

## Wisconsin Retirement System

# Independent Actuarial Audit of the December 31, 2013, Actuarial Valuations and the 2009-2011 Experience Study

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# Agenda

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- Project scope
- Census data
- Verification of test life detail
- Comments on report and assumptions and methods
- Summary



# Project Scope

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- Purpose of “limited scope” audit is to determine if results and conclusions determined by the valuation actuary are valid and appropriate.
- Peer review of December 31, 2013, actuarial valuations
  - Evaluate available data for performance of the valuations
  - Analysis of test life detail
  - Evaluation of valuation report, assumptions and methods, and assessment of conclusions
- Peer review of 2009-2011 experience study
  - Evaluation of results for reasonableness and consistency
  - Recommendations for improvement
- We acknowledge and appreciate the helpful assistance from the Legislative Audit Bureau, ETF staff and Gabriel Roeder Smith & Company (GRS) on this project.

# Valuation – Census Data

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- Data files provided are comprehensive enough to perform actuarial valuations and develop conclusions from the results.
- Most counts and statistics matched to within 1% with minimal data scrubbing.
- Additionally, we reviewed the transition of participants from active to annuitant status.
  - Isolated 22,400 records from active lives file that were reported with end of year status of “closed”.
  - Of these 22,400, we matched 9,600 to new records on the retired lives file.
  - The remaining 12,800 “non-matched” records either withdrew their contributions or received a lump sum.

# Valuation – Comments on Report

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- Detailed comments are included in our report. Highlights are shown below:
  - Inconsistency within the annual actuarial valuation and gain/loss analysis report related to the Executive and Elected Officials group.
    - Discussions with GRS on this subject revealed that the information contained on page B-1, including the total contribution rate, represents the final calculations; pages B-3 and B-4 were not updated in the final version of the report
  - There are four different asset values shown in the annual actuarial valuation and gain/loss analysis report and it is unclear how each asset value is used.
  - Suggest including a funded ratio using an “immediate gain” actuarial cost method, such as entry age normal.
    - The funded ratio using the current cost method is not a true indicator of the plan’s funded status.

# Valuation – Replication of Test Life Detail

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- Overall, we matched the calculations of the Present Value of Benefits (PVB) for individual test lives to within a reasonable tolerance.
- Detailed comments on the calculation of projected benefits are included in our report. Highlights are shown below:
  - We could not match the actuarial accrued liability for members with less than one year of service.
    - For example, for an active with 0.84 years of service, GRS calculated present value of benefits to be \$40,800 and accrued liability to be \$18,600 (or 45.6% of present value of benefits). Our calculated accrued liability for this individual was \$2,300.
  - Studying the test life detail provided by GRS revealed that two actuarial assumptions were not fully disclosed in the valuation report.
    - The benefits are being valued correctly.

# Experience Study – Economic Assumptions

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- No major issues with GRS’s economic assumption recommendations.
- **Inflation** – Report recommended no change to current “range” of 2.00% to 2.70%.
  - We recommend selecting a specific inflation assumption.
  - Note that the U.S. Federal Reserve formally targets long-term inflation of 2%.
- **Investment return** – Based on our analysis, we believe the 7.20% recommendation is reasonable, and provides margin for adverse experience.
  - We used Segal Rogerscasey capital market assumptions and calculated the median rate of return to be between 6.50%-7.20%, after adjusting for expenses.
  - 7.20% is towards the low end of the peer group range of 7.00% to 8.00%
- **Payroll Growth** – Report recommended no change to the current assumption of 3.20%.
  - The 3.2% assumption is supported by WRS’s actual experience.

## Experience Study – Economic Assumptions (cont'd)

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- **Salary Scale** – comprised of real wage increases of 3.2%, plus merit and seniority component.
  - Merit and seniority component was analyzed by comparing year-over-year salary increases, net of the assumed wage inflation.
  - A better approach is to examine year-over-year salary increases, net of actual wage inflation.
    - Reflecting this difference would have likely resulted in a recommendation to increase, rather than decrease, the merit and seniority assumption.



# Experience Study – Demographic Assumptions

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- **Mortality** – Healthy Mortality assumption is based on actual experience with a static projection (to 2017) of mortality improvement.
  - Margin stated as 8% for males and 7% for females.
    - We believe margin for future mortality improvements should be at least 10%.
    - Alternatively, use a table with generational improvement.
  
- **Retirement** – Actual experience during 2011 was excluded from the study because there were an unusually large number of retirements, which was perceived to be a one-time event.
  - This amounts to excluding 1/3<sup>rd</sup> of the plan's experience during the study.
    - Including this experience with a smaller relative weighting would have been a reasonable alternative approach.

## Experience Study – Demographic Assumptions (cont'd)

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- **Termination** – Overall, the recommendations in the Experience Study report are reasonable.
- **Disability Incidence** – Based on the analysis in the Experience Study Report, we believe the current and proposed disability rates are reasonable.
- **Other Comments** – In order to increase the credibility of the System's experience, consider using the most recent five years of experience for the next three-year Experience Study Report.

# Valuation Methods

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- **Cost Method** – Frozen Initial Liability actuarial cost method is used.
  - Reasonable, although not widely used among large public sector systems.
  - Governmental Accounting Standards Board (GASB) requires use of Entry Age Normal for financial statement reporting of Net Pension Liability.
  
- **Asset Method** – Investment gains and losses are smoothed over a five-year period, with no corridor around market value imposed.
  - We believe that five years is a sufficiently short period to constitute a reasonable asset smoothing method even if no corridor is used.
  
- **Core Trust Fund Annual Annuity Adjustment** – Allows retirees to receive core annuity increases when the investment return experience of the Fund is favorable.
  - We find that the methodology for determining the change in core annuities to be reasonable and appropriate.

# Summary

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- This audit validates the findings of the December 31, 2013, actuarial valuations.
  - Data appears complete.
  - Assumptions and methods are reasonable and comply with Actuarial Standards of Practice.
  - Test life replication matched to within reasonable range.
- We also believe the experience investigation covering the period 2009-2011, provides a reasonable basis for setting the actuarial assumptions.
  - In general, recommendations appear reasonable and appropriate.
- We have provided some suggestions to improve usefulness of the reports and fine tune calculation of actuarial liabilities.

# Questions?

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# Appendix – Test Life Detail – Retired Lives

➤ Table shows results of individual test life replications (ratio of Segal to GRS)

Counter	Test Life Description	Present Value of Benefits			Counter	Test Life Description	Present Value of Benefits		
		GRS	Segal	Ratio of Segal/ GRS			GRS	Segal	Ratio of Segal/ GRS
1	Disabled 40.63 - Participant	329,673	326,201	0.99	15	Disabled 40.63 (4) - Participant	448,059	457,705	1.02
2	Retired - Participant	329,341	331,152	1.01	16	Retired - Named Survivor	293,625	301,627	1.03
3	Disabled 40.63 - Named Survivor	481,622	484,077	1.01	17	Retired - Participant	92,413	92,172	1.00
4	Retired - Participant	229,663	227,646	0.99	18	Disabled 40.63 - Participant	683,308	683,705	1.00
5	Retired - Participant	175,768	174,225	0.99	19	Retired - Participant	164,723	168,190	1.02
6	Disabled 40.63 - Participant	789,943	799,898	1.01	20	Retired - Participant	192,564	196,616	1.02
7	Retired - Participant	3,892	4,082	1.05	21	Retired - Participant	383,464	383,579	1.00
8	Retired - Participant	3,822	4,009	1.05	22	Retired - Participant	346,965	347,069	1.00
9	Retired - Participant	44,658	44,978	1.01	23	Retired - Participant	105,769	106,548	1.01
10	Retired - Participant	33,371	33,611	1.01	24	Retired - Participant	102,420	103,175	1.01
11	Retired - Named Survivor	25,037	25,688	1.03	25	Retired - Participant	119,409	119,382	1.00
12	Retired - Named Survivor	25,126	25,780	1.03	26	Retired - Participant	1,156	1,159	1.00
13	Disabled 40.63 - Participant	573,306	575,183	1.00	27	Retired - Participant	124,586	124,908	1.00
14	Retired - Named Survivor	50,355	51,678	1.03					

# Appendix – Test Life Detail – Non-retired Lives

➤ Table shows results of individual test life replications (ratio of Segal to GRS)

Test Life Description	Present Value of Future Salary			Present Value of Benefits			Accrued Liability		
	GRS	Segal	Ratio of Segal/ GRS	GRS	Segal	Ratio of Segal/ GRS	GRS	Segal	Ratio of Segal/ GRS
Deferred Vested Elected & Executive - 1				20,367	20,561	1.01			
Deferred Vested University - 1				7,909	8,204	1.04			
Deferred Vested Protective w/SS - 1				26,407	26,795	1.01			
Deferred Vested Protective w/out SS - 1				72,353	74,438	1.03			
Deferred Vested Protective w/out SS - 2				234,891	235,208	1.00			
Deferred Vested Teacher - 1				37,280	37,280	1.00			
Deferred Vested General - 1				23,210	24,872	1.07			
Deferred Vested Teacher - 2				38,935	40,352	1.04			
Active Protective w/SS - 1	513,837	532,759	1.04	484,174	489,984	1.01	402,741	400,471	0.99
Active Protective w/SS - 2	677,834	657,491	0.97	187,764	180,256	0.96	44,026	43,897	1.00
Active Protective w/SS - 3	206,014	207,113	1.01	58,594	58,274	0.99	16,857	16,178	0.96
Active Protective w/SS - 4	466,436	460,894	0.99	83,165	84,078	1.01	691	3,525	5.10*
Active Protective w/out SS - 1	98,289	97,223	0.99	40,869	42,124	1.03	18,641	2,304	0.12*
Active Protective w/out SS - 2	1,013,005	1,011,688	1.00	315,959	316,368	1.00	109,522	108,331	0.99
Active Protective w/out SS - 3	443,670	441,341	0.99	552,327	551,191	1.00	435,591	433,114	0.99
Active Protective w/out SS - 4	295,412	292,982	0.99	119,712	114,732	0.96	28,392	11,846	0.42*
Active University - 1	147,852	149,881	1.01	21,197	21,332	1.01	1,264	1,686	1.33*
Active University - 2	862,400	863,542	1.00	208,951	210,257	1.01	95,577	97,430	1.02
Active University - 3	189,473	191,460	1.01	78,677	77,863	0.99	48,246	48,570	1.01

Note: Items above that are blank are not applicable to that test life.

\* Active member with less than one year of service.

## Appendix –Test Life Detail – Non-retired Lives (continued)

➤ Table shows results of individual test life replications (ratio of Segal to GRS)

Test Life Description	Present Value of Future Salary			Present Value of Benefits			Accrued Liability		
	GRS	Segal	Ratio of Segal/GRS	GRS	Segal	Ratio of Segal/GRS	GRS	Segal	Ratio of Segal/GRS
Active Teacher - 1	554,652	565,732	1.02	82,764	83,799	1.01	1,042	3,060	<b>2.94*</b>
Active Teacher - 2	1,441,406	1,432,105	0.99	243,373	242,685	1.00	56,143	58,195	1.04
Active Teacher - 3	194,466	197,899	1.02	286,852	290,962	1.01	260,110	258,059	0.99
Active Teacher - 4	361,459	365,746	1.01	200,153	197,838	0.99	145,594	142,136	0.98
Active General - 1	165,051	162,046	0.98	31,326	30,120	<b>0.96</b>	5,860	5,616	0.96
Active General - 2	269,806	269,448	1.00	245,612	247,334	1.01	212,335	209,231	0.99
Active General - 3	315,844	322,802	1.02	83,706	83,792	1.00	42,873	42,752	1.00
Active General - 4	186,421	185,032	0.99	137,190	139,031	1.01	106,310	103,376	0.97
Active Elected and Executive - 1	168,811	167,284	0.99	33,983	33,397	0.98	8,523	8,874	<b>1.04</b>
Active Elected and Executive - 2	58,941	58,589	0.99	15,815	15,830	1.00	8,029	1,715	<b>0.21*</b>
Active Elected and Executive - 3	641,818	641,347	1.00	641,150	641,739	1.00	556,121	532,192	<b>0.96</b>
Active Elected and Executive - 4	216,125	216,851	1.00	721,625	732,924	1.02	695,656	694,122	1.00
Active Elected and Executive - 5	537,071	531,776	0.99	86,089	86,667	1.01	18,379	18,690	1.02

Note: Items above that are blank are not applicable to that test life.

\* Active member with less than one year of service.