



IMRF

Annual Actuarial Valuation and
Gain (Loss) Analysis
December 31, 2015

May 20, 2016

GRS

Gabriel Roeder Smith & Company
Consultants & Actuaries
www.gabrielroeder.com



Annual Actuarial Valuation

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Purpose

- ◆ Calculate employer rates for 3,305 rate groups for the 2017 calendar year
- ◆ Measure financial position and funding progress
- ◆ Explain changes in financial position that occurred during the year



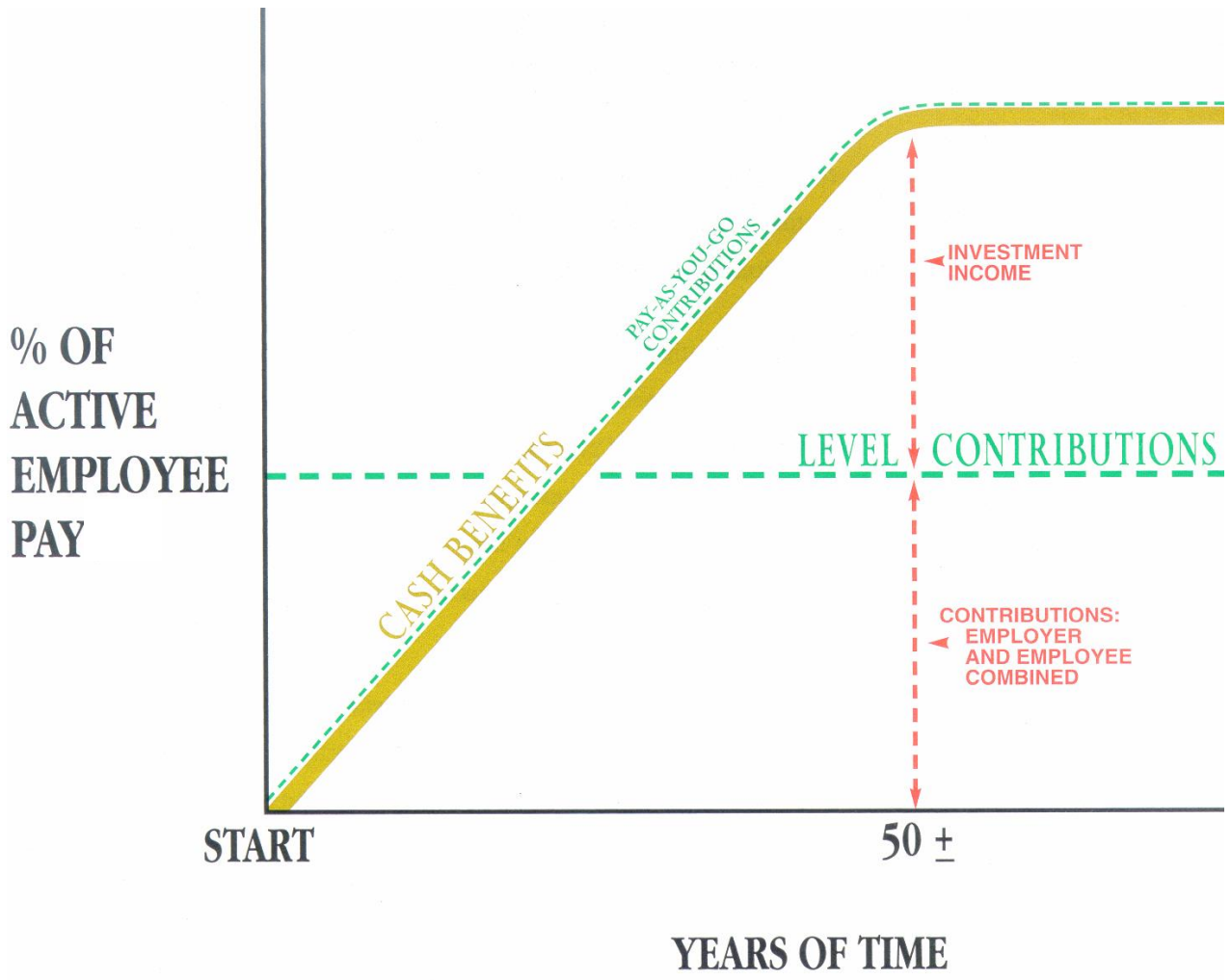
Basic Funding Objective

Establish and receive contributions which:

- ◆ Remain approximately level (as a % of payroll) from generation to generation
- ◆ When combined with present assets and future investment return are sufficient to pay benefits to current and future retirees



Financing Diagram





Valuation Uses Data On

- 1) People
- 2) Plan Benefits
- 3) Employers
- 4) Assets



IMRF Population

	<u>2015</u>	<u>2014</u>
Active Members		
• Tier 1	125,563	133,884
• Tier 2	48,269	39,695
• Total	<u>173,832</u>	<u>173,579</u>
Retirees	117,028	111,989
Inactive Members	<u>141,236</u>	<u>137,941</u>
Total	<u>432,096</u>	<u>423,509</u>



IMRF Population

	<u>2015</u>	<u>2014</u>
Active Members		
• Regular	169,431	169,146
• SLEP	4,167	4,194
• ECO	234	239
Total	<u>173,832</u>	<u>173,579</u>
Inactive Members		
• Regular	140,401	137,070
• SLEP	725	725
• ECO	110	146
Total	<u>141,236</u>	<u>137,941</u>



IMRF Employers 12/31/2015

School Districts	851
Townships	496
Other	488
Villages	472
Cities	305
Counties (Regular, SLEP & ECO)	269
Library Districts	223
Park Districts	201
Total	<hr/> 3,305
Employers with no Active Members	655
Total	<hr/> 3,960



Value of Assets (\$ Millions)

	<u>2015</u>	<u>2014</u>
Funding Value (FV)	\$34,913	\$32,700
Market Value (MV)	\$34,461	\$34,833
Ratio	101.3%	93.9%
Difference between FV and MV	\$ (452)	\$ 2,133
Market Value Rate of Return	0.5%	6.1%



Development of Average Contribution Rates Applicable to Calendar Year 2017

(Results as of December 31, 2015)

	% of Active Member Pays		
	Regular	SLEP	ECO
Tier 1 Normal Cost	7.28 %	12.47 %	16.84 %
Tier 2 Normal Cost	4.41 %	8.24 %	13.58 %
Average Employer Contributions for Normal Cost*			
Retirement	6.64 %	11.59 %	16.48 %
\$3,000 Lump Sum Death Benefit	0.03 %	0.02 %	0.05 %
Total & Permanent Disability Benefit	0.04 %	0.16 %	0.30 %
Total Normal Cost	6.71 %	11.77 %	16.83 %
Lump Sum Death-in-Service Benefits	0.15 %	0.15 %	0.15 %
Temporary Disability	0.12 %	0.12 %	0.12 %
13th Payments	0.62 %	0.62 %	0.62 %
Unfunded (Overfunded) Liabilities (26/10 years)	3.53 %	7.80 %	55.78 %
Early Retirement Incentive Liabilities	0.21 %	0.10 %	0.00 %
SLEP Supplemental Liabilities	0.00 %	1.83 %	0.00 %
Total Average Employer Rate	11.34 %	22.39 %	73.50 %
Prior Year Averages	11.73 %	22.71 %	86.07 %

* Average of Tier 1 and Tier 2 cost weighted on expected payroll.

Dupage County, Peoria County and Union School District 46 subject to individual rating.



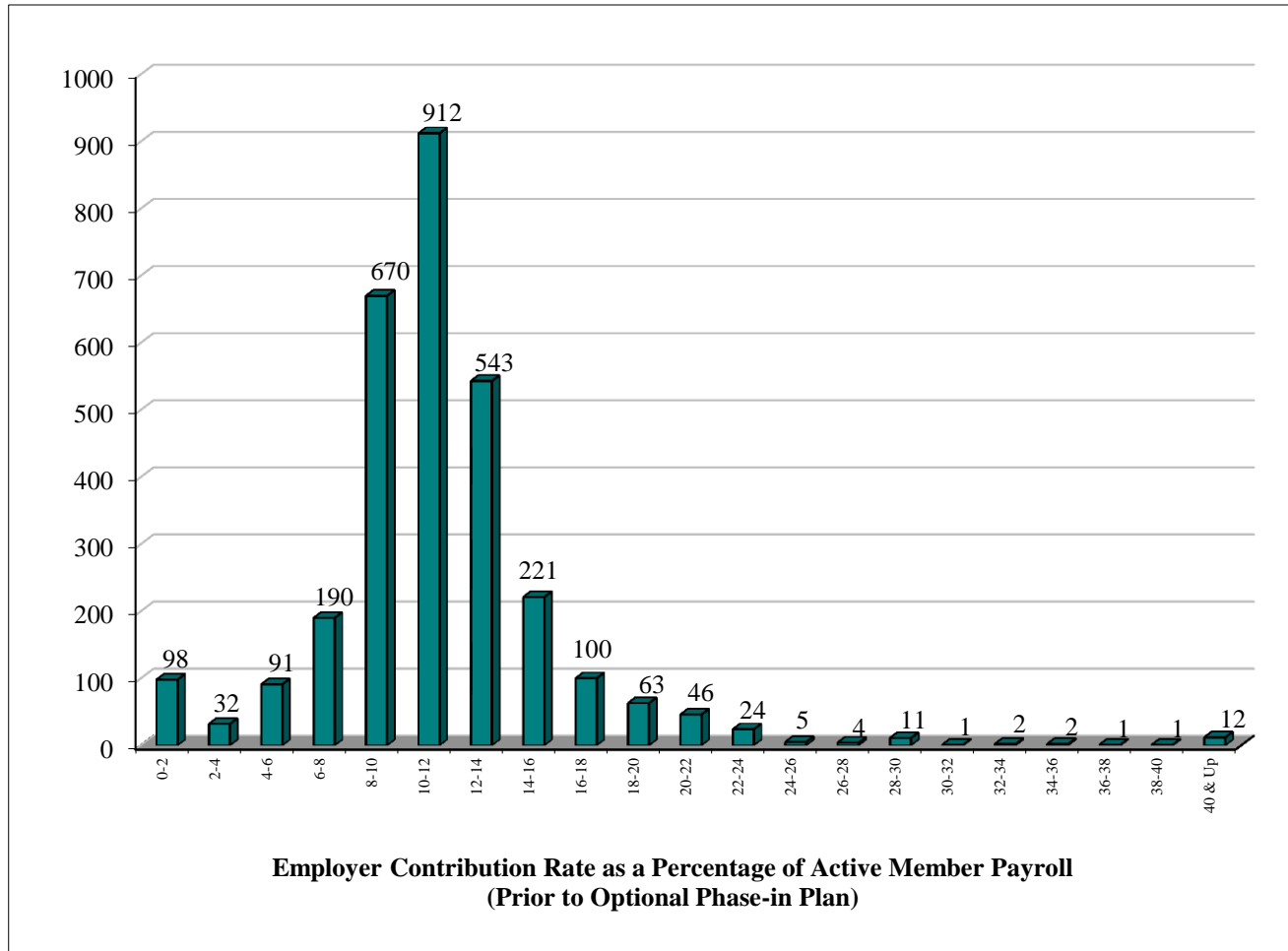
History of Total Average Employer Contribution Rates

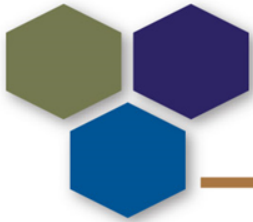
Rate Applies to Calendar Year	Rate Computed as of December 31	Employer Contribution Rate Expressed as % of Active Payroll					
		Regular Members		SLEP Members		ECO Members	
		Normal Cost	Average Total Rate	Normal Cost	Average Total Rate	Normal Cost	Average Total Rate
2000	1998	7.17%	8.16%	10.42%	14.28%	23.39%	41.38%
2001	1999	7.41%	6.64%	12.02%	14.86%	23.85%	42.58%
2002	2000	7.62%	5.87%	11.94%	14.13%	18.05%	38.46%
2003	2001	7.66%	6.22%	11.96%	14.04%	17.95%	40.37%
2004	2002	7.60%	7.82%	12.47%	16.29%	18.18%	44.90%
2005	2003	7.61%	9.25%	12.48%	17.15%	18.07%	42.66%
2006	2004	7.64%	10.04%	12.56%	18.25%	18.01%	44.90%
2007	2005	7.43%	9.72%	11.66%	18.42%	17.52%	41.30%
2008	2006	7.42%	9.47%	11.63%	19.33%	16.96%	41.80%
2009	2007	7.42%	9.27%	11.63%	18.42%	17.08%	42.77%
2010	2008	7.58%	11.89%	11.97%	21.63%	17.24%	43.57%
2011	2009	7.58%	12.14%	11.97%	21.76%	17.20%	42.72%
2012	2010	7.58%	12.42%	12.01%	22.48%	17.22%	47.15%
2013	2011	7.77%	12.85%	12.74%	23.40%	17.63%	46.85%
2014	2012	7.64%	12.58%	12.61%	23.20%	17.59%	74.52%
2015	2013	7.51%	11.69%	12.42%	22.33%	17.73%	70.37%
2016	2014	6.84%	11.73%	11.95%	22.71%	16.49%	86.07%
2017	2015	6.71%	11.34%	11.77%	22.39%	16.83%	73.50%



Contribution Rates for Employer Groups 2015 Actuarial Valuation

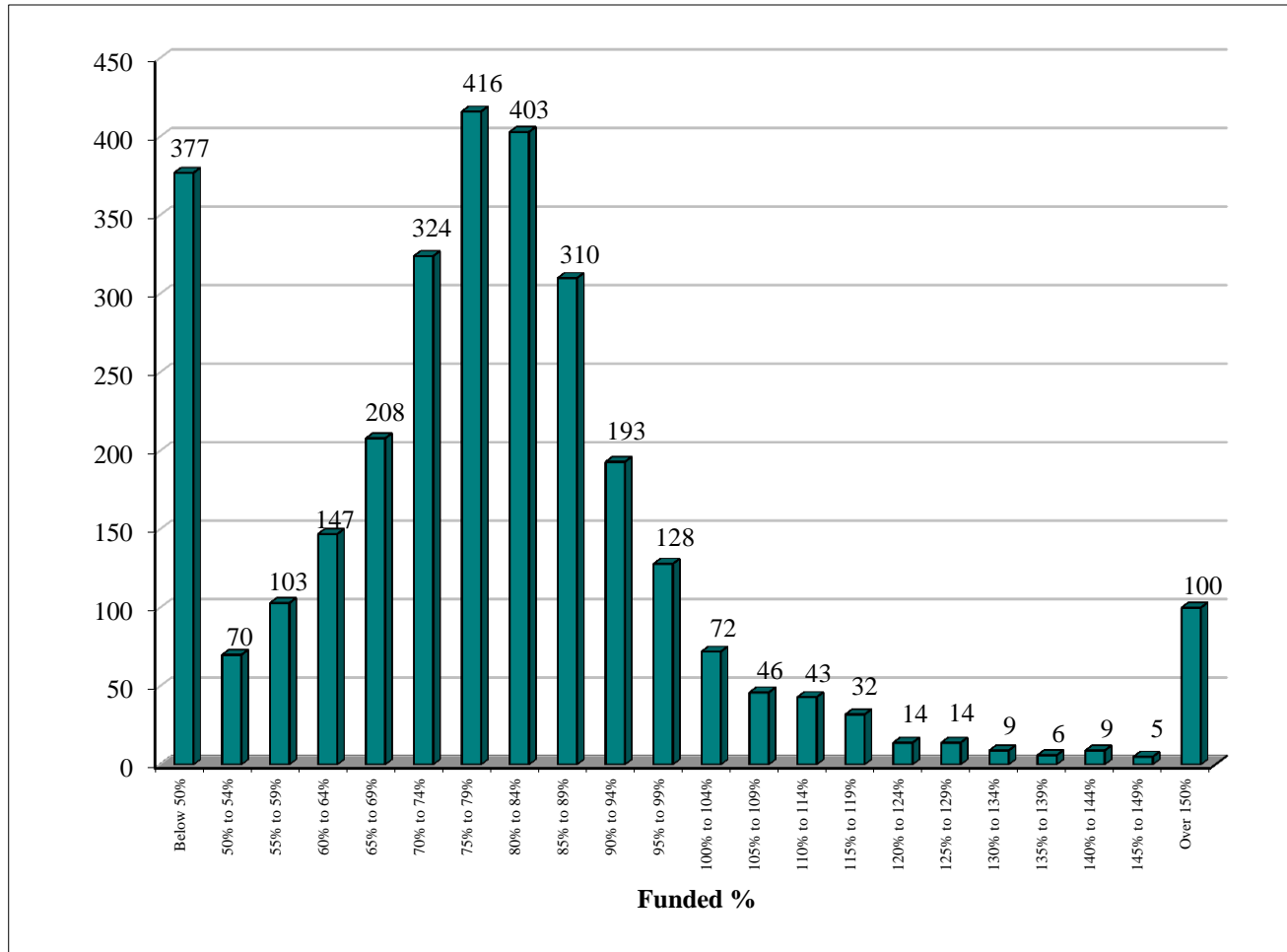
3,029 Regular Employers

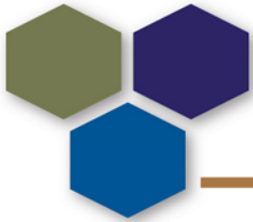




Funded Ratios for Employer Groups 2015 Actuarial Valuation

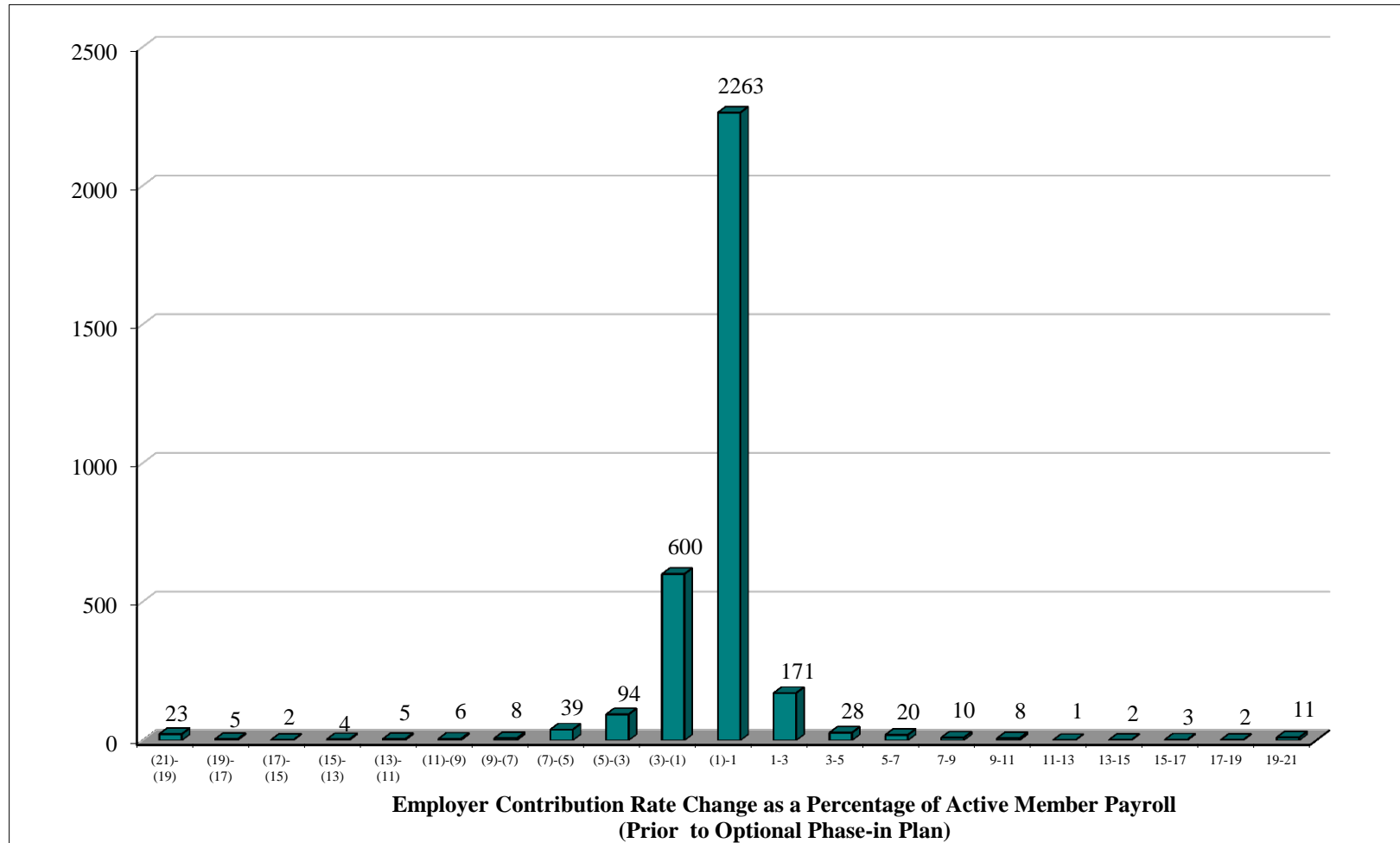
3,029 Regular Employers





Contribution Rate Changes for Employer Groups - 2015 Actuarial Valuation

3,305 Employers





Average Funding Ratios Comparative Statement

Valuation Date	Funded Ratio AVA Basis	Funded Ratio MV Basis	Unfunded/ Payroll	Accrued Liability Payroll
1994	87.1%	87.7%	35.6%	275.8%
2006	95.3%	99.8%	18.8%	399.4%
2007	96.1%	100.0%	16.0%	408.4%
2008*	84.3%	70.3%	64.1%	409.2%
2009	83.2%	81.5%	71.0%	423.2%
2010	83.3%	86.3%	76.3%	455.8%
2011*#	83.0%	80.2%	81.7%	481.4%
2012	84.3%	85.9%	78.7%	501.9%
2013	87.6%	96.6%	64.7%	520.4%
2014*	87.3%	93.0%	70.8%	556.5%
2015	88.4%	87.3%	66.1%	570.7%

* Assumption change

Benefit change



Outlook for 2016 Valuation

- ◆ 2016 Valuation affects 2018 contribution rates
- ◆ Unrecognized asset losses from smoothing method will drive rates up by about 10 basis points
- ◆ Increased number of people subject to post-2011 provisions (Tier 2) will drive rates down by about 10 basis points

Conclusion: If IMRF earns about 7.5% in 2016 and other assumptions are in line with expectations, average 2018 contribution rates may be similar to average 2017 rates



Appendix Gain (Loss) Analysis

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Gain (Loss) Analysis

A Gain (Loss) Analysis measures differences between Actual and Assumed Experience in each Risk Area



IMRF Risk Areas

Demographic

Normal retirement

Early retirement

Death-in-service

Disability

Other separations

Economic

Salary increases

Investment return



Change in Unfunded Accrued Liabilities During the Calendar Year 2015

	Unfunded Liability Development During	
	2015	2014
Unfunded Liability January 1	\$4,764,939,075	\$4,273,532,925
(Assumed Payments)	(306,609,121)	(253,703,224)
Assumed Interest	346,011,165	311,115,763
Expected Unfunded Liability December 31	4,804,341,119	4,330,945,464
Change Due to Experience Study	0	1,309,736,106
Change Due to Benefit Changes	0	0
Change Due to Data Changes	0	0
Change Due to Investment Experience	(313,208,972)	(767,567,271)
Change Due to Other Sources	82,314,274	(108,175,224)
Actual Unfunded Liability December 31	\$4,573,446,421	\$4,764,939,075
Gain (Loss) for the Year	\$ 230,894,698	\$ (433,993,611)



Investment Gain (Loss) - \$ Millions

1.	Beginning Funding Value	\$32,700
2.	Net Cash Flow	(533)
3.	Assumed Return	<u>2,433</u>
4.	Expected Funding Value: 1+2+3	34,600
5.	Actual Funding Value	34,913
6.	Gain (Loss): 5-4	313



How Does Asset Smoothing Impact Future Valuations

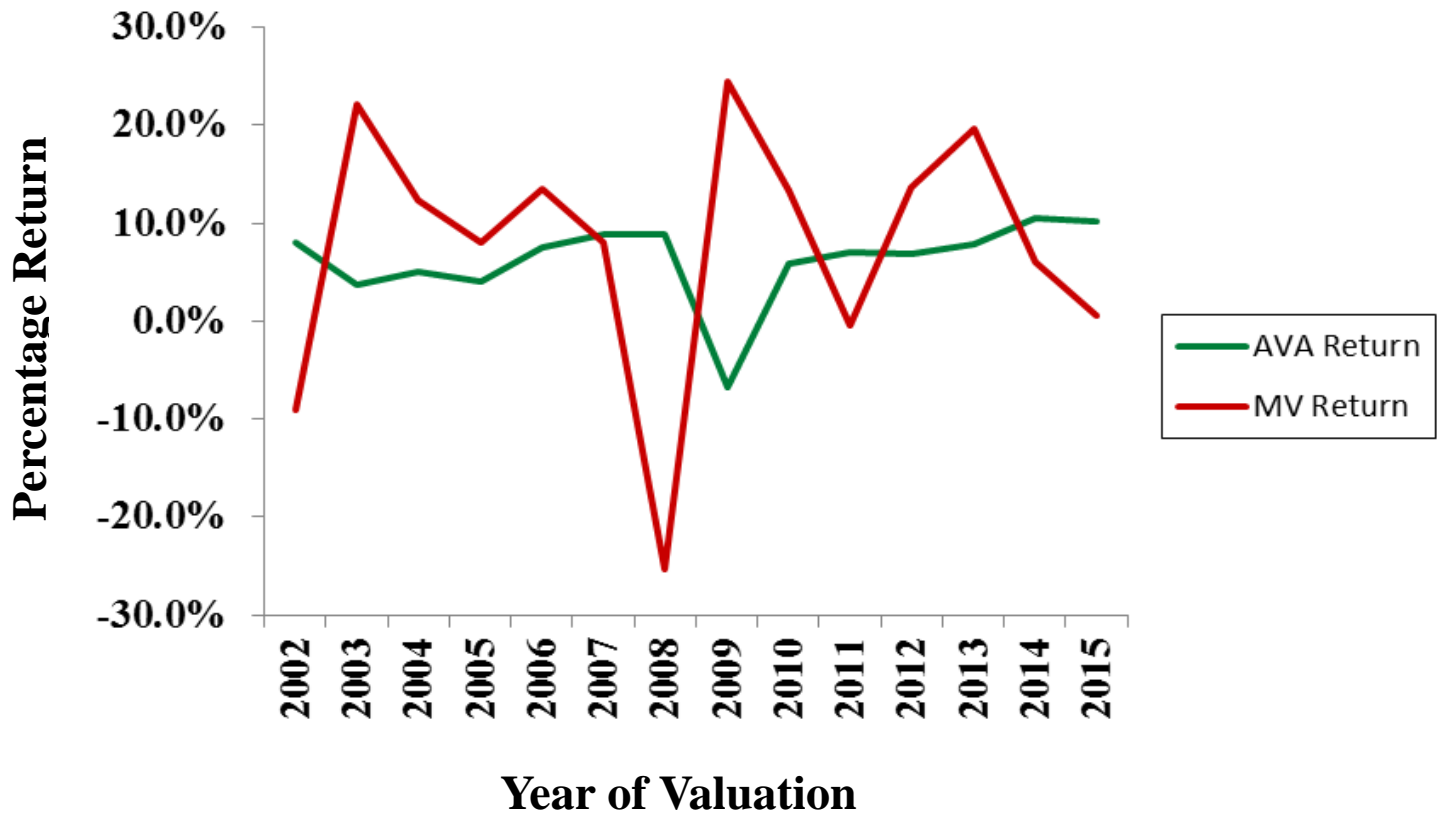
- ◆ Difference between Market Value and Funding Value (\$ (452) million) phased-in over next four years

Valuation Date	Scheduled Asset Gain	Potential Contribution Increase
12/31/2016	\$(113,015,411)	0.1%
12/31/2017	\$(113,015,411)	0.1%
12/31/2018	\$(113,015,411)	0.1%
12/31/2019	\$(113,015,412)	0.1%

- ◆ Assumes Market Value earns 7.5% in the next 4 years
- ◆ Actual results will likely be different

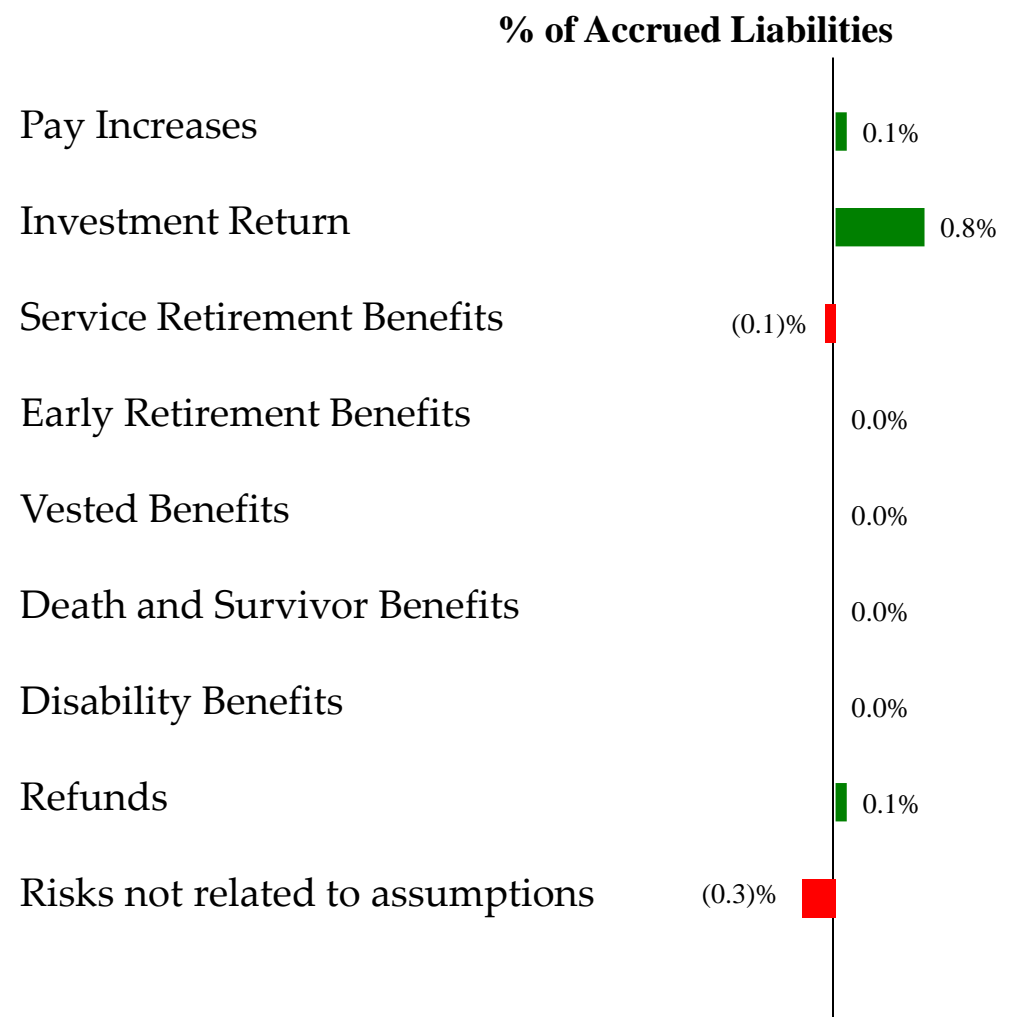


Market Value Return vs. Actuarial Value Return





Gain (Loss) Experience





Experience Gains & Losses by Risk Area - Comparative Statement

Experience Period	Pay Increases	Investment Return	Service Retirement	Early Retirement	Vested Deferred Retirement	Death and Survivor Benefits	Disability Benefits	Terminated with Refund	Other	Total Gain (Loss)	
										\$	Percent of Liabilities
1998	\$ (69.9)	\$ 515.7	\$ 37.8	\$(8.7)	\$ 37.8	\$7.7	\$ 5.7	\$(10.5)	\$(197.0)	\$ 318.6	2.9 %
1999 ¹	5.5	962.1	(6.8)	(5.1)	(14.6)	0.6	6.4	(21.1)	(168.1)	758.9	6.4 %
2000	12.2	642.5	0.8	(2.8)	(8.7)	1.8	9.8	(22.4)	(89.2)	544.0	4.2 %
2001	(29.5)	69.4	(4.9)	(1.0)	(20.3)	2.9	10.0	11.4	1.4	39.4	0.3 %
2002 ¹	19.5	(611.8)	(9.9)	(2.0)	(31.0)	4.3	6.9	2.3	(66.7)	(688.4)	(4.5)%
2003	36.8	(404.6)	(18.4)	(5.4)	(28.0)	2.3	5.9	10.0	(250.0)	(651.4)	(3.9)%
2004	(0.3)	(478.5)	(14.7)	(5.3)	(27.5)	3.4	7.3	15.8	(183.0)	(682.6)	(3.8)%
2005 ¹	130.0	23.8	(10.4)	(5.0)	(28.3)	1.9	12.0	19.3	(111.2)	32.1	0.2 %
2006	23.5	262.2	(8.6)	(3.4)	(32.7)	2.1	9.4	11.1	(211.7)	51.9	0.3 %
2007	(15.4)	305.8	(8.4)	(2.6)	(35.3)	4.1	10.2	23.2	(170.5)	111.1	0.6 %
2008 ¹	8.2	(3,331.5)	2.4	(2.1)	(40.8)	1.8	11.4	9.1	(40.5)	(3,382.0)	(12.6)%
2009	70.2	(343.2)	11.6	(0.5)	(38.3)	3.5	12.9	(11.8)	(53.5)	(349.1)	(1.4)%
2010	359.6	(90.5)	(0.2)	0.0	(32.3)	3.3	7.3	(0.3)	(442.1) ²	(195.2)	(0.7)%
2011 ¹	238.9	(164.3)	(22.9)	(5.7)	(25.9)	7.3	8.2	19.9	(344.4) ³	(288.9)	(1.0)%
2012	230.2	71.0	2.0	(3.0)	(24.7)	6.5	20.8	23.8	(89.0)	237.6	0.8 %
2013	141.5	811.5	(11.6)	(2.8)	(22.7)	3.2	15.7	45.1	(74.0)	905.9	2.8 %
2014 ¹	64.2	767.6	(19.3)	(4.9)	(19.7)	(2.2)	17.2	37.9	(1,274.8) ³	(434.0)	(1.3)%
2015	22.9	313.2	(28.5)	(4.7)	(16.8)	(3.4)	15.8	33.0	(100.6)	230.9	0.6 %

¹ Includes changes in assumptions due to the Experience Study.

² Includes one-time data changes of approximately \$250 million.

³ Includes Experience Study changes.



Reconciliation of Employer Contribution

	Regular	SLEP	ECO	Total
Prior Year	11.73 %	22.71 %	86.07 %	12.34 %
Tier 2 Structure	(0.13)%	(0.18)%	0.00 %	(0.13)%
Investment Return	(0.26)%	(0.39)%	(1.41)%	(0.27)%
Pay Increases	(0.06)%	0.92 %	(0.11)%	(0.02)%
Demographic	0.00 %	0.14 %	0.37 %	0.01 %
Population Change	(0.02)%	0.14 %	1.54 %	(0.01)%
Other	0.08 %	(0.95)%	(12.96)%	0.02 %
Current Year	11.34 %	22.39 %	73.50 %	11.94 %



Conclusion

- ◆ Investment markets continue to be volatile – recognition of prior gains led to slight decrease in contribution rates
- ◆ IMRF is still well-funded, (88% funding value basis, 87% market value basis) considering recent historic market volatility; national average is around 75%



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