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Kentucky Teachers' Retirement System Funding Working Group

“Actuarial Session #1”

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What Impacts Contribution Rates?



- Just about everything that happens to the System or its members
 - System assets
 - Return on Market Value of Assets
 - Deferred experience in smoothing method
 - Contributions to System (shortfall and lag)

 - System Liabilities
 - All demographic experience
 - ✓ Salaries
 - ✓ Retirement
 - ✓ Death
 - ✓ Termination
 - ✓ Disability
 - Changes in actuarial assumptions
 - Changes in actuarial methods



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Actuarial 101



Key Concept: Present Value



- Actuarial calculations typically involve determining a “present value”
- Present value: equivalent value, in today’s dollars, of a stream of future payments
- In other words, how much money would you need today (based on your assumptions) to make the expected payments in the future?
 - Time value of money is dependent on the assumed investment return/interest rate
 - Inverse relationship: Higher interest rate = lower present value
 - Expected payments involve probability of certain events occurring



Present Value



Example: You owe \$1,000 to 100 people one year from now. Each person is 70 years old. You expect an 8% return and the chance each person will be alive in one year is 98%. What is the present value of the debt?

$$100 \times \frac{\$1,000}{1.08} \times 98\% = \$90,741$$

Observation: Under what circumstances will you have exactly enough money to pay the debt?



Application to Pensions

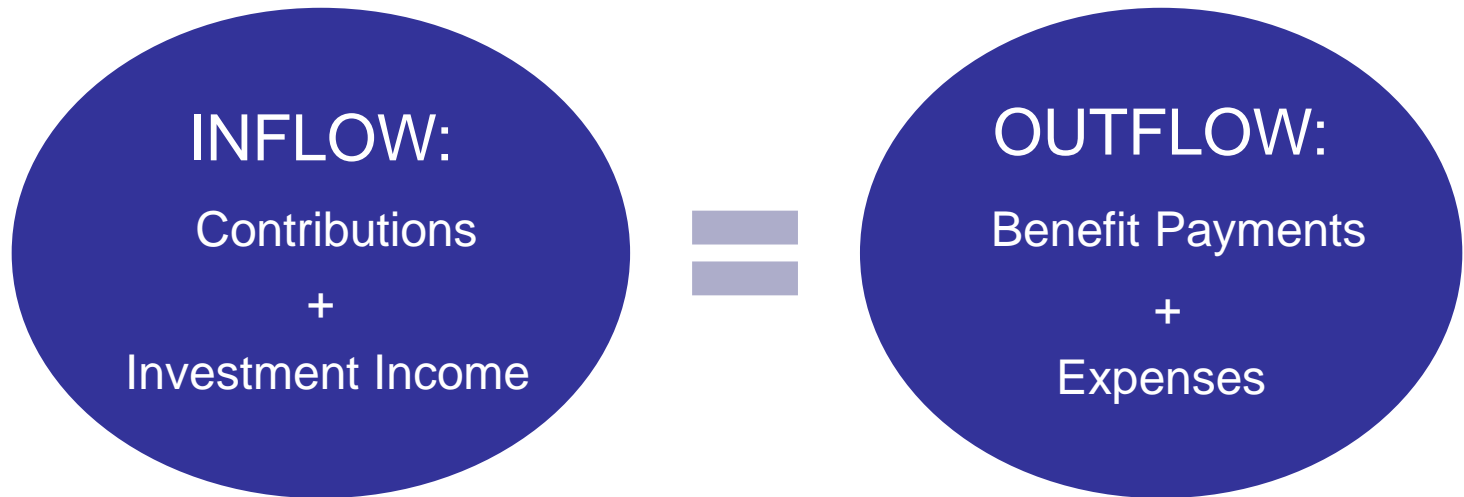


Events to Consider in Actuarial Present Value

- Mortality
- Interest Rate
- Retirement
- Withdrawal
- Disability
- Salary Increases
- Cost of Living Adjustments



Funding Equation: $C + I = B + E$



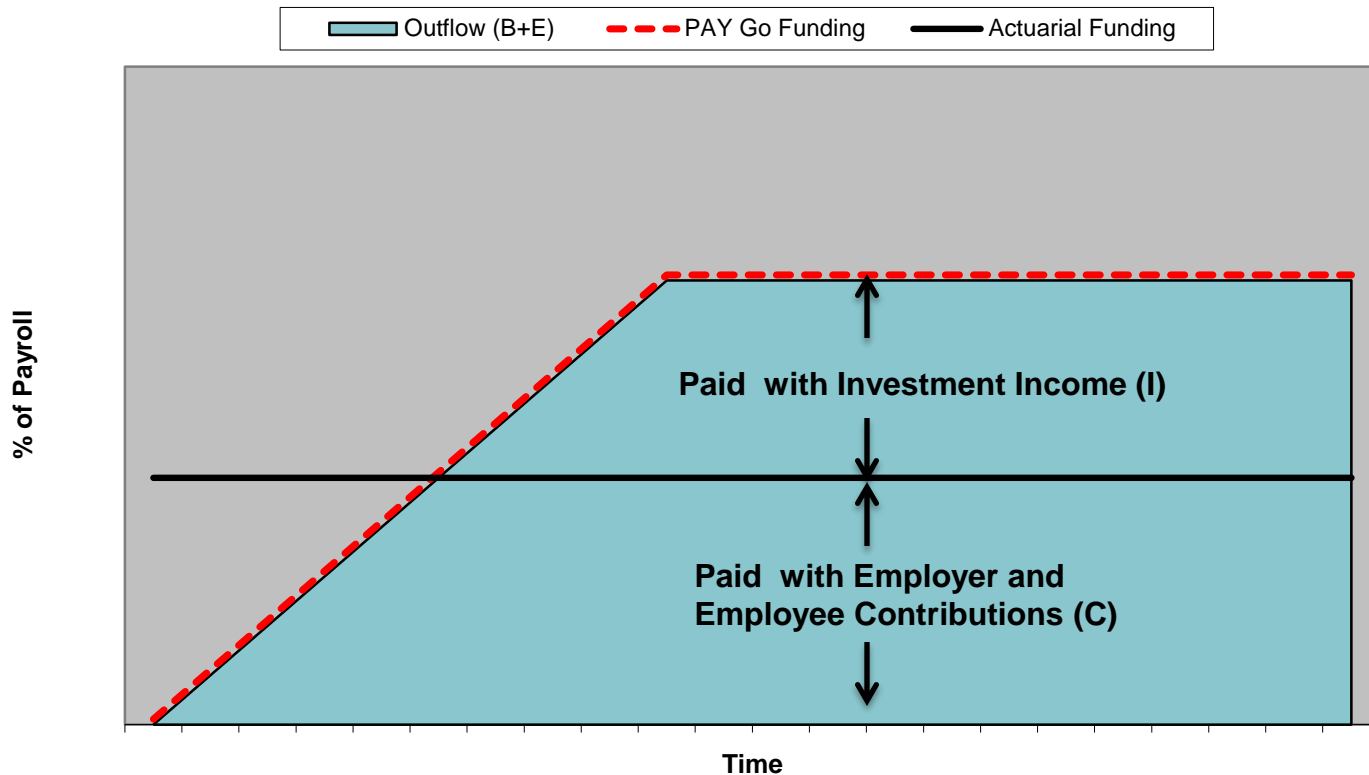
Pay as you go funding accomplishes this in each year

Actuarial funding accomplishes this over the life of the plan



Basic Funding Methods

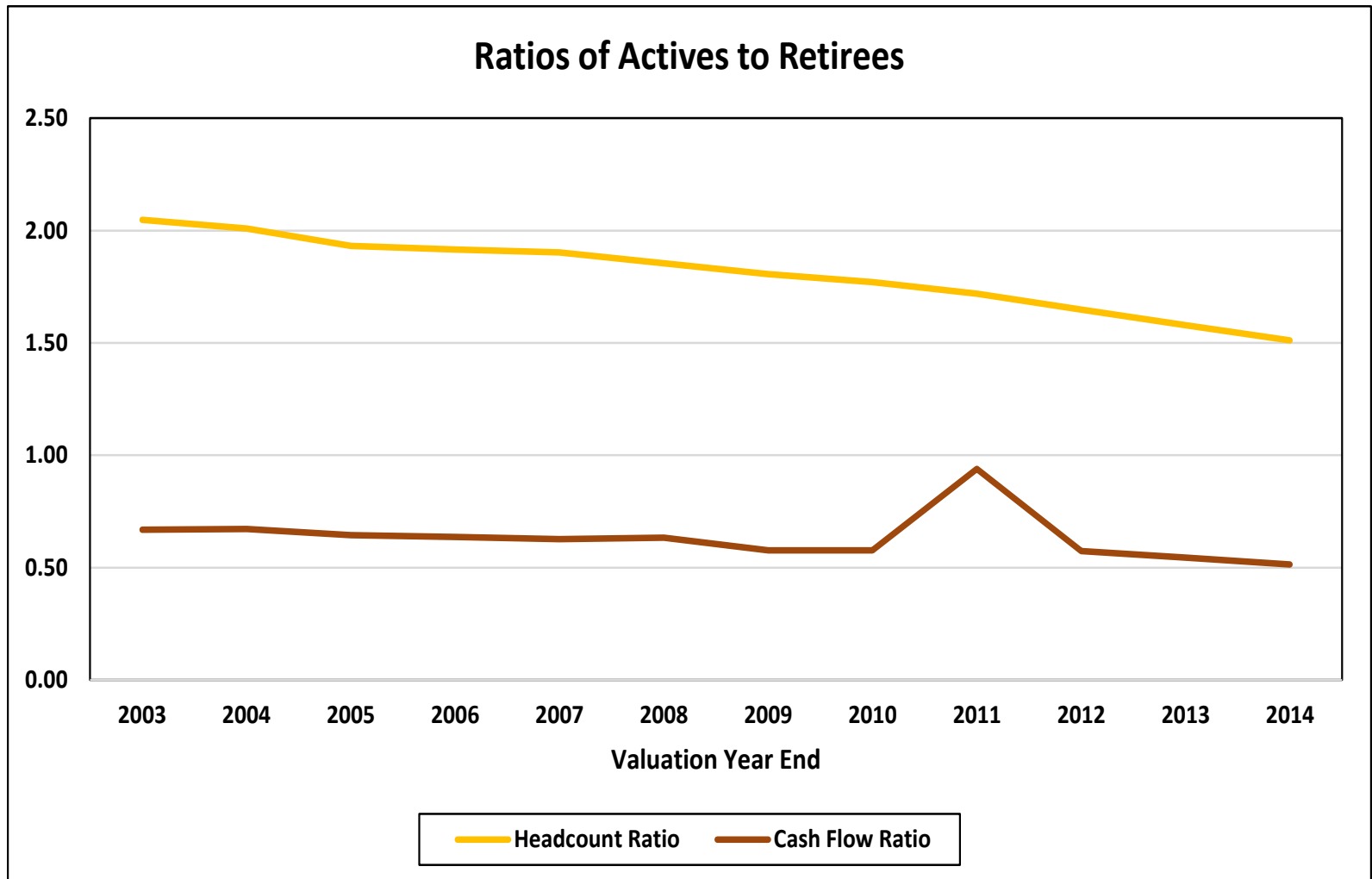
Pay As You Go vs. Actuarial Funding



Under actuarial funding excess contributions in early years are invested, and the investment income is used to pay benefits in later years.



Historical View of KTRS Data





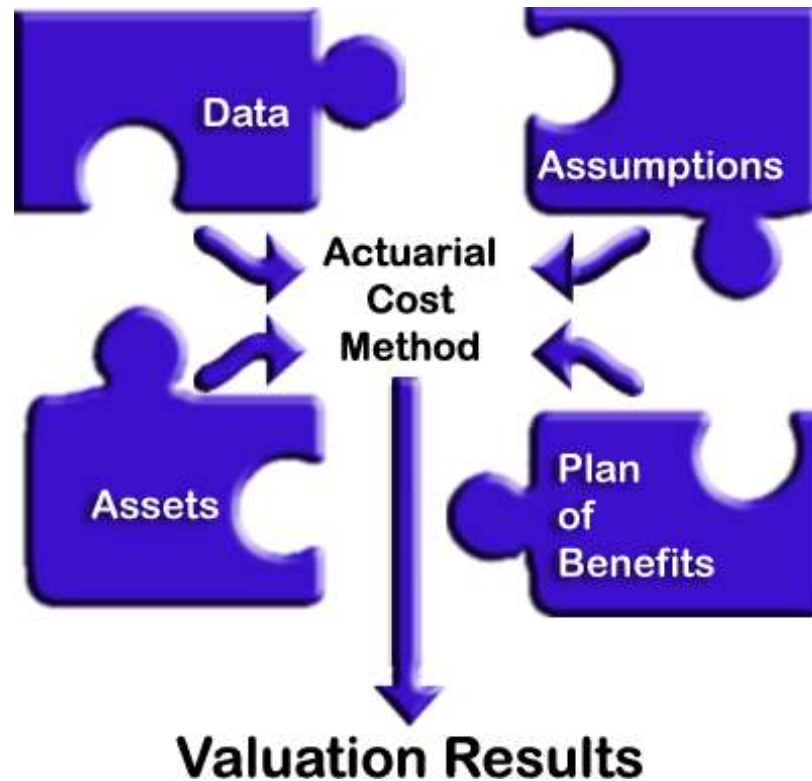
The Actuarial Valuation



- A set of projections and measurements to determine whether the plan is “on track” to becoming fully funded over a specific time period
- Goal is to accumulate assets while members are working which are sufficient to pay the benefits once member retires
- Develops a contribution rate to meet specified funding goals



Key Elements of the Actuarial Valuation





Retirement System Liabilities



- Once we know “who” is or may be entitled to benefit payments from the plan, we need to address:
 - When?
 - How much?
 - How long?

- The promise to pay benefits in the future constitutes the system “liabilities”



Normal Cost



- The normal cost generally represents the portion of the cost of projected benefits for actives allocated to the current plan year.
- Pension costs are paid over the life of an employee's career. With investment, the assets should pay for a lifetime annuity.
- Normal cost usually is a percent of payroll.



Actuarial Liability



- Portion of Total Liability (Present Value of Future Benefits) allocated by the cost method to Years of Service already worked
- Amount that would have accumulated today from prior normal cost payments if all assumptions had been met in the past
- “Funding Target” based on actuarial cost method
- NOT the value of benefits actually earned – includes component of future service and salary



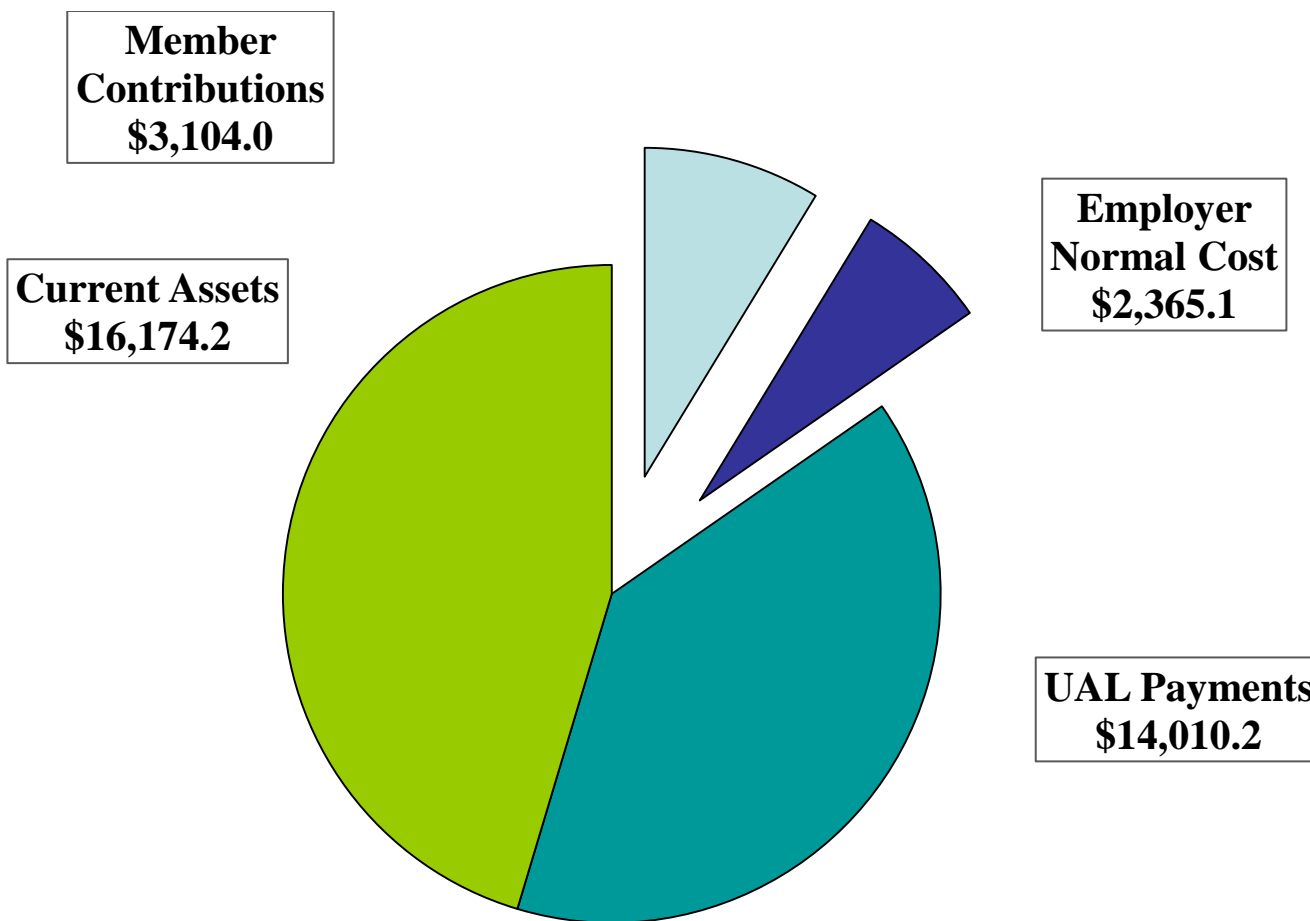
Unfunded Actuarial Liability

- Unfunded actuarial liability (UAL) = Actuarial Liability less Actuarial Assets
- The existence of an UAL does not automatically mean the system is “underfunded”
- Long term debt
 - Key question is affordability of payments to eliminate it
- Must be financed in addition to the ongoing cost for actives (normal cost) in order to reach fully funded status



Financing of Retirement Benefit Promises

(\$ millions)



Actuarial Liability: \$30,184.4
Present Value of Future Normal Cost: \$5,469.1



Allocation of Contribution Rate Non-University



<u>Val</u> <u>Year</u>	Total Rate - Pension *			<u>Member</u> <u>Rate *</u>	<u>Total</u> <u>Employer</u> <u>Rate *</u>
	<u>Normal</u>	<u>UAL**</u>	<u>Total</u>		
2010	17.21	16.16[†]	33.37[†]	9.105	24.265[†]
2011	15.05	18.90[†]	33.95[†]	9.105	24.845[†]
2012	15.15	20.70[†]	35.85[†]	9.105	26.745[†]
2013	15.81	22.49[†]	38.30[†]	9.105	29.195[†]
2014	16.72	22.21[†]	38.93[†]	9.105	29.825[†]

* Excludes Life and Medical

** Assumes 30 year amortization period for payment of UAL

† Less 1% for Members Hired Before July 1, 2008

****Non-University Statutory Rates for Pension is 12.325%****



Schedule of Employer Contributions



<u>Fiscal Year</u> <u>Ending</u>	<u>Annual Required</u> <u>Contributions</u>	<u>Actual Employer</u> <u>Contributions</u>	<u>Percentage</u> <u>Contributed</u>
2009	\$600,282,735	\$442,549,935	74%
2010	633,938,088	479,805,088	76
2011	678,741,428	1,037,935,993*	153
2012	757,822,190	557,339,552	74
2013	802,984,644	568,233,446	71
2014	823,446,156	563,326,249	68

***Includes Pension Obligation Bond proceeds of \$465,384,165**



State Required Increase Contribution Rates



<u>Valuation Date</u>	<u>Fiscal Year</u>	<u>Increase</u>	<u>Cumulative Increase</u>	<u>In Dollars</u>
6/30/2004	6/30/2007	0.11%	0.11%	\$ 3,174,600
6/30/2005	6/30/2008	1.21	1.32	38,965,900
6/30/2006	6/30/2009	0.56	1.88	60,499,800
6/30/2007	6/30/2010	0.58	2.46	82,331,200
6/30/2008	6/30/2011	1.13	3.59	121,457,000
6/30/2009	6/30/2012	2.22	5.81	208,649,000
6/30/2010	6/30/2013	1.46	7.27	260,980,000
6/30/2011	6/30/2014	0.75	8.02	299,420,000
6/30/2012	6/30/2015	2.40	10.42	386,400,000
6/30/2013	6/30/2016	2.55	12.97	487,400,000
6/30/2014	6/30/2017	0.83	13.80	520,372,000



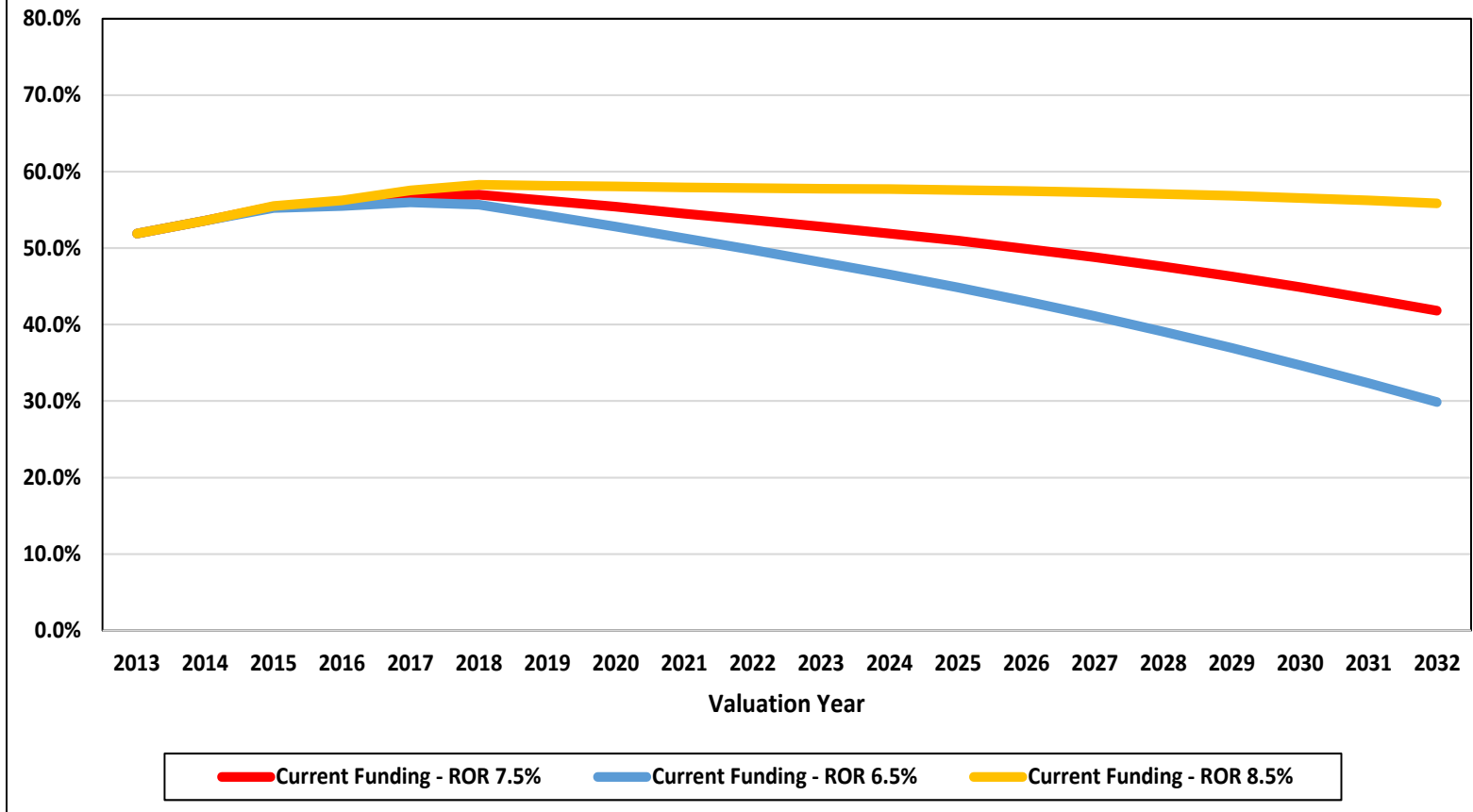
Asset/Liability Results



Current Funding Statutory Contributions Only



Projection of Funding Ratio under Various Investment Return Scenarios





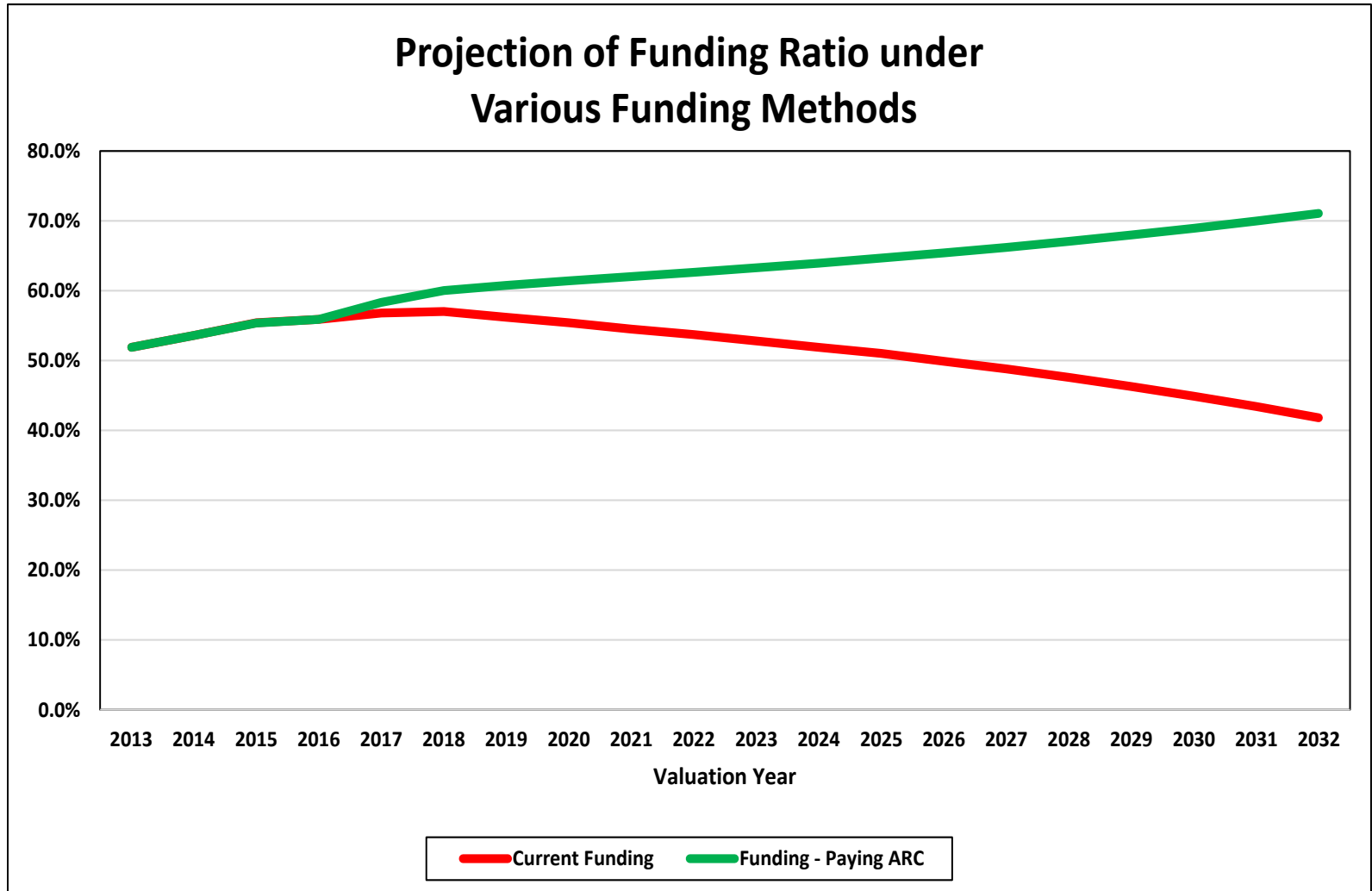
KTRS Funding Policy



- New Policy adopted by Board in 2014
- Closes amortization period for “Legacy UAL” beginning June 30, 2014 at 30 years
- All new sources of UAL will be amortized over a closed 20 year period
 - Benefit changes
 - Assumption and Method Changes
 - Experience Gains and Losses
- Goal of policy is to reach 100% by 2044



Funding – ARC vs. Statutory





Pension Obligation Bonds



What is a Pension Obligation Bond?



- Bond issued by pension plan sponsor.
- Proceeds contributed to the pension plan.
- Considered an interest rate arbitrage by IRS so interest payments to investors are taxable.
- Generally exchanging a variable rate obligation (unfunded accrued liability or a portion thereof) for a fixed rate obligation (POB).



House Bill 4



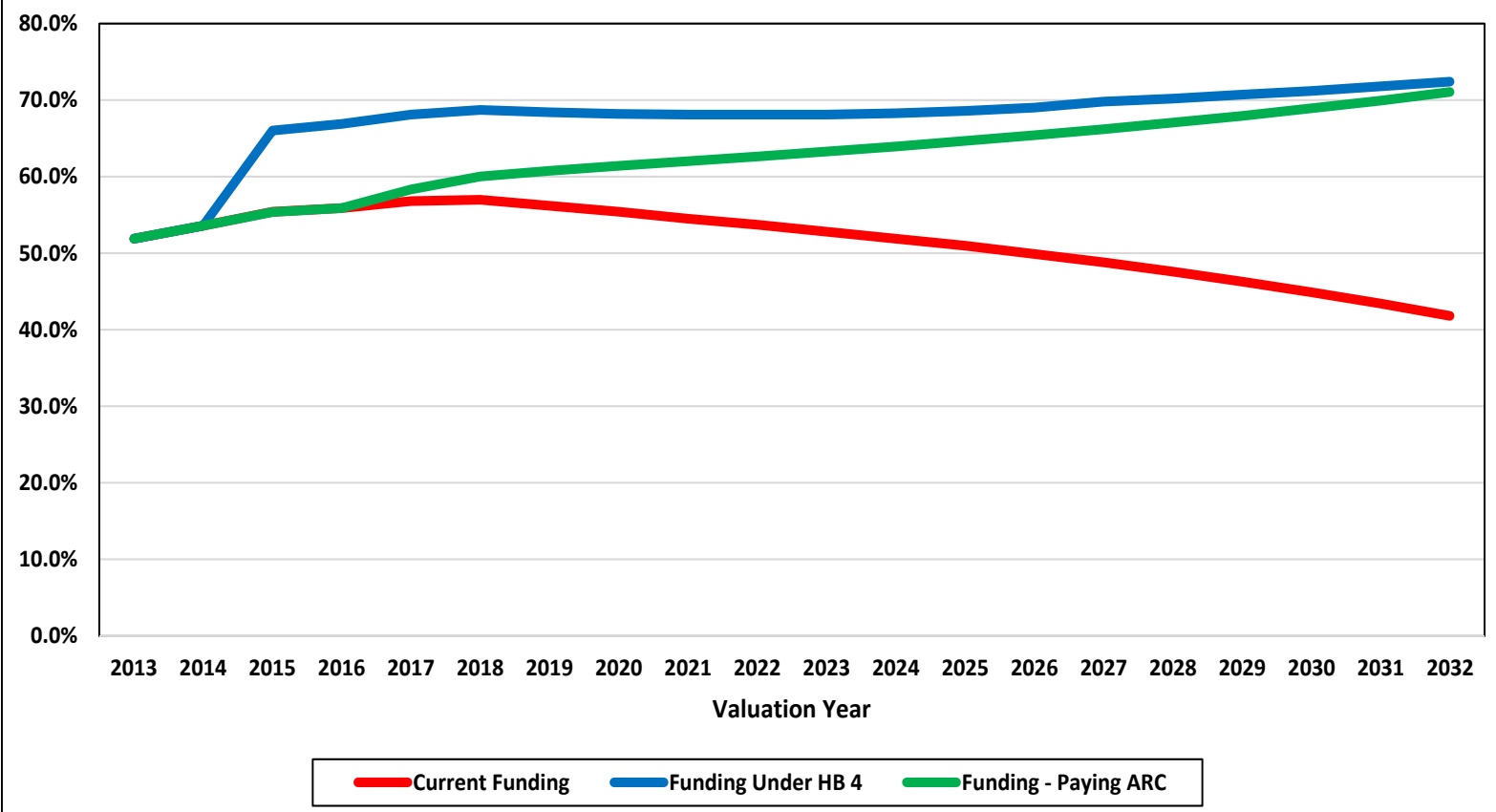
- Introduced this past legislation period.
- Basically would have provided funding notes in an amount not to exceed \$3.3 Billion in fiscal year 2015-2016 to finance pension obligations.
- Also would have required State to pay additional contributions needed to fund KTRS pension on actuarially sound basis by phasing into full contribution rates over a 7 year period beginning 2016-2017 fiscal year.



House Bill 4



Projection of Funding Ratio under Various Funding Methods





House Bill 4



Projection of Contributions under Various Funding Methods

