DECEMBER 31, 2012 ACTUARIAL VALUATION UPDATE & FINANCIAL MODELING

OREGON PUBLIC EMPLOYEES RETIREMENT SYSTEM

November 22, 2013

Presented by:
Matt Larrabee, FSA, EA
Scott Preppernau, FSA, EA

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Introduction

- In September, we presented preliminary system average valuation results for the Tier 1/Tier 2 & OPSRP programs
  - Reflected benefit provisions then in effect, including Senate Bill 822
- October's special legislative session made further modifications to post-2013 COLAs via SB 861
- Today's presentation:
  - Illustrates the impact of the SB 861 modifications on the preliminary valuation results shown in September
  - Reviews valuation results for the retiree health insurance programs
  - Shows long-term projections of system average contribution rates and funded status reflecting investment results through October 31, 2013 and the COLA changes of SB 861

Valuation Process and Timeline

- Actuarial valuations are conducted annually
  - Alternate between "rate setting" and "advisory" valuations
  - The 12/31/2012 valuation is advisory
- The Board adopts employer contribution rates developed in rate setting valuations, and those rates go into effect 18 months subsequent to the valuation date

Valuation Date	Employer Contribution Rates
12/31/2011 →	July 2013 – June 2015
12/31/2013 →	July 2015 – June 2017

Special Session Changes to PERS Benefits

- October's special legislative session passed Senate Bill 861 and Senate Bill 862
- Senate Bill 861 changed post-2013 COLAs as shown below

Annual Benefit Amount	COLA under SB 822	COLA under SB 861
First $20,000	2.00%	1.25%
$20,000 - $40,000	1.50%	1.25%
$40,000 - $60,000	1.00%	1.25%
$60,000 or more	0.25%	0.15%

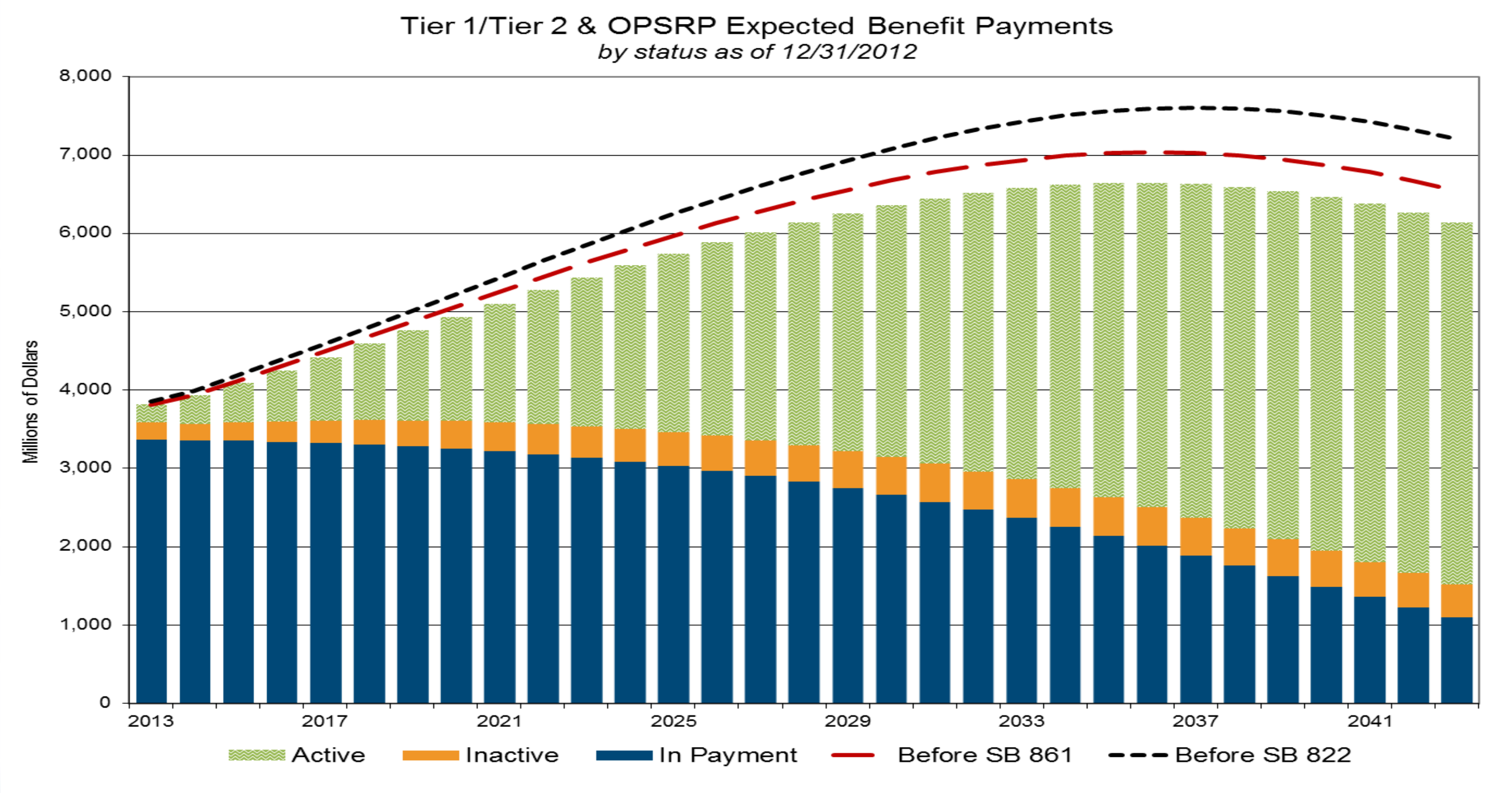
  – Also authorized six years of limited supplemental payments to be paid from Contingency Reserve

- Senate Bill 862 made other specific, limited changes that will not have an effect on valuation results

Development of Liabilities

Liabilities are calculated from projected benefit payments

Effects of recent benefit provision changes are projected below



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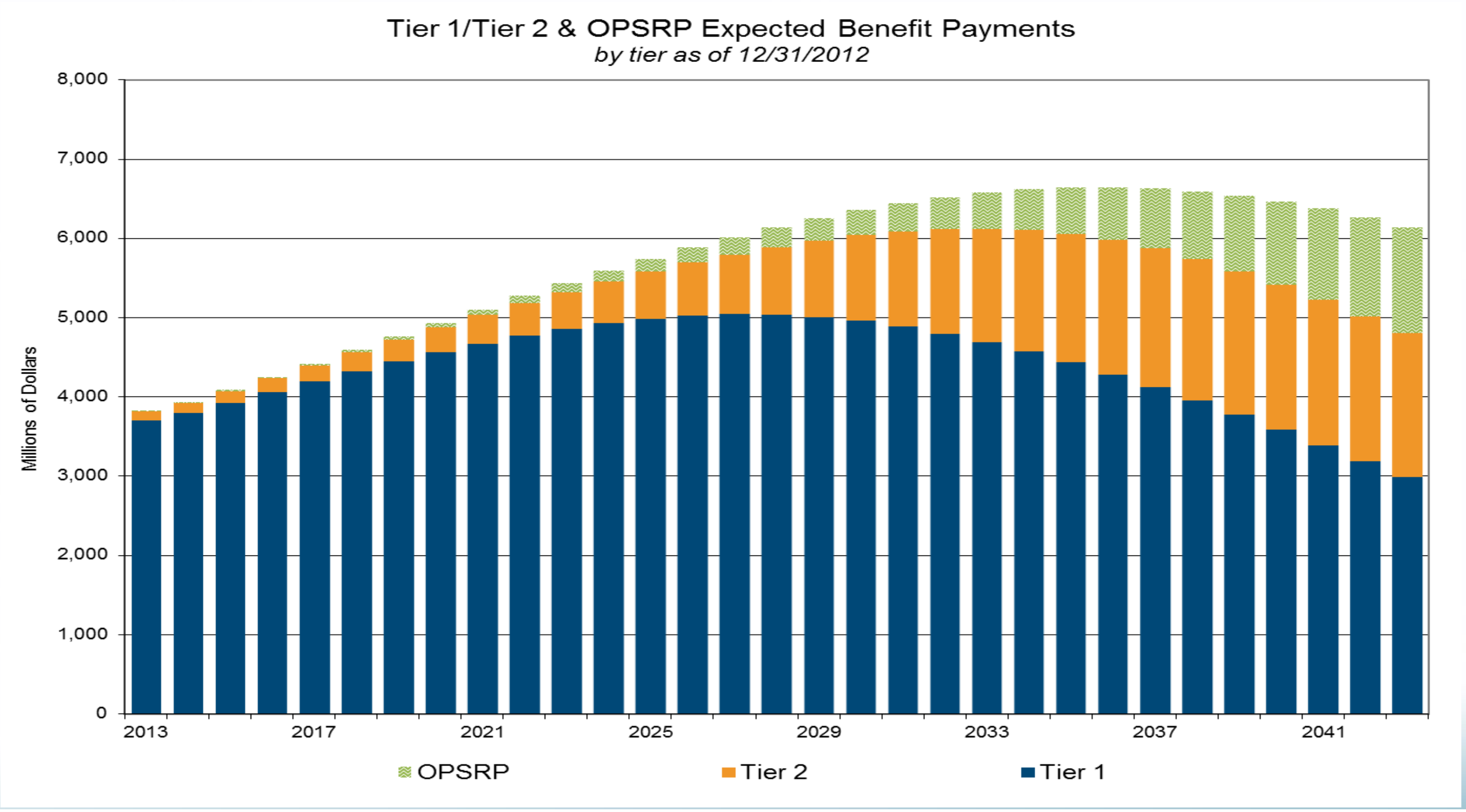
Development of Liabilities

This chart shows projected payments split by membership group



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12/31/2012 Valuation Results

Tier 1/Tier 2 & OPSRP (Excluding Side Accounts & Retiree Health Care)

(amounts in billions)	**Post-SB 822 12/31/2012**	**Post-SB 861 12/31/2012**
Accrued Liability	$62.5	$60.4
Assets	$49.3	$49.3
Unfunded Accrued Liability (UAL)	$13.2	$11.1
Funded Status	79%	82%

SB 861 changes reduced accrued liability by $2.1 billion as of 12/31/2012

Results reflect investment results through year-end 2012

Uncollared System Average Rates

Excludes Retiree Health Care, IAP Contributions, Rate Collar, Side Accounts

	12/31/2011[1] 2013 - 2015 Final			12/31/2012[1] 2015 - 2017 Advisory		
	Tier 1 / Tier 2	OPSRP	System-Wide	Tier 1 / Tier 2	OPSRP	System-Wide
Normal Cost	9.00%	6.56%	8.16%	13.45%	7.81%	11.32%
Tier 1/Tier 2 UAL	14.77%	14.77%	14.77%	8.90%	8.90%	8.90%
OPSRP UAL	0.15%	0.15%	0.15%	0.60%	0.60%	0.60%
Valuation Uncollared Rate	**23.92%**	**21.48%**	**23.08%**	**22.95%**	**17.31%**	**20.82%**
SB 822 Benefit Provisions	**-2.50%**	**-2.50%**	**-2.50%**			
Uncollared Rate	**21.42%**	**18.98%**	**20.58%**			

SB 822 & SB 861 benefit provisions and 2012 investment results reflected in 2015-17 advisory rates

2015 - 2017 uncollared rates reflect a re-amortization (as a level percentage of payroll) of Tier 1/Tier 2 UAL over twenty years

[1] *For this exhibit, adjustments are assumed not to be limited due to an individual employer reaching a 0.00% contribution rate.*

Collared System Average Base Rates

Excludes Retiree Health Care & IAP Contributions, Side Account Offsets

	12/31/2011[1] 2013 - 2015 Final			12/31/2012[1] 2015 - 2017 Advisory		
	Tier 1 / Tier 2	OPSRP	System-Wide	Tier 1 / Tier 2	OPSRP	System-Wide
Uncollared Rate	**21.42%**	**18.98%**	**20.58%**	**22.95%**	**17.31%**	**20.82%**
Collar Adjustment	(2.30%)	(2.30%)	(2.30%)	(2.17%)	(2.17%)	(2.17%)
SB 822 Rate Deferral	(1.78%)	(1.78%)	(1.78%)	N/A	N/A	N/A
Collared Base Rate	**17.34%**	**14.90%**	**16.50%**	**20.78%**	**15.14%**	**18.65%**
Change from 2013-2015				**3.44%**	**0.24%**	**2.15%**

The rate collar limits increases that would be effective July 2015

Barring benefit modifications or 2013 investment returns varying significantly from assumption, final 2015 – 2017 base rates will be similar to advisory 2015 – 2017 base rates

[1] *For this exhibit, adjustments are assumed not to be limited due to an individual employer reaching a 0.00% contribution rate.*

Collared System Average Net Rates

Excludes Retiree Health Care & IAP Contributions

	12/31/2011[1] 2013 - 2015 Final			12/31/2012[1] 2015 - 2017 Advisory		
	Tier 1 / Tier 2	OPSRP	System-Wide	Tier 1 / Tier 2	OPSRP	System-Wide
Collared Base Rate	**17.34%**	**14.90%**	**16.50%**	**20.78%**	**15.14%**	**18.65%**
Side Account (Offset)	(5.26%)	(5.26%)	(5.26%)	(5.70%)	(5.70%)	(5.70%)
SLGRP Charge/(Offset)	(0.44%)	(0.44%)	(0.44%)	(0.45%)	(0.45%)	(0.45%)
Collared Net Rate	**11.64%**	**9.20%**	**10.80%**	**14.63%**	**8.99%**	**12.50%**
Change from 2013-2015				**2.99%**	**(0.21%)**	**1.70%**

Rates vary substantially by employer and by pool, and not all employers have side account offsets

Changes in side account offsets are not collared, and thus are more volatile than base rates (for example, strong 2013 investment results would increase 2015 - 2017 side account offsets)

[1] *For this exhibit, adjustments are assumed not to be limited due to an individual employer reaching a 0.00% contribution rate.*

Comments on System Average Rates

- No single employer pays the system average rate
  - 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
- The 2015 - 2017 rates are only advisory
  - Final rates will be based on 12/31/2013 funded status
  - The most significant differences between advisory and final rates will likely be due to side account rate offset changes, based on 2013 investment performance

12/31/2012 Retiree Health Care Valuation

- Two separate health care benefit subsidies are valued:
  - RHIA provides a $60 per month subsidy toward healthcare premiums for Medicare-eligible Tier 1/Tier 2 retirees
  - RHIPA provides Tier 1/Tier 2 state employees who retire prior to age 65 with an alternative to PEBB coverage until they reach Medicare eligibility
- OPSRP retirees are not eligible for either subsidy
- RHIA and RHIPA benefits are currently less well funded than Tier 1/Tier 2 & OPSRP benefits
  - To help address that, in July 2009 the Board shortened the shortfall amortization period to ten years to improve funded status over time
  - Rates reflecting the shorter amortization were first effective July 2011

12/31/2012 Retiree Health Care Valuation

- While funded status is low, RHIA and RHIPA liabilities combined are less than 1% of the pension liability
- In this year's experience study, we recommended restructuring the RHIPA participation assumption for future state government retirements
  - We assumed higher participation rates for retirees eligible for the largest employer-paid subsidies
  - RHIPA program has historically had participation levels less than 20%

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12/31/2012 Retiree Health Care Valuation

- RHIPA funded status declined in the past year from 13% to 7%, reflecting both actual participation experience and updated assumptions for future participation experience
  - Assuming higher future participation increases the calculated liabilities
  - It also increases contribution rates, helping to fund the program
- The higher contribution rates effective July 2011 have helped mitigate the program's negative cash flow
- Additional rate increases due to the updated assumptions will be first effective in July 2015
- RHIPA warrants continued monitoring, as funded status is very low and subsidy payments are sensitive to actual participation levels

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12/31/2012 Retiree Health Care Valuation

Unfunded Accrued Liability (UAL) and Advisory Contribution Rates

(amounts in millions)	RHIA		RHIPA*	
	12/31/2011	12/31/2012	12/31/2011	12/31/2012
Accrued Liability	$461	$472	$35	$60
Assets	$239	$292	$ 5	$ 4
UAL	$222	$180	$30	$56
Funded Status	**52%**	**62%**	**13%**	**7%**
Normal Cost Rate	**0.10%**	**0.08%**	**0.07%**	**0.09%**
UAL Rate	**0.49%**	**0.48%**	**0.20%**	**0.34%**
Total Rate	**0.59%**	**0.56%**	**0.27%**	**0.43%**

**State Agencies, OUS, and State Judiciary are the only employers who pay RHIPA rates*

RHIPA assets at year-end 2012 were only slightly larger than the magnitude of 2012 RHIPA benefit payments

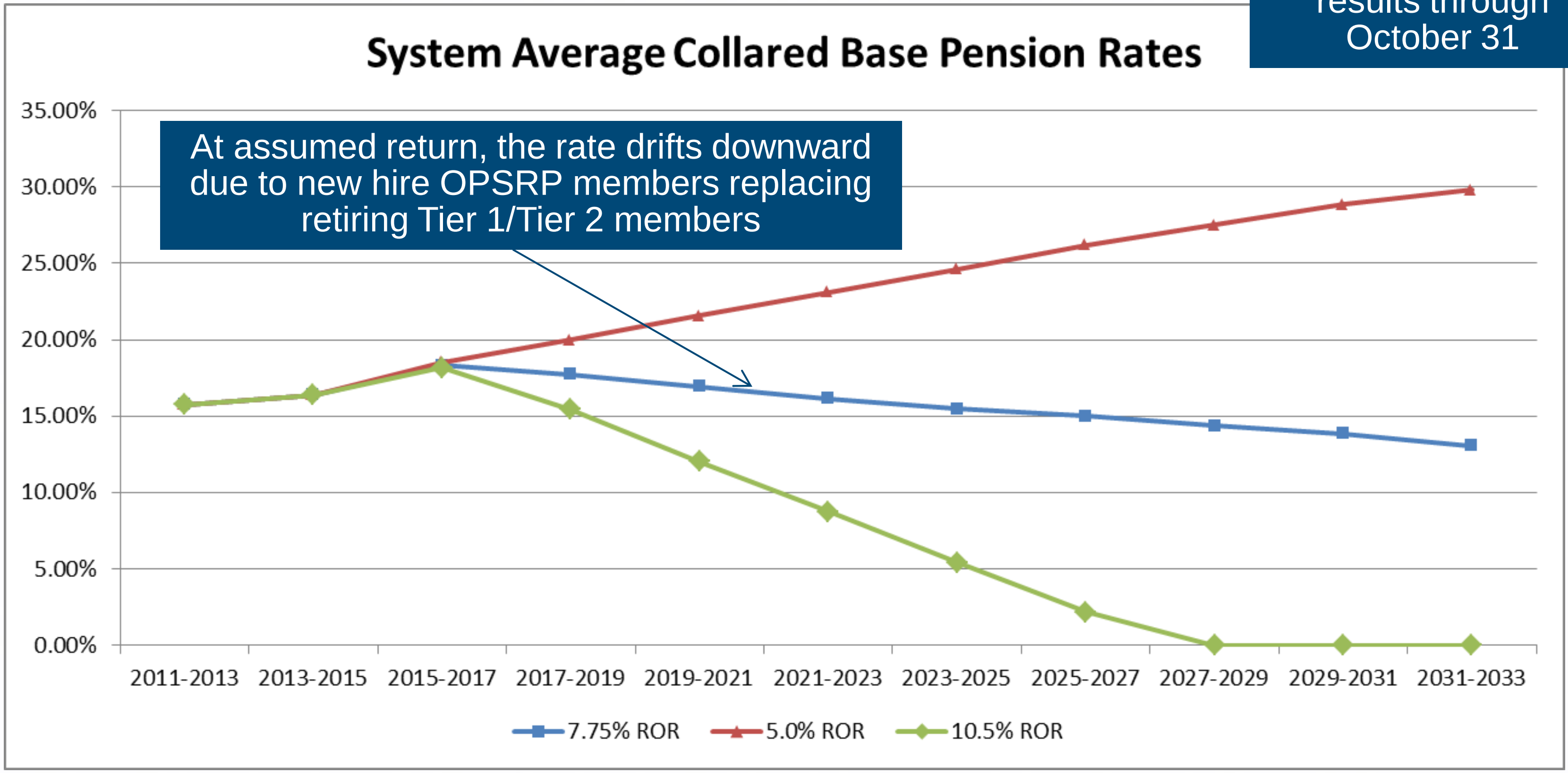
Financial Modeling

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 12/31/2012 liabilities and assumptions
  - Liabilities reflect SB 822 & SB 861 benefit changes
  - Also reflect EAN cost allocation method and 7.75% return assumption
- Modeling uses 12/31/2012 assets adjusted for regular account returns of 12.41% through October 2013 as reported by Oregon State Treasury

Steady Return Model Projections

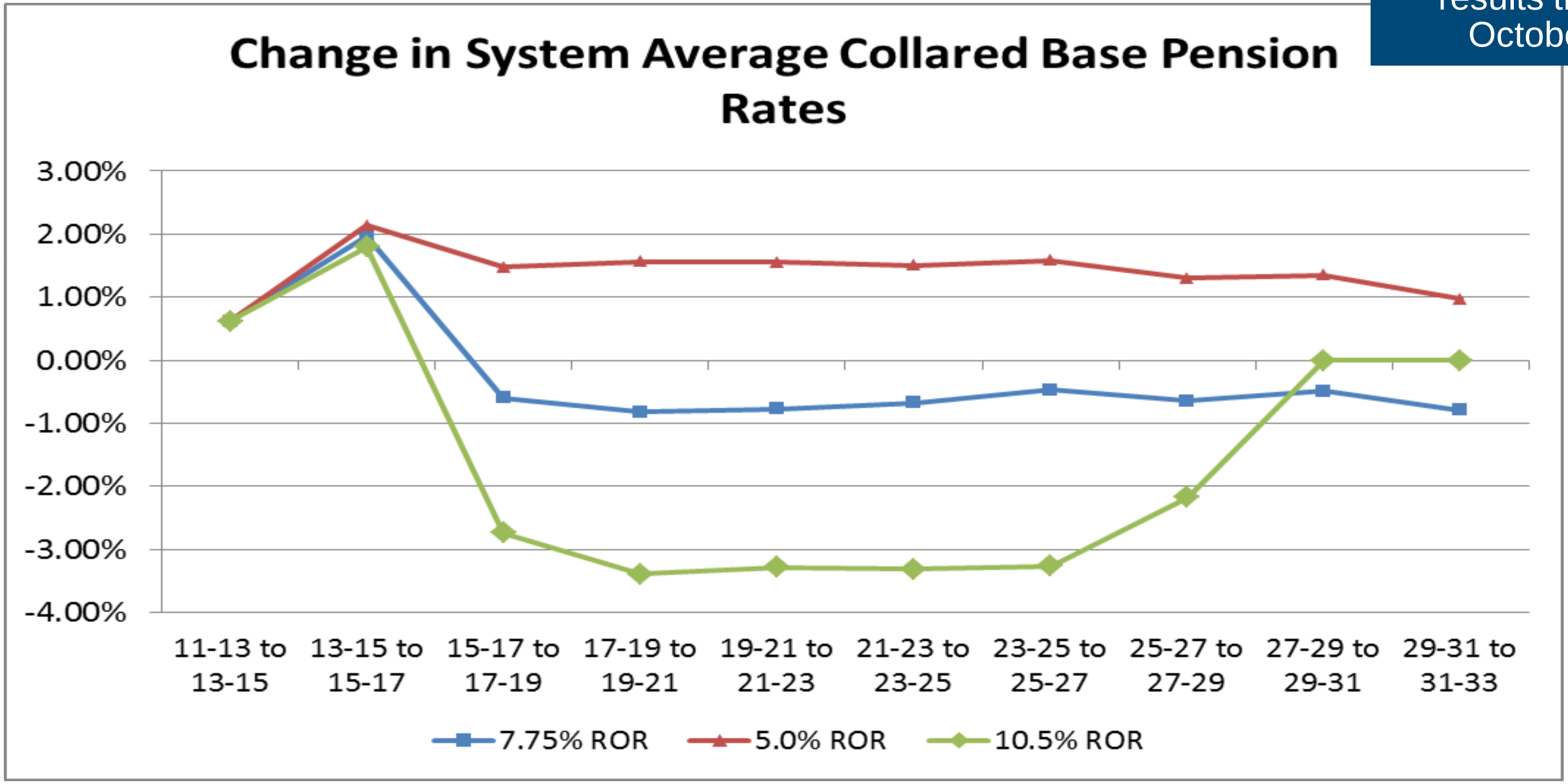
Reflects effects of SB 822 & SB 861 and investment results through October 31



The steady rate model illustrates impact of consistently achieving the assumed 7.75% return compared to plus or minus 2.75% of that rate

Steady Return Model Projections

Reflects effects of SB 822 & SB 861 and investment results through October 31



Shows biennium to biennium changes under steady return projections

The 2015 increase is nearly identical in all scenarios due to rate collaring

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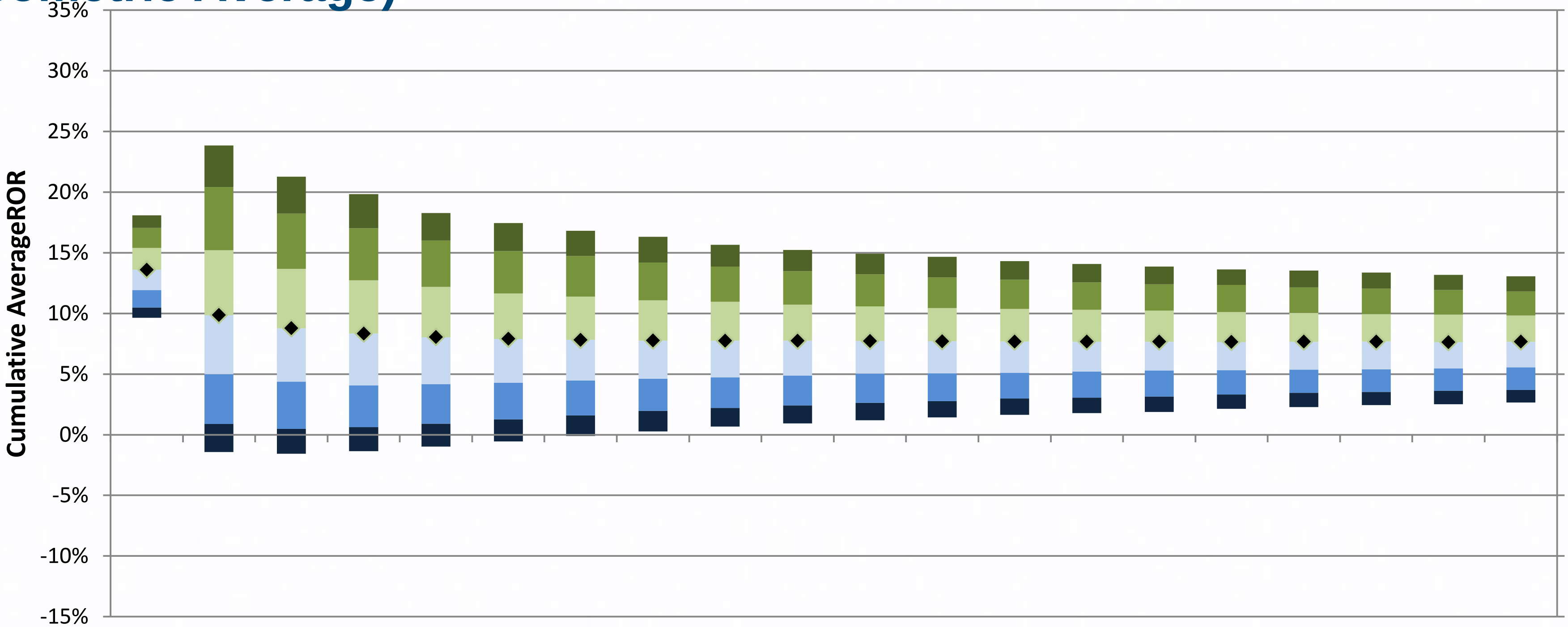
Variable Return Model

- 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 will be experienced by the fund
  - Returns are shown as average annualized returns on a calendar year basis, and incorporate the published 2013 returns through October 31

PERS Fund Rate of Return

Cumulative Annualized Average Investment Return From 1/1/2013 (Geometric Average)



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		18.1%	23.8%	21.3%	19.8%	18.3%	17.4%	16.8%	16.3%	15.7%	15.2%	14.9%	14.7%	14.3%	14.1%	13.9%	13.6%	13.5%	13.4%	13.2%	13.1%
90th		17.1%	20.4%	18.2%	17.0%	16.0%	15.1%	14.7%	14.2%	13.9%	13.5%	13.2%	13.0%	12.8%	12.6%	12.4%	12.3%	12.1%	12.1%	11.9%	11.8%
75th		15.4%	15.2%	13.7%	12.7%	12.2%	11.6%	11.4%	11.1%	11.0%	10.7%	10.6%	10.4%	10.4%	10.3%	10.2%	10.1%	10.0%	9.9%	9.9%	9.8%
50th		13.6%	9.9%	8.8%	8.3%	8.0%	7.9%	7.8%	7.8%	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%	7.7%	7.6%	7.7%	7.7%	7.6%	7.7%
25th		11.9%	5.0%	4.4%	4.1%	4.2%	4.3%	4.5%	4.6%	4.7%	4.9%	5.0%	5.1%	5.1%	5.2%	5.3%	5.3%	5.4%	5.4%	5.5%	5.5%
10th		10.5%	0.9%	0.5%	0.6%	0.9%	1.3%	1.6%	2.0%	2.2%	2.4%	2.6%	2.8%	3.0%	3.1%	3.2%	3.3%	3.4%	3.5%	3.6%	3.7%
5th		9.6%	-1.4%	-1.6%	-1.4%	-1.0%	-0.5%	-0.1%	0.3%	0.7%	0.9%	1.2%	1.4%	1.6%	1.8%	1.9%	2.1%	2.3%	2.4%	2.5%	2.6%

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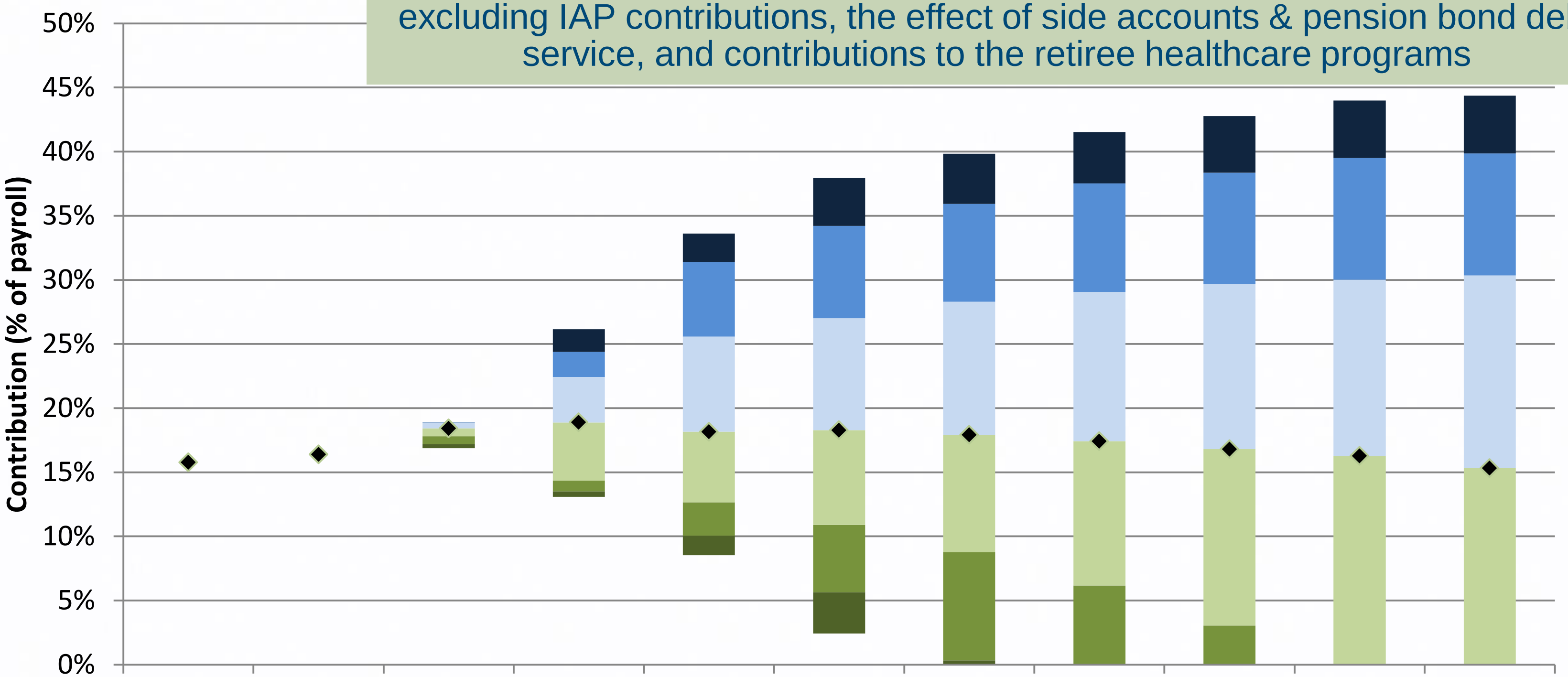
Collared System Average Base Contribution Rates

"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	2011-2013	2013-2015	2015-2017	2017-2019	2019-2021	2021-2023	2023-2025	2025-2027	2027-2029	2029-2031	2031-2033
5th	15.8%	16.4%	18.9%	26.1%	33.6%	38.0%	39.8%	41.5%	42.8%	44.0%	44.4%
10th	15.8%	16.4%	18.9%	24.4%	31.4%	34.2%	35.9%	37.5%	38.3%	39.5%	39.9%
25th	15.8%	16.4%	18.9%	22.4%	25.6%	27.0%	28.3%	29.1%	29.7%	30.0%	30.3%
50th	15.8%	16.4%	18.4%	18.9%	18.2%	18.3%	17.9%	17.4%	16.8%	16.3%	15.3%
75th	15.8%	16.4%	17.8%	14.3%	12.7%	10.9%	8.8%	6.2%	3.1%	0.0%	0.0%
90th	15.8%	16.4%	17.2%	13.5%	10.1%	5.6%	0.3%	0.0%	0.0%	0.0%	0.0%
95th	15.8%	16.4%	16.9%	13.1%	8.5%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%

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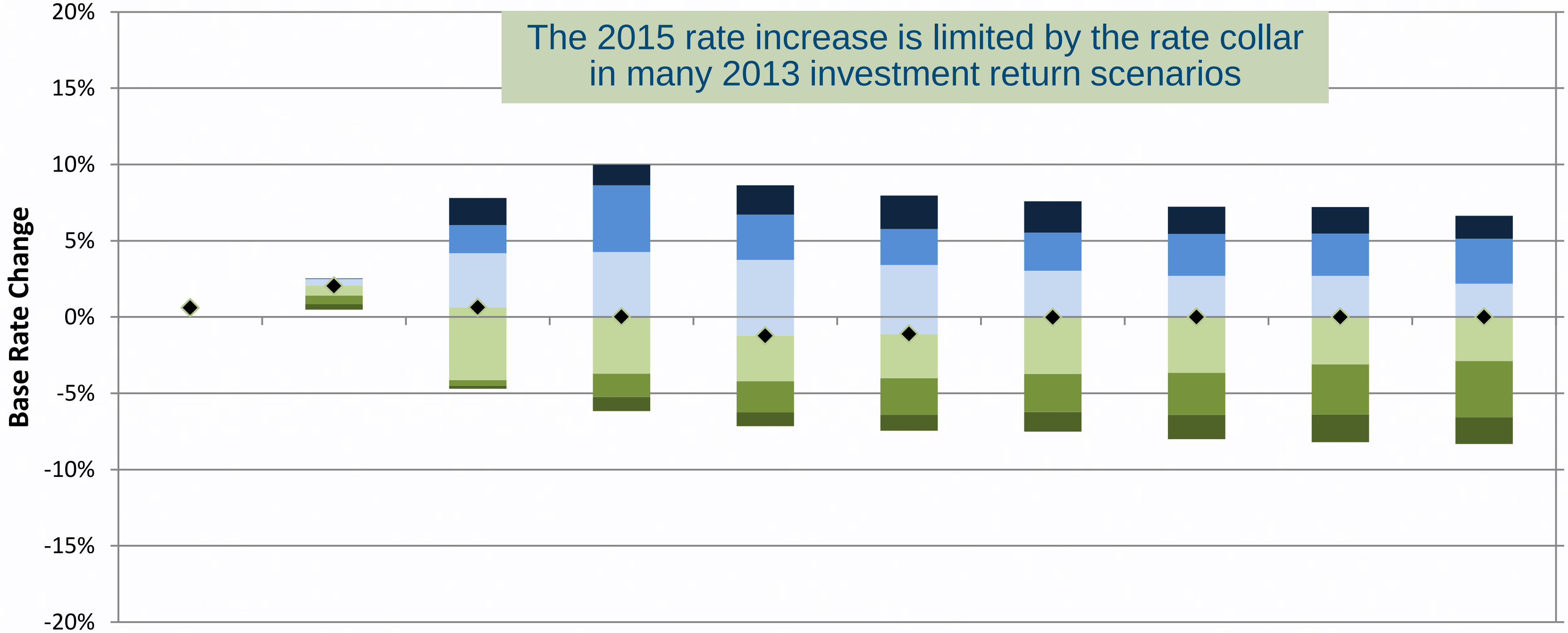
Biennium to Biennium Change

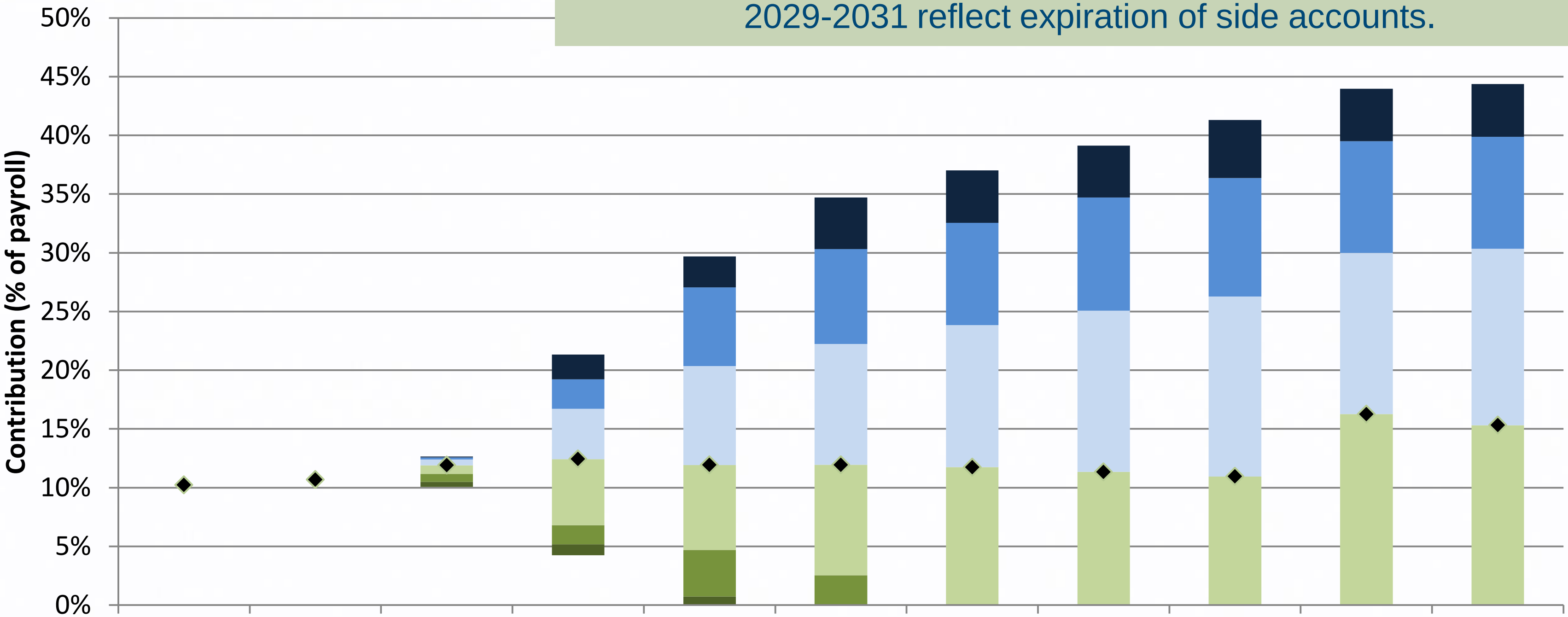
Collared System Average Base Contribution Rates



Change from:		11-13 to 13-15	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
5th		0.6%	2.5%	7.8%	10.0%	8.6%	8.0%	7.6%	7.2%	7.2%	6.6%
10th		0.6%	2.5%	6.0%	8.6%	6.7%	5.8%	5.5%	5.4%	5.5%	5.1%
25th		0.6%	2.5%	4.2%	4.3%	3.7%	3.4%	3.0%	2.7%	2.7%	2.2%
50th		0.6%	2.0%	0.6%	0.0%	-1.2%	-1.1%	0.0%	0.0%	0.0%	0.0%
75th		0.6%	1.4%	-4.1%	-3.7%	-4.2%	-4.0%	-3.7%	-3.7%	-3.1%	-2.9%
90th		0.6%	0.8%	-4.5%	-5.2%	-6.2%	-6.4%	-6.2%	-6.4%	-6.4%	-6.6%
95th		0.6%	0.5%	-4.7%	-6.2%	-7.2%	-7.4%	-7.5%	-8.0%	-8.2%	-8.3%

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	2011-2013	2013-2015	2015-2017	2017-2019	2019-2021	2021-2023	2023-2025	2025-2027	2027-2029	2029-2031	2031-2033
5th	10.2%	10.7%	12.6%	21.3%	29.7%	34.7%	37.0%	39.1%	41.3%	44.0%	44.4%
10th	10.2%	10.7%	12.6%	19.2%	27.0%	30.3%	32.5%	34.7%	36.4%	39.5%	39.9%
25th	10.2%	10.7%	12.4%	16.7%	20.4%	22.2%	23.8%	25.1%	26.3%	30.0%	30.3%
50th	10.2%	10.7%	11.9%	12.4%	11.9%	11.9%	11.7%	11.3%	10.9%	16.3%	15.3%
75th	10.2%	10.7%	11.2%	6.8%	4.7%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%
90th	10.2%	10.7%	10.5%	5.2%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
95th	10.2%	10.7%	10.1%	4.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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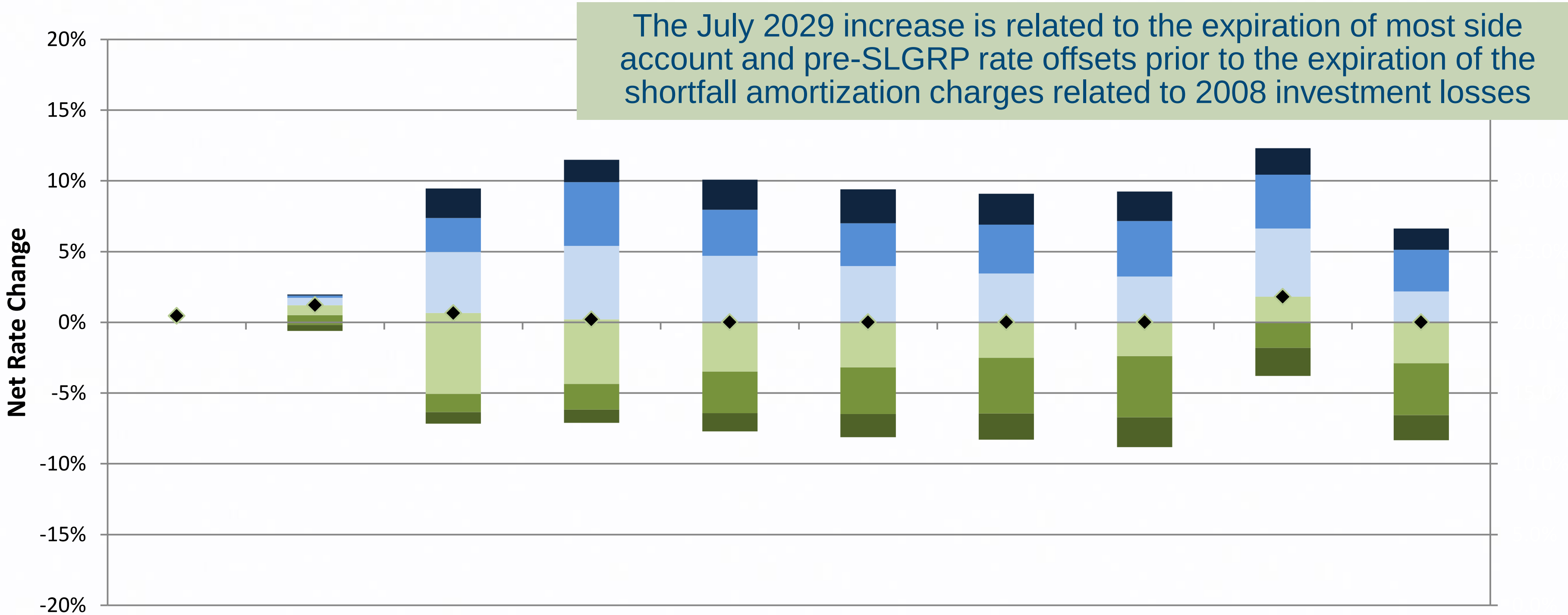
Biennium to Biennium Change

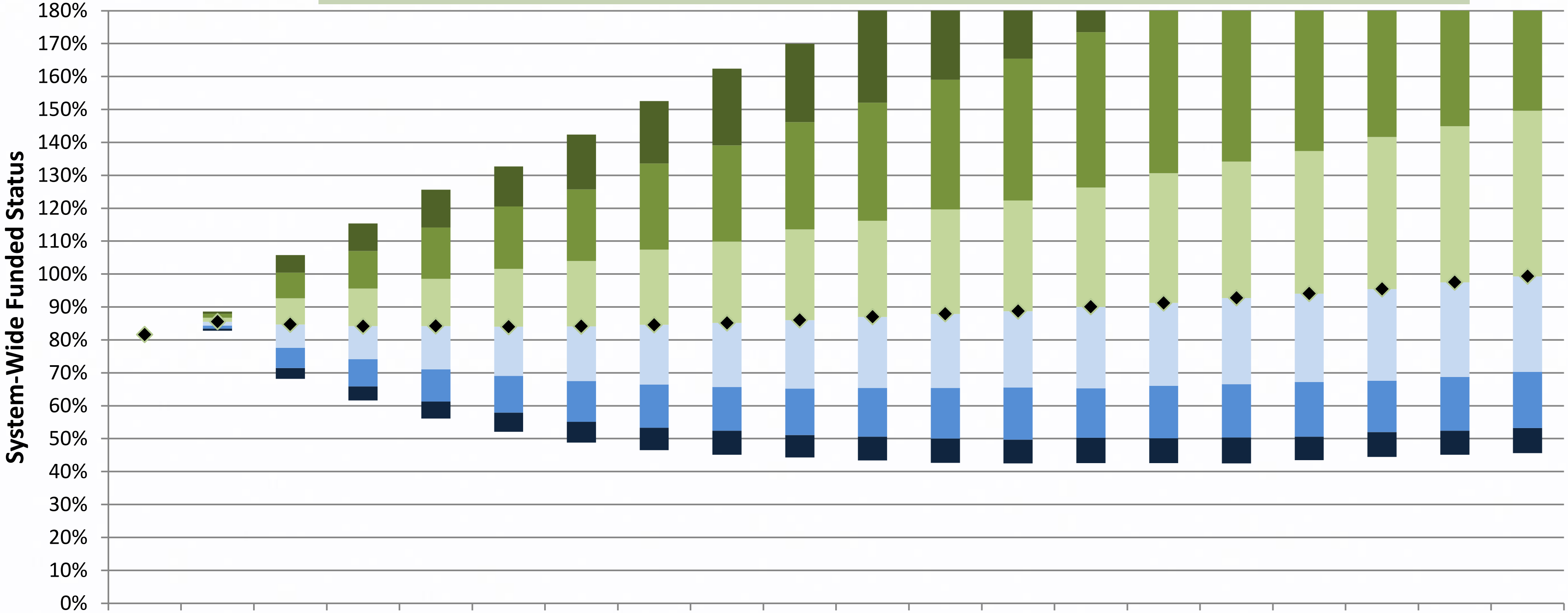
System Average Net Contribution Rates



Change from:	11-13 to 13-15	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
5th	0.4%	2.0%	9.5%	11.5%	10.1%	9.4%	9.1%	9.3%	12.3%	6.6%
10th	0.4%	1.9%	7.4%	9.9%	8.0%	7.0%	6.9%	7.2%	10.4%	5.1%
25th	0.4%	1.7%	5.0%	5.4%	4.7%	4.0%	3.5%	3.2%	6.6%	2.2%
50th	0.4%	1.2%	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%
75th	0.4%	0.5%	-5.1%	-4.3%	-3.5%	-3.2%	-2.5%	-2.4%	0.0%	-2.9%
90th	0.4%	-0.2%	-6.3%	-6.2%	-6.4%	-6.5%	-6.4%	-6.7%	-1.8%	-6.6%
95th	0.4%	-0.6%	-7.2%	-7.1%	-7.7%	-8.1%	-8.3%	-8.8%	-3.8%	-8.3%

Funded Status (excluding Side Accounts)

At the 50th percentile, funded status starts between 85% and 86% at year-end 2013 and progresses toward 100% over the modeled period



PY Ending 12/31	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
95th	81.6%	88.6%	105.8%	115.4%	125.6%	132.7%	142.4%	152.5%	162.4%	170.0%	180.2%	191.5%	202.9%	212.4%	225.8%	236.5%	247.7%	265.2%	281.5%	295.7%
90th	81.6%	87.9%	100.4%	107.0%	114.1%	120.6%	125.7%	133.6%	139.1%	146.1%	152.1%	159.0%	165.5%	173.5%	180.3%	188.5%	198.9%	205.6%	215.5%	222.8%
75th	81.6%	86.8%	92.6%	95.6%	98.6%	101.6%	104.0%	107.4%	109.9%	113.6%	116.2%	119.6%	122.3%	126.3%	130.6%	134.1%	137.4%	141.6%	144.9%	149.6%
50th	81.6%	85.5%	84.7%	84.2%	84.2%	84.0%	84.1%	84.6%	85.2%	86.0%	87.0%	87.9%	88.7%	90.0%	91.2%	92.7%	94.0%	95.4%	97.5%	99.3%
25th	81.6%	84.4%	77.6%	74.2%	71.1%	69.1%	67.5%	66.5%	65.7%	65.2%	65.4%	65.4%	65.6%	65.3%	66.0%	66.6%	67.2%	67.6%	68.8%	70.3%
10th	81.6%	83.4%	71.5%	65.9%	61.3%	57.9%	55.2%	53.3%	52.4%	51.1%	50.6%	50.0%	49.7%	50.3%	50.1%	50.3%	50.6%	52.0%	52.4%	53.2%
5th	81.6%	82.8%	68.1%	61.6%	56.1%	52.1%	48.8%	46.5%	45.1%	44.3%	43.4%	42.6%	42.5%	42.6%	42.6%	42.4%	43.5%	44.5%	45.1%	45.6%

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%	74%
Funded Status (Excluding Side Accounts) < 60%	45%
Funded Status (Excluding Side Accounts) < 40%	11%
Base Rate (Excluding Retiree Healthcare) >30% of Pay	40%

Wrap Up / Next Steps

- Questions?
- Final valuation steps
  - Issue System-wide December 31, 2012 actuarial valuation
  - Prepare employer-specific advisory valuation reports
    - PERS distributes to employers
- At the January meeting, preliminary year-end 2013 investment results will be available
  - We can then comment on any estimated impact on 12/31/2013 valuation results

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This presentation summarizes key preliminary results of an actuarial valuation of the Oregon Public Employees Retirement System ("PERS" or "the System") as of December 31, 2012, for the Plan Year ending December 31, 2012. The results are preliminary in nature and may not be relied upon to, for example, prepare the System's Consolidated Annual Financial Report (CAFR). The reliance document will be the forthcoming formal December 31, 2012 System-Wide Actuarial Valuation Report. This presentation also summarizes deterministic and stochastic modeling of the System over a 20-year period beginning December 31, 2012

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

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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.

Milliman's work is prepared solely for the internal business use of the Oregon Public Employees Retirement System. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception(s):

(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.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

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

Data Exhibits

	December 31				
	2012				2011
	Tier 1	Tier 2	OPSRP	Total	Total
Active Members					
Count	42,776	46,661	77,666	167,103	170,972
Average age	54.4	48.4	41.8	46.9	46.6
Average total service	22.2	12.2	4.9	11.4	11.0
Average prior year covered salary	$ 65,737	$ 56,008	$ 39,375	$ 50,768	$ 49,388
Dormant Members[1]					
Count	19,668	16,397	5,806	41,871	40,507
Average age	57.3	50.6	44.9	53.0	52.9
Average monthly deferred benefit	$ 2,116	$ 641	$ 283	$ 1,284	$ 1,235
Retired Members and Beneficiaries[1]					
Count	114,045	7,410	582	122,037	118,408
Average age	71.2	65.6	64.9	70.8	70.6
Average monthly benefit	$ 2,422	$ 879	$ 351	$ 2,318	$ 2,265
Total members	**176,489**	**70,468**	**84,054**	**331,011**	**329,887**

1. Dormant and Retiree counts are shown by lives within the system. In other words, a member is counted once for purposes of this exhibit, regardless of their service history for different rate pools.

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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 data exhibits on the preceding slides.

Assets as of December 31, 2012, were based on values provided by Oregon PERS reflecting the Board's earnings crediting decisions for 2012. Financial model projections reflect October 31, 2013 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. December 31, 2011 results were calculated under Projected Unit Credit.

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 will be 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 and were presented to the PERS Board in July 2013.

Provisions

Provisions valued are as detailed in the 2011 Valuation Report, with the exception the provisions of Senate Bill 822, which was enacted by the legislature in April 2013, and SB 861, enacted in October 2013.

The combination of these legislative changes reduced benefits in two ways:

- Eliminated tax remedy benefit for members not subject to Oregon state income taxes
- Reduced the COLA benefit payable to members. Under the new legislation, the 2013 COLA was 1.5%, and in subsequent years it will be based on the following graded marginal rate structure: 1.25% on first $60,000 of annual benefit and 0.15% on benefits over $60,000.

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 12/31/2012 was assumed to be $600.2M, based on the PERS Board's 2012 crediting decisions. No future increases or decreases to this reserve were assumed.

The Tier 1 Rate Guarantee Reserve ("RGR") was assumed to be -$0.3M (i.e., in deficit status) as of 12/31/2012, based on the PERS Board's 2012 crediting decisions. 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 December 18, 2012, and changes made with the OIC's June 2013 asset/liability analysis.

	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%	21.20%	**15.15%**
Emerging Markets Equity	11.00%	7.30%	30.00%	**4.55%**
Private Equity	11.70%	8.00%	30.00%	**20.00%**
US Universal Fixed Income	5.15%	5.05%	4.20%	**8.00%**
US Short Duration Bonds	3.80%	3.75%	2.35%	**8.00%**
Leveraged Loans	6.70%	6.25%	9.85%	**3.00%**
High Yield	7.40%	6.75%	11.05%	**1.00%**
Real Estate	6.85%	6.20%	12.00%	**10.00%**
Global REITs	8.90%	6.60%	23.05%	**2.50%**
Natural Resources	6.95%	6.20%	13.00%	**2.50%**
Infrastructure	8.85%	7.10%	20.00%	**2.50%**
Commodities	7.50%	5.30%	22.50%	**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)	**8.35%**	**7.45%**	**14.80%**	**100.00%**

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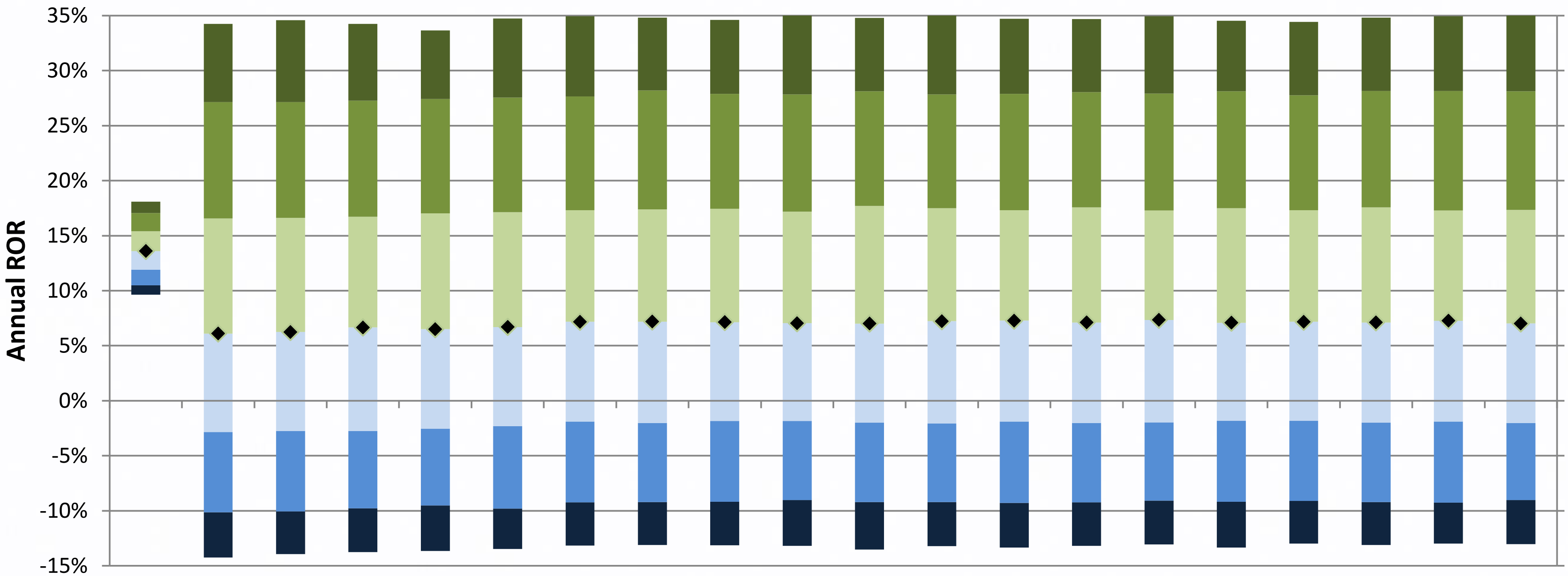
PERS Fund Rate of Return

Single Calendar Year Investment Returns

Our capital market outlook model projects lower median returns in the years following October 2013 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		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
95th		18.1%	34.2%	34.6%	34.3%	33.7%	34.7%	34.9%	34.8%	34.6%	35.1%	34.8%	35.2%	34.7%	34.7%	34.9%	34.5%	34.4%	34.8%	35.0%	35.1%
90th		17.1%	27.1%	27.1%	27.3%	27.4%	27.5%	27.7%	28.2%	27.9%	27.8%	28.1%	27.8%	27.9%	28.0%	27.9%	28.1%	27.7%	28.2%	28.1%	28.1%
75th		15.4%	16.6%	16.6%	16.7%	17.0%	17.1%	17.3%	17.4%	17.5%	17.2%	17.7%	17.5%	17.3%	17.6%	17.3%	17.5%	17.3%	17.6%	17.3%	17.3%
50th		13.6%	6.1%	6.2%	6.7%	6.5%	6.7%	7.2%	7.2%	7.1%	7.1%	7.0%	7.2%	7.3%	7.1%	7.3%	7.1%	7.2%	7.1%	7.3%	7.0%
25th		11.9%	-2.8%	-2.7%	-2.7%	-2.5%	-2.3%	-1.9%	-2.0%	-1.8%	-1.8%	-2.0%	-2.1%	-1.9%	-2.0%	-2.0%	-1.8%	-1.8%	-2.0%	-1.9%	-2.0%
10th		10.5%	-10.1%	-10.1%	-9.8%	-9.5%	-9.8%	-9.2%	-9.2%	-9.2%	-9.0%	-9.2%	-9.2%	-9.3%	-9.2%	-9.1%	-9.2%	-9.1%	-9.2%	-9.3%	-9.0%
5th		9.6%	-14.2%	-13.9%	-13.8%	-13.6%	-13.5%	-13.2%	-13.1%	-13.1%	-13.2%	-13.5%	-13.2%	-13.3%	-13.2%	-13.1%	-13.3%	-13.0%	-13.1%	-13.0%	-13.0%

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