



Wisconsin Retirement System

35th Annual Actuarial Valuation as of
December 31, 2015 and Gain/Loss
Analysis

June 2016

GRS

Gabriel Roeder Smith & Company
Consultants & Actuaries
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Changes from Last Year

◆ Primary Changes

- ▶ Experience study
- ▶ Combined General and Executive Groups
- ▶ Incorporated suggestions from audit

◆ Technical Changes

- ▶ Amortization period for Experience Amortization Reserve (EAR) reset to 20 years (from 25 years)
- ▶ Method of reporting the Unfunded Actuarial Accrued Liability (UAAL) contribution rate modified to be based on actual results (has no impact on overall results)

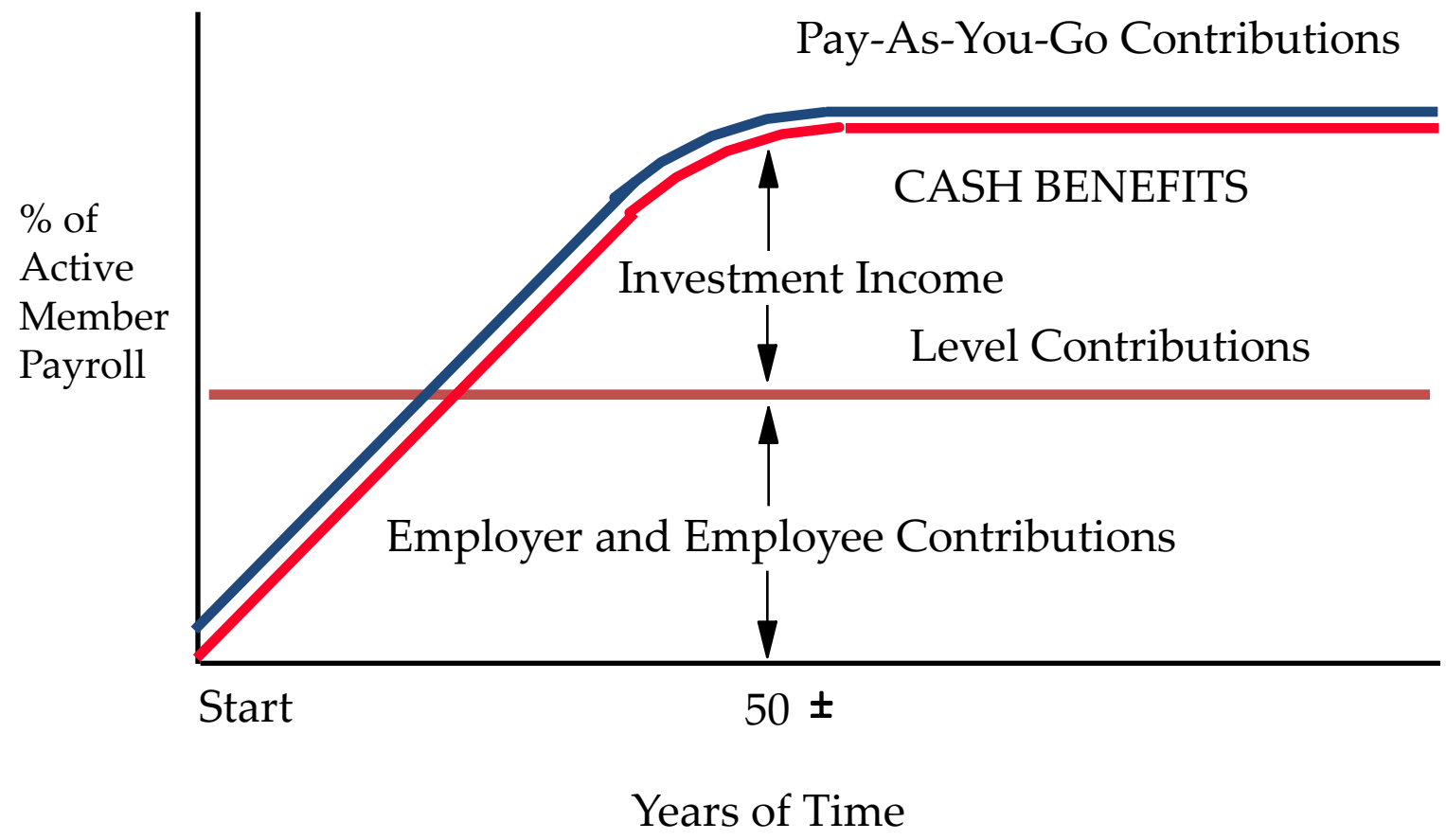


Funding Objectives

- ◆ Intergenerational equity with respect to plan costs
- ◆ Stable or increasing ratio of assets to liabilities
- ◆ Stable pattern of contribution rates

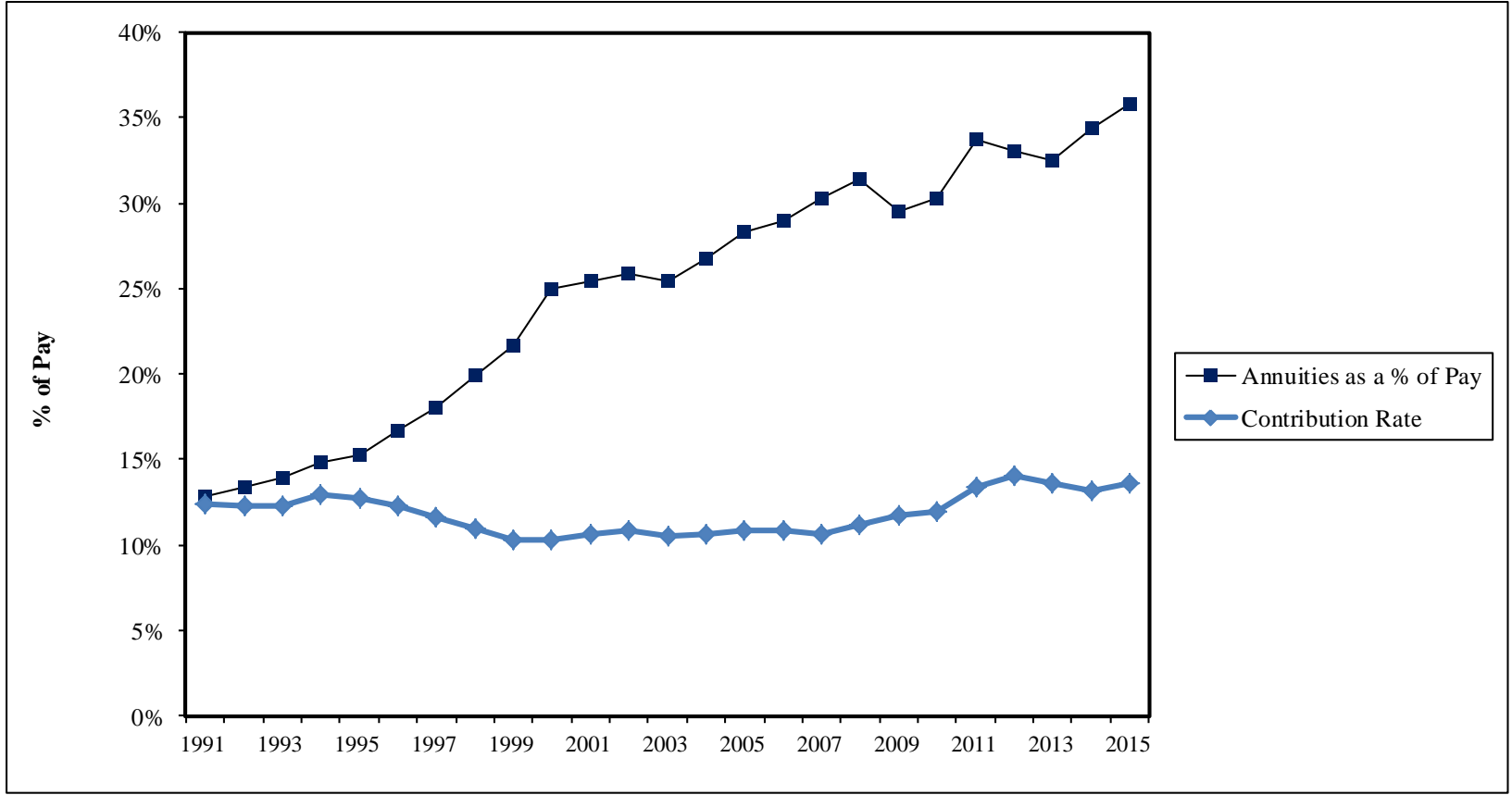


Financing Diagram





Annuities as a % of Payroll and WRS Average Total Contribution Rate*



Annuities are expected to continue to increase as a percent of payroll for several more decades.

*Average total rate shown is for General Participants.

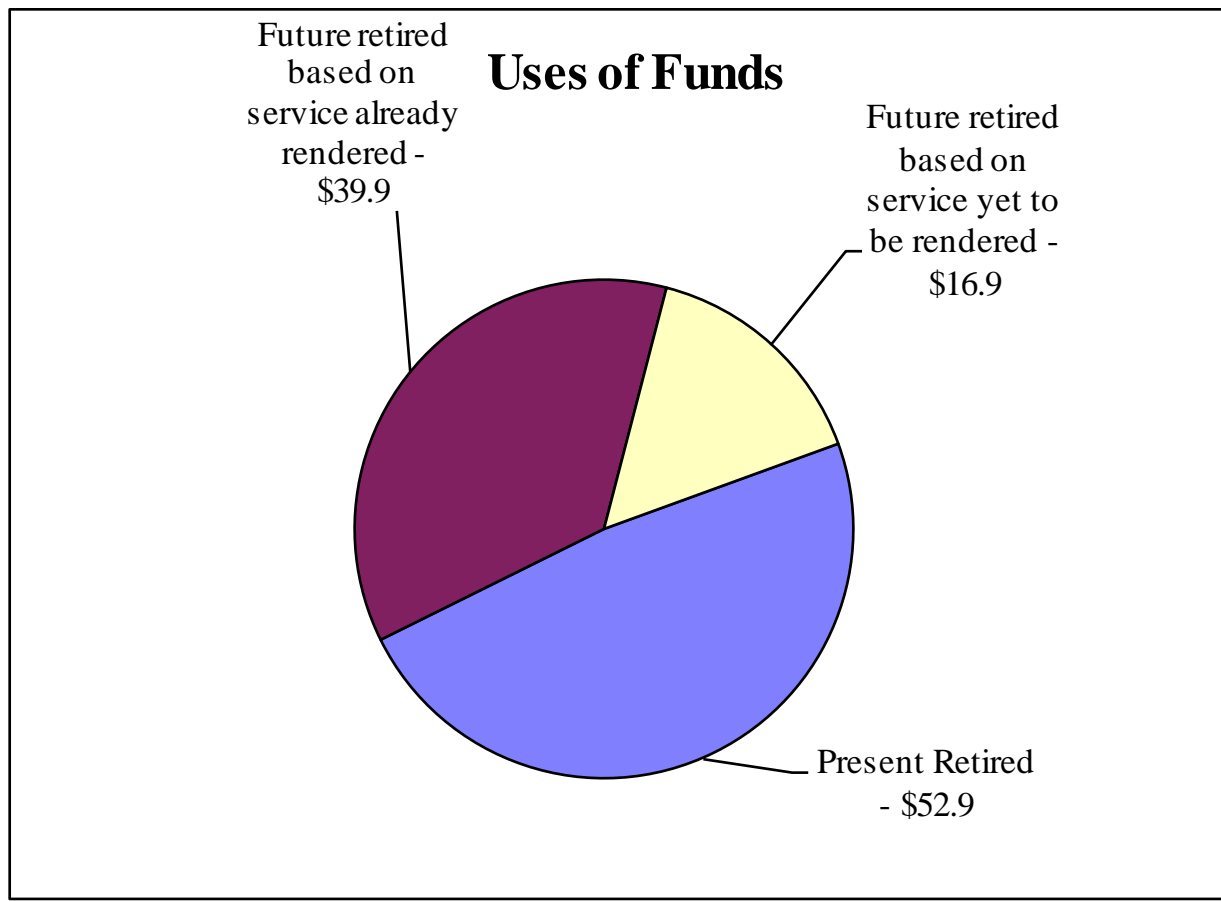


Active Participants

Valuation Group	Number	Annual Earnings (\$Millions)	Group Averages			
			Earnings	Age	Years of Service	Contribs.
General	231,631	\$11,785.7	\$50,881	45.7	11.5	\$53,670
Executive Group & Elected Officials	1,380	108.0	78,230	55.2	13.7	100,731
Protective Occupation with Social Security	19,273	1,170.9	60,755	40.6	12.9	63,246
Protective Occupation without Social Security	2,730	208.5	76,376	41.1	14.2	77,683
Total Active Participants	255,014	\$13,273.1	\$52,048	45.3	11.7	\$54,906
Prior Year	256,100	\$13,037.4	\$50,907	45.5	11.7	\$53,731



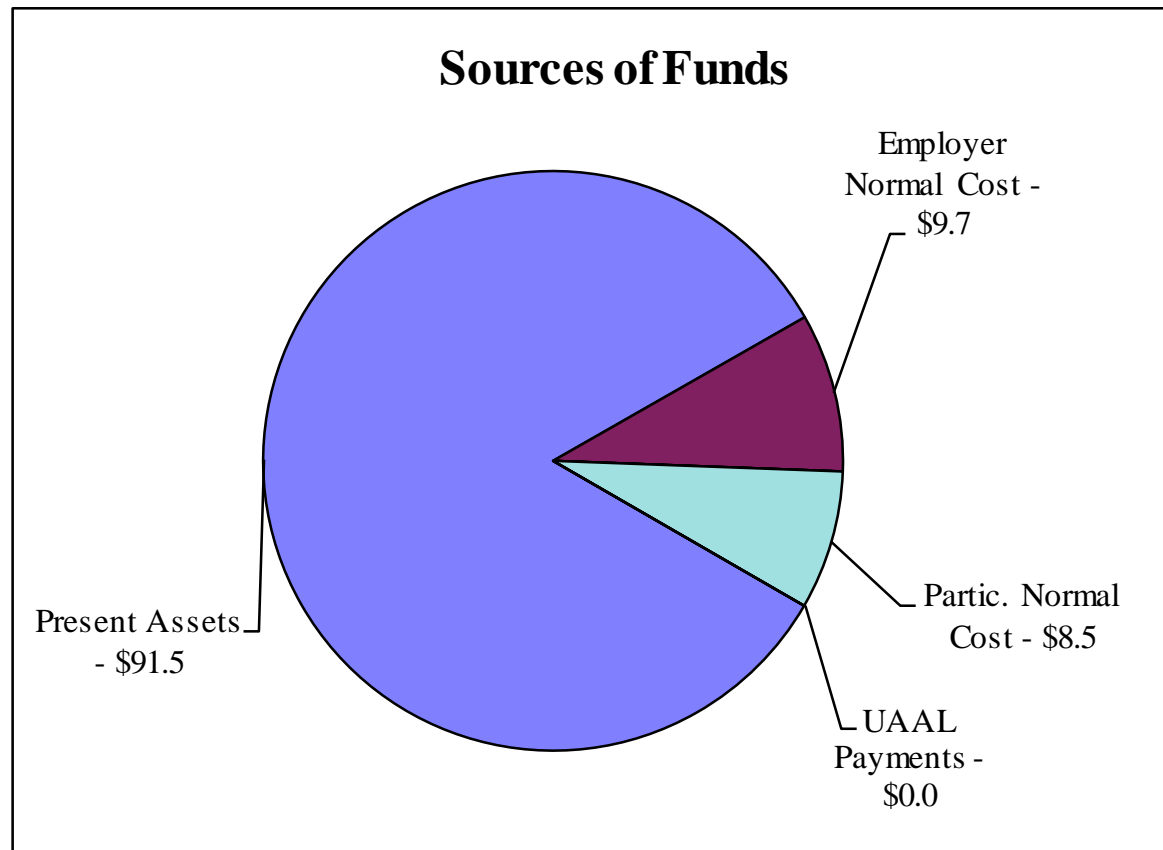
\$109.7 Billion* of Benefit Promises to Present Active and Retired Members



* Present value of future benefits; all divisions combined.



Sources of Funds for Financing \$109.7 Billion of Benefit Promises





Summary of December 31, 2015 Valuation Results

	General, Executive & Elected Officials		Protective Occupation			
			With Soc. Sec.		Without Soc. Sec.	
	2017	2016	2017	2016	2017	2016
Employer Normal Cost	6.80%	6.60%	10.60%	9.40%	14.90%	13.20%
Participant Normal Cost	6.80%	6.60%	6.80%	6.60%	6.80%	6.60%
Total Normal Cost	13.6%	13.2%	17.4%	16.0%	21.7%	19.8%
Unfunded Actuarial Accrued Liability (UAAL)	0.07%	0.00%	0.08%	0.00%	0.14%	0.20%
WRS Average Total	13.7%	13.2%	17.5%	16.0%	21.8%	20.0%



Comparative Statement of Total Average Contribution Rates

Valuation 12/31	General	Executive & Elected	Protective with Soc. Sec.	Protective without Soc. Sec.
1995	12.7%	15.9%	15.6%	21.3%
2000	10.3%	12.7%	11.8%	14.9%
2005	10.8%	11.6%	13.4%	14.6%
2010	11.9%	14.1%	14.9%	17.5%
2011	13.4%	14.0%	16.4%	19.3%
2012	14.0%	15.5%	17.1%	21.0%
2013	13.6%	15.4%	16.3%	20.2%
2014	13.2%	15.6%	16.0%	20.0%
2015	13.7%	13.7%	17.5%	21.8%

Beginning with 12/31/2015 valuation contribution rates for the General, Executive and Elected groups were combined.



Reasons for Contribution Changes

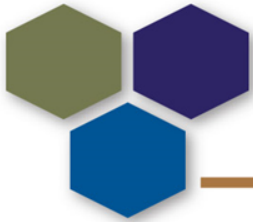
	General and E&E	Protective with Soc. Sec.	Protective without Soc. Sec.
2015 Normal Cost Rate	13.20%	16.00%	19.80%
Effect of Asset Performance	0.10%	0.15%	0.25%
Effect of Assumption Change	0.30%	1.10%	1.20%
Effect of Salary Experience	(0.05)%	0.07%	0.15%
Demographic and Other Experience	0.01%	0.05%	0.27%
Effect of Money Purchase Benefit	0.04%	0.03%	0.03%
2016 Normal Cost Rate	13.60%	17.40%	21.70%

The effect of Asset Performance is different for each group because the ratio of assets to payroll is different for each group.



Impact of Asset Gains/Losses

- ◆ Asset gains and losses above or below the assumed rate of return are smoothed in over the current year, and four future years
- ◆ Four years after a valuation date, all asset gains or losses known at valuation date are fully recognized
- ◆ Smoothing method in WRS is referred to as the Market Recognition Account (MRA)



Operation of Market Recognition Account (MRA) - \$ Millions

	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Actual Investment Return	\$ (619)				
Assumed Investment Return	6,100				
Gain/(Loss) to be phased-in	(6,719)				
Phased-in recognition					
• Current year	(1,344)	?	?	?	?
• First prior year	(243)	\$(1,344)	?	?	?
• Second prior year	953	(243)	\$(1,344)	?	?
• Third prior year	793	953	(243)	\$(1,344)	?
• Fourth prior year	<u>(936)</u>	<u>793</u>	<u>953</u>	<u>(243)</u>	<u>\$(1,344)</u>
Total recognized gain (loss)	\$ (776)	\$ 160	\$ (633)	\$(1,586)	\$(1,344)

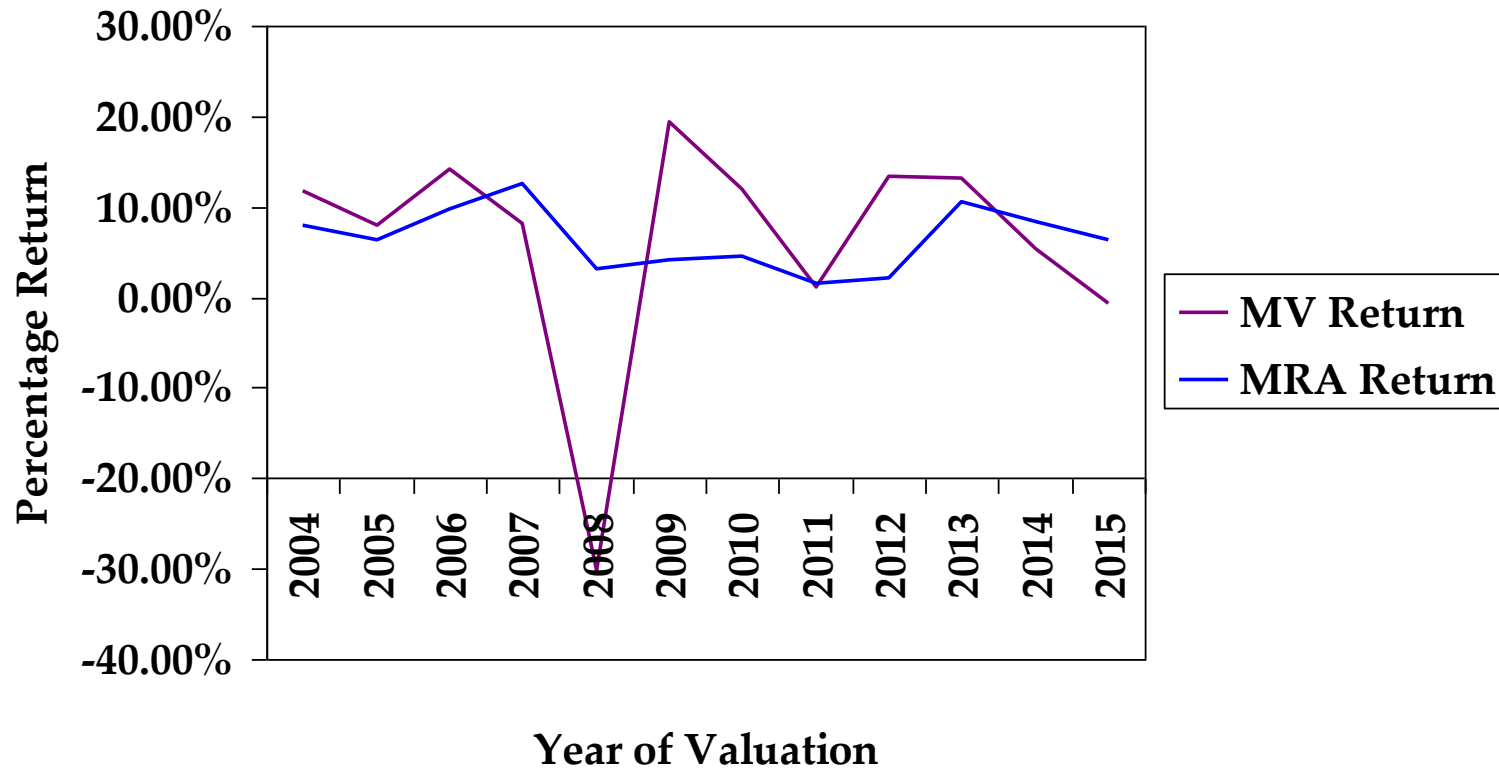


Allocation of 2015 MRA gain/(loss)

	<u>\$ Millions</u>
Total Recognized Gain/(Loss) in MRA	\$(776)
Portion of gain/(loss) impacting retirees (dividends)	(427)
Portion of gain/(loss) impacting actives	(320)
Portion of gain/(loss) impacting non-WRS programs	(29)



Market Value Return vs. Market Recognition (Actuarial) Return





Concluding Remarks

- ◆ There are \$3.4 billion of unrecognized losses in the MRA
- ◆ Due to the cost sharing nature of WRS, asset losses have been traditionally shared by:
 - ▶ Employees (through reduced money purchase benefits)
 - ▶ Employers (through increases in contributions)
 - ▶ Retirees (through reduced dividends)



Gain/Loss Analysis

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2015 Gain/Loss Analysis

A Gain/Loss Analysis measures differences between actual and assumed experience in each Risk Area.



WRS Assumption Risk Areas

Primary Risks

Demographic

Normal retirement

Early retirement

Death-in-service

Disability

Other separations

Economic

Salary increases

Investment return



Why Have a Gain/Loss Analysis?

- ◆ To gain an understanding of reasons for contribution rate changes
- ◆ It is a year-by-year measure of the operation of assumptions
- ◆ To determine when assumption changes are needed
- ◆ To understand the nature of risk



Population Development During 2015

	<u>Actual</u>	<u>Expected</u>
Beginning Census	256,100	
(-) Normal Retirement	4,169	4,123
(-) Early Retirement	3,890	4,241
(-) Death	126	253
(-) Disability Retirement		
- Total Approved	127	195
- Less Pending	29	
- Net New	98	
(-) Other Separations	14,511	12,025
(-) Transfers Out	1,586	
(+) Transfers In	1,586	
(+) New Entrants	21,708	
Ending Census	255,014	



Population Development During 2015

Normal Retirements: Varied by group and gender. Overall, slightly higher than expected, but net result on liabilities is a small loss.

Early Retirements: Lower than expected, overall producing a small loss.

Deaths: Among active participants were lower than expected. The net result for the past year was a small loss.

Disabilities: Lower than expected, producing a gain.

Other Separations: Varied by group, gender and service. The net result was a small gain.



Components of Total Gain/(Loss)

	<u>Gain/(Loss) in Millions</u>	
	<u>2014</u>	<u>2015</u>
Economic Risk Areas	\$349	\$(141)
Decrement Risk Areas	14	(15)
Other Activity	<u>(140)</u>	<u>(19)</u>
Total Gain/(Loss)	\$ 223	\$(175)



Investment Earnings in 2015 (Active Participants)

	<u>\$ Millions</u>
A. Average balance on Participant and Employer Accumulation Reserves	\$37,308
B. Expected earnings: 7.2%	2,686
C. Earnings credited to Participant and Employer Accumulation Reserves	2,148
D. Gain (loss) from earnings: C - B	\$ (538)



Investment Earnings in 2015 (Active Participants)

- ◆ \$538 million is the total recognized asset loss for the year
- ◆ However, part of the total gain/loss is allocated to Variable Excess accounts
- ◆ Some of the loss flows through to members via the operation of Money Purchase minimum benefits
- ◆ Must net these out to determine remaining core fund gain or loss
- ◆ Remaining portion affects contribution rates



Investment Earnings in 2015 (Active Participants)

	<u>\$ Millions</u>
Gross Gain/(Loss) for the Year	\$(538)
Less Estimated Gain/(Loss) due to Money Purchase	(119)
Less Estimated Gain/(Loss) due to Variable Excess	<u>(217)</u>
Net Core Fund Asset Gain/(Loss)	\$(202)



Comparative Schedule of Experience Gains/Losses by Decrement

Divisions Combined (Millions)

	<u>2014</u>	<u>2015</u>
Normal Retirement	\$ (10.4)	\$ (22.0)
Early Retirement	(19.7)	(26.8)
Disability Retirement	20.3	14.4
Death with Benefit	0.2	(2.6)
Other Separations	<u>23.2</u>	<u>22.2</u>
Total	\$ 13.6	\$ (14.8)
As % of Liabilities	<0.04%	<0.05%



Salary Related Gain/Loss

- ◆ Pay increases were overall less than expected, resulting in a gain

	Gain/Loss	% of Group
	\$ Millions	Liabilities
General	\$74.5	0.2 %
Executive & Elected	2.8	1.2 %
Protective w/Soc. Sec.	(11.1)	(0.3)%
Protective w/o Soc. Sec.	(5.5)	(0.6)%
	<u>\$60.7</u>	<u>0.1 %</u>



Concluding Remarks

- ◆ Recognition of remaining prior asset losses are expected over the next few years
- ◆ This Gain/Loss Analysis is the first in a regular 3-year experience cycle
- ◆ This study together with the 2016 and 2017 results will form the basis for the next experience study



Audit Highlights

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Actuarial Audit

- ◆ Actuarial Audits are typically required every 5 years
- ◆ Segal conducted an audit of the following work products in a report issued on November 13, 2015:
 - ▶ December 31, 2013 actuarial valuation
 - ▶ 2009-2011 Experience Study
- ◆ They are currently auditing the GASB 68 reporting information



Actuarial Audit

- ◆ Generally two types of actuarial audit:
 - ▶ Full Replication
 - ▶ Limited Scope (this method was performed)
- ◆ Key findings includes:
 - ▶ Validation of December 31, 2013 actuarial valuation and 2009-2011 Experience Study
 - ▶ Actuarial Cost Method and Asset Valuation method conform to Actuarial Standards of Practice
 - ▶ Data appears complete
 - ▶ Minor issues and suggestions, but generally agree with results



Actuarial Audit

- ◆ Segal made a number of suggestions to enhance the reports
- ◆ Since Audit report was received after 2012-2014 Experience Study report was complete, Experience Study recommendations will be reviewed with the 2015-2017 Experience Study
- ◆ However, primary recommendation of use of fully generational mortality was included in the 2012-2014 Experience study and was used in the December 31, 2015 valuations



Actuarial Audit

- ◆ Other key recommendation was to add a funded ratio using an immediate gain cost method (entry age cost method)
- ◆ WRS uses what is known as the Frozen Entry Age Cost Method
- ◆ Under this cost method, an initial unfunded liability was created and substantially paid off
- ◆ Therefore, funded ratios under this method are always 100% and recent gains or losses are not reflected in the liability measure (rather they are reflected in the normal cost measure)



Actuarial Audit

- ◆ Page F-4 of December 31, 2015 valuation now reports the funded ratios under both the current cost method and the entry age cost method
- ◆ This will help users of the report compare the funded ratio of the WRS to other systems

WRS Funded Ratios

	Current Frozen Entry Age Method	Traditional Entry Age Method
2014	100.0%	99.5%
2015	100.0%	98.7%



Disclaimers

- ◆ This presentation shall not be construed to provide tax advice, legal advice or investment advice.
- ◆ Brian Murphy, Mark Buis and James Anderson are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.
- ◆ This is one of multiple documents comprising the actuarial report. Additional information regarding actuarial assumptions and methods, and important additional disclosures are provided in the full report entitled “Thirty-Fifth Annual Actuarial Valuation and Gain Loss Analysis.”
- ◆ If you need additional information to make an informed decision about the contents of this presentation or the contents of the full report, or if anything appears to be missing or incomplete, please contact us before making use of the information.