

GAQC Event: Understanding the Actuary's Role and Relevant Assumptions in Governmental Audit Engagements



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

A Governmental Audit Quality Center Web Event

December 19, 2017

Presenters

Jeff Markert, CPA
KPMG

Bob Scott, CPA
City of Carrollton, TX

Michelle Watterworth, CPA (Moderator)
Plante Moran

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

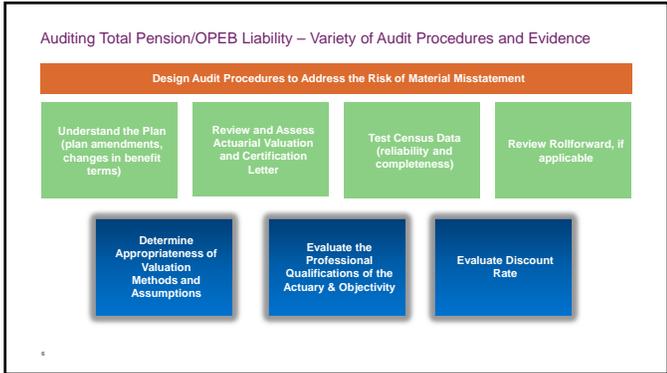
- Projecting
- Discounting
- Attributing

Specific considerations

Resources available

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Overview of Auditing Considerations



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AU-C Section 540
Auditing Accounting Estimates, Including Fair Value Accounting Estimates, and Related Disclosures

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Requirements

Risk Assessment Procedures and Related Activities

108 When performing risk assessment procedures and related activities to obtain an understanding of the entity and its environment, including the entity's internal control, as required by section 315, the auditor should obtain an understanding of the following in order to provide a basis for the identification and assessment of the risks of material misstatement for accounting estimates: (Ref: par. A11)

xxx

c. How management makes the accounting estimates and the data on which they are based, including (Ref: par. A21–A22)

xxx

iv. the assumptions underlying the accounting estimates; (Ref: par. A30–A35) v. 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; and (Ref: par. A36)

xxx

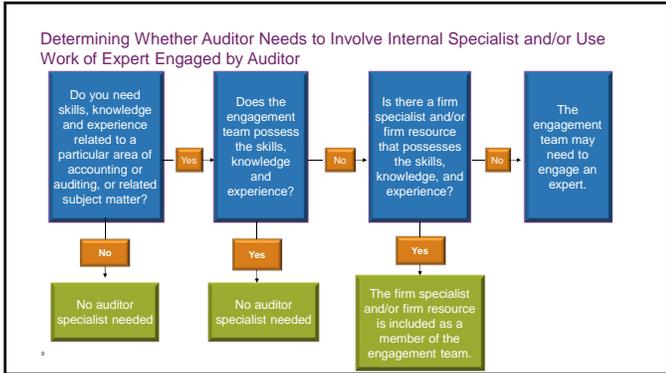
Use of Specialists & Impact on Audit

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

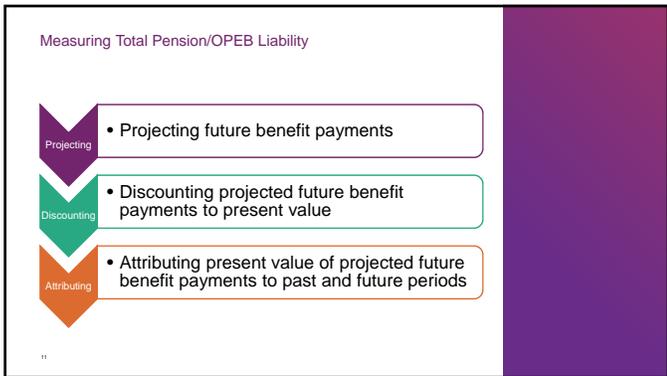
Management's Specialist

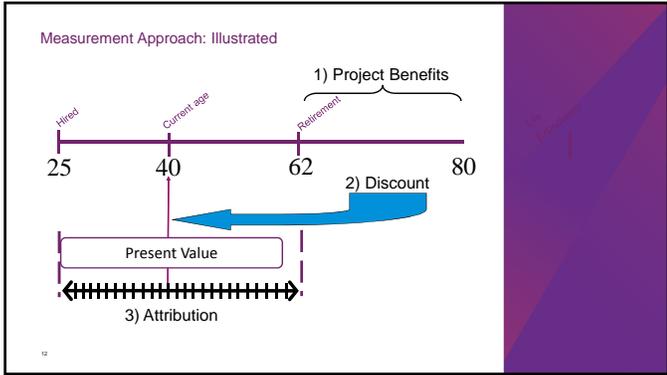
- An individual or organization possessing expertise in a field other than accounting or auditing, whose work in that field is used by the entity to assist the *entity* in preparing the financial statements



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Overview of Measuring Liability





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

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Actuarial Experience Study

Mortality

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

Male	Female	Healthy
Beneficiary	Disabled	Hazardous occupation (e.g. public safety)

Different groups of retired members have different mortality profiles

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Step 1 – Projecting

Projecting Future Benefit Payments

Total Pension/OPEB Liability

Projecting

Discounting

Attributing

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

Projected future benefit payments

Pension **OPEB**

Mortality Retirement Salary Scale (if benefit is pay related) Mortality Retirement Base Year Claims Cost Health Care Cost Trend Rate Participation Rate

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

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Remember

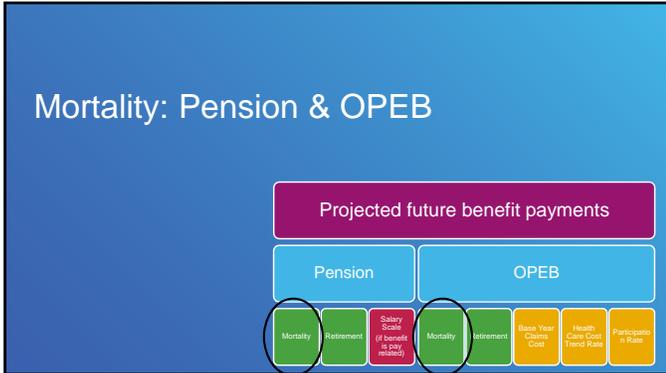
Employer management is ultimately responsible for the assumptions

- 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

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Mortality Development

Three step process:

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    graph LR
      A[Review member demographics] --> B[Choose base mortality tables]
      B --> C[Select mortality improvement]
  
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- 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

Population Size

Base Mortality Tables – Society of Actuaries

Retirement Plans (RP)-2014 RP Headcount-Weighted (RPH)-2014	RP-2000
Employee:	Employee
Total (blue & white collar)	Healthy annuitant
Blue Collar	Disabled retiree
White Collar	
Bottom 25% (based on salary)	
Top 25% (based on salary)	
Healthy annuitant:	
Total (blue & white collar)	
Blue Collar	
White Collar	
Bottom 25% (based on benefit)	
Top 25% (based on benefit)	
Disabled retiree	

Published mortality tables, unadjusted

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

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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

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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	Presences of medical coverage	Employed vs. non-employed

Tables need to be **adjusted** if not representative of the group



Published mortality tables, unadjusted

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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



Published mortality tables, adjusted

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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



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Mortality Improvement

Accounts for projected improvement in mortality rates since base mortality table was originally published

Improvement scales published by Society of Actuaries

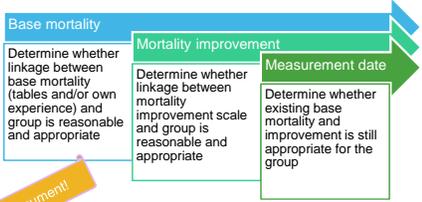
- Scale AA
- Scale BB
- MP-2014
- MP-2015
- MP-2016

Improvement scale used adjusted or unadjusted

Representative of the group

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Auditing Mortality Assumption

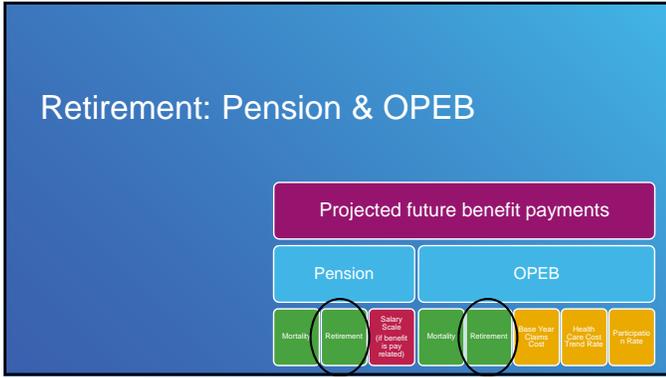


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    graph LR
      A[Base mortality] --> B[Determine whether linkage between base mortality (tables and/or own experience) and group is reasonable and appropriate]
      B --> C[Mortality improvement]
      C --> D[Determine whether linkage between mortality improvement scale and group is reasonable and appropriate]
      D --> E[Measurement date]
      E --> F[Determine whether existing base mortality and improvement is still appropriate for the group]
      G[Document!]
      H[Interaction with client's actuary will be necessary.]
  
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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

Member demographics

- Occupation
- Union or Non-Union
- Work environment
- Hazardous conditions

Plan provisions and early retirement incentives

- Availability of unreduced benefits
- Subsidized benefits at early retirement
- Supplemental benefits paid to a specific age

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Retirement Assumption Considerations

External influences

- Availability of Social Security benefits
- Availability of Medicare benefits

Review past experience

- Actuarial gains/losses associated with retirement
- Experience studies
- Periodic review

Salary Scale: Compensation Increases - Pension

Projected future benefit payments

Pension		OPEB					
Mortality	Retirement	Salary Scale (if benefit is pay related)	Mortality	Retirement	Base Year Claims Cost	Health Care Cost Trend Rate	Participation Rate

Compensation Increases

Projects individuals future compensation in pension/OPEB plans that provide benefits based on compensation

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    graph LR
      A[Compensation at measurement date] --> B[Percentage increase per year]
      B --> C[Projected salary at retirement]
    
```

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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

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Compensation Increases

Percentage increase per year (continued)

- Consider factors specific to plan and its participants

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Auditing Compensation Increase Rate

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Base Year Claims Cost

Expected medical claims to be paid in retirement

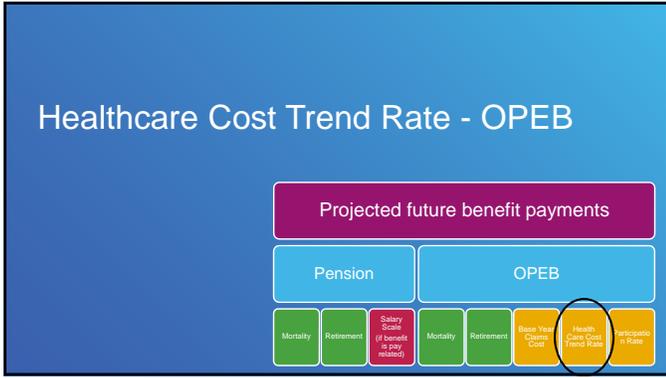
- Usually separated by pre-Medicare (under 65) and post-Medicare (65 and older)
- Post-Medicare claims significantly less than pre-Medicare claims
 - Medicare becomes primary payer
 - Plan becomes secondary payer

Preferred is to use claims experience of the health plan if credible

- If not fully credible, consider health care premiums and/or manual rates

Base Year Claims Cost Considerations

Aggregate Claims Data	Health Care Premiums	Number of Years of Claims Information to Use
Health Care Trending of Historical Information	Age-Specific Costs	Credibility Weighting of Claims Information
Plan Design and Plan Design Changes	Medicare Integration	Gross Claims vs. Net Claims Information



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:

Medical cost trend rate	9% decreasing by 0.5% to an ultimate level of 5%
Drug cost trend rate	10% decreasing by 1% to an ultimate level of 6%
Medicare Part B	6%

How is the Healthcare Cost Trend Rate Determined?

Short-term rates

- Reflects recent or near-term experience (e.g., next years 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

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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



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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)



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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



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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.

Document!

Interaction with client's actuary will be necessary.

Participation Rate - OPEB

Projected future benefit payments

Pension
Mortality, Retirement

OPEB
Mortality, Retirement, Base Year Claims Cost, Health Care Cost Trend Rate, **Participation in Rate**

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

Document!

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Step 2 – Discounting

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

Total Pension/OPEB Liability

Projecting

Discounting

Attributing

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!

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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

COMMON PITFALLS:

- Anchoring on historical real rates of return
- Rate is similar to what is used by other plans

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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

Investment type	Plan A		Plan B	
	Current	Expected	Current	Expected
Cash	5%	2%	15%	10%
Domestic equity	25%	25%	35%	30%
International equity	20%	25%	10%	10%
Domestic fixed income	25%	20%	40%	45%
Hedge	10%	15%	-	-
Real estate	10%	10%	-	5%
Venture capital	5%	3%	-	-

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 managements expert (specialist)

Example Building Block Approach

Mathematical equation

Asset Class	Target asset Allocation (A)	Long-Term Expected Real Rate of Return (B)	Weighted Long-Term Expected Real Rate of Return (A x B)
Domestic equity	27.50%	6.00%	1.65%
International equity	27.50%	6.25%	1.72%
Fixed income	30.00%	2.75%	0.83%
Real estate	7.50%	5.75%	0.43%
Private equity	7.50%	7.00%	0.53%
Total	100.00%		5.16%
			2.50% Inflation factor
			7.66%

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

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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

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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

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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

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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

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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 500, *Audit Evidence*

- Using the Work of a Management Specialist

AU-C section 620, *Using the Work of an Auditor's Specialist*

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Resources

Actuarial Standards Board

- <http://www.actuarialstandardsboard.org/>

Code of Professional Conduct

- <http://www.actuary.org/content/code-professional-conduct>

U.S. 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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