

FINANCIAL MODELING

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

November 21, 2014

Presented by:

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Introduction

- In July, we presented preliminary system average valuation results as of December 31, 2013 for the Tier 1/Tier 2 & OPSRP programs
- In September, the Board adopted employer-specific contribution rates effective July 1, 2015
 - Based on the December 31, 2013 actuarial valuation
- Today's presentation covers long-term projections of system average contribution rates and funded status reflecting estimated investment results through October 31, 2014

Financial Modeling

Models and Inputs

- Rates are projected with both a steady return model and a variable return model where investment returns change from year to year
- Modeling starts with 12/31/2013 liabilities and assumptions
- Modeling uses 12/31/2013 assets adjusted for estimated regular account returns of 6.6% through October 2014
 - 6.6% estimate based on combined effects of:
 - Published year-to-date regular account returns through September 30 of 6.10%
 - Estimated October returns developed using the OPERF policy benchmark's October return of 0.44%
 - Returns for November & December vary in our model based on scenario

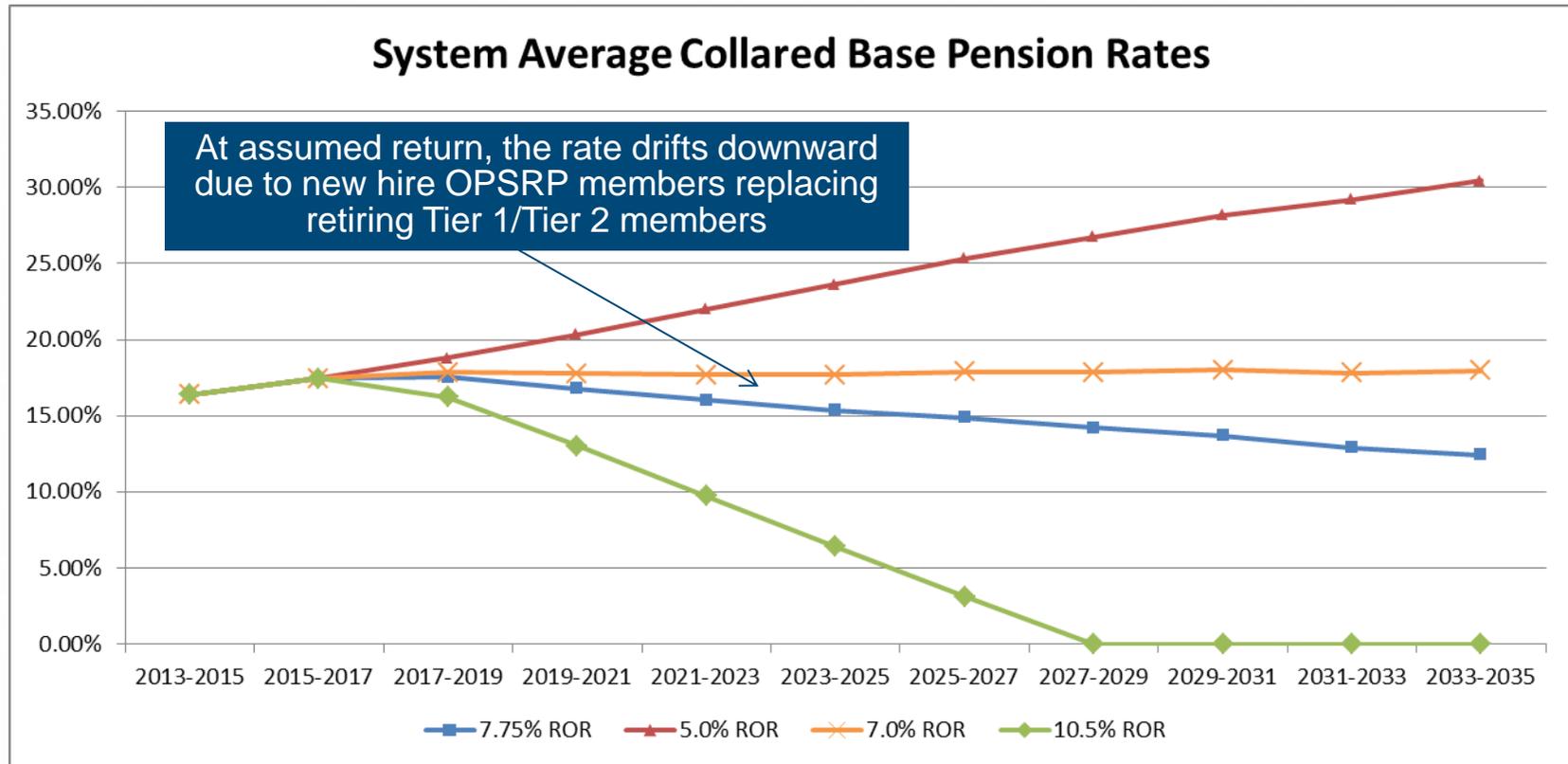
Financial Modeling

Comments on System Average Rates

- Projections depict system average funded status and contribution rates
 - Comparable to system average rates discussed in July
- No single employer pays the system average rate – for the 2015 - 2017 biennium:
 - School district base rates are above the average
 - Most SLGRP employers' base rates are below the average
- Rates shown do not include the effects of:
 - Individual Account Plan (IAP) contributions
 - Rates for the RHIA & RHIPA retiree healthcare programs
 - Debt service payments on pension obligation bonds

Steady Return Model Projections

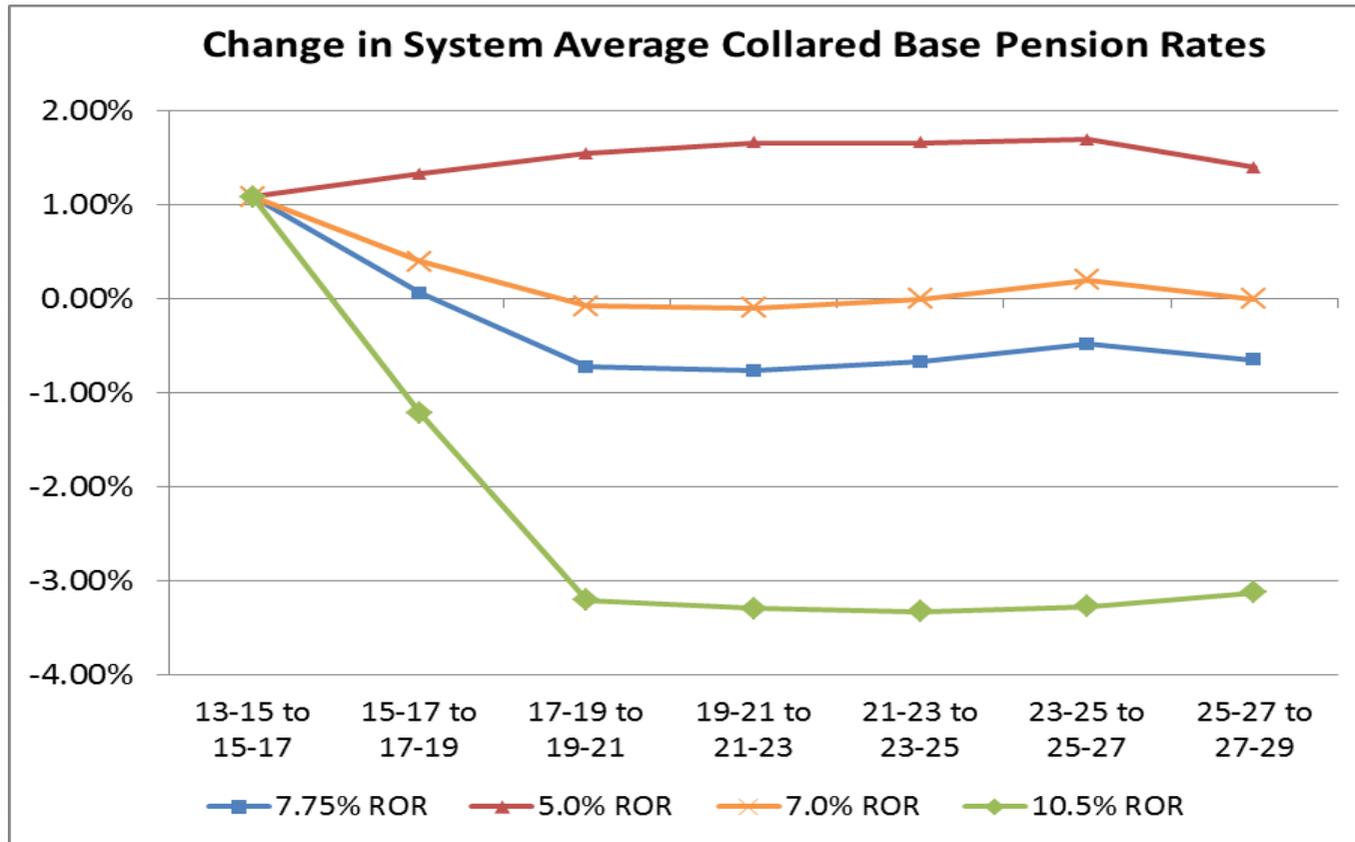
An annual investment return of 7.00% keeps rates approximately level in the model



The steady rate model illustrates impact of consistently achieving the assumed 7.75% return and three alternative returns

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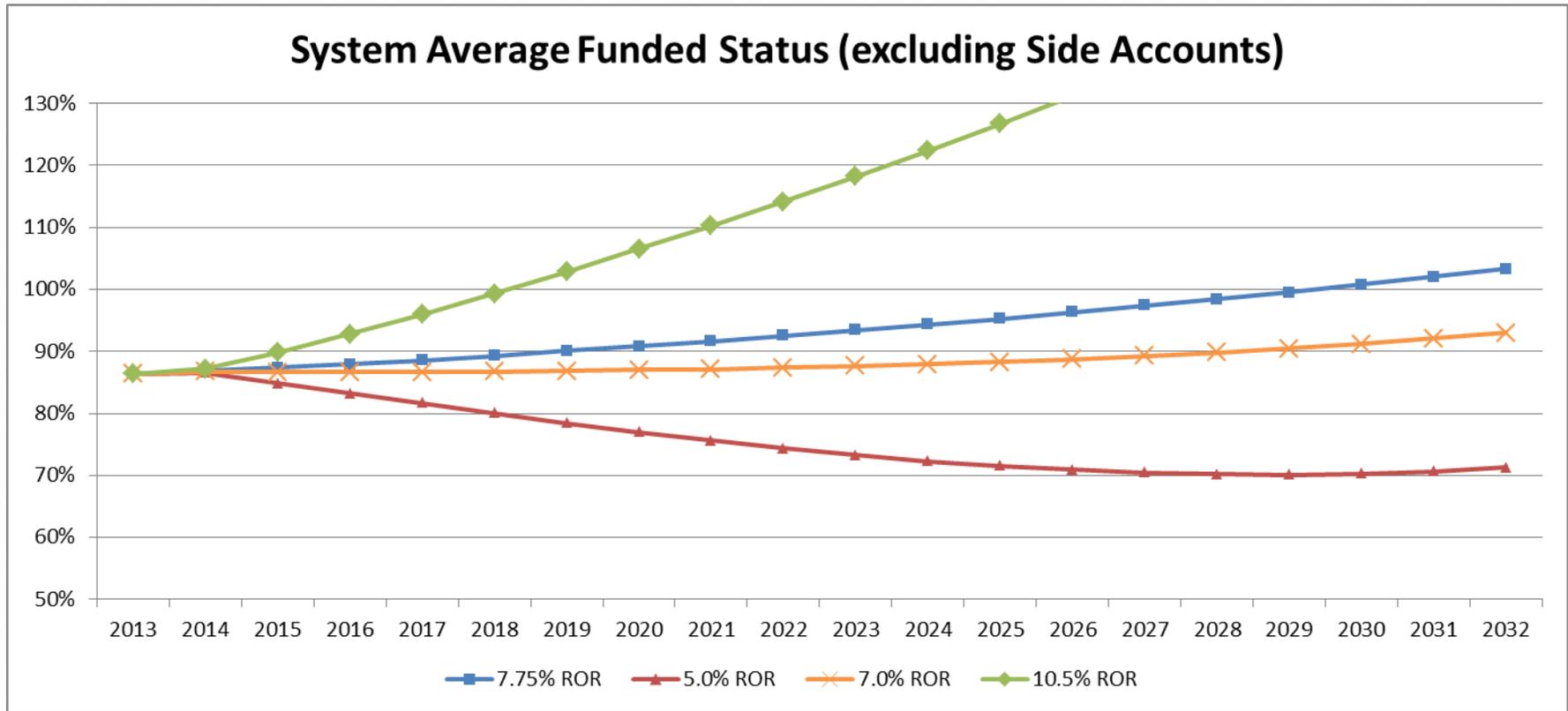
Steady Return Model Projections



Shows biennium to biennium changes under steady return projections

Steady Return Model Projections

Funded status reaches 100% by 2030 in the model when investment returns equal 7.75%



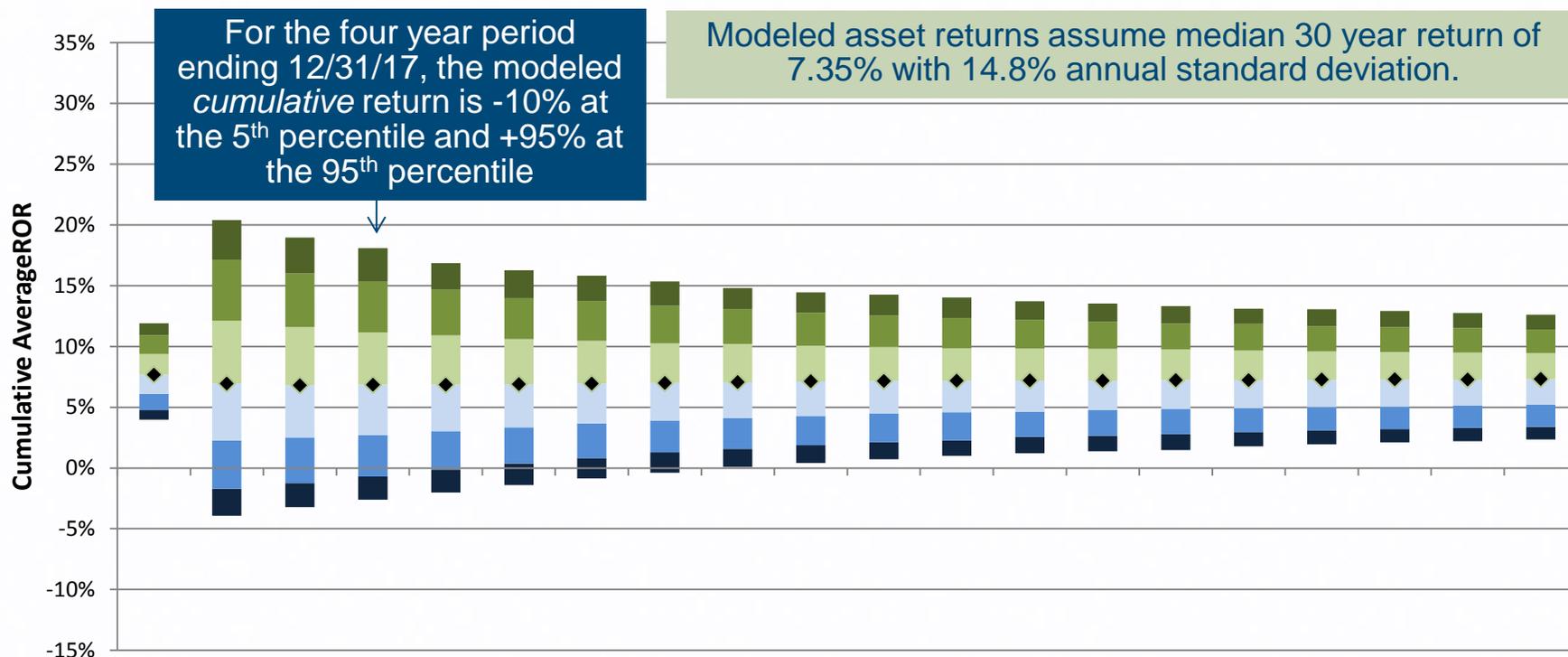
Shows projected funded status under steady return projections

Variable Return Model

- Model results are likelihood ranges instead of a single amount
 - The distribution is based on a stochastic simulation using 10,000 trials
 - Scenarios were developed by our national capital market specialists, and use the current OPERF target asset allocation policy
- In our results charts, the dots represent median outcomes
- We display model results from the 5th to 95th percentiles
 - Ten percent of model outcomes fall outside of the depicted range
- The chart format is demonstrated on the next slide
 - It shows the modeled range of potential future investment returns that could be experienced by the fund
 - Returns are shown as average annualized returns on a calendar year basis, and incorporate estimated 2014 returns through October 31

Average Annualized Rate of Investment Return

Post-2013 Modeled Returns (Geometric Average)

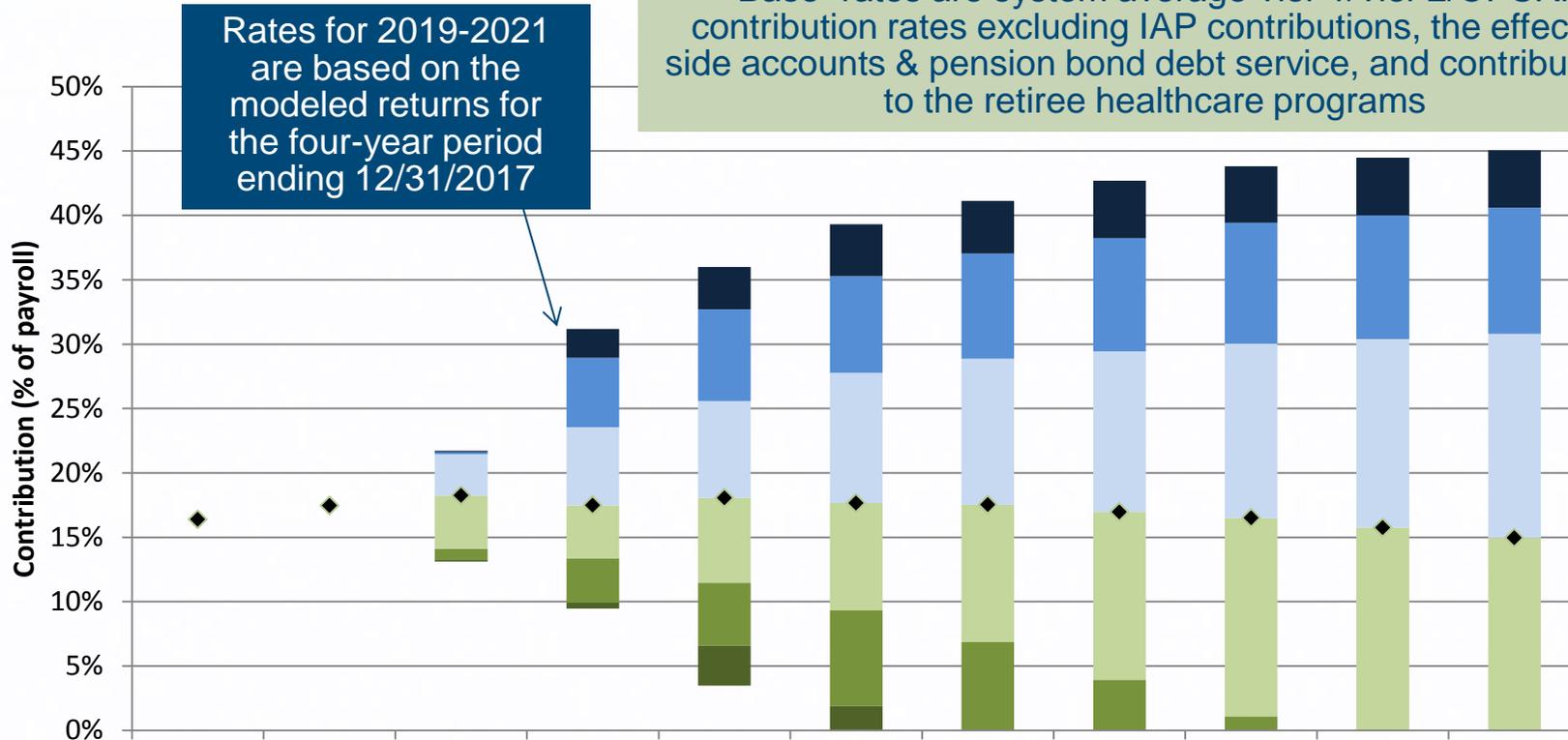


| PY Ending 12/31 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 95th | 11.9% | 20.4% | 19.0% | 18.1% | 16.9% | 16.3% | 15.8% | 15.3% | 14.8% | 14.5% | 14.3% | 14.0% | 13.7% | 13.5% | 13.3% | 13.1% | 13.1% | 12.9% | 12.8% | 12.6% |
| 90th | 10.9% | 17.2% | 16.0% | 15.3% | 14.7% | 14.0% | 13.7% | 13.3% | 13.1% | 12.8% | 12.6% | 12.4% | 12.2% | 12.0% | 11.9% | 11.9% | 11.7% | 11.6% | 11.5% | 11.4% |
| 75th | 9.4% | 12.1% | 11.6% | 11.2% | 10.9% | 10.6% | 10.5% | 10.3% | 10.2% | 10.1% | 10.0% | 9.9% | 9.8% | 9.8% | 9.7% | 9.7% | 9.6% | 9.5% | 9.5% | 9.5% |
| 50th | 7.7% | 6.9% | 6.8% | 6.9% | 6.8% | 6.9% | 6.9% | 7.0% | 7.1% | 7.1% | 7.2% | 7.2% | 7.2% | 7.2% | 7.2% | 7.2% | 7.3% | 7.3% | 7.3% | 7.3% |
| 25th | 6.1% | 2.2% | 2.5% | 2.7% | 3.0% | 3.3% | 3.7% | 3.9% | 4.1% | 4.3% | 4.5% | 4.6% | 4.6% | 4.8% | 4.9% | 4.9% | 5.0% | 5.0% | 5.1% | 5.2% |
| 10th | 4.8% | -1.7% | -1.2% | -0.7% | -0.1% | 0.4% | 0.8% | 1.3% | 1.6% | 1.9% | 2.1% | 2.3% | 2.6% | 2.7% | 2.8% | 3.0% | 3.1% | 3.2% | 3.3% | 3.4% |
| 5th | 4.0% | -3.9% | -3.2% | -2.6% | -2.0% | -1.4% | -0.9% | -0.4% | 0.1% | 0.4% | 0.7% | 1.0% | 1.2% | 1.4% | 1.5% | 1.8% | 1.9% | 2.1% | 2.2% | 2.4% |

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Collared System Average Base Contribution Rates

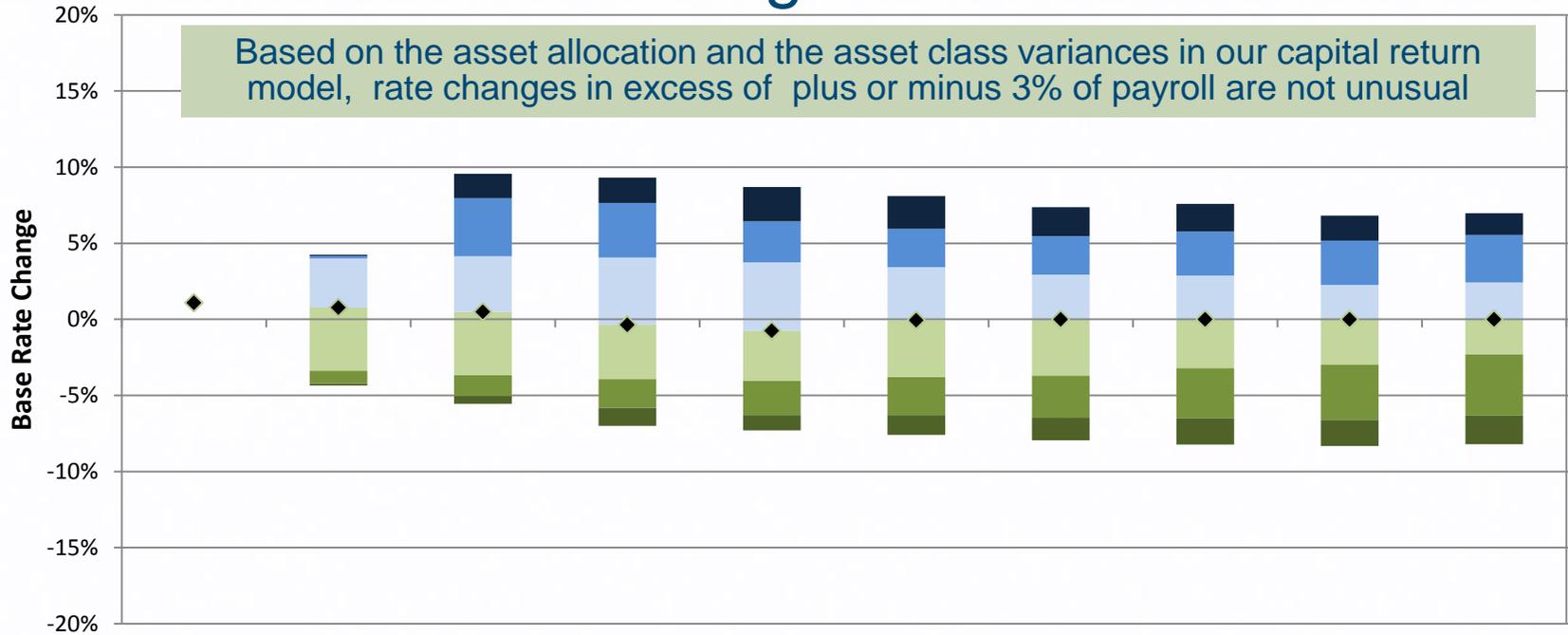
“Base” rates are system average Tier 1/Tier 2/OPSRP contribution rates excluding IAP contributions, the effect of side accounts & pension bond debt service, and contributions to the retiree healthcare programs



| Biennium | 2013-2015 | 2015-2017 | 2017-2019 | 2019-2021 | 2021-2023 | 2023-2025 | 2025-2027 | 2027-2029 | 2029-2031 | 2031-2033 | 2033-2035 |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 5th | 16.4% | 17.5% | 21.7% | 31.2% | 36.0% | 39.3% | 41.1% | 42.7% | 43.8% | 44.5% | 45.1% |
| 10th | 16.4% | 17.5% | 21.6% | 28.9% | 32.7% | 35.3% | 37.0% | 38.2% | 39.4% | 40.0% | 40.6% |
| 25th | 16.4% | 17.5% | 21.5% | 23.6% | 25.6% | 27.8% | 28.9% | 29.4% | 30.0% | 30.4% | 30.8% |
| 50th | 16.4% | 17.5% | 18.2% | 17.5% | 18.1% | 17.7% | 17.5% | 17.0% | 16.5% | 15.8% | 15.0% |
| 75th | 16.4% | 17.5% | 14.1% | 13.4% | 11.5% | 9.3% | 6.9% | 3.9% | 1.1% | 0.0% | 0.0% |
| 90th | 16.4% | 17.5% | 13.3% | 9.9% | 6.6% | 1.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 95th | 16.4% | 17.5% | 13.1% | 9.5% | 3.5% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

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Collared System Average Base Contribution Rates Biennium to Biennium Changes

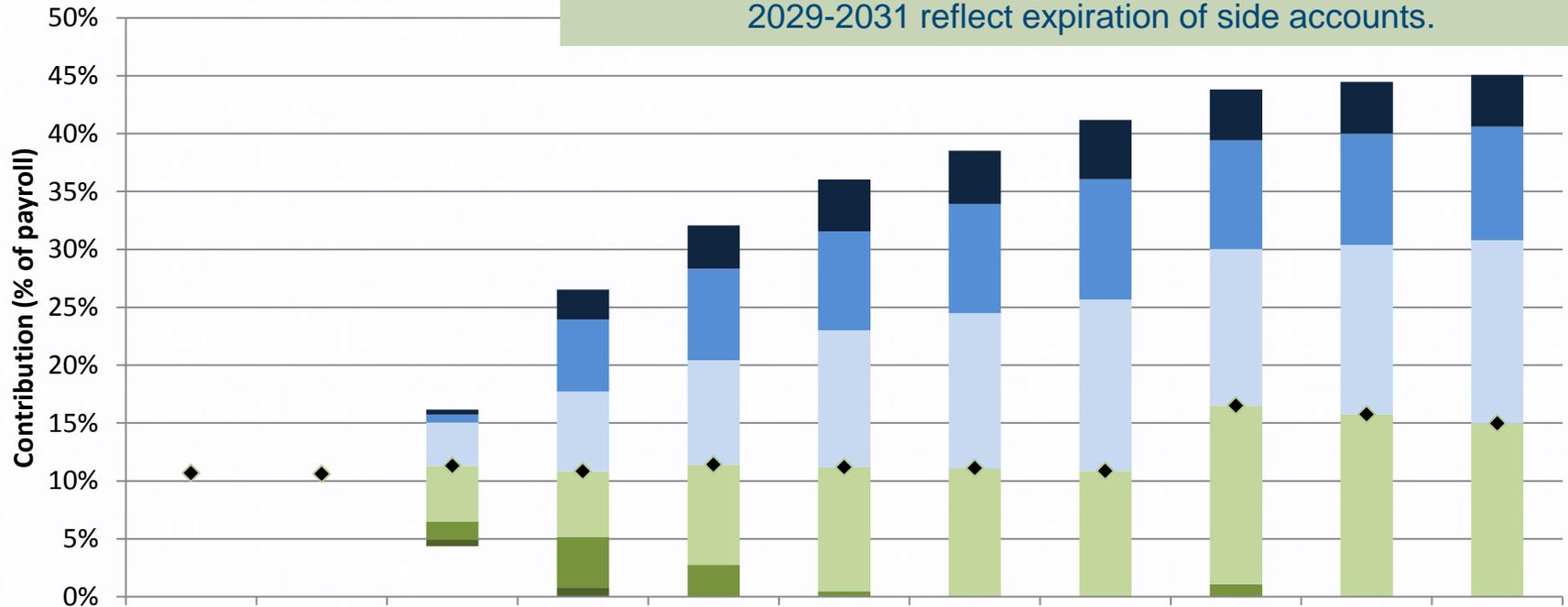


| Change from: | 13-15 to 15-17 | 15-17 to 17-19 | 17-19 to 19-21 | 19-21 to 21-23 | 21-23 to 23-25 | 23-25 to 25-27 | 25-27 to 27-29 | 27-29 to 29-31 | 29-31 to 31-33 | 31-33 to 33-35 |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 5th | 1.1% | 4.3% | 9.6% | 9.3% | 8.7% | 8.1% | 7.4% | 7.6% | 6.8% | 7.0% |
| 10th | 1.1% | 4.2% | 8.0% | 7.6% | 6.4% | 5.9% | 5.5% | 5.8% | 5.2% | 5.5% |
| 25th | 1.1% | 4.0% | 4.1% | 4.1% | 3.8% | 3.4% | 2.9% | 2.9% | 2.3% | 2.4% |
| 50th | 1.1% | 0.8% | 0.5% | -0.4% | -0.8% | -0.1% | 0.0% | 0.0% | 0.0% | 0.0% |
| 75th | 1.1% | -3.4% | -3.7% | -3.9% | -4.1% | -3.8% | -3.7% | -3.2% | -3.0% | -2.3% |
| 90th | 1.1% | -4.2% | -5.0% | -5.8% | -6.3% | -6.3% | -6.5% | -6.5% | -6.6% | -6.3% |
| 95th | 1.1% | -4.4% | -5.6% | -7.0% | -7.3% | -7.6% | -7.9% | -8.2% | -8.3% | -8.2% |

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System Average Net Contribution Rates

“Net” rates are base rates adjusted to reflect the projected effect of side account rate offsets and pre-SLGRP rate offsets. Increases in 2029-2031 reflect expiration of side accounts.

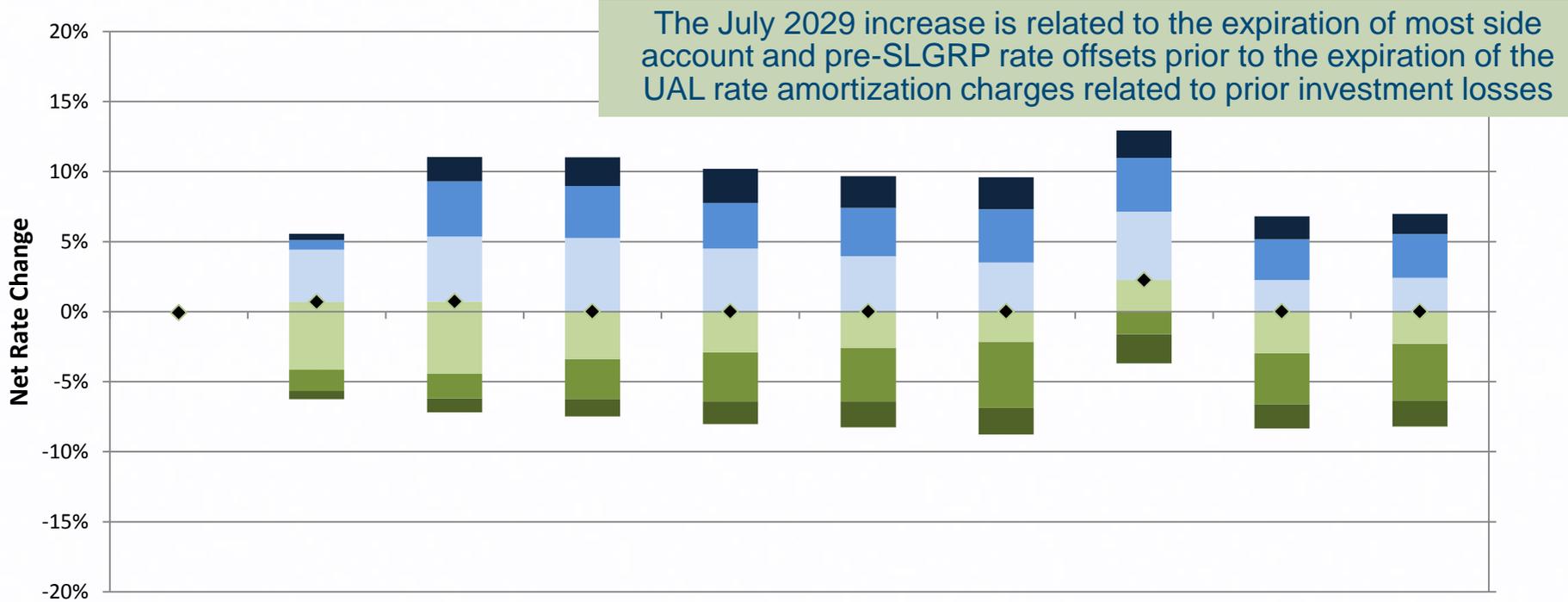


| Biennium | 2013-2015 | 2015-2017 | 2017-2019 | 2019-2021 | 2021-2023 | 2023-2025 | 2025-2027 | 2027-2029 | 2029-2031 | 2031-2033 | 2033-2035 |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 5th | 10.7% | 10.6% | 16.2% | 26.5% | 32.1% | 36.0% | 38.5% | 41.2% | 43.8% | 44.5% | 45.1% |
| 10th | 10.7% | 10.6% | 15.7% | 23.9% | 28.3% | 31.5% | 33.9% | 36.1% | 39.4% | 40.0% | 40.6% |
| 25th | 10.7% | 10.6% | 15.1% | 17.7% | 20.4% | 23.0% | 24.5% | 25.7% | 30.0% | 30.4% | 30.8% |
| 50th | 10.7% | 10.6% | 11.3% | 10.8% | 11.4% | 11.2% | 11.1% | 10.8% | 16.5% | 15.8% | 15.0% |
| 75th | 10.7% | 10.6% | 6.5% | 5.2% | 2.8% | 0.5% | 0.0% | 0.0% | 1.1% | 0.0% | 0.0% |
| 90th | 10.7% | 10.6% | 5.0% | 0.8% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 95th | 10.7% | 10.6% | 4.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

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System Average Net Contribution Rates

Biennium to Biennium Changes

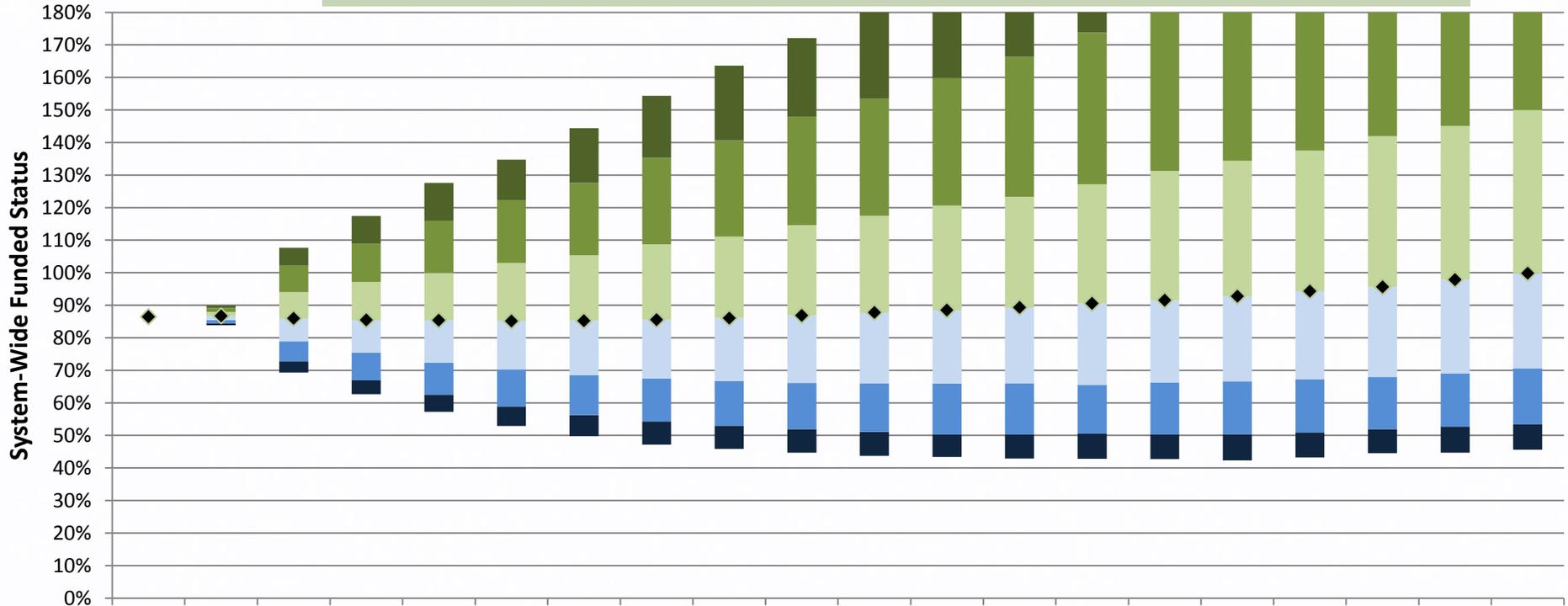


| Change from: | 13-15 to 15-17 | 15-17 to 17-19 | 17-19 to 19-21 | 19-21 to 21-23 | 21-23 to 23-25 | 23-25 to 25-27 | 25-27 to 27-29 | 27-29 to 29-31 | 29-31 to 31-33 | 31-33 to 33-35 |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 5th | -0.1% | 5.6% | 11.0% | 11.0% | 10.2% | 9.7% | 9.6% | 12.9% | 6.8% | 7.0% |
| 10th | -0.1% | 5.1% | 9.3% | 9.0% | 7.8% | 7.4% | 7.3% | 11.0% | 5.2% | 5.5% |
| 25th | -0.1% | 4.4% | 5.4% | 5.3% | 4.5% | 4.0% | 3.5% | 7.1% | 2.3% | 2.4% |
| 50th | -0.1% | 0.7% | 0.7% | 0.0% | 0.0% | 0.0% | 0.0% | 2.3% | 0.0% | 0.0% |
| 75th | -0.1% | -4.1% | -4.4% | -3.4% | -2.9% | -2.6% | -2.1% | 0.0% | -3.0% | -2.3% |
| 90th | -0.1% | -5.7% | -6.2% | -6.2% | -6.4% | -6.4% | -6.9% | -1.6% | -6.6% | -6.3% |
| 95th | -0.1% | -6.2% | -7.2% | -7.5% | -8.0% | -8.3% | -8.8% | -3.7% | -8.3% | -8.2% |

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Funded Status (Excluding Side Accounts)

At the 50th percentile, funded status starts between 86% and 87% at year-end 2014 and progresses toward 100% over the modeled period



| PY Ending 12/31 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|-----------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 95th | 86.4% | 89.9% | 107.6% | 117.4% | 127.6% | 134.7% | 144.4% | 154.3% | 163.6% | 172.1% | 181.5% | 193.2% | 204.3% | 213.1% | 226.6% | 239.1% | 248.0% | 263.8% | 280.2% | 295.3% |
| 90th | 86.4% | 89.2% | 102.1% | 108.9% | 115.9% | 122.4% | 127.6% | 135.3% | 140.7% | 147.9% | 153.5% | 159.8% | 166.3% | 173.8% | 180.7% | 189.9% | 198.9% | 205.8% | 215.5% | 222.7% |
| 75th | 86.4% | 88.0% | 94.0% | 97.1% | 99.9% | 102.9% | 105.4% | 108.7% | 111.1% | 114.6% | 117.5% | 120.6% | 123.3% | 127.2% | 131.3% | 134.4% | 137.5% | 141.9% | 145.1% | 150.0% |
| 50th | 86.4% | 86.7% | 85.9% | 85.4% | 85.4% | 85.1% | 85.2% | 85.5% | 86.0% | 86.9% | 87.7% | 88.5% | 89.3% | 90.6% | 91.5% | 92.8% | 94.3% | 95.6% | 97.9% | 99.8% |
| 25th | 86.4% | 85.5% | 78.9% | 75.4% | 72.3% | 70.2% | 68.5% | 67.5% | 66.7% | 66.1% | 66.1% | 66.0% | 66.0% | 65.6% | 66.3% | 66.6% | 67.2% | 67.9% | 69.0% | 70.7% |
| 10th | 86.4% | 84.5% | 72.7% | 67.0% | 62.5% | 58.9% | 56.2% | 54.3% | 53.0% | 51.9% | 51.1% | 50.3% | 50.3% | 50.5% | 50.3% | 50.4% | 50.9% | 51.9% | 52.8% | 53.4% |
| 5th | 86.4% | 83.9% | 69.3% | 62.7% | 57.2% | 52.9% | 49.8% | 47.1% | 45.9% | 44.7% | 43.8% | 43.4% | 42.8% | 42.8% | 42.7% | 42.3% | 43.2% | 44.5% | 44.7% | 45.6% |

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Variable Return Model Stress Test

- We also used the variable return model to do a “stress test” of the likelihood of certain events in the 10,000 scenarios modeled
- The likelihood of specified events occurring at some point during the 20 year projection period is shown below

Likelihood of Event Occurring at Some Point in Next 20 Years

| | |
|--|-----|
| Funded Status (Excluding Side Accounts) > 100% | 75% |
| Funded Status (Excluding Side Accounts) < 60% | 44% |
| Funded Status (Excluding Side Accounts) < 40% | 11% |
| Base Rate (Excluding Retiree Healthcare) >30% of Pay | 41% |

Variable Return Model Stress Test

- Probability of a rate increase exceeding a selected threshold in at least one of the next three biennial rate changes
 - Changes at July 2017, July 2019 and July 2021

| Likelihood of a Biennial Rate Increase Exceeding Threshold at Some Point in Next Three Biennia | | |
|--|------------------|-----------------|
| <u>Threshold Increase</u> | <u>Base Rate</u> | <u>Net Rate</u> |
| 3% of Pay | 65% | 68% |
| 4% of Pay | 49% | 62% |
| 5% of Pay | 31% | 47% |

Comparison of Base Rate and Net Rate likelihoods illustrates the increased volatility associated with Side Accounts

Wrap Up / Next Steps

- Questions?
- At the January meeting, preliminary year-end 2014 investment results will be available
 - We can then comment on estimated impact on the 12/31/2014 valuation results, which will develop advisory 2017 – 2019 contribution rates

Certification

This presentation summarizes deterministic and stochastic modeling for the Oregon Public Employees Retirement System (“PERS” or “the System”) over a 20 year period beginning December 31, 2013 under a wide range of potential economic scenarios. The results are based upon the same assumptions, methods, and plan provisions as described in the December 31, 2013 System-Wide Actuarial Valuation Report, except where noted otherwise.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the System’s staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the System have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the System and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the System.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan’s funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The PERS Board has the final decision regarding the appropriateness of the assumptions.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Actuarial computations presented in this report under GASB Statements No. 25 and 27, 43 and 45 are for purposes of fulfilling financial accounting requirements. The computations prepared for these two purposes may differ as disclosed in our report. The calculations in the enclosed report have been made on a basis consistent with our understanding of the System’s

Certification

funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the plan provisions described in the appendix of this report, and of GASB Statements No. 25 and 27, 43 and 45. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

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- (a) The System may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.
- (b) The System may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

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The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

Appendix

Actuarial Basis Data

We have based our calculation of the liabilities on the data supplied by the Oregon Public Employees Retirement System and summarized in the Valuation Report.

Assets as of December 31, 2013, were based on values provided by Oregon PERS reflecting the Board's earnings crediting decisions for 2013, as shown in the Valuation Report. Financial model projections reflect October 31, 2014 investment results for regular and variable accounts as published by Oregon State Treasury.

Methods / Policies

Actuarial Cost Method: Entry Age Normal, adopted effective December 31, 2012.

UAL Amortization: The UAL for OPSRP and Retiree Health Care as of December 31, 2007 are amortized as a level percentage of combined valuation payroll over a closed 16 year period for OPSRP and a closed 10 year period for Retiree Health Care. For the Tier 1/Tier 2 UAL, the amortization period was reset at 20 years as of December 31, 2013. Gains and losses between subsequent odd-year valuations are amortized as a level percentage of combined valuation payroll over the amortization period (20 years for Tier/Tier 1, 16 years for OPSRP, 10 years for Retiree Health Care) from the odd-year valuation in which they are first recognized.

Appendix

Actuarial Basis

Methods / Policies (cont'd)

Contribution rate stabilization method: Contribution rates for a rate pool (e.g. Tier 1/Tier 2 SLGRP, Tier 1/Tier 2 School Districts, OPSRP) are confined to a collar based on the prior contribution rate (prior to application of side accounts, pre-SLGRP liabilities, and 6 percent Independent Employer minimum). The new contribution rate will generally not increase or decrease from the prior contribution rate by more than the greater of 3 percentage points or 20 percent of the prior contribution rate. If the funded percentage excluding side accounts drops below 60% or increases above 140%, the size of the collar doubles. If the funded percentage excluding side accounts is between 60% and 70% or between 130% and 140%, the size of the rate collar is increased on a graded scale.

Expenses: OPSRP administration expenses are assumed to be equal to \$5.5M and are added to the OPSRP normal cost.

Actuarial Value of Assets: Equal to Market Value of Assets excluding Contingency and Tier 1 Rate Guarantee Reserves. The Tier 1 Rate Guarantee Reserve is not excluded from assets if it is negative (i.e. in deficit status).

Assumptions

Assumptions for valuation calculations are as described in the 2012 Experience Study for Oregon PERS.

Provisions

Provisions valued are as detailed in the Valuation Report.

Appendix

Rate Projection Basis

Assumptions

In general, all assumptions are as described in the 2012 Experience Study Report.

The major assumptions used in our 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 – 7.75%
- Tier 1 Regular account growth – 7.75%
- Actual fund investment return– Varies by scenario according to capital market assumptions
- Variable account growth – Equal to investment return on public equity portion of the fund
- Inflation assumption – 2.75%
- Inflation experience – Varies by scenario according to capital market assumptions
- Wage growth assumption – 3.75%
- Wage growth experience– 1.00% greater than inflation experience
- Demographic experience – as described in 2012 Experience Study report

Appendix

Rate Projection Basis

Reserve Projection

Contingency Reserve as of 12/31/2013 was assumed to be \$667.7M. No future increases or decreases to this reserve were assumed.

The Tier 1 Rate Guarantee Reserve (“RGR”) was assumed to be \$434.2M as of 12/31/2013. The reserve was assumed to grow with returns in excess of 7.75% on Tier 1 Member Accounts. When aggregate returns were below 7.75%, applicable amounts from the RGR were transferred to Tier 1 Member Accounts to maintain the 7.75% target growth on the member accounts. The RGR reserve is allowed to be negative, but the reserve is not excluded from valuation assets when it is negative. We did not include in rates any potential additional employer levy that could be required to eliminate a persistent negative RGR.

Appendix

Rate Projection Basis

Capital Market Model

For each 20-year projection, we ran 10,000 stochastic scenarios for inflation and asset class rates of return. The scenarios were calibrated to represent Milliman's capital market assumptions in terms of expected average returns, the expected year-to-year volatility of the returns, and the expected correlation between the returns of different asset classes. Annual rates of return for each of the asset classes and inflation are generated from a multivariate lognormal probability distribution. Rates of return are independent from year to year.

For this purpose, we considered the Oregon PERS Fund to be allocated among the model's asset classes as shown below. This allocation is based on the Oregon Investment Council's Statement of Investment Objectives and Policy Framework for the Oregon PERS Fund, as revised October 30, 2013.

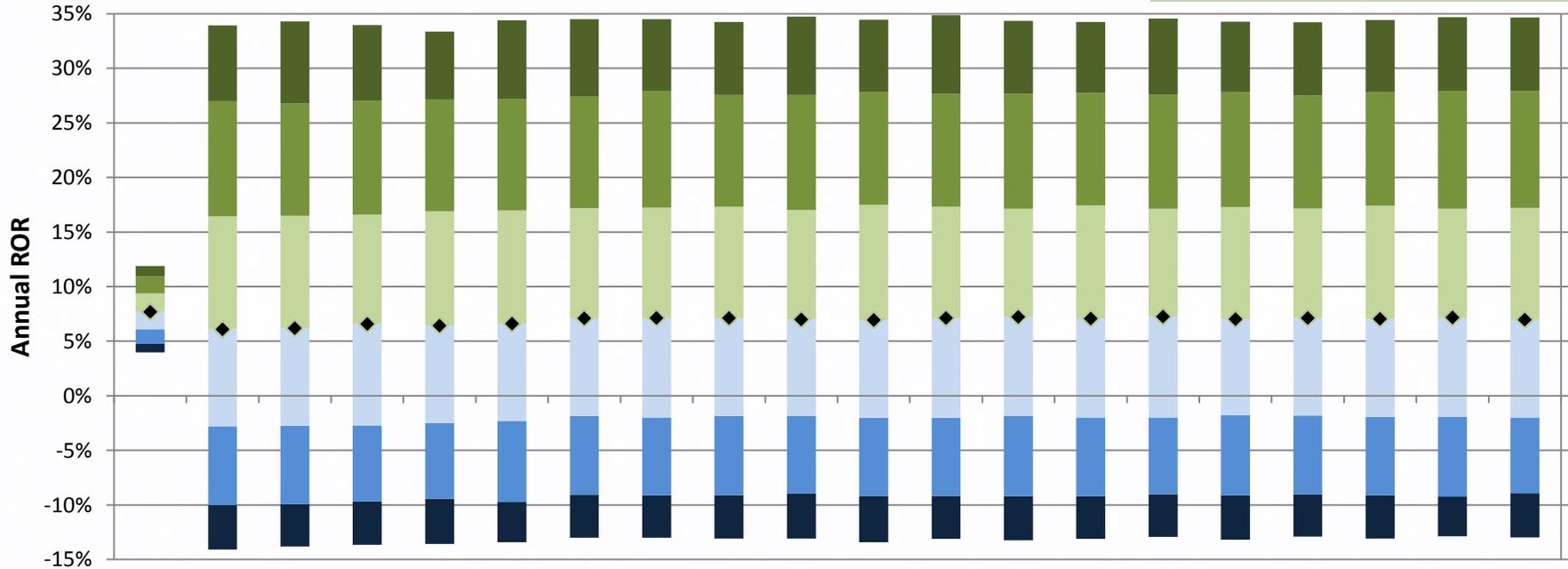
| | Annual Arithmetic Mean | 30-Year Annualized Geometric Mean | Annual Standard Deviation | Policy Allocation |
|---|-----------------------------------|--|--------------------------------------|------------------------------|
| US Broad Equity | 8.50% | 7.00% | 18.65% | 17.80% |
| Non-US Developed Large/Mid-Cap Equity | 8.80% | 6.85% | 21.25% | 15.15% |
| Emerging Markets Equity | 11.00% | 7.30% | 29.85% | 4.55% |
| Private Equity | 11.70% | 8.00% | 30.00% | 20.00% |
| US Universal Fixed Income | 5.05% | 4.95% | 4.20% | 8.00% |
| US Short Duration Bonds | 3.70% | 3.65% | 2.35% | 8.00% |
| Leveraged Loans | 6.15% | 5.75% | 9.20% | 3.00% |
| High Yield | 6.80% | 6.25% | 11.00% | 1.00% |
| Real Estate | 6.85% | 6.20% | 12.00% | 10.00% |
| Global REITs | 8.90% | 6.60% | 22.95% | 2.50% |
| Natural Resources | 6.95% | 6.20% | 13.00% | 2.50% |
| Infrastructure | 8.50% | 6.55% | 18.60% | 2.50% |
| Commodities | 6.90% | 5.15% | 20.00% | 2.50% |
| Hedge Funds | 7.50% | 7.15% | 8.75% | 2.50% |
| US Inflation (CPI-U) | 2.75% | 2.75% | 1.70% | N/A |
| Fund Total (reflecting asset class correlations) | 8.30% | 7.35% | 14.80% | 100.00% |

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PERS Fund Rate of Return

Single Calendar Year Investment Returns

Our capital market outlook model projects lower median returns in the first five years following 2014 due to current low yields on fixed income. Higher median returns are projected in the latter portion of the modeling period.



| PY Ending 12/31 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|-----------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 95th | 11.9% | 33.9% | 34.3% | 33.9% | 33.4% | 34.4% | 34.5% | 34.5% | 34.3% | 34.7% | 34.5% | 34.9% | 34.3% | 34.2% | 34.5% | 34.3% | 34.2% | 34.4% | 34.7% | 34.7% |
| 90th | 10.9% | 27.0% | 26.8% | 27.0% | 27.1% | 27.2% | 27.4% | 27.9% | 27.6% | 27.6% | 27.8% | 27.7% | 27.7% | 27.7% | 27.6% | 27.8% | 27.5% | 27.8% | 27.9% | 27.9% |
| 75th | 9.4% | 16.4% | 16.5% | 16.6% | 16.9% | 17.0% | 17.2% | 17.2% | 17.3% | 17.0% | 17.5% | 17.3% | 17.1% | 17.4% | 17.1% | 17.3% | 17.2% | 17.4% | 17.1% | 17.2% |
| 50th | 7.7% | 6.1% | 6.2% | 6.6% | 6.4% | 6.6% | 7.1% | 7.1% | 7.1% | 7.0% | 6.9% | 7.1% | 7.2% | 7.1% | 7.3% | 7.0% | 7.1% | 7.0% | 7.2% | 7.0% |
| 25th | 6.1% | -2.8% | -2.7% | -2.7% | -2.5% | -2.3% | -1.9% | -2.0% | -1.9% | -1.8% | -2.0% | -2.0% | -1.8% | -2.0% | -2.0% | -1.8% | -1.8% | -2.0% | -1.9% | -2.0% |
| 10th | 4.8% | -10.0% | -9.9% | -9.7% | -9.4% | -9.7% | -9.1% | -9.1% | -9.1% | -9.0% | -9.2% | -9.2% | -9.2% | -9.2% | -9.0% | -9.1% | -9.0% | -9.1% | -9.2% | -8.9% |
| 5th | 4.0% | -14.1% | -13.8% | -13.6% | -13.6% | -13.4% | -13.0% | -13.0% | -13.1% | -13.1% | -13.4% | -13.1% | -13.2% | -13.1% | -12.9% | -13.2% | -12.9% | -13.1% | -12.9% | -13.0% |

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