



Wisconsin Retirement System

30th Annual Actuarial
Valuation of Retired Lives
December 31, 2012

GRS

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



Operation of the System

	Core Annuities	Variable Annuities
Ratio of Assets to Liabilities	If >0.5%, dividend may be granted If <-0.5%, prior dividends reduced	If > 2%, variable annuity increased If <-2%, variable annuity decreased
Increase/Decrease Rounding Conventions	Rounded to nearest 0.1%	Truncated, carried to next year
Adjustment Effective Date	April following 12/31 valuation	April following 12/31 valuation
Investment Return Hurdle (+/-) to Trigger Annuity Adjustment	Returns +/- 5%	Returns +/- 5%



Smoothing Mechanisms - Core

- ◆ Undesirable for retirees to experience wide swings in monthly benefits from year to year (especially downward swings)
- ◆ Mitigated in Core division by asset smoothing process and portfolio mix
- ◆ Asset smoothing has worked well historically, but a fifth negative dividend could not be avoided this year



Smoothing Mechanisms - Variable

- ◆ Variable fund is marked to market each year and subject to wide swings
- ◆ Dropping fractions from the percent is a form of smoothing
- ◆ Usually has very little effect due to the magnitude of the gains and losses



Summary of Results – December 31, 2012

\$ Millions

	Core	Variable
Number of Annuitants	173,571	39,873
Annual Annuities	\$ 3,815.8	\$ 304.6
Fund Balance	40,591.6	3,463.9
Actuarial Reserve	41,852.4	3,169.6
Ratio	0.97	1.093

For Core, average decrease is 3% and maximum decrease is 9.6%.
For Variable, average increase is 9%.



Summary of Results

- ◆ This valuation recognizes the last of the scheduled recognition of investment losses from 2008 under the five year smoothing method
- ◆ Due to the remaining unrecognized gains, there is a possibility of a positive dividend in 2014



Experience Study Changes

- ◆ Old method used ‘unprojected’ mortality table and loaded for future mortality improvements over 3 years (1.003, 1.006, 1.010 loads in respective years)
- ◆ New method uses ‘projected’ mortality table and phases into new table over 3 years (0.993, 0.996, 1.000 loads in respective years)
- ◆ Data reserve load reduced from 0.2% to 0.1%
- ◆ The net effect on the dividend was a small gain



Primary Sources of Core Dividend

	<u>% of APV</u>
1. SWIB published investment return	13.70%
2. MRA adjustment	<u>(11.50)%</u>
3. Published effective earnings rate	2.20%
4. Adjustment to relate earnings to average core annuity balance	<u>(0.10)%</u>
5. Earnings rate based on average balance	2.10%
6. Expected dividend before adjustments: 1.021/1.05-1	(2.76)%
7. Adjustment to relate average asset to ending liability	(0.03)%
8. Carryover from last year due to timing of dividend accounting adjustments and rounding	(0.09)%
9. Adjustments to contingency reserve and data reserve	(0.30)%
10. Experience study	0.22%
11. Experience and other effects	(0.05)%
12. Statutory adjustment to round to nearest one-tenth percent	<u>0.01%</u>
13. Computed average dividend rate: (6)+(7)+(8)+(9)+(10)+(11)+(12)	(3.0)%
14. Adjustment for members at or near the statutory floor	(6.6)%
15. Final maximum computed dividend rate: (13)+(14)	(9.6)%



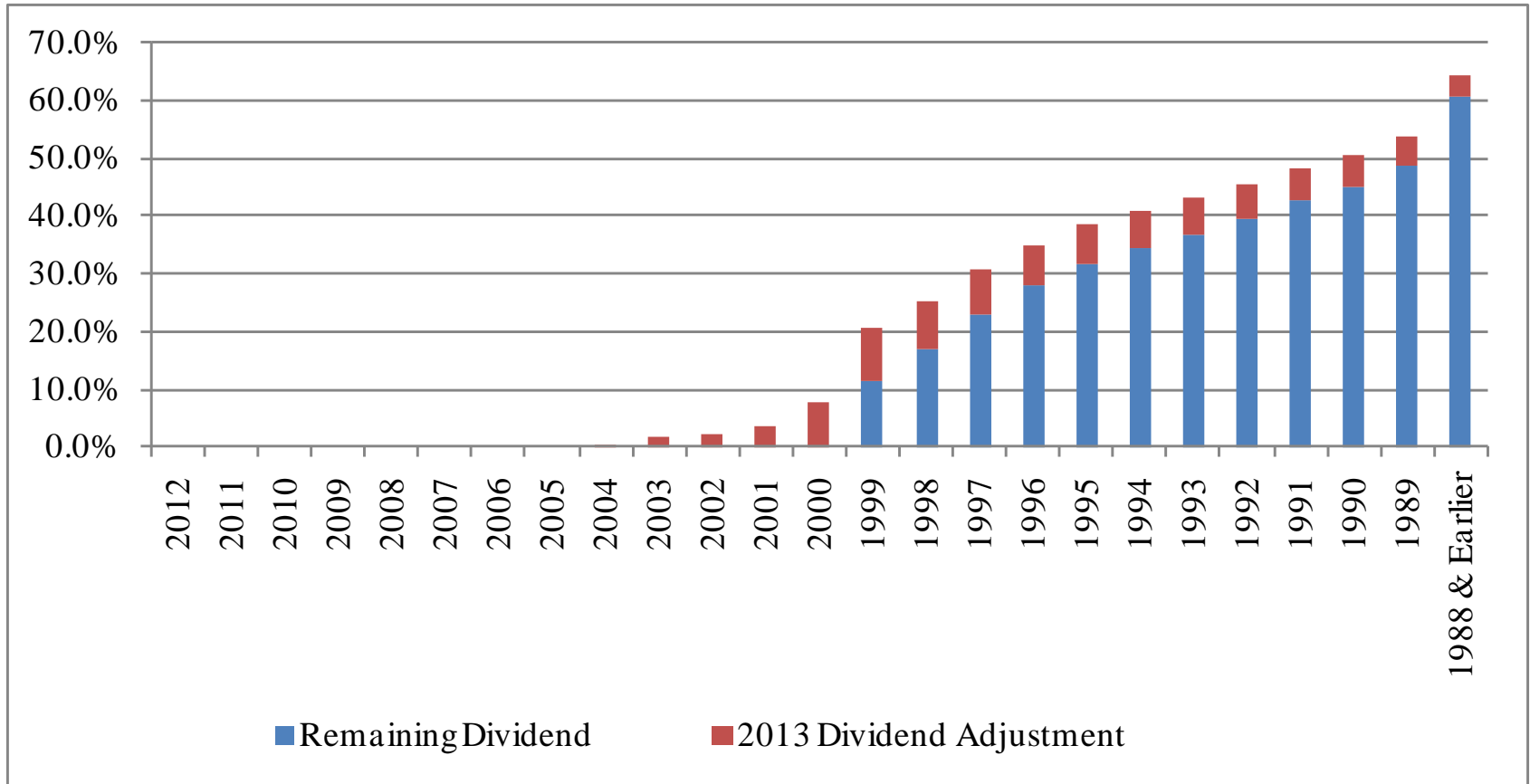
Liability Attributable to Dividends

Valuation	Liability for Dividend Remaining (billions)	Liability for Dividend Adjustment (billions)	Ratio
12/31/2008	\$9.2	\$(0.8)	(8.7)%
12/31/2009	8.1	(0.4)	(4.9)%
12/31/2010	7.2	(0.3)	(4.2)%
12/31/2011	6.4	(1.7)	(26.6)%
12/31/2012	4.5	(1.3)	(28.9)%

- ◆ Liability for Dividend Remaining represents the value of all previously granted dividends
- ◆ Liability for Dividend Adjustment represents the value of the dividend that needs to be reduced to maintain actuarial balance
- ◆ As the liability for the Dividend Remaining decreases, the Dividend Adjustment becomes highly leveraged

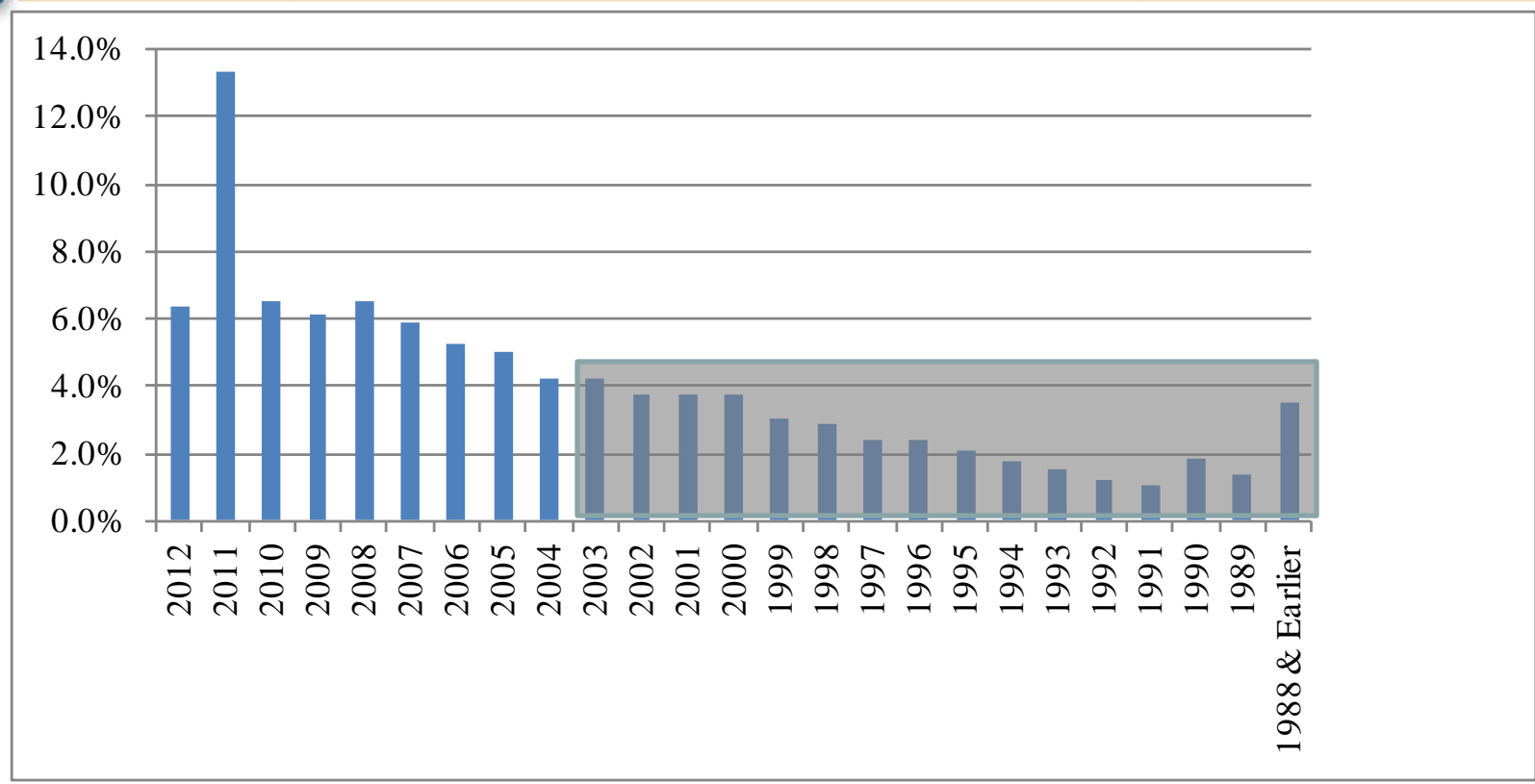


Dividend Remaining (as a percentage of total benefit) by Year of Retirement





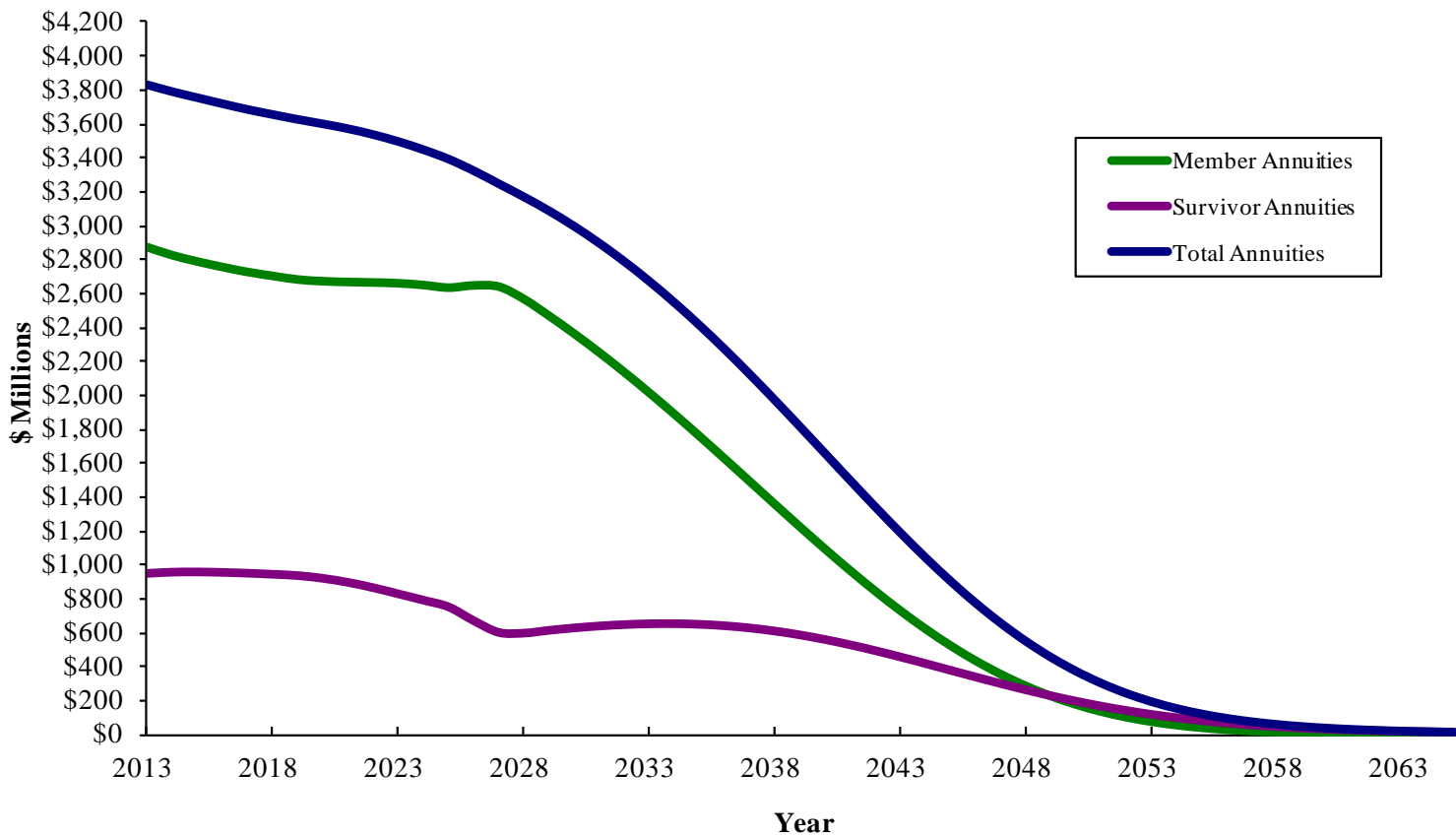
Liabilities (as a percentage of total) by Year of Retirement



Shaded region represents membership group that negative dividend can be spread over.



Projected Future Core Annuities



Total Future Payments	\$96.0 billion
From Present Assets	40.6
From Investment Return	55.4

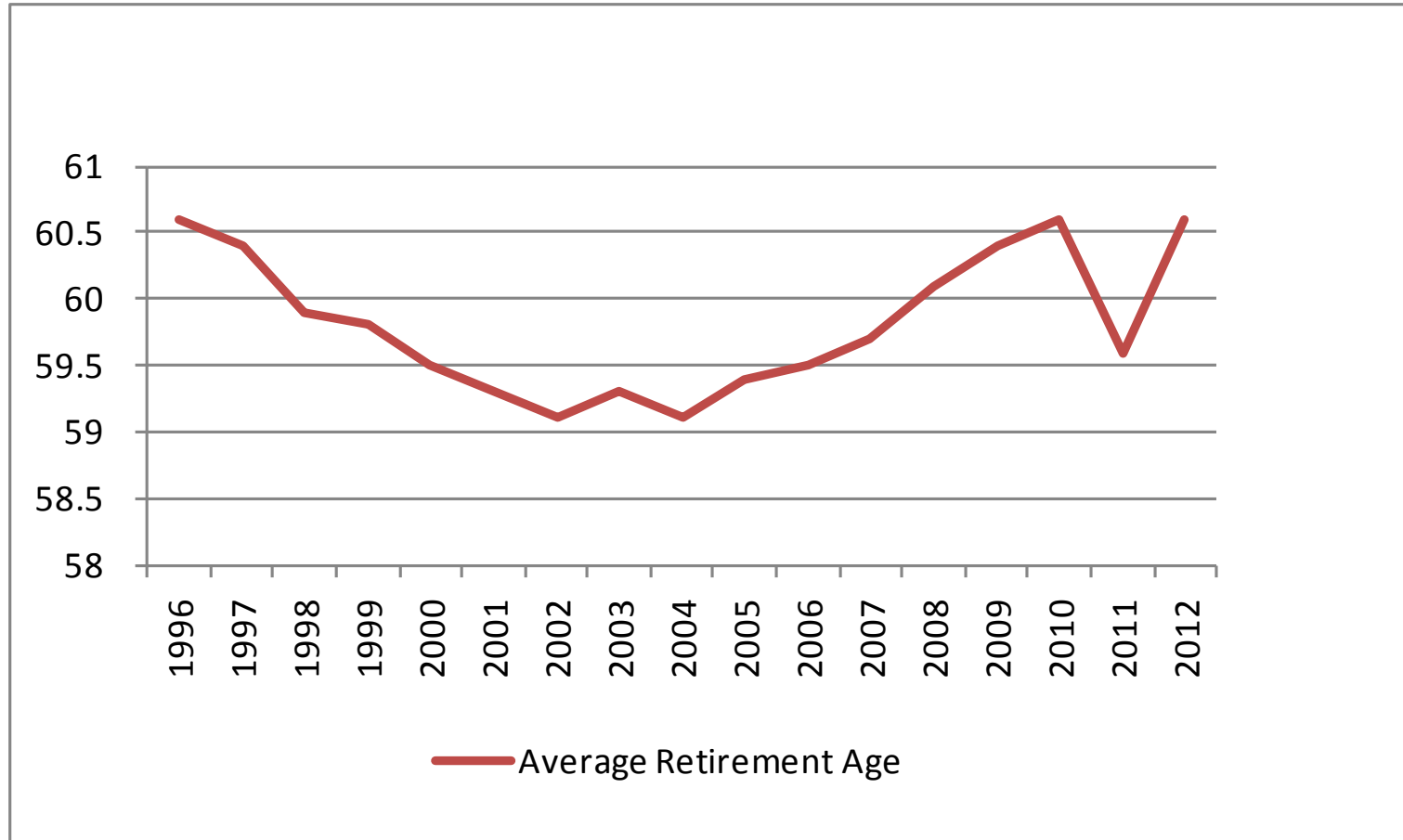


Primary Sources of Variable Adjustment

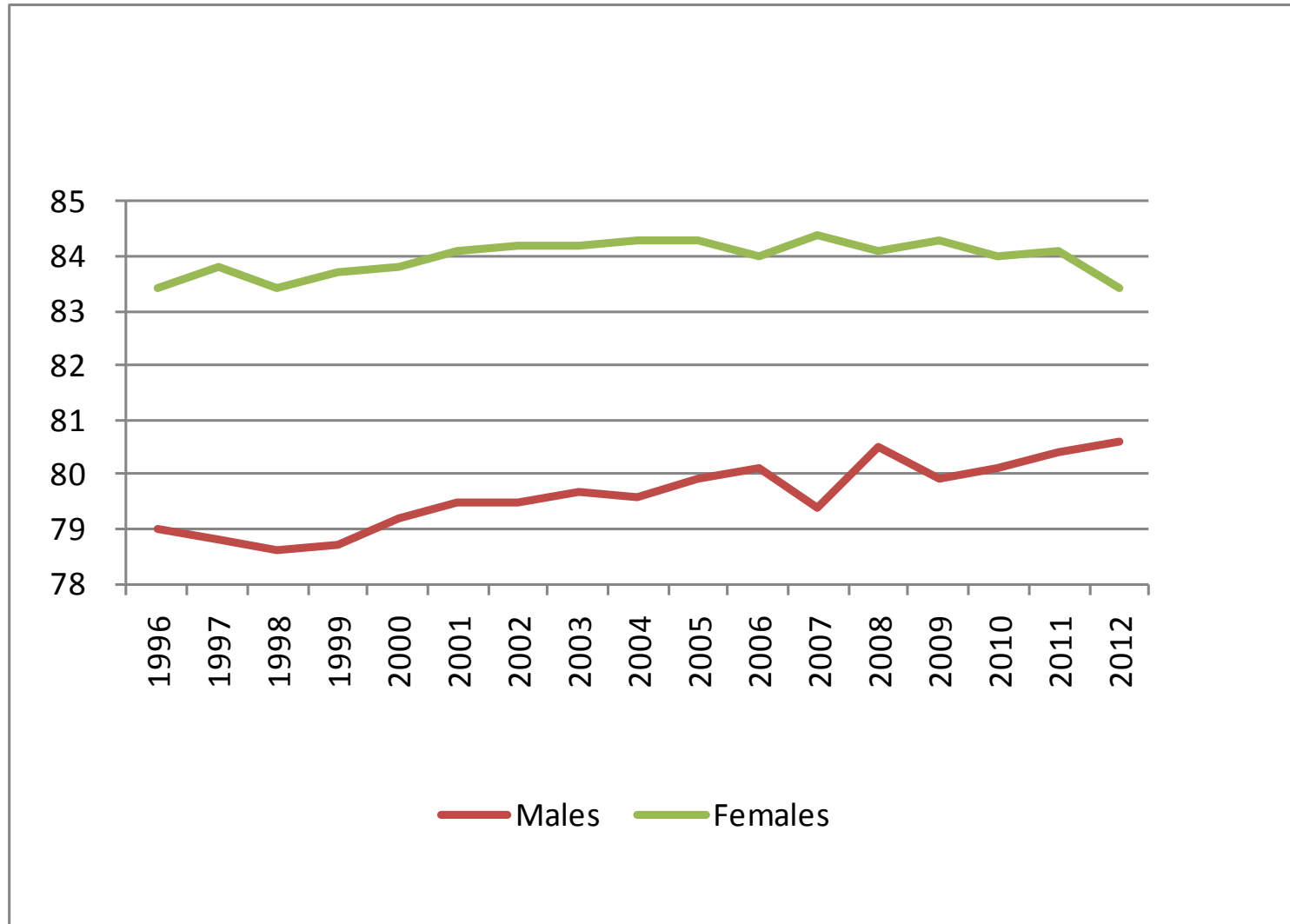
	<u>% of APV</u>
1. SWIB published investment return	16.9%
2. Adjustment to published effective rate	<u>0.1%</u>
3. Published effective earnings rate	17.0%
4. Adjustment to relate earnings to average variable annuity fund balance	<u>(0.5)%</u>
5. Earnings rate based on average balance	16.5%
6. Expected change before adjustments: 1.165/1.05-1	11.0%
7. Adjustment to relate average asset to ending liability	0.0%
8. Carryover from last year due to timing of distribution, accounting adjustments and truncation	(1.3)%
9. Adjustments to contingency reserve	(0.3)%
10. Experience study	0.0%
11. Experience and other effects	(0.1)%
12. Statutory adjustment: (truncate to whole percent)	<u>(0.3)%</u>
13. Variable annuity change: (6)+(7)+(8)+(9)+(10)+(11)+(12)	9.0%



Average Retirement Age

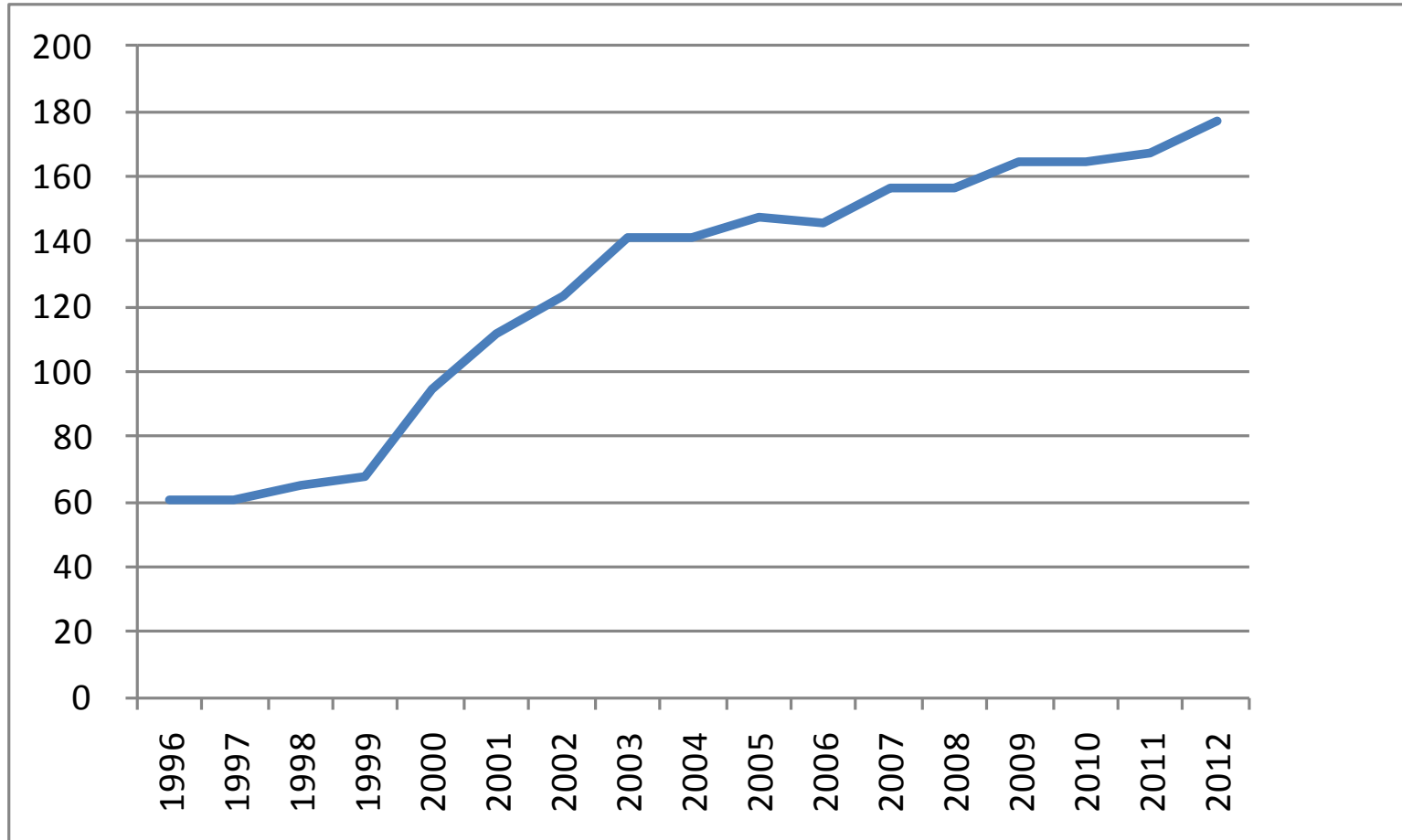


Average Age at Death





Number of Original Annuitants Over 100 Years Old





Comparative Statement - Core

Valuation Date	Number	\$ Millions			Ratio	Change in		
		Annual Annuities	Fund Balance	Actuarial Reserve		Annuities		CPI*
						Average	Maximum	
2002	116,289	2,226.6	23,142.4	23,202.9	0.997	0.0 %	0.0 %	2.4 %
2003	121,582	2,364.7	25,071.9	24,724.0	1.014	1.4 %	1.4 %	1.9 %
2004	126,211	2,500.3	26,920.0	26,232.2	1.026	2.6 %	2.6 %	3.3 %
2005	131,674	2,691.4	28,575.3	28,359.7	1.008	0.8 %	0.8 %	3.4 %
2006	137,117	2,843.6	31,180.5	30,273.9	1.030	3.0 %	3.0 %	2.6 %
2007	142,906	3,075.3	35,050.1	32,877.5	1.066	6.6 %	6.6 %	4.1 %
2008	144,033	3,399.3	35,798.1	36,551.5	0.979	(2.1)%	(2.1)%	0.1 %
2009	150,671	3,449.3	36,655.8	37,072.7	0.989	(1.1)%	(1.3)%	2.7 %
2010	155,775	3,532.4	37,798.4	38,148.5	0.991	(0.9)%	(1.2)%	1.5 %
2011	167,453	3,842.0	40,411.5	42,078.3	0.960	(4.0)%	(7.0)%	3.0 %
2012	173,655	3,806.3	40,591.6	41,852.4	0.970	(3.0)%	(9.6)%	1.7 %
30-Year Average						4.1 %	3.8 %	2.9 %
10-Year Average						0.3 %	(0.8)%	2.4 %

**Based on December CPI-U67 index.*



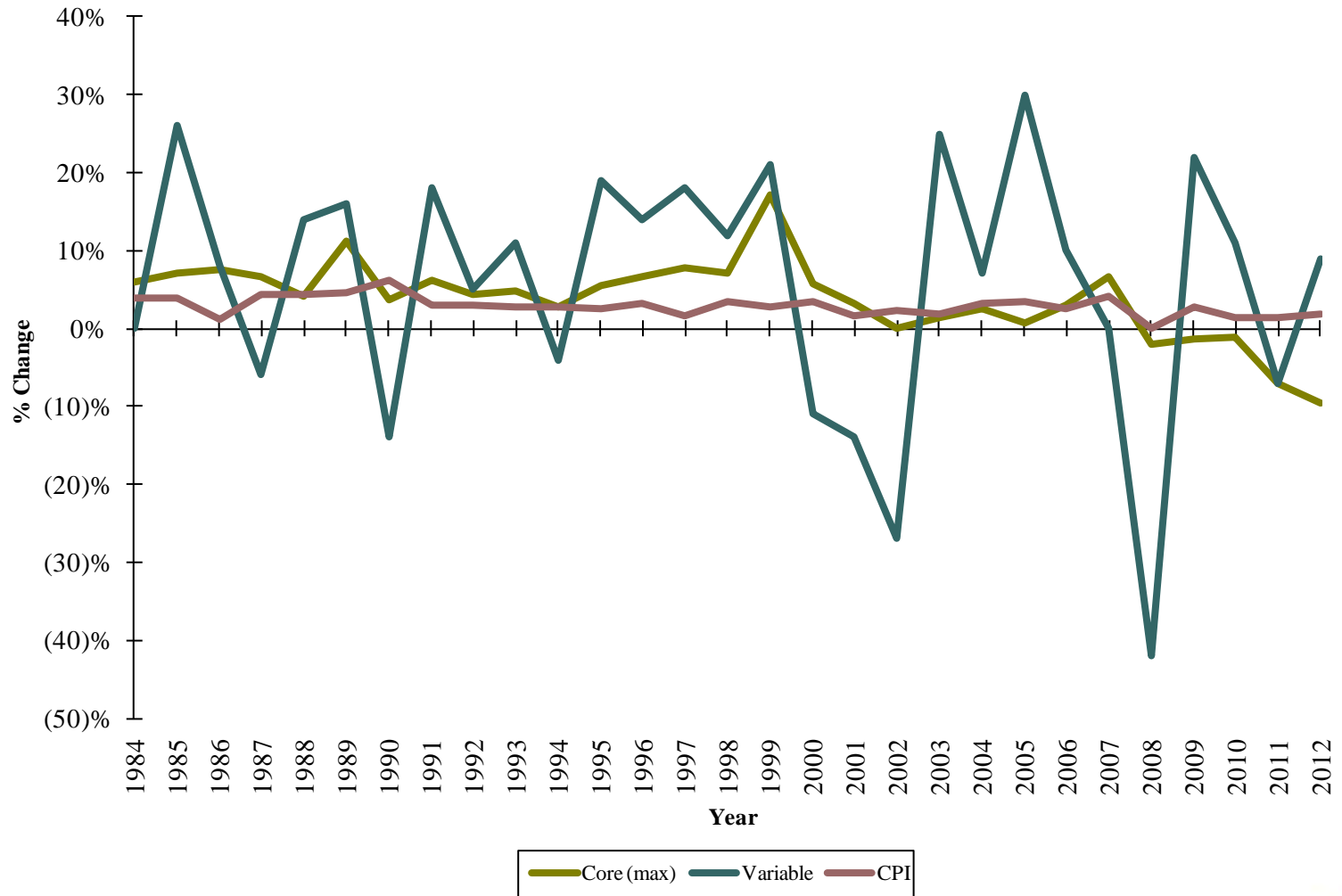
Comparative Statement - Variable

Valuation Date	Number	\$ Millions				Change in	
		Annual Annuities	Fund Balance	Actuarial Reserve	Ratio	Annuities	CPI*
2002	28,662	374.0	2,899.3	3,999.1	0.726	(27.0)%	2.4 %
2003	29,496	273.3	3,635.9	2,892.2	1.257	25.0 %	1.9 %
2004	30,270	346.0	3,909.9	3,654.5	1.070	7.0 %	3.3 %
2005	31,499	376.5	4,092.7	3,970.7	1.031	3.0 %	3.4 %
2006	32,683	391.8	4,594.2	4,145.2	1.108	10.0 %	2.6 %
2007	33,880	432.6	4,625.0	4,563.7	1.013	0.0 %	4.1 %
2008	34,927	427.0	2,574.5	4,491.0	0.573	(42.0)%	0.1 %
2009	34,836	240.3	3,078.4	2,512.7	1.225	22.0 %	2.7 %
2010	35,866	288.4	3,340.6	3,005.4	1.111	11.0 %	1.5 %
2011	38,949	330.3	3,197.9	3,462.9	0.924	(7.0)%	3.0 %
2012	39,873	304.6	3,463.9	3,169.6	1.093	9.0 %	1.7 %
30-Year Average						4.1 %	2.9 %
10-Year Average						1.9 %	2.4 %

**Based on December CPI-U67 index.*



History of % Changes





Looking Ahead

- ◆ As of the December 31, 2012 valuation, the 2008 market losses have been fully recognized
- ◆ Next year, a positive dividend is possible provided the core fund does not have a poor investment year (i.e., negative return)
- ◆ A positive dividend would be spread equally over all annuitants