflation likely to follow general inflation plus a positive margin

**Attitudes and behaviors**
- Societal views changing regarding use of health care services to defer death – increasing use of medical services
- Changing behaviors and habits – lower rates of smoking reducing trends while increases in obesity, stress and depression will increase trends

**Government policy**
- Regulatory changes – mandatory provision of certain medical services

Considerations – National/Global Factors

**Medical research**
- Increases in rate of new device, drug and procedure development to accommodate aging population

**Technology**
- Mitigate or eliminate diseases and other conditions – lower healthcare trend rates
- New expensive treatments – higher healthcare trend rates

**National education**
- Increased awareness of healthcare issues leading to demands for more prevention – increase short-term costs but potentially decreasing long-term costs

Considerations – Plan Specific Factors

**Plan provisions**
- Healthcare benefits offered have direct influence on trend rate

**Geographical location**
- Trends vary depending on location of covered employees
- Urban areas may experience higher trend rates
- Number of insurers/medical providers in an area – more competition may mean slower growth in trend rates
Short-Term Healthcare Trend Rates
Reflects known plan experience
- Recent trends in plan's premium rates or claims costs
- Consideration of subsequent year premium rates
- Consider whether observed trend is expected to continue into future years
Experience of similar plans

Long-Term Healthcare Trend Rates
Economic models
- Based on expected CPI or GDP increases with an appropriate gap between healthcare trend rates and the underlying economic variables
Healthcare trend models
- Large actuarial firms build proprietary models
- Other models available (Society of Actuaries)

Transitional Healthcare Trend Rates
Curve for transition from initial current trend to long-term trend
- Simple approach of straight-line transition may be appropriate
- Number of years between short-term and long-term trends can significantly impact the liability
Transition period has least support from past experience or modeling
- More variability than initial short-term rate and long-term rate
Auditing Healthcare Cost Trend Rate Assumption

- Short-term rate: Determine if short-term rate is appropriate for plan based on recent or near-term experience and experience of similar plans.
- Long-term rate: Determine if long-term rate is reasonable, appropriate, and representative of the plan provisions.
- Transition: Determine if transition period between short and long-term rates is reasonable and appropriate for the plan.

Interaction with client’s actuary will be necessary.

Participation Rate - OPEB

Projected future benefit payments
- Pension
- OPEB

What is the Participation Rate?

The percentage of retirees who are assumed to elect retiree healthcare coverage

Considerations include:
- Gender
- Spousal/dependent coverage options
- Plan design
- Other available coverage
- Retiree cost versus marketplace

Typically based on historical plan experience

Participation rates decrease as retiree costs increase.
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Auditing Considerations

Perform retrospective analysis
Evaluate experience study (if available)
Consider changes to substantive plan
Consider changes in workforce
Consider relevant economic events

Step 2 – Discounting

Discounting Future Benefit Payments to Present Value: Pension/OPEB Non-Trust

- Pension and OPEB plans NOT administered as a trust or equivalent arrangement
- A yield or index rate for 20-year, tax exempt general obligation municipal bonds with average rating of AA/Aa or higher (or equivalent quality on another rating scale).

No assumptions used in discounting in this situation!
Discounting Future Benefit Payments to Present Value: Pension/OPEB Trusted

Pension and OPEB plans administered as a trust or equivalent arrangement:
- A single blended rate should be used to discount projected future benefit payments, based on:
  - The long-term expected rate of return on plan investments (net of investment expenses) that are expected to be used to finance the payment of benefits, to the extent that the plan’s fiduciary net position is projected to be sufficient to make projected benefit payments and is expected to be invested, using a strategy to achieve that return; and
  - A yield or index rate for 20-year, tax-exempt general obligation municipal bonds with average rating of AA/Aa or higher, to the extent that the conditions above are not met.

Assumptions

Discounting future benefit payments to present value

Long-Term Rate of Return

Forward looking

- Based on best-estimate of future real rate of return on the plan’s investments
- Management selects appropriate rate based on analysis

COMMON PITFALLS:
- Anchoring on historical real rates of return
- Rate is similar to what is used by other plans
How the Long-Term Rate of Return is Developed

Nature and mix of current and expected plan investments
- Specific and unique to each plan
- Target asset allocation
- Example

<table>
<thead>
<tr>
<th>Investment type</th>
<th>Plan A</th>
<th>Plan B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current</td>
<td>Expected</td>
</tr>
<tr>
<td>Cash</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Domestic equity</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>International equity</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Domestic fixed income</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Hedge</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>Real estate</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Venture capital</td>
<td>5%</td>
<td>3%</td>
</tr>
</tbody>
</table>

How the Long-Term Rate of Return is Developed

Modeling
- Future real-rates of return are modeled using current and expected asset allocations as well as nature of investments
- Building block approach, Monte Carlo simulation, or proprietary method
- Each investment class has its own long-term rate of return estimated
- Investment advisor often involved

Inflation
- Every long-term rate of return contains an inflation factor

COMMON PITFALL – Investment advisor is management’s expert (specialist)

Example Building Block Approach

Mathematical equation

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Target Asset Allocation</th>
<th>Long-Term Expected Rate of Return</th>
<th>Expected Long-Term Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic equity</td>
<td>27.50%</td>
<td>6.60%</td>
<td>1.45%</td>
</tr>
<tr>
<td>International equity</td>
<td>27.50%</td>
<td>6.15%</td>
<td>1.15%</td>
</tr>
<tr>
<td>Domestic fixed income</td>
<td>25%</td>
<td>5.15%</td>
<td>1.05%</td>
</tr>
<tr>
<td>Real estate</td>
<td>7.50%</td>
<td>5.15%</td>
<td>0.45%</td>
</tr>
<tr>
<td>Private equity</td>
<td>7.50%</td>
<td>7.66%</td>
<td>0.53%</td>
</tr>
<tr>
<td>Total</td>
<td>100.00%</td>
<td>2.50%</td>
<td>Inflation factor</td>
</tr>
</tbody>
</table>

Inflation factor should be consistent across all assumptions (e.g., salary scale, long-term rate of return)
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Auditing Long-Term Rate of Return

Obtain management’s support for assumption
• Determine if it is forward-looking
• Determine if it is based on analysis of expected returns correlated to the target asset allocation as of the measurement date
• Review inputs to assumption (i.e., inflation factor) to determine if reasonable based on the plan investments, investing strategy and market conditions
• Validate individual rates for each asset class

Depletion Date Projections—Assumptions important to projections

Expected future contributions—Employer/Non-employer/Member
Benefit payment projections
Future plan member contributions (above normal cost)
Administrative expense projections
Closed or open plan
Long-term rate of return on investments

Auditing Discount Rate

Obtain understanding of methodology:
• Tie first year cash flow assumption to actual results, including BOY net position
• Determine if projected contributions are based on statute, contract or written funding policy. Consider most recent 5 year period.
• Review projected benefit payments for reasonableness.
• Determine if administrative expense trend is representative of past history
• Recalculate investment earnings
• Check for mathematical accuracy
• Recompute discount rate
Step 3 – Attributing

Attributing the Present Value of Projected Future Benefit Payments to Past and Future Periods

Based on the actuarial cost method applied:
- **Entry Age Normal** method is the only allowable actuarial cost method:
  - Attribution made on individual employee-by-employee basis
  - Service costs based on level percentage of that employee's projected pay
  - Service costs attributed through all assumed exit ages through retirement

Ordinarily rely on actuary as management's expert to attribute

Specific Considerations
Considerations for Employer Auditors

Single and agent plans
- Employer auditor is solely responsible for determining sufficiency and appropriateness of audit evidence over actuarial assumptions

Cost-sharing plans
- Primarily use plan auditor opinion on net pension/OPEB liability in accordance with AU-C 805, Special Considerations – Audits of Single Financial Statements and Specific Elements
- Limited high level procedures over actuarial assumptions performed

Audit Guidance

AICPA Audit and Accounting Guide, State & Local Governments
- Provides specific audit guidance for both plan and employers based on plan type
  - Chapter 13-Defined Benefit Pensions
  - Chapter 14-OPEB
AU-C section 550, Audit Evidence
- Using the Work of a Management Specialist
AU-C section 620, Using the Work of an Auditor’s Specialist

Resources

Actuarial Standards Board
- [http://www.actuarialstandardsboard.org/](http://www.actuarialstandardsboard.org/)
Code of Professional Conduct
- [http://www.actuary.org/content/code-professional-conduct](http://www.actuary.org/content/code-professional-conduct)
U.S. Qualification Standards
- [http://www.actuary.org/content/us-qualification-standards](http://www.actuary.org/content/us-qualification-standards)
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Key Points to Remember!

- Demonstrate how critical pension and OPEB actuarial assumptions are developed.
- Identify opportunities to improve audit quality in this area.
- Choose the appropriate balance of actuarial specialist involvement.

Questions?

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- If you need assistance with locating your certificate, please contact the AICPA Service Center at 888.777.7077 or service@aicpa.org.
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Thank you