



Experience Study Overview

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Office of the State Actuary
"Securing tomorrow's pensions today."

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Today's Presentation

- What is an experience study?
- Why do we do them?
- How do we do them?
- Next steps



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What Is An Experience Study?

- Compares “actual to expected” experience over the study period
- Two types
 - Demographic
 - Economic
- Experience study period
 - A “look back” period
 - Five to six years for demographic
 - Thirty-plus years for economic

Why Do We Do Them?

- Ensure actuarial assumptions remain reasonable
- What is a reasonable assumption?
 - Expected to appropriately model contingency being measured
 - Not anticipated to produce significant cumulative actuarial gains or losses over measurement period
- Reasonable assumptions and methods produce reasonable and adequate contribution rates

Two Types Of Assumptions

- Economic
 - Estimate amount of future pension payments
 - Mostly independent of underlying plan design
- Demographic
 - Estimate timing of future pension payments
 - “Plan population” and “plan design” specific

Current Assumptions

Economic

- Rate of investment return
- Rate of inflation
- Rate of general salary increases
- Growth in system membership (for amortizing the Plan 1 UAAL)
- All prescribed in statute

Demographic

- Retirement
- Mortality
- Termination from employment
- Disability
- Election of optional forms of benefit payment
- Other non-economic assumptions
- Not prescribed in statute

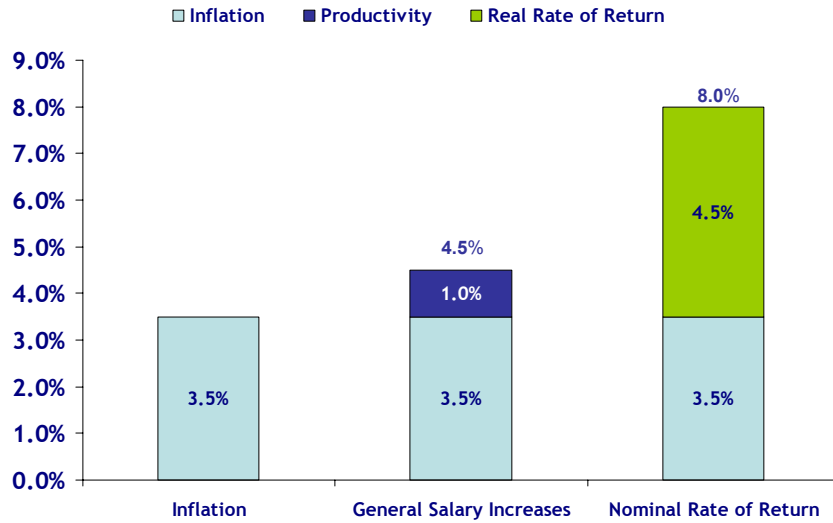
Selecting Economic Assumptions

1. Identify components, evaluate relevant data
2. Develop “best-estimate” range
3. Select specific estimate within range
4. Review all assumptions for consistency

Building Block Approach

- Start with inflation
- Inflation is a component of nominal rate of return and general salary increase assumptions

Building Block Example - Current Assumptions



Best Estimate Range

“The narrowest range within which the actuary reasonably anticipates that the actual results, compounded over the measurement period, are more likely than not to fall”

Measurement Period

- Period after valuation date during which an assumption will apply for a given measurement
- Forward looking
- Typically, very long-term

"More Likely Than Not"

- Output from a probability distribution function ranges from 0 to 1
- Median is the 50th percentile of the distribution
- Range from the 25th to the 75th percentile is called the "inter-quartile" range
- More likely than not, the results will fall within the inter-quartile range

Best Estimate Range - Example

- Rate of return = [7%, 9%]
- Inflation = [2%, 5%]

Selecting A Specific Estimate

- Ultimately, single-point estimate selected for each assumption
- Median is reasonable, but its selection is not required

A Set of Economic Assumptions

- Review individual assumptions first
- Then review entire set of assumptions for reasonableness, consistency
- For example, lowering the inflation assumption, but not adjusting the general salary increase or rate of return assumptions could produce inconsistent economic assumptions

Recap - Economic Assumptions

- Actuaries use professional judgment to estimate future economic outcomes based on past experience and future expectations
- An actuary's best estimate assumption is typically represented by a range
- Ultimately, actuary selects a single point estimate from the range for each assumption
- Entire set of economic assumptions should be consistent

Selecting Demographic Assumptions

1. Inventory existing assumptions
2. Consider relevant “assumption universe” and specific considerations for each assumption
3. Select assumption format
4. Review other considerations
5. Select the specific assumption
6. Evaluate reasonableness

Existing Demographic Assumptions

- Retirement
- Mortality
- Termination from employment
- Disability
- Election of optional forms of benefit payment
- Other non-economic assumptions

What Is The Assumption Universe?

- A universe of possible options an actuary might reasonably use for the specific assumption
- Examples
 - National experience tables and studies
 - Plan specific experience data and tables
- OSA has over 30 years of plan specific experience data
- Experience is incorporated in our current demographic assumptions
 - That is why the look-back period is shorter for our demographic studies in Washington

Example of Plan Specific Experience Data (1995-2000)

Age	Actual	Current Assumption		New Assumption	
		Expected	Ratio	Expected	Ratio
-54	3	6	50%	4	75%
55-59	13	16	81%	11	118%
60-64	19	31	61%	22	86%
65-69	28	54	52%	41	68%
70-74	69	73	95%	60	115%
75-79	64	68	94%	59	108%
80-84	51	46	111%	42	121%
85-89	19	22	86%	22	86%
90-94	8	6	133%	7	114%
95-99	1	1	100%	1	100%
100+	0	0		0	
Total	275	323	85%	269	102%

General Considerations

- Have recent plan design changes influenced future behavior?
- Use different assumptions for different participant subgroups?
 - Public safety and non-public safety
 - Within public safety, law enforcement vs. fire fighter
- Washington's retirement systems are generally split by occupation (more so than other states)

Specific Considerations For Each Assumption (Examples)

- Retirement assumption
 - Does the availability of other employer-sponsored postretirement benefits influence retirement behavior (post-retirement employment; access to OPEB, etc.)?
- Termination from employment assumption
 - Does termination experience vary based on employer-specific or job-related factors?
- Mortality assumption
 - Use different mortality assumptions before and after retirement?
 - Consider likelihood and extent of mortality improvement in the future?
- Disability assumption
 - Include a recovery assumption?

Assumption Format

- Form in which a particular demographic assumption will be used or expressed
- Examples
 - Table or single-point estimate
 - Table based on age only
 - Table based on age and gender (i.e., retirement, mortality)
 - Table based on years of service (i.e., termination from employment, merit increases)

Other Considerations

- Materiality
 - Establish appropriate balance between refined methodology and materiality
- Cost effectiveness
 - Establish appropriate balance between refined methodology and cost effectiveness
- Combined effect of assumptions
 - Combined effect of all assumptions should be reasonable

Selecting the Specific Assumption

- Ultimately, you must land on a specific assumption
- Selection made from the appropriate assumption universe
- Applied under the appropriate assumption format
- Includes both general and specific considerations for each assumption
- An exercise of professional judgment

Evaluating Reasonableness

- Assumption should appropriately model the contingency being measured
- No significant cumulative actuarial gains or losses over the measurement period
- Combined effect of assumptions is also reasonable

Recap - Demographic Assumptions

- Actuaries use professional judgment to estimate future economic outcomes based on past experience and future expectations
- Actuary should select reasonable demographic assumptions in light of particular characteristics of the plan
- A reasonable assumption is
 - expected to appropriately model the contingency
 - not anticipated to produce significant cumulative actuarial gains or losses over the measurement period

Presentation Overview

- Experience study compares actual to expected experience
- Experience studies ensure actuarial assumptions/contribution rates remain reasonable
- Two types: economic and demographic
- Actuary's use professional judgment to estimate possible future outcomes
 - Based on blend of past experience and future expectations
- Actuaries select/recommend assumptions by applying professional judgment

Missing Crystal Ball

- No one knows what the future holds
- The best an actuary can do is use professional judgment
- Estimation is based on past experience and future expectations
 - Significant data concerning the past
 - Past not necessarily the best indicator of the future

What If You're Wrong?

- Natural consequences will follow
- For example, if you assume 8% rate of return and the fund earns more in the long-run, the plan will experience actuarial gains in the future
 - All else being equal, the plan will build a reserve if the assumption remains unchanged
- Opposite is true if fund earns less than assumed rate

Why Not Just Remove The Risk?

- For example, comfortably assume a much lower rate of return and build up a reserve.
- Resulting higher contribution rates for members, employers, and the state (tax payers)
- An “overfunded” plan’s assets could be targeted for other purposes

Balancing Act

- Ultimately, it’s a risk management exercise which balances several factors
 - Actuarial science and standards of practice
 - Budget
 - Stakeholder interests

Next Steps

- OSA recommendation to PFC on economic assumptions by September 1
- PFC may adopt changes to the economic assumptions by October 31
- LEOFF 2 Board may adopt changes at any time
- Preliminary analysis of demographic assumptions underway
 - Preview of analysis this interim?
- Demographic experience study will conclude in June/July of 2008