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Oregon PERS Liability Primer for OIC

Matt Larrabee

Introduction

Who We Are / Who We Are Not

- We are the actuary for PERS, and our responsibilities include:
 - Actuarial valuation of system liabilities
 - Calculation of recommended employer contribution rates
 - Financial projections of assets, liabilities, and contribution rates
 - Recommendations on valuation assumptions, calculation methodologies
 - Review of system demographic and economic experience

- We are not an investment consultant to PERS
 - We are neither retained nor licensed to provide investment advice
 - As such, nothing in this presentation is intended to be or should be construed to be investment advice

The intent of this presentation is to provide background on the PERS benefit structure and dynamics to assist OIC and SIS in their analysis by providing an understanding of system liabilities and employer contribution rates

PERS Benefit Structure, System Dynamics, Return Assumption

Executive Summary

- System liabilities and benefit payments are mature and predictable
 - The historical earnings guarantee accelerated system's maturation
 - The current guarantee level is diminishing as a factor in liability levels
- Employer rates, which are established in advance, are projected to rise steadily due to the 2008-2009 market downturn
- Some current assets will be used for net cash outflows over the next ten years
- Contribution rates are more sensitive to investment return volatility than other western states' systems
 - For the same level of investment return variance, PERS has a larger change in funded status and employer contribution rates
- The investment return assumption (currently 8%) is set by PERB based on the actuary's analysis of the OIC allocation policy
 - The selected assumption is not a target return for the OIC to achieve
 - An assumption change would affect employer rates and some benefit levels

Introduction

Overview of Contributions

- Employer contribution rates are set by PERB
 - Based on recommendations from the actuary
- In setting rates, PERB has identified the following guiding principles:
 - ***Transparent***
 - ***Predictable and stable rates***
 - ***Protect funded status***
 - ***Equitable across generations***
 - ***Actuarially sound***
 - ***GASB compliant***

Introduction

Overview of Contributions

- PERS-related contributions have various sources and destinations
- Fixed Member contributions to the Individual Account Program (IAP)
 - 6% of payroll; “picked up” by many employers
- Fixed employer contributions to Pension Obligation Bond (POB) debt service
 - For those employers who have chosen to issue POBs
- Variable employer contributions to the Tier 1/Tier 2/OPSRP program
 - Determined by actuarial valuation in advance

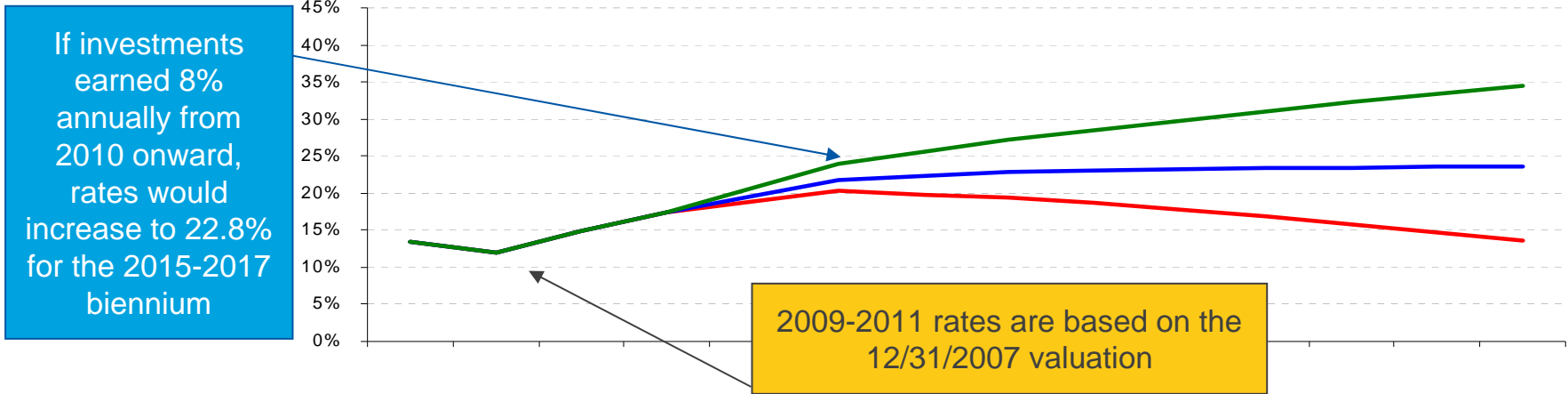
Valuation	Employer Contribution Rates
12/31/2007	7/1/2009 – 6/30/2011
12/31/2009	7/1/2011 – 6/30/2013

- Consists of new benefit costs plus amortization of any funding shortfalls on prior benefits
- Varies primarily due to investment performance and associated changes in system funded status

Introduction

Overview of Funded Status; Contribution Rate Projections

- Estimated funded status at December 31, 2009 on a fair market basis:
 - 75% excluding side accounts; 85% including side accounts
 - Side accounts are prepaid contributions that provide rate offsets, reducing required future contributions
- The chart below illustrates projected changes in the variable “base” employer rate under several investment return scenarios



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
10.5% Return	13.4%	12.1%	14.8%	17.4%	18.9%	20.3%	19.8%	19.4%	18.6%	17.8%	16.8%	15.8%	14.7%	13.6%
8% Return	13.4%	12.1%	14.8%	17.4%	19.7%	21.8%	22.3%	22.8%	23.0%	23.2%	23.4%	23.5%	23.5%	23.5%
4.5% Return	13.4%	12.1%	14.8%	17.4%	20.7%	23.9%	25.6%	27.2%	28.5%	29.8%	31.0%	32.2%	33.3%	34.4%

Although fair market asset values are used for the actuarial calculations, rates are smoothed via a “rate collar” mechanism

PERS Benefit Structure and System Dynamics

PERS Benefit Structure

Overview

- PERS Members receive life annuity retirement benefits according to one of three different benefit tiers, depending on hire date

Benefit Tier	Date of Hire
Tier 1	Before January 1, 1996
Tier 2	January 1, 1996 to August 28, 2003
OPSRP	After August 28, 2003

- PERS reform legislation passed in 2003:
 - Created the OPSRP benefit tier
 - Significantly changed the dynamics of Tier 1 and Tier 2 liabilities
 - Directed post-2003 Member contributions away from Tier 1 and Tier 2 and into the Individual Account Program (IAP)
 - OPSRP Members also participate in the IAP

PERS Benefit Structure

Overview of Structure

- In general, Tier 1 and Tier 2 Members receive the greater of benefits calculated under two approaches:
 - Account balance-based (a.k.a. “Money Match”):
 - Member’s pre-reform contributions are accumulated with earnings to retirement
 - At retirement, the balance is matched by the employer and the total is converted to a life annuity
 - Traditional defined benefit annuity formula (a.k.a. “Full Formula”):
 - (Final pay) x (Final service) x (Percentage Multiplier)
- All OPSRP benefits are calculated under a Full Formula-like approach
 - Key differences (illustrated below for General Service Members):
 - Lower percentage multiplier
 - *Tier 1 – 1.67%; Tier 2 – 1.67%; OPSRP – 1.50%*
 - Later normal retirement age
 - *Tier 1 – Age 58; Tier 2 – Age 60; OPSRP – Age 65*

PERS Benefit Structure

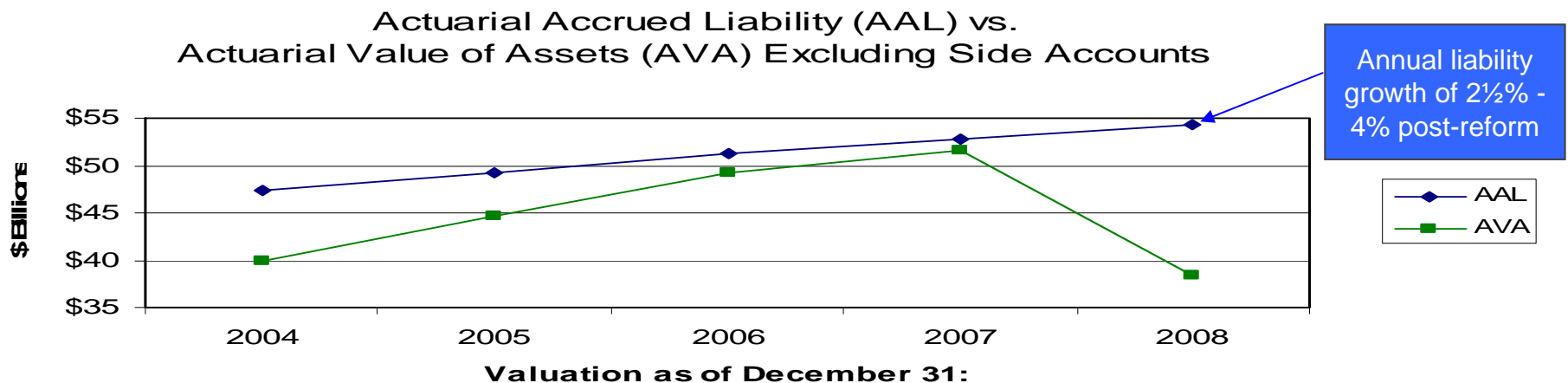
Growth of Tier 1 / Tier 2 Member Money Match Account Balances

- Money Match Member Account Balance earnings crediting is done as follows:
 - Tier 1 Member Accounts
 - Cannot be credited with less than the investment return assumption (currently 8% per year)
 - Since 2003, also cannot be credited more than the assumption rate until a special “Rate Guarantee Reserve” is fully funded
 - This reserve is presently in deficit status as a result of the market downturn
 - Tier 2 Member Accounts
 - Credited with actual market returns on regular accounts

PERS Benefit Structure

Effect of Reform

- There are no new Member contributions to Money Match accounts
 - Accounts only go up (or down) with earnings credited
 - Crediting stops at Member retirement, at which point the account balance is annuitized
- Liabilities for active Members have been shifting from the Money Match approach to the Full Formula approach
 - Some Tier 1 Members still retire under Money Match
 - Substantially all Tier 2 Members will retire under Full Formula
- Post-reform, liabilities have shown slow, predictable growth

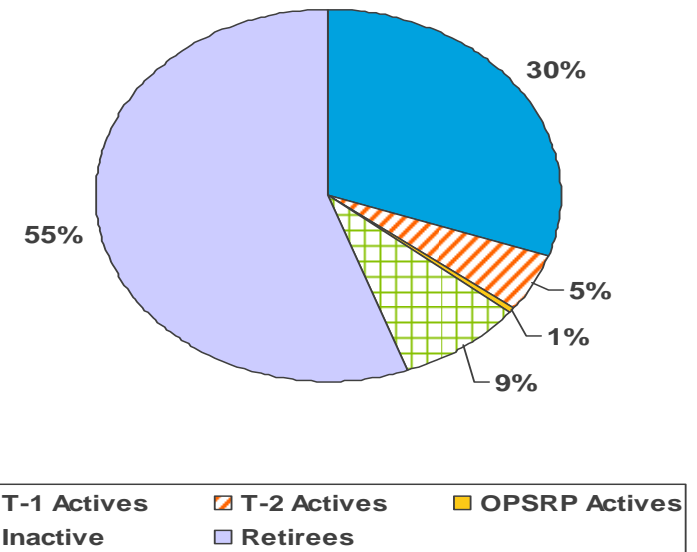


Actuarial Accrued Liability by Member Category

Plan Demographics and System Dynamics

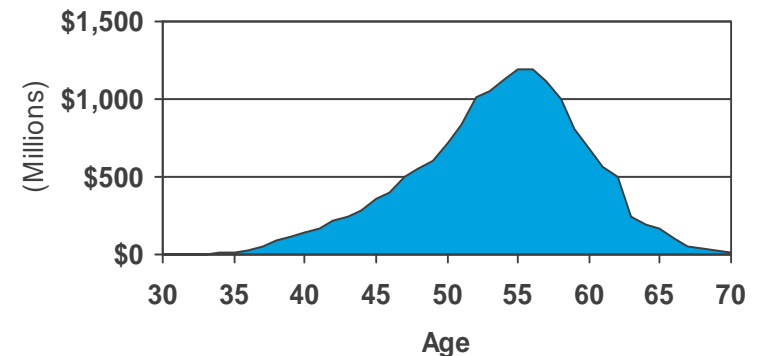
System Maturity

- 64% of PERS liabilities are for retired and inactive Members
- Of the active liability, over 80% is for Tier 1 Members, with the majority of that liability for Members over age 52
 - The over 52 group will be the last one with “Money Match” retirement benefits (others will receive “Full Formula” benefits)
 - Once those retirements have occurred, a change to the Tier 1 earnings guarantee would not affect projected benefit payments
- The maturity of the system means that future benefit payment levels and associated liabilities are quite predictable



Information from December 31, 2008 Actuarial Valuation

Distribution of Tier 1 Active Liability

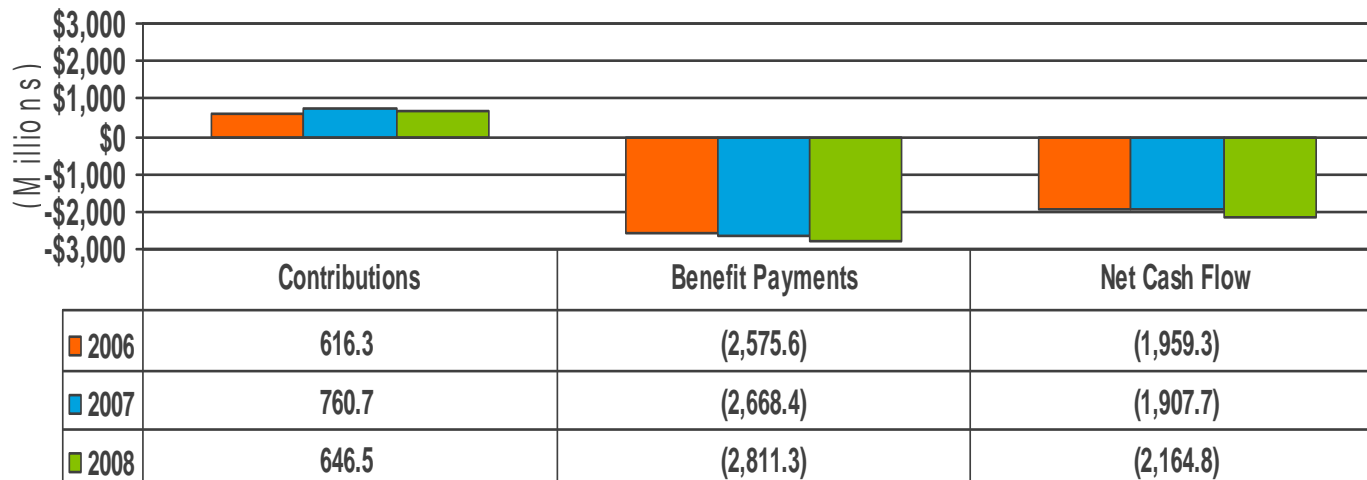


Plan Demographics and System Dynamics

Tier 1/Tier 2/OPSRP Cash Flow

- As shown in the graph below, for the Tier 1/Tier 2/OPSRP program:
 - Benefit payments currently exceed new employer contributions, which is typical of mature systems
 - Benefit payments are projected to grow to \$5 billion annually by 2017
- Contribution rates will not increase until July 2011, but will rise steadily thereafter even if the 8% annual investment return assumption is met
- IAP contributions (not included in this slide) are approximately \$500 million

Changes in Tier 1/Tier 2 & OPSRP Assets (Including Side Accounts & Reserves)

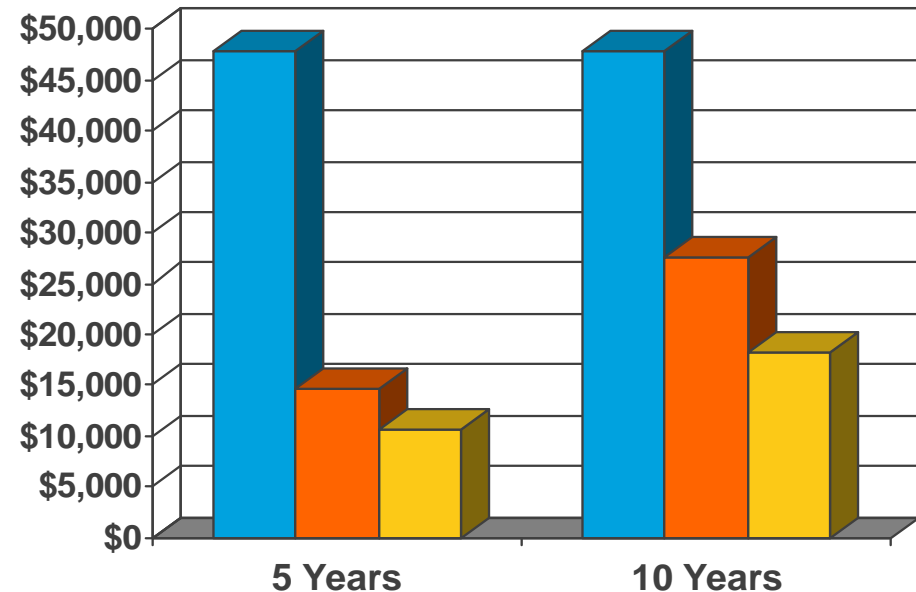


Plan Demographics and System Dynamics

Tier 1/Tier 2/OPSRP Cash Flow

- Even with projected contribution rate increases, negative cash flow will persist as benefit payments escalate
 - A portion of current assets will be needed to cover net cash outflows
 - With 8% annual investment return:
 - 22% of current assets will be needed for 5-year net outflows
 - 38% of current assets will be needed for 10-year net outflows
- The present value of benefit payments over the next ten years (at an 8% discount rate) is over half of the current value of assets

Comparison of Year-End 2009 Assets to Present Value (PV) of 5 & 10 Year Cash Flows (\$ millions)



- Assets (Estimated, Including Side Accounts)
- PV of Projected Benefit Payments
- PV of Projected Median Net Cash Outflows

Plan Demographics and System Dynamics

Benchmarking Metrics

- Like all funded systems, PERS pays for benefits using a combination of contributions and investment earnings. The immutable and fundamental long-term relationship is:

$$\text{Benefits Paid} + \text{Expenses} = \text{Contributions} + \text{Investment Earnings}$$

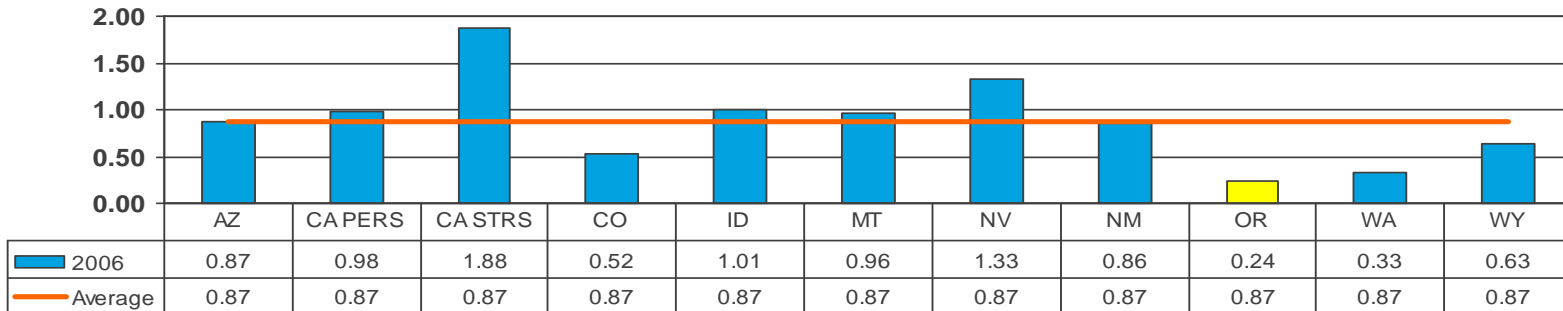
- When investment earnings deviate from the assumed level, the amount of contributions required changes
- While this is true for all systems, the impact of investment return volatility on contribution rates varies by system
 - Contribution rates are more sensitive to investment volatility when:
 - The ratio of contributions to benefit payments is low,
 - The ratio of active Members to retirees is low, and/or
 - The ratio of assets to active payroll is high

PERS contribution rates are significantly more sensitive to investment volatility than those of other western states' systems

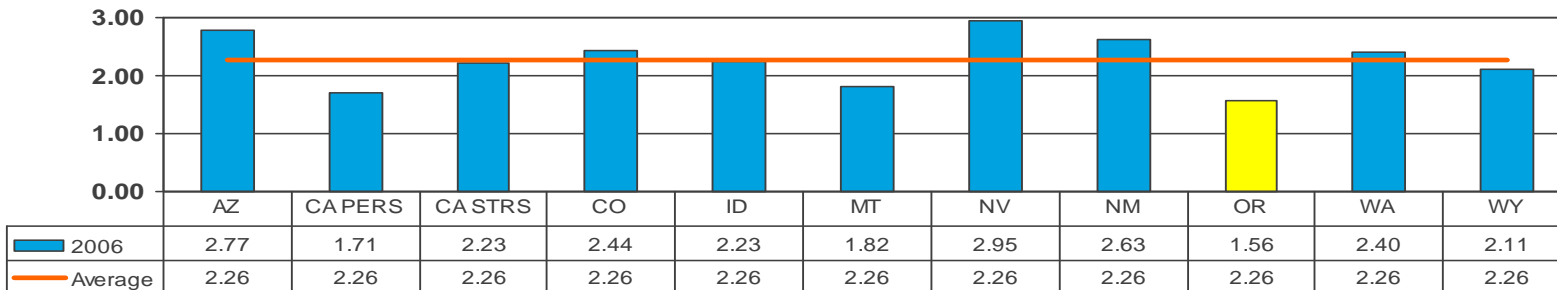
Plan Demographics and System Dynamics

Benchmarking – Contribution Rate Sensitivity to Investment Returns

Contributions / Benefit Payments



Active Members / Retirees and Beneficiaries

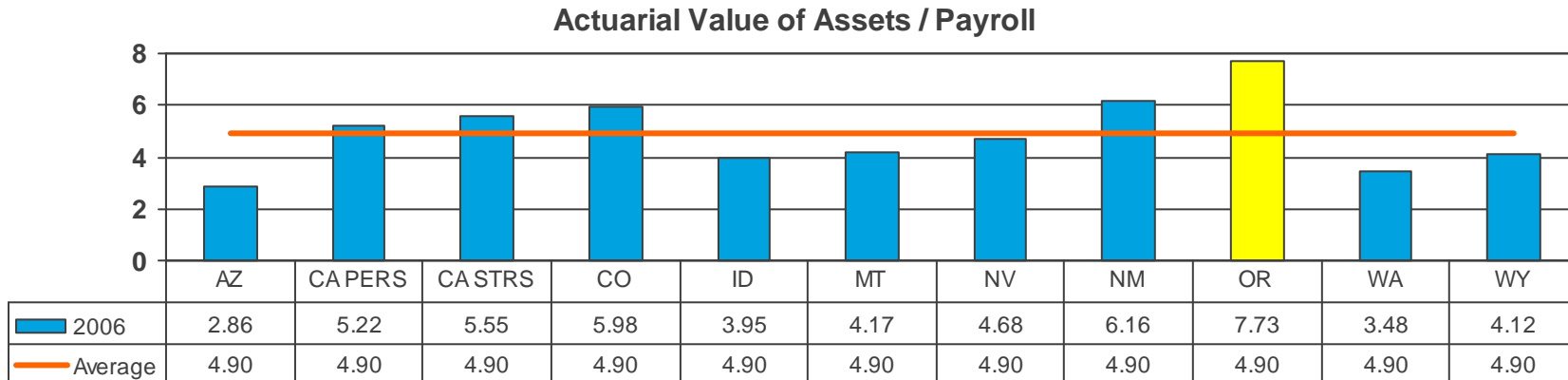


- Based on a 2006 survey of large public retirement systems, among western states' systems, PERS had:
 - The lowest ratio of contributions to benefit payments, and
 - The lowest active member to retiree ratio

Note: Data above is based upon the Comprehensive Annual Financial Reports of each retirement system as published on their respective web sites. There are differences in reporting dates and other factors that may make direct comparisons imperfect.

Plan Demographics and System Dynamics

Benchmarking – Contribution Rate Sensitivity to Investment Returns



- Any variation in investment performance from the investment earnings assumption is amortized as a level percentage of payroll through employer contribution rates
- Contribution rates for systems with higher asset to payroll ratios are more sensitive to actual investment returns
 - For a given deviation from expected return, a larger contribution rate adjustment is needed to address the shortfall (or surplus) created
- Among these systems, PERS has the highest assets to payroll ratio and, consequently, is the most sensitive to volatility in investment experience

Note: Data above is based upon the Comprehensive Annual Financial Reports of each retirement system as published on their respective web sites. There are differences in reporting dates and other factors that may make direct comparisons imperfect.

PERS Benefit Structure and System Dynamics

Summary

- Projected benefit payments and associated liabilities are predictable
- Employer rates, which are established in advance, are projected to rise steadily due to the 2008-2009 market downturn
- System cash flow is negative, and a portion of current assets will likely be needed for net cash outflows over the next ten years
- Benchmarking indicates PERS contribution rates are more sensitive to investment return volatility than other western states' systems
 - For the same level of investment return variance, PERS has a larger change in funded status and employer contribution rates
- The historical level of the earnings crediting guarantee to Tier 1 Members played a role in the maturation of the system's liability
 - The current guarantee level is diminishing as a factor in liabilities
 - Only Members who retire in the future under Money Match are affected by the current guarantee level, and Members in that group are likely to retire within the next several years

Investment Return Assumption

Investment Return Assumption

Uses of Assumption

- The investment return assumption is 8%, and has been so since 1989
- This key assumption is used for a variety of important purposes
 - Earnings crediting level for Tier 1 Member Accounts
 - Interest rate used to annuitize Money Match account balances
 - Interest rate used to convert annuities to optional forms of benefit in a financially equivalent manner
 - Rate used to “net present value” projected benefit cash flows to calculate system liabilities
 - **All of these factors directly affect employer contribution rates**
- Despite its significance, there is a fair amount of confusion over how the 8% assumption was developed and how it should be used
 - One misconception is that it is a investment return target to meet or exceed against which OIC should develop an asset allocation

Investment Return Assumption

Development of Assumption

- This investment return assumption is developed by the actuary and reviewed and approved by PERB
 - We use two key inputs to advise on an appropriate rate:
 - Asset allocation policy as developed by OIC
 - Long-term capital market expectations of both Mercer & SIS
- The assumption is the expected (i.e., mean) return **given the allocation selected**
 - It is **not** intended as an investment target that must be met or exceeded each year
- If allocation policy or capital market expectations change, the return assumption would be revisited and could be revised
 - An assumption change would affect benefit levels for some Members, and reported liabilities and contribution rates for all employers
 - This was covered in detail in our July 2009 presentation to PERB

Possible Risk Tolerance Metrics

Possible Risk Tolerance Metrics

Overview

- When conducting risk analyses, systems are more frequently looking at metrics beyond asset risk and return
 - Typical metrics involve funded status or contribution rates
- Possible risk tolerance metrics for PERS could include:
 - Identifying a “maximum sustainable employer contribution rate”, and developing policies in which rates have a particular likelihood (95%+, for example) of not exceeding that rate
 - Creating a similar metric for “minimum acceptable funded status”
 - Identifying a “maximum permissible funded status volatility” level
 - Identifying a minimum liquidity measure
- Development of these risk tolerance metrics should be based on input from PERS, OIC and other stakeholders

Actuarial Certification

Mercer has prepared this presentation exclusively for the Public Employees Retirement Board (PERB) to inform PERB and other stakeholders on actuarial considerations related to asset/liability analysis to be undertaken by Strategic Investment Solutions (SIS) and the Oregon Investment Council (OIC). This presentation may not be used or relied upon by any other party or for any other purpose; Mercer is not responsible for the consequences of any unauthorized use.

This report material includes or is derived from projections of future funding and/or accounting costs and/or benefit related results. To prepare these projections or results, various *actuarial assumptions*, as described in the Appendix, were used to project a limited number of scenarios from a range of possibilities. However, the future is uncertain, and the system's actual experience will likely differ from the assumptions utilized and the scenarios presented; these differences may be significant or material. In addition, different assumptions or scenarios may also be within the reasonable range and results based on those assumptions would be different. This report has been created for a limited purpose, is presented at a particular point in time and should not be viewed as a prediction of the system's future financial condition. To prepare the results shown in this report, various *actuarial methods*, as described in the Appendix, were used.

Because actual system experience will differ from the assumptions, decisions about benefit changes, investment policy, funding amounts, benefit security and/or benefit-related issues should be made only after careful consideration of alternative future financial conditions and scenarios and not solely on the basis of a valuation report or reports.

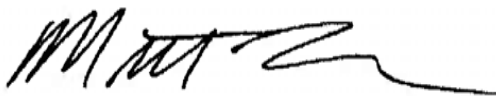
This report is based on data and system provisions as described in the Appendix. Oregon PERS is solely responsible for the validity, accuracy and comprehensiveness of this information. If the data or plan provisions supplied are not accurate and complete, the valuation results may differ significantly from the results that would be obtained with accurate and complete information; this may require a later revision of this report.

Actuarial Certification - Continued

Professional Qualifications

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, that would impair the objectivity of our work.

We are available to answer any questions on the material contained in the report, or to provide explanations or further details as may be appropriate.



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January 27, 2010

Date



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Appendix

Financial Projections

Overview

- Basis for modeling
 - 12/31/2008 Tier 1/Tier 2/OPSRP actuarial valuation
 - Contribution rates and funded status are modeled on a system-wide basis, and do not include retiree healthcare or IAP contributions
 - **Based on published investment returns through November 30, 2009**
 - The OIC published November 2009 return on general account assets of +15.55% was treated as the 2009 12-month annual investment return
 - 2009 investment experience is assumed to improve funded status 4%
- Projected effects of 10.5%, 8.0%, 4.5% annual investment returns
 - Represents 25-year earnings average, valuation interest rate, and 10-year earnings average, respectively

Charts shown without consideration of side accounts or associated rate offsets

Base Rates Versus Net Rates

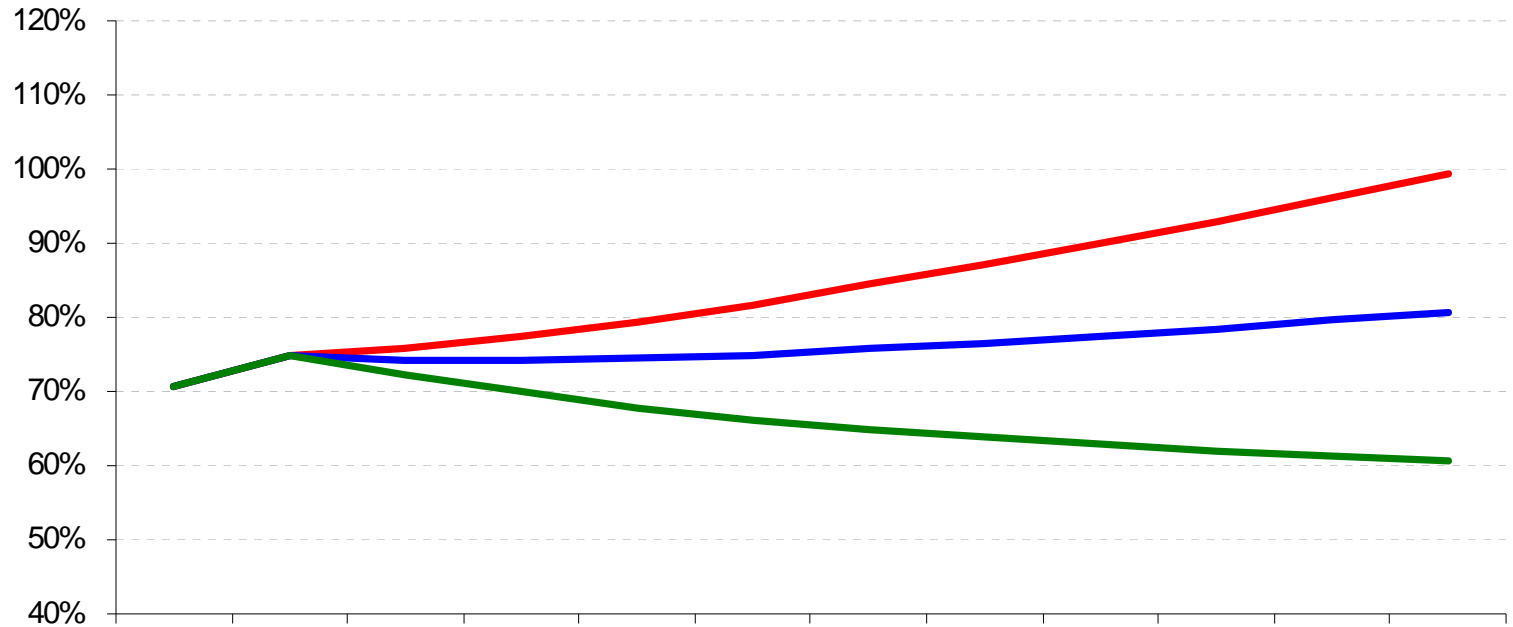
- The modeled base contribution rate consists of two parts:
 - Normal Cost Rate
 - Economic value of new benefits earned each year
 - Unfunded Actuarial Liability (UAL) Rate
 - Amortization payment of shortfalls for benefits already earned
- Base rates exclude the effects of:
 - Side account rate offsets
 - Payments for Individual Account Program (IAP), retiree healthcare, and debt service on Pension Obligation Bonds (POBs)
- Net rates include the effect of side account rate offsets

Usefulness / Limitations of Models

- The recent downturn and subsequent partial recovery help to illustrate both the usefulness and limitations of actuarial modeling
- Models are useful because they can provide:
 - Long-term forecasting using “best estimate” assumptions
 - Sensitivity analysis on the effect of a key factor varying from assumption
 - Example: September 2009 Board meeting projections
 - An estimate of the likely range of possible outcomes (with percentiles) for a robust variety of possible future experience
 - Examples: Annual financial modeling presentations to the Board
 - The ability for policymakers and stakeholders to quantify the projected long-term effects of significant recent changes
- Models are limited because they look at a limited set of possible future outcomes
 - Accordingly, there is no guarantee that actual future experience will fall within the range of outcomes modeled

Ten-Year Financial Projections – Funded Status

Excludes Side Accounts



As of 12/31	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
10.5% Return	71%	75%	76%	77%	79%	82%	84%	87%	90%	93%	96%	99%
8% Return	71%	75%	74%	74%	74%	75%	76%	77%	78%	79%	80%	81%
4.5% Return	71%	75%	72%	70%	68%	66%	65%	64%	63%	62%	61%	61%

Appendix

Actuarial Basis

Data

We have based our financial projections of the liabilities on the data, methods, assumptions and plan provisions described in the December 31, 2008, Actuarial Valuation (“2008 Valuation Report”) for the Oregon Public Employees Retirement System.

Assets as of December 31, 2008, were based on values provided by Oregon PERS reflecting the Board’s earnings crediting decisions for 2008. Assets and year-to-date returns as of November 30, 2009 as published by the Oregon Investment Council (OIC) were used as the basis for estimating December 31, 2009 assets.

As the starting point for the financial projections, assets were updated based on year-to-date investment results through November 30, 2009 as published by the Oregon Investment Council (OIC). Year-to-date 2009 returns as of that date on regular accounts are +15.55%.

We have assumed that the active participant data reflected in the valuation of the Plan remains stable over the projection period (i.e. – participants leaving employment are replaced by new hires in such a way that the total counts, average age, and average service remain stable from year to year). No new members are assumed to be eligible for Tier 1 and Tier 2 benefits; all new entrants are assumed to become members under the OPSRP benefit formula.

Methods / Policies

Liabilities are based on the Projected Unit Credit method and are rolled forward according to the following rules:

Normal cost: Normal cost increases with assumed wage growth adjusted for wage experience, demographic experience and asset return experience (if applicable). Demographic experience follows assumptions described in the 2008 Valuation Report.

Accrued liability: Liabilities increase with normal cost and decrease with benefit payments. Results are adjusted for wage, demographic and asset experience (if applicable).

Contribution Rates: The projected contribution rates are calculated on each odd valuation date in accordance with methodologies described in the 2007 and 2008 Valuation Reports. Rates are applied 18 months after the biennial determination date.

Expenses: Administration expenses for financial projections were assumed to be equal to \$6.6M plus .05% of Market Value of Assets.

Actuarial Value of Assets: Equal to Market Value of Assets excluding Contingency, Capital Preservation and Tier 1 Rate Guarantee Reserves

Appendix

Actuarial Basis

Assumptions

In general, assumptions for ten-year financial projections are as described in the 2008 Valuation Report.

The major assumptions used in our ten-year financial projections are shown below. They are aggregate average assumptions that apply to the whole population and were held constant throughout the projection period. The economic experience adjustments were allowed to vary in future years given the conditions defined in each economic scenario.

- Valuation interest rate — 8.00%
- General Accounts Growth — 8.00%
- Variable Account Growth — 8.50%
- Wage growth assumption — 3.75%
- Wage growth experience — inflation + 1.25%
- Demographic experience — reflects decrement assumptions as described in the 2008 Valuation Report.

Reserve Projections

Contingency Reserve as of 12/31/2008 is \$653.2M. No future increases or decreases from this reserve were assumed.

Capital Preservation Reserve was assumed to be \$0 throughout the projection period.

Tier 1 Rate Guarantee Reserve (“T1RGR”) is a deficit of \$0.98B as of 12/31/2008. The reserve was assumed to grow with returns in excess of 8% on Tier 1 Member Accounts plus T1RGR. When aggregate returns were below 8%, applicable amounts from the T1RGR were transferred to the Tier 1 Member Accounts to maintain the 8% target growth on the member accounts. No contributions were allocated to the T1 RGR and the 5-year call on a deficit was not modeled.

Provisions

Provisions valued are as detailed in the 2008 Valuation Report.

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