



Minnesota Legislative Commission on Pensions and Retirement

2008 – 2014 Experience Study Review

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Experience Study Review – Agenda

- Scope
- Summary Results
- Financial Impact
- Investment Return Assumption
- Mortality Assumption

Scope

Scope – Experience Studies Review

- **Review experience studies for compliance with applicable State Statutes, LCPR Standards, and Actuarial Standards of Practice**
- **Assess the completeness, reasonableness, and consistency of retained actuaries' methods and recommendations**
- **Economic Assumptions**
 - Investment return
 - Individual compensation increases
 - Payroll growth
- **Demographic Assumptions**
 - Mortality
 - Retirement
 - Withdrawal
 - Disability
 - Other Misc.
- **Plans Studied**
 - MSRS General, PERA General, TRA

Summary Results

High-Level Summary of Results

- **No issues were identified that would cause us to disagree with the retained actuaries' recommendations**
- **The selected investment return assumption of 8.0% is reasonable and supportable**
 - TRA retained actuary relied on SBI data to support this recommendation
 - MSRS/PERA retained actuary recommended a range of 7.0% – 8.0%
 - The analysis performed by retained actuary supports a best estimate of 7.0%
 - Our report identifies additional sources that support 8.0%
- **Mortality experience is showing longer life expectancies for all three plans**
 - Retained actuaries recommend RP-2014/MP-2014 tables with adjustments to reflect plan specific experience
 - For all plans we believe recently published mortality improvement scale MP-2015 should be considered
 - Minnesota was an early adopter of generational mortality improvements within the public sector; these recommendations continue that pattern of recognizing the most recently available data

Financial Impact

Financial Impact

	TRA	MSRS	PERA
Funded Ratio – 7/1/14 Valuation	74.1%	83.0%	73.5%
8.0% Investment Return Assumption	(2.4%)	(2.5%)*	(1.6%)*
Mortality Changes	(1.7%)	(2.3%)	(2.5%)
All Other Changes**	<u>(0.1%)</u>	<u>(0.2%)</u>	<u>(0.6%)</u>
Funded Ratio – Proposed	69.9%	78.0%	68.8%
Sufficiency/(Deficiency) – 7/1/14 Valuation	(3.5%)	(1.8%)	(2.0%)
8.0% Investment Return Assumption	(1.7%)	(1.3%)*	(1.0%)*
Mortality Changes	(1.0%)	(1.1%)	(1.0%)
All Other Changes**	<u>(0.5%)</u>	<u>(0.4%)</u>	<u>(0.3%)</u>
Sufficiency/(Deficiency) – Proposed	(6.7%)	(4.6%)	(4.3%)

*Includes all other changes from Omnibus 2015 Pension Bill which were not decoupled by retained actuary, including payroll growth reduction from 3.75% to 3.50% and adjustments in salary scale.

**Other changes include those made to salary scale, retirement, withdrawal, disability, marital status, and payment form.

Investment Return Assumption

Investment Return Assumption – TRA

- **Retained actuary recommended an 8.0% investment return assumption**
- **Support:**
 - Historical: Minnesota State Board of Investment (SBI) historical returns
 - Projected: SBI projected nominal net return of 8.36%
 - After adjusting for expenses and reduced inflation assumption, projection is **8.00%**
 - Benchmark: Considered investment return assumption from 2013 of 120+ large public pension plans; noted that while median is 7.75%, the average asset mix of this group is less aggressive than SBI's
- **Review**
 - We agree with support
 - Although only a single source of capital market expectations is considered, the single source is the asset manager and forecasts on a 30+ year time horizon

Investment Return Assumption – TRA Data

- **State Board of Investment – Historic:**

Data Source	Net Rate of Return
SBI Returns (last 1 year)	18.60%
SBI Returns (last 3 years)	11.50%
SBI Returns (last 5 years)	14.50%
SBI Returns (last 10 year)	8.40%
SBI Returns (last 20 years)	9.00%
SBI Returns (last 30 years)	10.30%

- **State Board of Investment – Projected:**

Time Span (years)	Mean Real Return	25 th Percentile Real Return	Median Real Return	75 th Percentile Real Return
1	6.20%	-3.22%	5.36%	14.71%
5	5.53%	1.43%	5.36%	9.44%
10	5.45%	2.57%	5.36%	8.23%
20	5.40%	3.38%	5.36%	7.38%
30	5.39%	3.74%	5.36%	7.01%
50	5.38%	4.10%	5.36%	6.64%

- **5.36% real return plus 2.75% inflation less 0.11% expenses yields 8.00% investment return assumption**

Investment Return Assumption – MSRS/PERA

- **Retained actuary recommended a range of 7.0% – 8.0%**
- **Support:**
 - Historical: Minnesota State Board of Investment (SBI) historical returns
 - Projected: GRS Capital Market Assumption Modeler develops range
 - Arithmetic mean return: 7.91% (~8%)
 - Geometric mean return: 6.97% (~7%)
 - Support provided for use of geometric mean
- **Review**
 - Arithmetic and geometric return assumptions are both acceptable under Actuarial Standards of Practice
 - We believe range is reasonable but consider geometric returns more appropriate for this purpose

Investment Return Assumption – MSRS/PERA Data

- Projections from GRS Capital Market Assumption Modeler

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of Exceeding 8.50%	Probability of Exceeding 8.00%	Probability of Exceeding 7.00%
	25th	50th	75th			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	3.88%	5.90%	7.96%	20%	25%	36%
2	4.75%	6.63%	8.54%	25%	31%	45%
3	4.69%	6.78%	8.92%	29%	35%	47%
4	5.06%	7.21%	9.40%	34%	40%	53%
5	5.46%	7.54%	9.66%	38%	44%	57%
6	5.48%	7.74%	10.06%	41%	47%	59%
Average	4.89%	6.97%	9.09%	31%	37%	50%

- **Median Geometric return is 6.97%**

- By definition, this return is expected to be met 50% of the time
- Note that an 8.00% assumption has only a 37% likelihood of being met
- Industry trend is toward a preference of geometric returns, including the SOA’s Blue Ribbon Panel, as noted by the retained actuary

Investment Return Assumption – MSRS/PERA

- **Deloitte Support of Recommended Range:**

- GRS Capital Market Assumption Modeler (10-20 year time horizon): **6.97%**
- Horizon 2015 Survey of Capital Market Assumptions (20-year time horizon): **8.27%**
 - Same method as was used by retained actuary to develop 6.97%
 - Different investment consultants, longer time horizon
- SBI projected nominal net return (30+ year time horizon): **8.00%**
 - As noted in data provided on slide 10

Mortality Assumption

Mortality Assumption Recommendation

- Retained actuaries generally recommended adjustment from RP-2000 based tables projected with Scale AA to RP-2014 based tables projected with Scale MP-2014
 - Both prior and current base tables adjusted to match plan experience

		Current	Proposed
TRA	Male Retirees	RP-2000 White Collar (-2)	RP-2014 White Collar (-3), *0.80 Pre-70, *1.478 Post-70
	Female Retirees	RP-2000 White Collar (-3)	RP-2014 White Collar (-3), *0.85 Pre-75, *1.362 Post-75
MSRS	Male Retirees	RP-2000 White Collar	RP-2014 White Collar (+2)
	Female Retirees	RP-2000 White Collar	RP-2014 White Collar
PERA	Male Retirees	RP-2000 White Collar	RP-2014 White Collar (+2)
	Female Retirees	RP-2000 White Collar (-2)	RP-2014 White Collar, *0.90

Note: Parenthetical refers to set back or set forward of ages before applying rates in the applicable mortality table

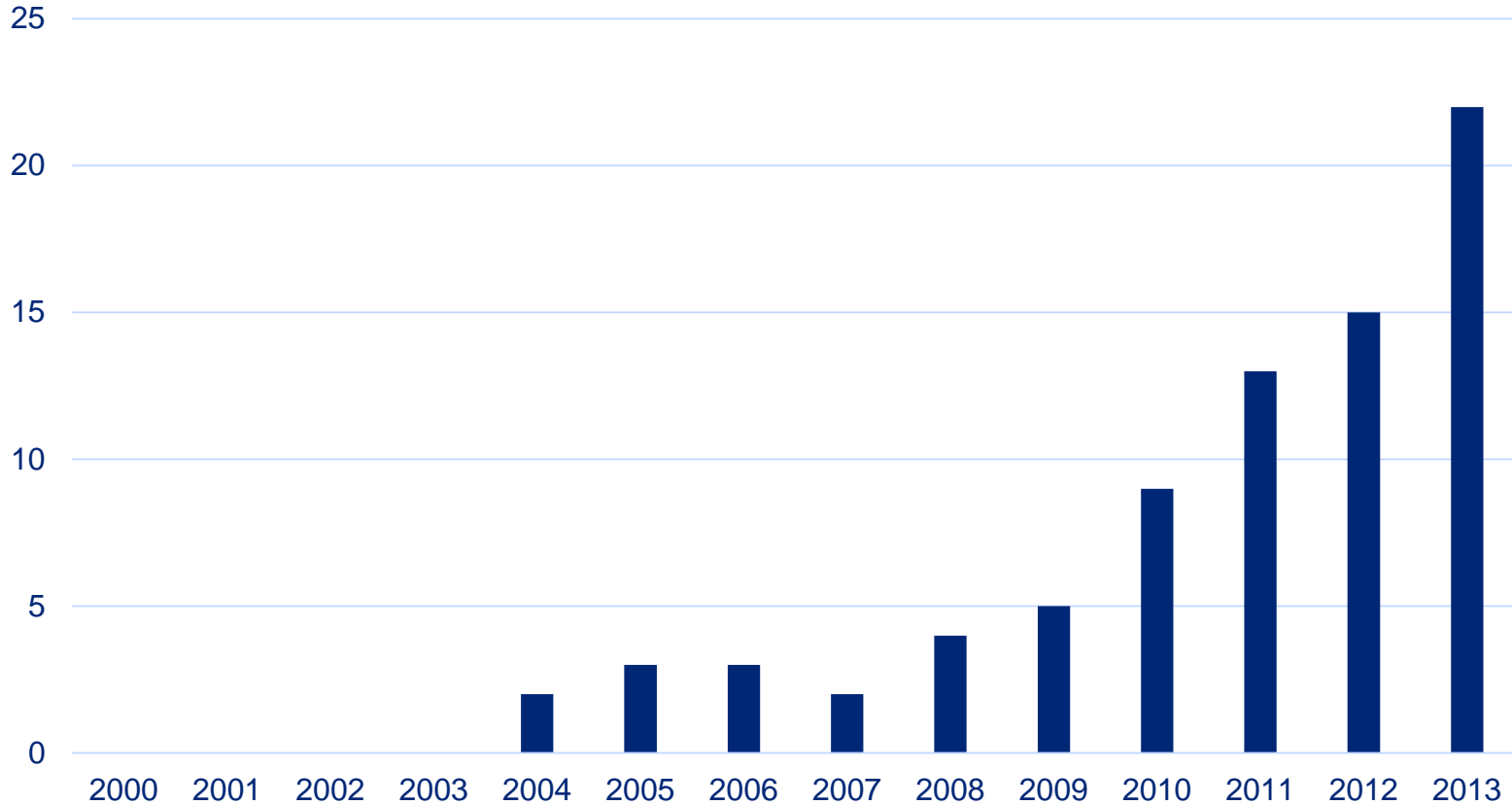
Mortality Assumption Support – Observed A/E Ratios

- Prior experience study based on experience from 2004 – 2008; projected mortality improvements from that point
- Based on observed Actual deaths/Expected deaths over the period 2008 – 2014, the current mortality assumptions understated mortality improvements for TRA retirees and MSRS female retirees

Participant Group		Deaths	Exposure	Ratio of Actual/Expected	
				Current Assumption	Proposed Assumption
TRA	Healthy Male Retirees	2,619	120,076	88%	100%
	Healthy Female Retirees	2,981	161,114	94%	98%
MSRS	Healthy Male Retirees	2,403	72,510	100%	101%
	Healthy Female Retirees	1,936	73,566	91%	105%
PERA	Healthy Male Retirees	4,476	123,034	100%	101%
	Healthy Female Retirees	5,656	240,257	101%	108%

Prevalence of Generational Scaling

Number of State and Local Pension Plans Using Generational Scaling



Source: Center for Retirement Research at Boston College; Based on 112 reports

Mortality Improvement – MP-2015

- **Subsequent to the release of the Experience Studies, the Society of Actuaries released a revised mortality projection scale, MP-2015, based on two additional years of mortality improvement data**
 - Shows lower projected mortality improvement rates, which will result in lower liabilities
 - Adoption of the revised scale expected to reduce Actuarial Accrued Liability by approximately 0.5% – 1.5%
 - We recommend this mortality improvement table be adopted
 - Future updates should be considered, but implemented only in experience study years unless impact is sufficiently large
 - Future updates may create actuarial gains or losses

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