NORTH DAKOTA RETIREMENT AND INVESTMENT OFFICE
Teachers' Fund for Retirement
State Investment Board

NORTH DAKOTA TEACHERS' FUND FOR RETIREMENT

Actuarial Valuation as of July 1, 2012

Discussion of Valuation Results and Projections

October 30, 2012

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#5298635_1

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Discussion Topics

Segal

- Summary of Valuation Highlights
- Membership and Demographics
- Valuation Results and Projections
- New GASB Requirements and Moody's Proposed Adjustments

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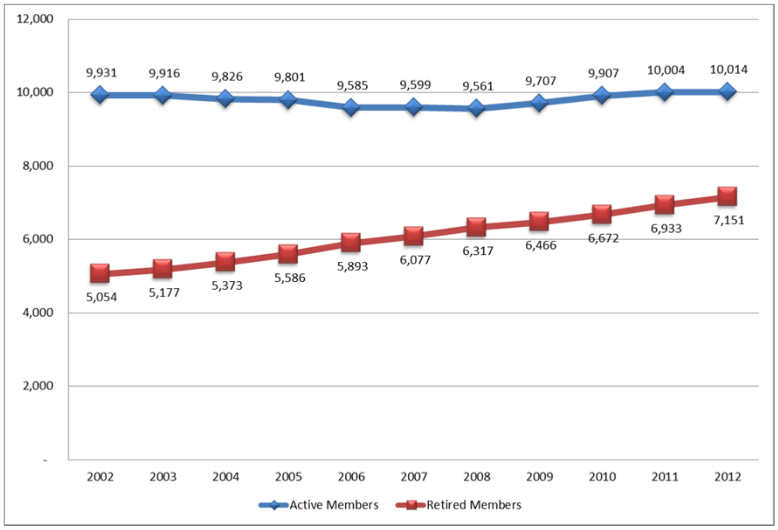
Summary of Valuation Highlights

- Valuation reflects increases in contribution rates (4% for both members and employers) contained in HB 1134
  - Member rate increased from 7.75% in FY12 to 9.75% for FY13 and FY14 and increases to 11.75% for FY15 and thereafter
  - Employer rate increased from 8.75% in FY12 to 10.75% for FY13 and FY14 and increases to 12.75% for FY15 and thereafter
  - Increases would revert to 7.75% for both members and employers once the funded ratio reaches 90% (measured using the actuarial value of assets)
- Market value of assets returned -1.4% for year ending 6/30/12 (Segal calculation)
  - Gradual recognition of deferred losses resulted in -1.4% return on actuarial assets
  - Unrecognized investment losses represent about 6% of market assets
- Net impact on funded ratio was a decrease from 66.3% (as of 7/1/2011) to 60.9% (as of 7/1/2012)
- Net impact on GASB 25 Annual Required Contribution (ARC) was a decrease from 13.16% of payroll (FY12) to 13.02% of payroll (FY13)
  - Based on the employer contribution rate for fiscal 2013 of 10.75%, there is a contribution deficiency of 2.27% of payroll
    - Additional contribution rate increases from HB 1134 (effective 7/1/2014) will address this deficiency

Membership

	2012	2011	Change
Active:			
• Number	10,014	10,004	+0.1%
• Payroll	$505.3 mil	$488.8 mil	+3.4%
• Average Age	43.7 years	43.9 years	- 0.2 years
• Average Service	13.7 years	13.8 years	- 0.1 years
Retirees and Beneficiaries			
• Number	7,151	6,933	+3.1%
• Total Annual Benefits	$ 142.8 mil	$ 133.6 mil	+6.9%
• Average Monthly Benefit	$1,664	$1,606	+3.6%

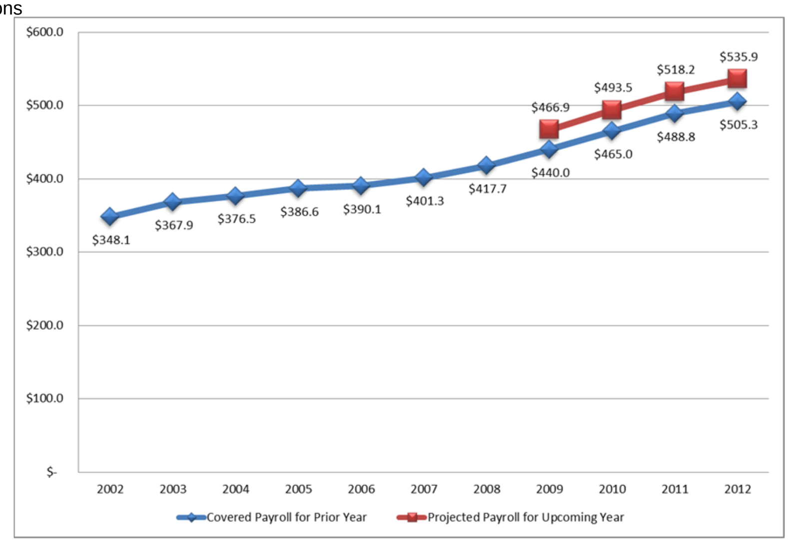
Active and Retired Membership



Since 2002, number of retirees and beneficiaries has increased 3.5% per year on average.

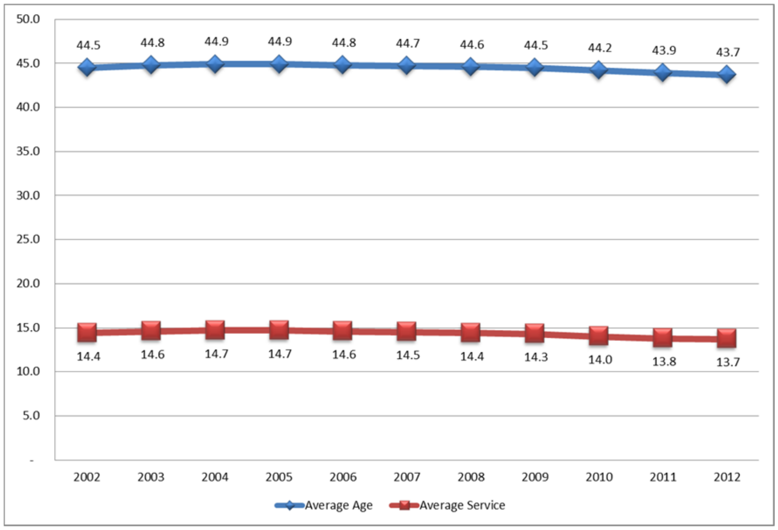
Active Payroll

$ Millions



Since 2002, active payroll has increased, on average, 3.8% per year.

Average Age and Service of Active Members



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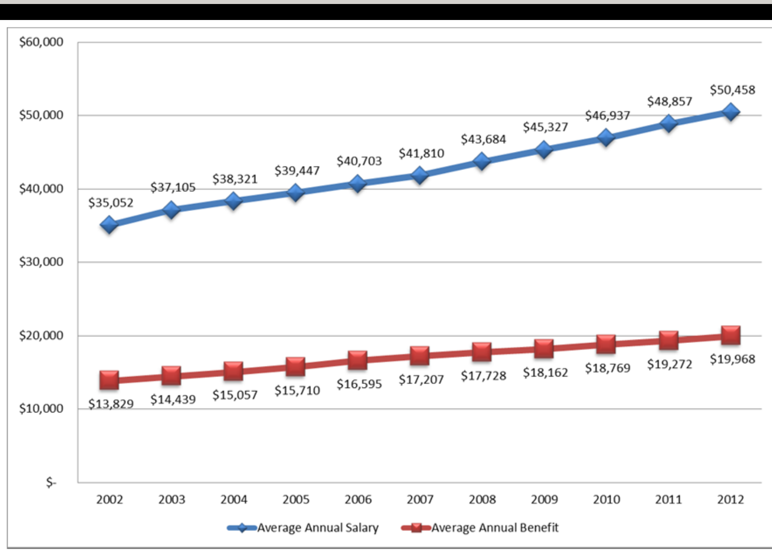
Average Salary and Average Benefit



Since 2002, average salary has increased, on average, 3.7% per year. Average annual benefit has also increased by 3.7% per year.

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Assets

- The market value of assets decreased from $1.726 billion (as of June 30, 2011) to $1.654 billion (as of June 30, 2012)
  - Segal determined the investment return was -1.4%, net of investment and administrative expenses*
- The actuarial value of assets – which smoothes investment gains and losses over five years – decreased from $1.823 billion (as of June 30, 2011) to $1.748 billion (as of June 30, 2012)
  - Investment return of -1.4%, net of investment and administrative expenses
  - Actuarial value is 105.7% of market
  - There is a total of $94 million of deferred investment losses that will be recognized in future years
- The average annual return on market assets over the past 10 years is 5.5%*
  - 20-year average is 7.0%
- The average annual return on actuarial assets over the past 10 years is 4.0%
  - 20-year average is 6.9%

* The investment returns calculated by Segal are based on a very simplified approach using annual income and end of year data. The investment consultant's calculations are more accurate and are based on daily time-weighted cash flows.

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Market Value of Assets ($ in millions)

Fiscal Year Ending June 30, 2012	
Beginning of Year	$1,726
Contributions:	
• Employer	46
• Member	41
• Service Purchases	2
• Total	89
Benefits and Refunds	(138)
Investment Income (net)	(23)
End of Year	$1,654
Rate of Return	-1.4%

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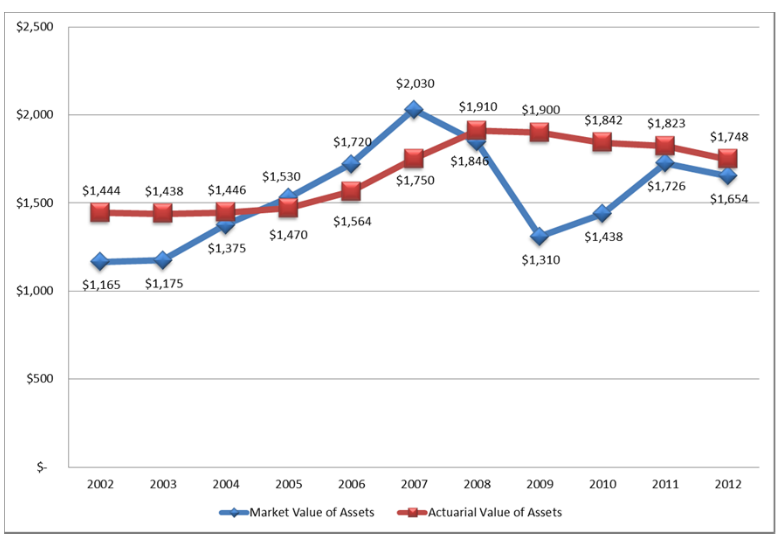
Actuarial Value of Assets ($ in millions)

1. Market Value of Assets as of June 30, 2011	$1,726
2. Contributions and Benefits for FYE June 30, 2012	(49)
3. Expected Return	136
4. Expected Market Value of Assets (1) + (2) + (3)	$1,813
5. Actual Market Value of Assets on June 30, 2012	**1,654**
6. Excess/(Shortfall) for FYE June 30, 2012 (5) – (4)	(159)
Excess/(Shortfall) Returns:	

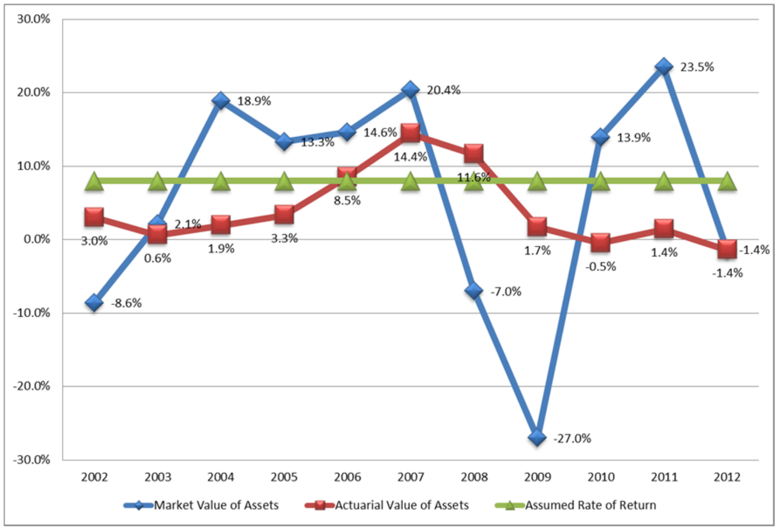
Year	Initial Amount	Deferral %	Unrecognized Amount
2012	($159)	80%	($128)
2011	220	60%	132
2010	74	40%	30
2009	(640)	20%	(128)
2008	(303)	0%	0
7. Total			**($94)**
8. Actuarial Value of Assets as of June 30, 2012 (5) - (7)			**$1,748**
9. Actuarial Value of Assets as a % of Market Value of Assets			106%

Market and Actuarial Values of Assets

$ Millions



Asset Returns



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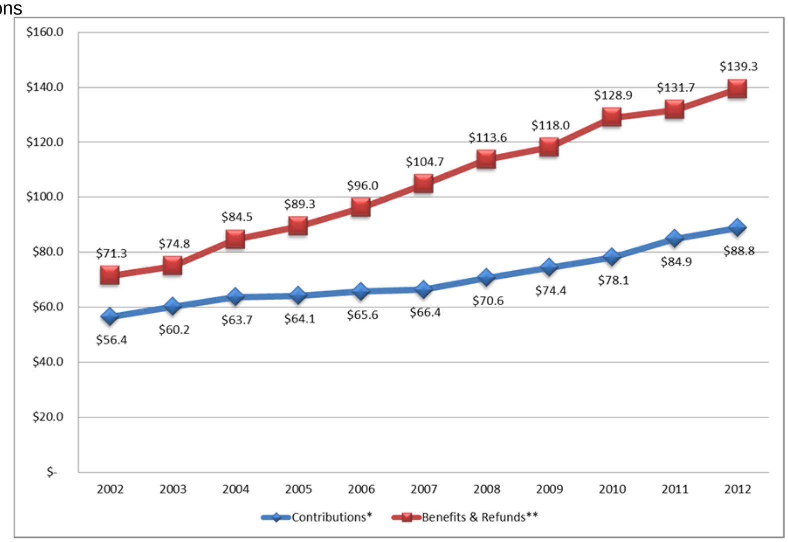
Contributions vs. Benefits and Refunds

$ Millions



* Includes member and employer contributions, and service purchases

** Includes administrative expenses

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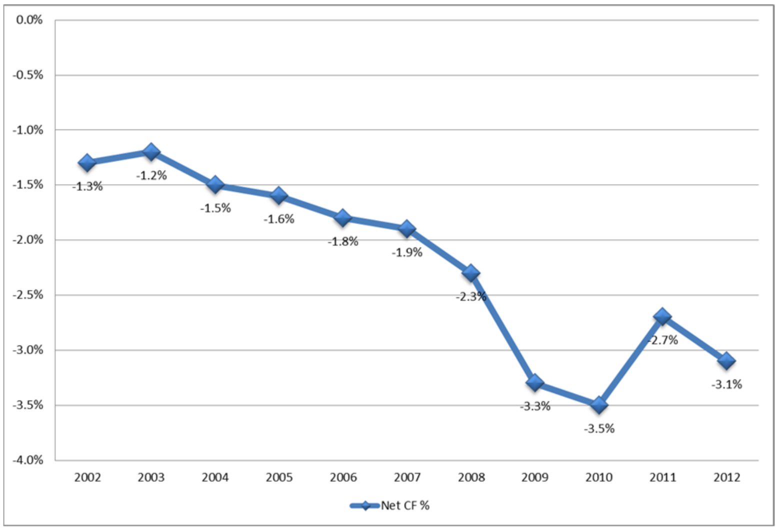
Net Cash Flow as a % of Market Value



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Valuation Results ($ in millions)

	July 1, 2012	July 1, 2011
Actuarial Accrued Liability:		
• Active Members	$1,373	$1,352
• Inactive Members	70	66
• Retirees and Beneficiaries	1,429	1,332
Total	**$2,872**	**$2,750**
Actuarial Assets	1,748	1,823
Unfunded Accrued Liability	$1,124	$ 927
Funded Ratio	60.9%	66.3%

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Annual Required Contribution

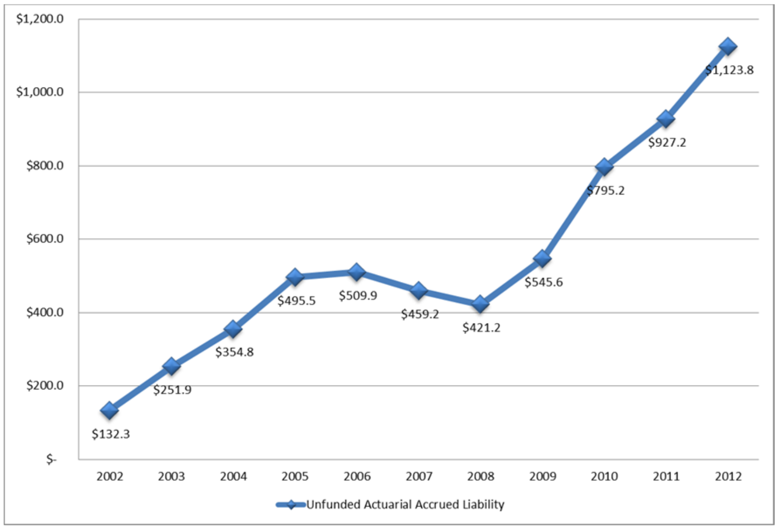
	July 1, 2012	July 1, 2011
Normal Cost Rate	9.83%	9.80%
Member Rate	9.75%	7.75%
Employer Normal Cost Rate	0.08%	2.05%
Adjusted for Timing	0.08%	2.12%
Amortization of UAAL	12.94%	11.04%
Annual Required Contribution	13.02%	13.16%
Employer Rate	10.75%	8.75%
Contribution Sufficiency/(Deficiency)	(2.27%)	(4.41%)

Valuation Results - Comments

- The actuarial accrued liability increased from $2.750 billion (as of June 30, 2011) to $2.872 billion (as of June 30, 2012)
- The unfunded actuarial accrued liability (UAAL) increased from $927 million to $1,124 million
  - UAAL is 222% of active payroll supplied by System
- The funded ratio on an AVA basis decreased from 66% to 61%
  - On a market value basis, the funded ratio decreased from 63% to 58%
- The Annual Required Contribution (ARC) decreased from 13.16% of payroll to 13.02% of payroll
  - Compared to 10.75% employer contribution, results in a contribution shortfall of 2.27%
  - The funding period based on the 10.75% statutory rate is 51 years
  - Reflecting the additional 4% increase in total contribution rate would result in a funding period of 23 years

Unfunded Actuarial Accrued Liability

$ Millions



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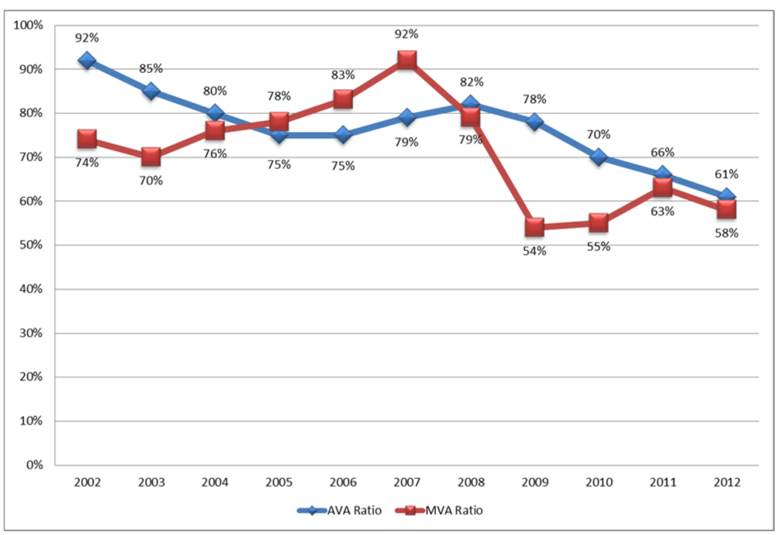
Funded Ratios



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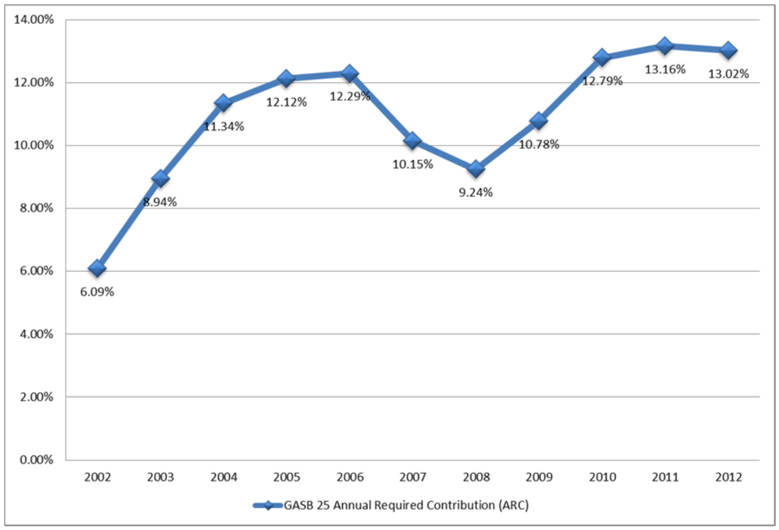
GASB 25 Annual Required Contribution (ARC)



Since 2005, the calculation of the ARC is based on 30-year level percentage of payroll amortization.

Prior to 2005, the ARC calculation was based on a 20-year amortization period.

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Projections

- Projections of estimated funded ratios for 30 years
  - Based on FY13 investment return scenarios ranging from -24% to +24%
  - Assumes Fund earns 8% per year in FY14 and each year thereafter
  - Additional projections assuming Fund earns 7% or 9% per year every year
  - All other experience is assumed to emerge as expected
- Includes contribution rate increases from HB 1134
  - Member rate is 9.75% for FY13 and FY14 and increases to 11.75% for FY15 and thereafter
  - Employer rate is 10.75% for FY13 and FY14 and increases to 12.75% for FY15 and thereafter
  - Increases “sunset” back to 7.75% once the funded ratio reaches 90% (based on actuarial assets)

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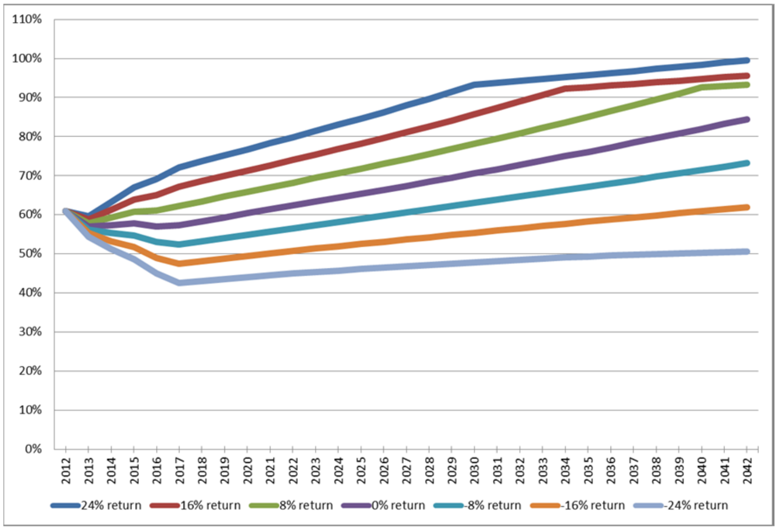
Projected Funded Ratios (AVA Basis)



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Projected Funded Ratios (AVA Basis)

Valuation Year	24% for FY2013	16% for FY2013	8% for FY2013	0% for FY2013	-8% for FY2013	-16% for FY2013	-24% for FY2013
2012	61%	61%	61%	61%	61%	61%	61%
2013	60%	59%	58%	57%	56%	55%	54%
2014	63%	61%	59%	57%	55%	53%	51%
2015	67%	64%	61%	58%	55%	52%	49%
2016	69%	65%	61%	57%	53%	49%	45%
2017	72%	67%	62%	57%	52%	47%	42%
2022	80%	74%	68%	62%	57%	51%	45%
2027	88%	81%	74%	67%	61%	54%	47%
2032	94%	89%	81%	73%	65%	57%	49%
2037	97%	94%	88%	78%	69%	59%	50%
2042	100%	96%	93%	84%	73%	62%	51%

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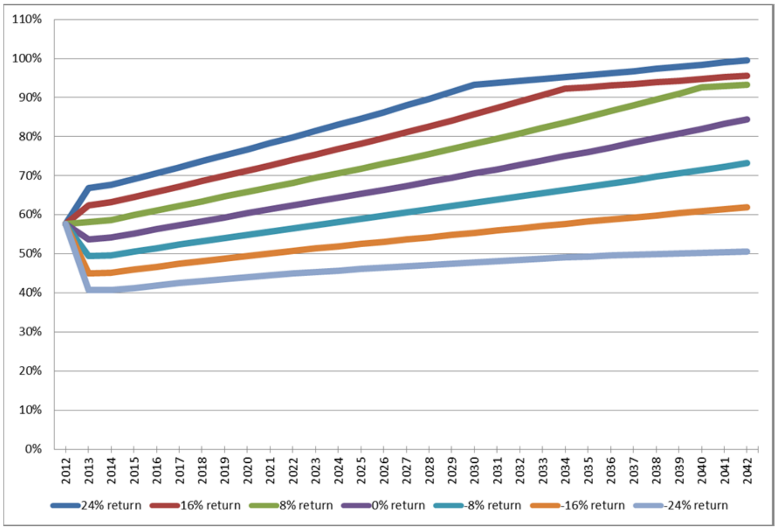
Projected Funded Ratios (MVA Basis)



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Projected Funded Ratios (MVA Basis)

Valuation Year	24% for FY2013	16% for FY2013	8% for FY2013	0% for FY2013	-8% for FY2013	-16% for FY2013	-24% for FY2013
2012	58%	58%	58%	58%	58%	58%	58%
2013	67%	63%	58%	54%	49%	45%	41%
2014	68%	63%	59%	54%	50%	45%	41%
2015	69%	65%	60%	55%	51%	46%	41%
2016	71%	66%	61%	56%	52%	47%	42%
2017	72%	67%	62%	57%	52%	47%	42%
2022	80%	74%	68%	62%	57%	51%	45%
2027	88%	81%	74%	67%	61%	54%	47%
2032	94%	89%	81%	73%	65%	57%	49%
2037	97%	94%	88%	78%	69%	59%	50%
2042	100%	96%	93%	84%	73%	62%	51%

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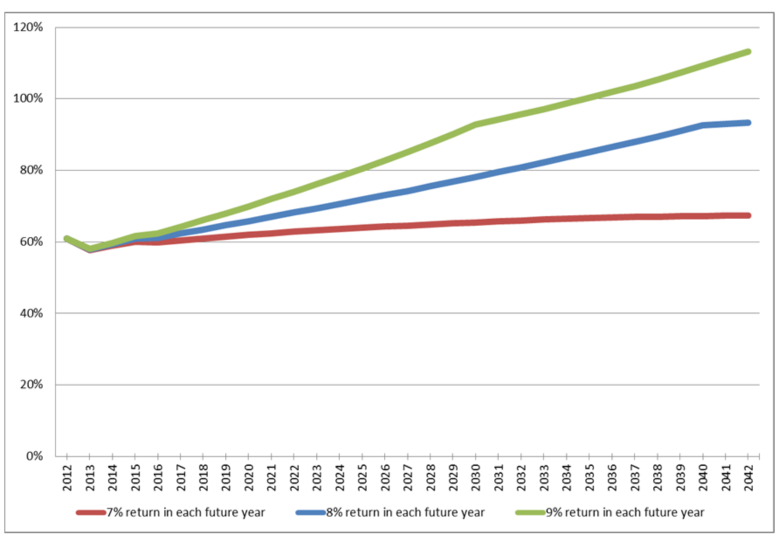
Projected Margin (AVA Basis)

Valuation Year	24% for FY2013	16% for FY2013	8% for FY2013	0% for FY2013	-8% for FY2013	-16% for FY2013	-24% for FY2013
2012	-2.27%	-2.27%	-2.27%	-2.27%	-2.27%	-2.27%	-2.27%
2013	-0.94%	-1.24%	-1.53%	-1.82%	-2.11%	-2.41%	-2.70%
2014	2.12%	1.44%	0.76%	0.08%	-0.60%	-1.28%	-1.96%
2015	3.16%	2.10%	1.05%	-0.01%	-1.06%	-2.11%	-3.17%
2016	3.72%	2.31%	0.90%	-0.52%	-1.93%	-3.34%	-4.75%
2017	4.61%	2.85%	1.09%	-0.66%	-2.42%	-4.18%	-5.94%
2022	6.67%	4.48%	2.28%	0.08%	-2.12%	-4.31%	-6.51%
2027	9.41%	6.71%	4.00%	1.29%	-1.41%	-4.12%	-6.82%
2032	2.53%	9.50%	6.16%	2.83%	-0.50%	-3.84%	-7.17%
2037	3.40%	1.97%	8.73%	4.58%	0.42%	-3.73%	-7.89%
2042	4.49%	2.70%	1.62%	6.73%	1.54%	-3.65%	-8.84%

Projected Funded Ratios (AVA Basis) Actual Returns +1% or -1% of Assumed



New GASB Requirements and Moody's Proposed Adjustments

- GASB 67 provides for accounting with respect to Plan (replaces GASB 25)
  - Effective for fiscal year July 1, 2013 to June 30, 2014
- GASB 68 provides for financial reporting by employers (replaces GASB 27)
  - Effective for fiscal year July 1, 2014 to June 30, 2015
- Net Pension Liability reported on the employer's balance sheet and in Plan's notes to the financial statements
- Annual pension expense (for employers) is essentially equal to change in Total Pension Liability during the year, with deferrals of certain items
- Moody's issued Request for Comment on its proposal to implement four adjustments to pension liabilities and cost information – Moody's will use this information to prepare bond ratings
  - 5.5% discount rate
  - Market value of assets
  - Proxy for contribution based on 17 year amortization
  - Moody's intends to publish the results of its adjustments for all plans

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Questions?

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