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**Presentation of December 31, 2010  
Valuation Results to KPER Study Commission  
July 22, 2011**

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# Basic Retirement Funding Equation



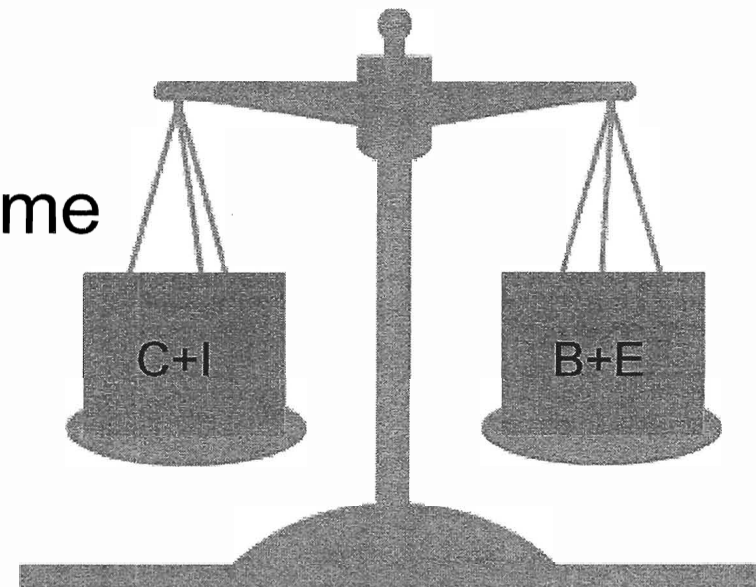
$$C + I = B + E$$

C = contributions

I = investment income

B = benefits paid

E = expenses



$$C + I = B + E$$

B depends on

- Plan Provisions
- Experience

C depends on

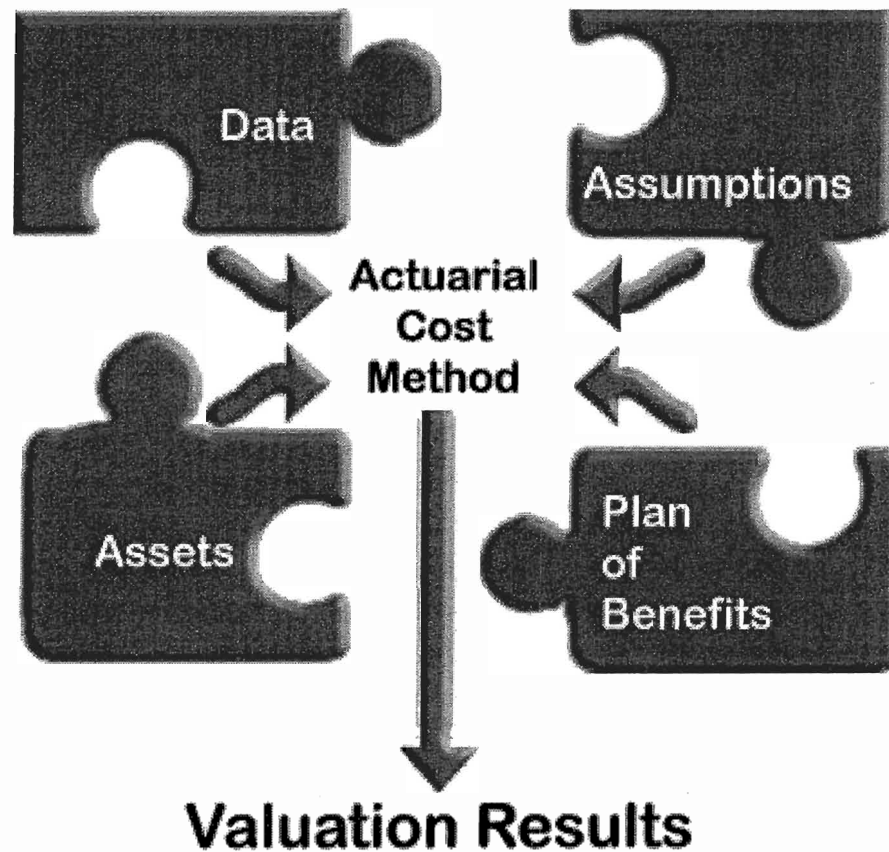
- Short Term: Actuarial Assumptions  
Actuarial Cost Method
- Long Term: I, B, E



It is a measurement at a point in time - the valuation date - of the cash flows that have occurred, to date, versus those that are expected to occur in the future.

Valuation process is self correcting in that actual experience is captured every time a new valuation is performed.

# Where Does the Actuary Get These Numbers?

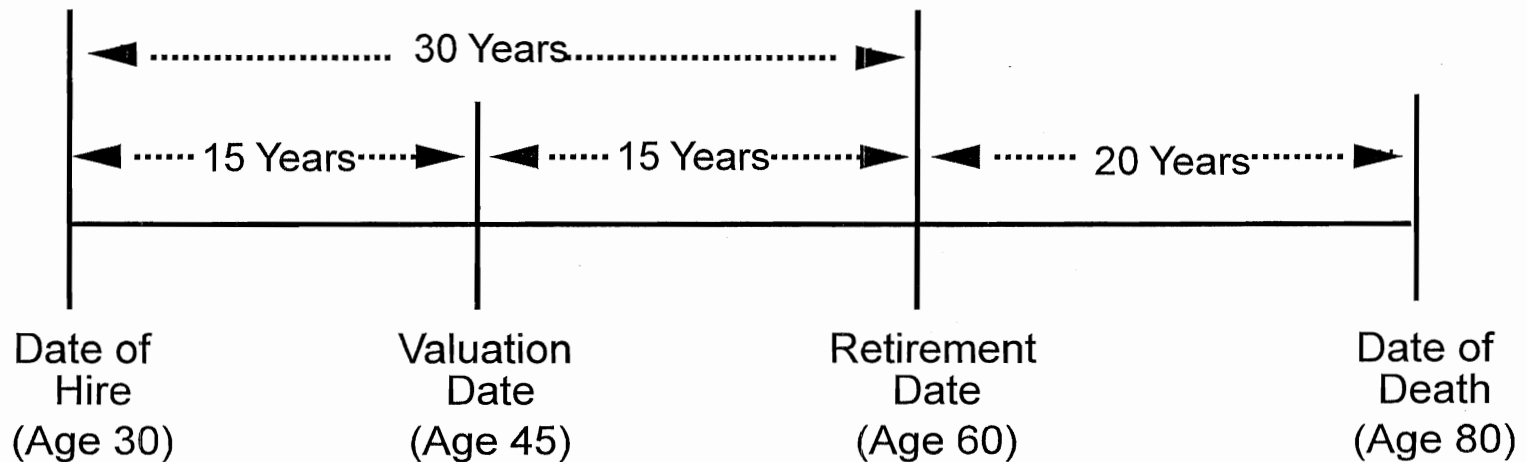


**KNOWN at valuation date:**

1. age
2. salary
3. gender
4. service to date
5. membership group

**ASSUMED at valuation date:**

1. future salary increases
2. retirement date(s)
3. death rates before and after retirement
4. disability rates
5. other termination rates



**KNOWN at valuation date:**

1. Market value of Investment Fund
2. Composition of Investment Fund
  - Stocks
  - Bonds
  - Alternatives
  - Real Estate
  - International
3. Value of \$1

**ASSUMED at valuation date:**

1. Future rates of investment return
2. Future rates of inflation (Future value of \$1)

- Budgeting tool to fund benefits
- Allocates the financing of benefits to periods before and after the valuation date.
- Costs are not usually identical to the benefits earned in that year
- Different methods, but KPERS uses most common method, Entry Age Normal.
  - Produces stable contribution rates (if assumptions are met and entry age remains same)





## Present Value of Benefits

Present Value of Future Normal Cost

Past Service Cost  
or  
Actuarial Liability

Future Normal Cost

Annual Normal Cost

Date of Hire

Valuation  
Date (VD)

Date of  
Retirement

$$\text{Actuarial Liability} - \text{Actuarial Assets} = \text{Unfunded Actuarial Liability}$$

- Unfunded actuarial liability (UAL) is a natural part of retirement system funding.
- The existence of an UAL does not automatically mean the system is underfunded”
- Comparable to a mortgage on a home
- Must be financed in addition to ongoing cost for actives (normal cost)

1. Granting initial benefits or granting benefit increases for service already rendered.
2. Actual experience which is less favorable than assumed:
  - a. Higher salary increases
  - b. Earlier retirement age
  - c. Lower death rates (people living longer)
  - d. Lower rates of investment earnings
  - e. Lower rates of non-death terminations
3. Contributing less than the actuarial rate.
4. Changes in actuarial assumptions/methods.

# Amortization of Unfunded Actuarial Liability



- UAL paid off with a schedule of amortization payments
- KPERS amortization period is a closed 40 year period that started in 1993
  - Ends in 2033
  - 22 years remain with 12/31/10 valuation
- Level % of payroll amortization method – dollar amount of payment increases 4% each year. Covered payroll is expected to increase 4% also.
- Payments are less than interest on the UAL for nearly 25 of the 40 year period so dollar amount of UAL is expected to grow even if all assumptions are met.

- Measurement of Assets and Liabilities
- Best Estimate of Ultimate Costs
  - Project future benefits using actuarial assumptions
  - Calculate present value of future benefits
  - Apply cost method to allocate to periods of service
- Calculate Employer Contribution Rates
  - FY14 for State
  - FY13 for Local
- Disclosures for Financial Report
- Baseline for Legislative Changes

- No change
  - Assumptions
  - Actuarial methods
  - Benefit structure
- Senate Substitute for HB 2194 not reflected in formal results, but impact reported
- Change in actuarial firms resulted in use of different valuation software. Impact quantified on December 31, 2009 valuation.

- Due to investment performance in 2010 (+13%), the System's funded status held steady in the 12/31/10 valuation. The UAL increased \$587 million to \$8.3 billion, and the funded ratio declined slightly to 62%.
- The amount of deferred investment loss from 2008 declined from \$1.7 billion in the 12/31/09 valuation to \$672 million in the 12/31/10 valuation.
- State group is at ARC date for FY2014 at a rate of 9.82%.
- Contribution shortfall exists, but Local and School are in actuarial balance (statutory contribution rate will converge with actuarial rate before 2033).



# Key 12/31/10 Valuation Measurements



Group	Contribution Rates*		Actuarial Funded Status	
	Actuarial Rate	Statutory Rate	Unfunded Actuarial Liability (in Millions)	Funded Ratio
State	9.82%	9.97%**	\$931.6	76%
School	15.12%	9.97%	\$5,312.5	55%
Local	9.43%	7.94%	\$1,395.0	63%
KP&F	17.26%	17.26%	\$598.4	74%
Judges	23.62%	23.62%	\$26.6	83%
System Totals			\$8,264.1	62%

\*Effective for fiscal year beginning in 2013. (FY 2014 for State and School Groups, State KP&F employers, and Judges. CY 2013 for Local Group and Local KP&F employers.)

\*\*The difference between the statutory and actuarial contribution rates is contributed to the School group.



- A key measurement of KPERS' long term funding status and financial health is its funded ratio (actuarial assets divided by actuarial liability).
- A funded ratio of 80% and rising is generally considered to indicate adequate funding.
- A funded ratio of 60% or below can be considered at significant risk and in need of prompt remedial action to stabilize funding.
- At 55% funded, the School group's funded status is the weakest of the three KPERS groups and continues to be the major cause of concern.

- Assets
  
- Liabilities (future benefit payments)
  
- Contribution Rates

## **COST BASIS**

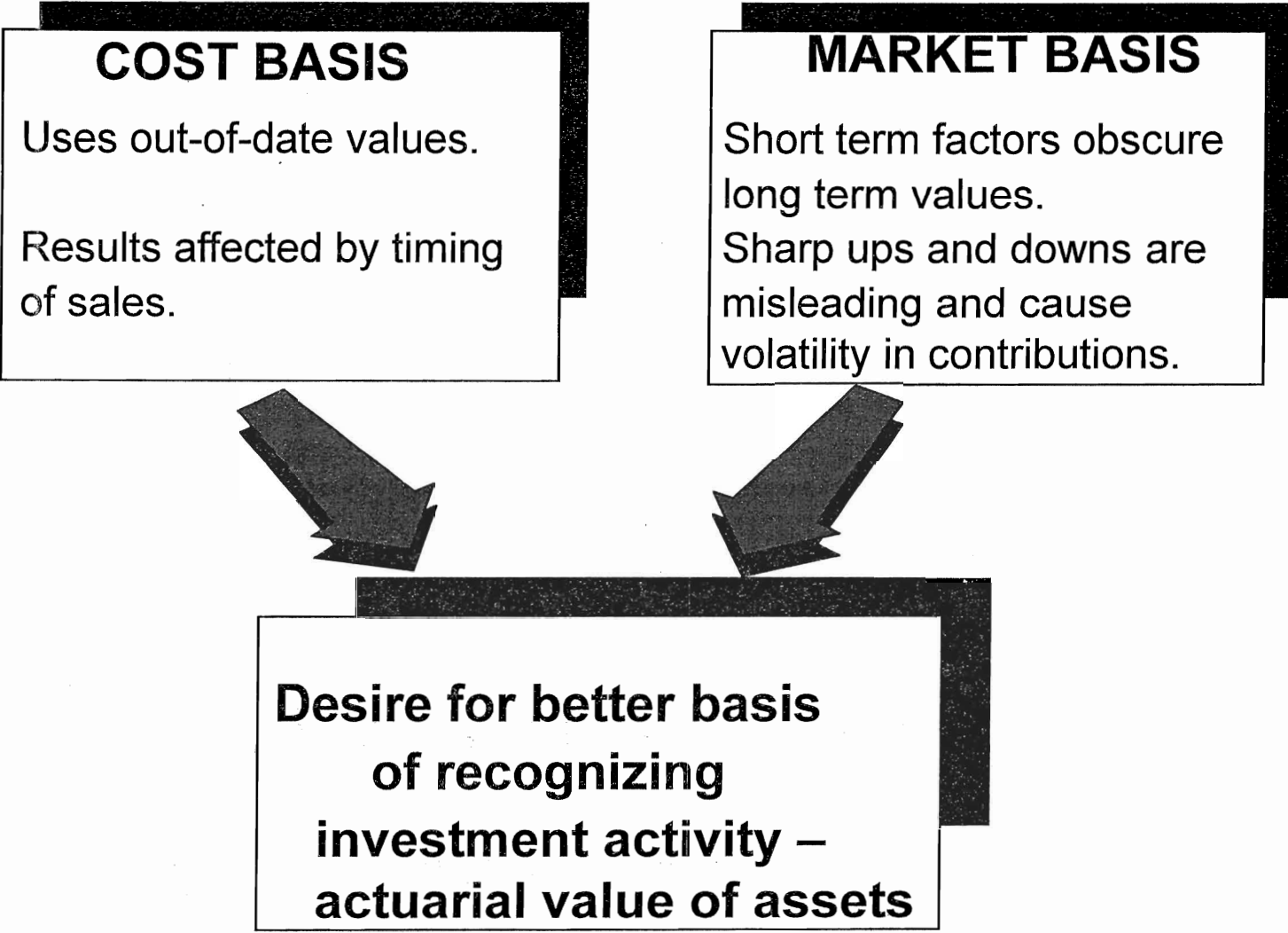
Uses out-of-date values.

Results affected by timing of sales.

## **MARKET BASIS**

Short term factors obscure long term values.

Sharp ups and downs are misleading and cause volatility in contributions.



**Desire for better basis  
of recognizing  
investment activity –  
actuarial value of assets**

- Market value not used directly in valuation
  - All actuarial measurements (UAL, funded ratio, and actuarial contribution rate) use the actuarial value of assets
  
- Gain/loss is measured on difference between actual investment return and expected, based on the 8% assumed rate of return
  - Gain/loss each year is spread evenly over 5 years
  - If expected value is \$8,442M and actual market value is \$8,863M, the gain is \$421M
  - Recognize 20% or \$84M each year



	<u>MVA</u>	<u>AVA</u>
Value at 12/31/09	\$ 11,755	\$ 13,461
▪ Contributions	790	790
▪ Benefit Payments	(1,165)	(1,165)
▪ Investment Income	1,538	504
Value at 12/31/10	\$ 12,918	\$ 13,590
Rate of Return	13%	4%

- Actuarial/Market = 105%
- Deferred experience yet to be recognized
  - \$672M down from \$1.7 billion last year
  - Expect loss on actuarial assets in next two years even if 8% expected return is met
  - Loss will translate to higher UAL and lower funded ratio, absent offsetting favorable experience

- Actuarial Liability less Actuarial Assets
- Impacted by:
  - benefit changes
  - experience gains/losses
  - assumption changes
  - actuarial method changes
  - actual contributions
- Expected to increase:
  - Payment methodology results in increase in UAL
  - Difference in statutory contribution rate and ARC increases UAL each year

	<u>Actuarial Liability(AL)</u>	<u>Actuarial Assets</u>	<u>Unfunded AL*</u>
State	\$ 3,815	\$ 2,883	\$ 932
School	11,774	6,462	5,313
Local	3,794	2,399	1,395
KP&F	2,319	1,721	598
Judges	<u>152</u>	<u>125</u>	<u>27</u>
Total	\$ 21,854*	\$ 13,590*	\$ 8,264*

\* Amounts may not add due to rounding





## Change in Unfunded Actuarial Liability (\$M)



UAL 12/31/09	\$ 7,677
Cap/Timing/Method	388
Experience	
– Investment	560
– Other	(334)
Change in Actuarial Software	(27)
UAL 12/31/10	\$ 8,264

# Funded Ratio (Actuarial Assets/Actuarial Liability)



	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
State	86%	87%	72%	78%	76%
School	61%	63%	52%	56%	55%
Local	69%	70%	59%	64%	63%
KP&F	83%	86%	71%	76%	74%
Judges	87%	89%	75%	82%	83%
Total	69%	71%	59%	64%	62%



# Funded Ratio on Actuarial and Market Value



12/31/05    12/31/06    12/31/07    12/31/08    12/31/09    12/31/10

**Using Actuarial Value of Assets:**

Funded Ratio (AVA/AL)	69%	69%	71%	59%	64%	62%
Unfunded Actuarial Liability (AL-AVA)	\$5,152	\$5,364	\$5,552	\$8,279	\$7,677	\$8,264

**Using Market Value of Assets:**

Funded Ratio (MVA/AL)	72%	76%	75%	49%	56%	59%
Unfunded Actuarial Liability (AL-MVA)	\$4,583	\$4,184	\$4,817	\$10,250	\$9,384	\$8,936

	<u>Total Normal Cost</u>	<u>Member Contribution</u>	<u>Employer Normal Cost</u>	<u>UAL Paymt</u>	<u>Total Contr Rate</u>
State	7.72%	4.16%	3.56%	6.26%	9.82%*
School	8.12%	4.17%	3.95%	11.17%	15.12%
Local	7.68%	4.20%	3.48%	5.95%	9.43%
KP&F	14.39%	6.79%	7.60%	9.66%	17.26%
Judges	20.48%	5.82%	14.66%	8.96%	23.62%



<u>System</u>	<u>Actuarial Rate</u>		<u>Statutory</u>
	<u>12/31/09</u>	<u>12/31/10</u>	<u>12/31/10</u>
State	9.55%	9.82%	9.97%*
School	14.69%	15.12%	9.97%
Local	9.44%	9.43%	7.94%
KP&F	16.54%	17.26%	17.26%
Judges	23.75%	23.62%	23.62%

\* The excess of the statutory over the actuarial contribution rates is contributed to the School group.

- Not precise predictions but general estimates
  - Preliminary model results – final review being performed
  - Final ARC dates/rates may change
  
- Based on many assumptions
  - 8% return on market value from 12/31/10 forward
  - All actuarial assumptions met
  - Current plan provisions
  - Current statutory caps and timing lag
  - New entrant profile



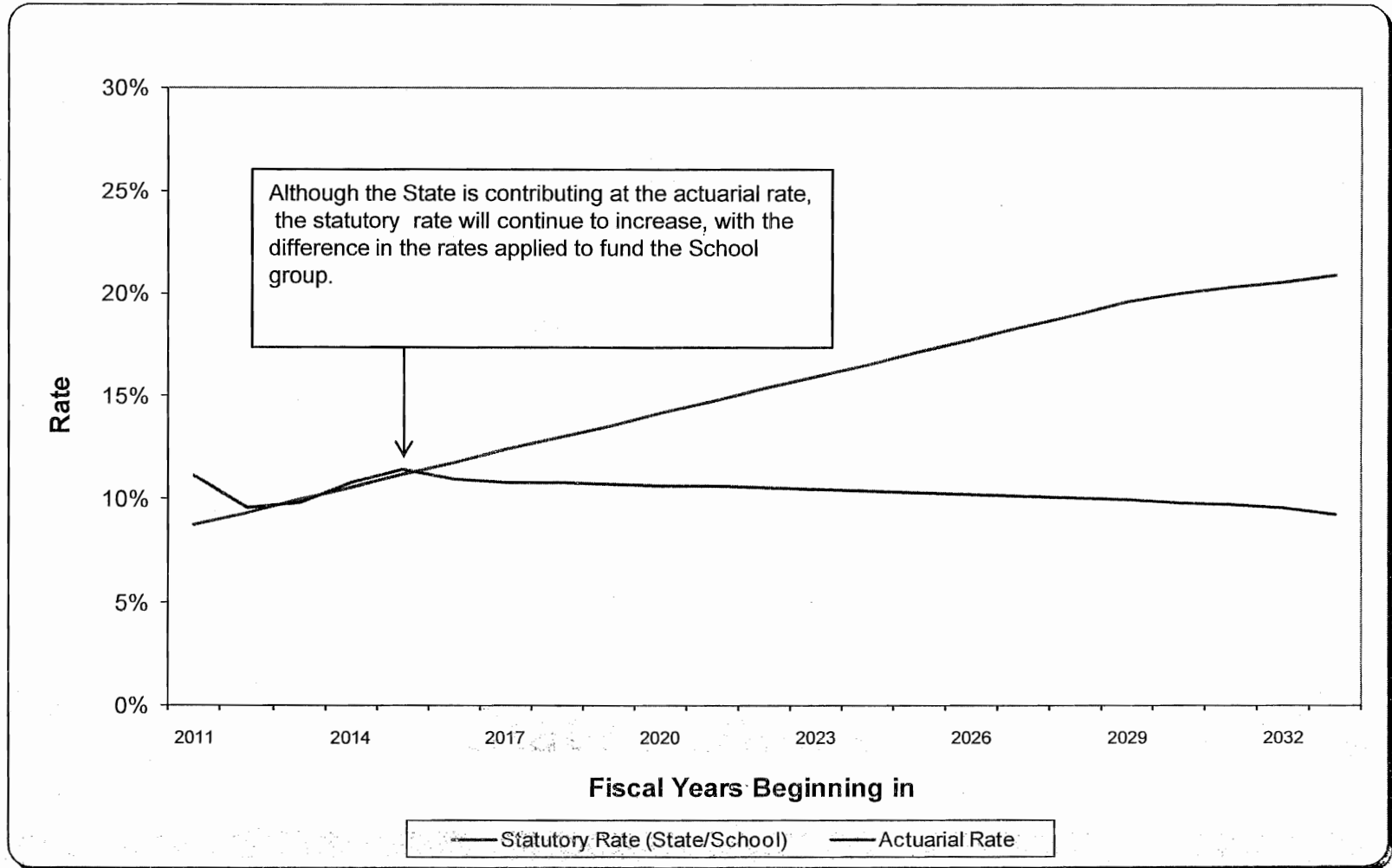
➤ 12/31/10 Valuation

- Funded Ratio: 76%
- Actuarial rate: 9.82%
- Statutory rate: 9.97%

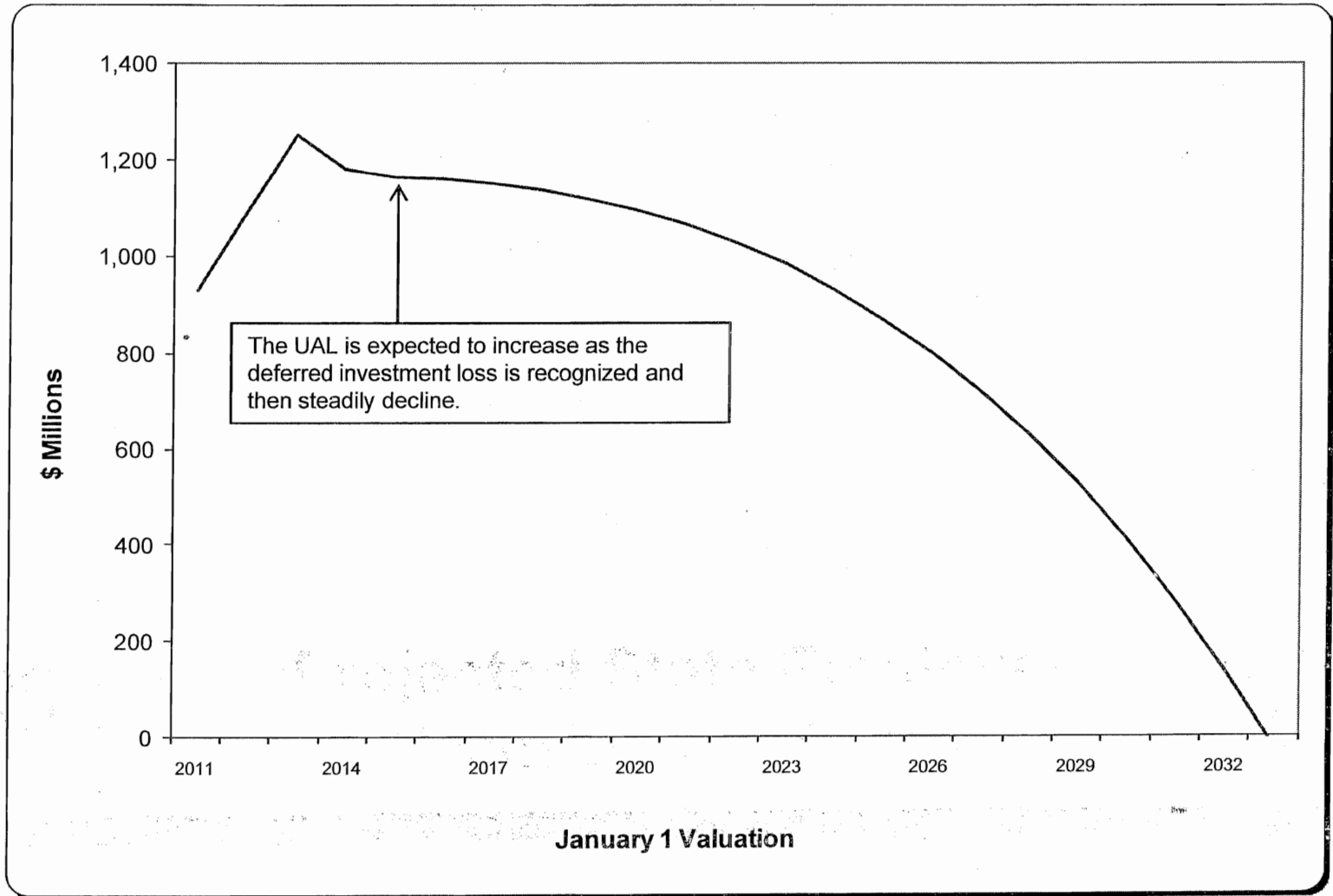
➤ ARC Date/Rate

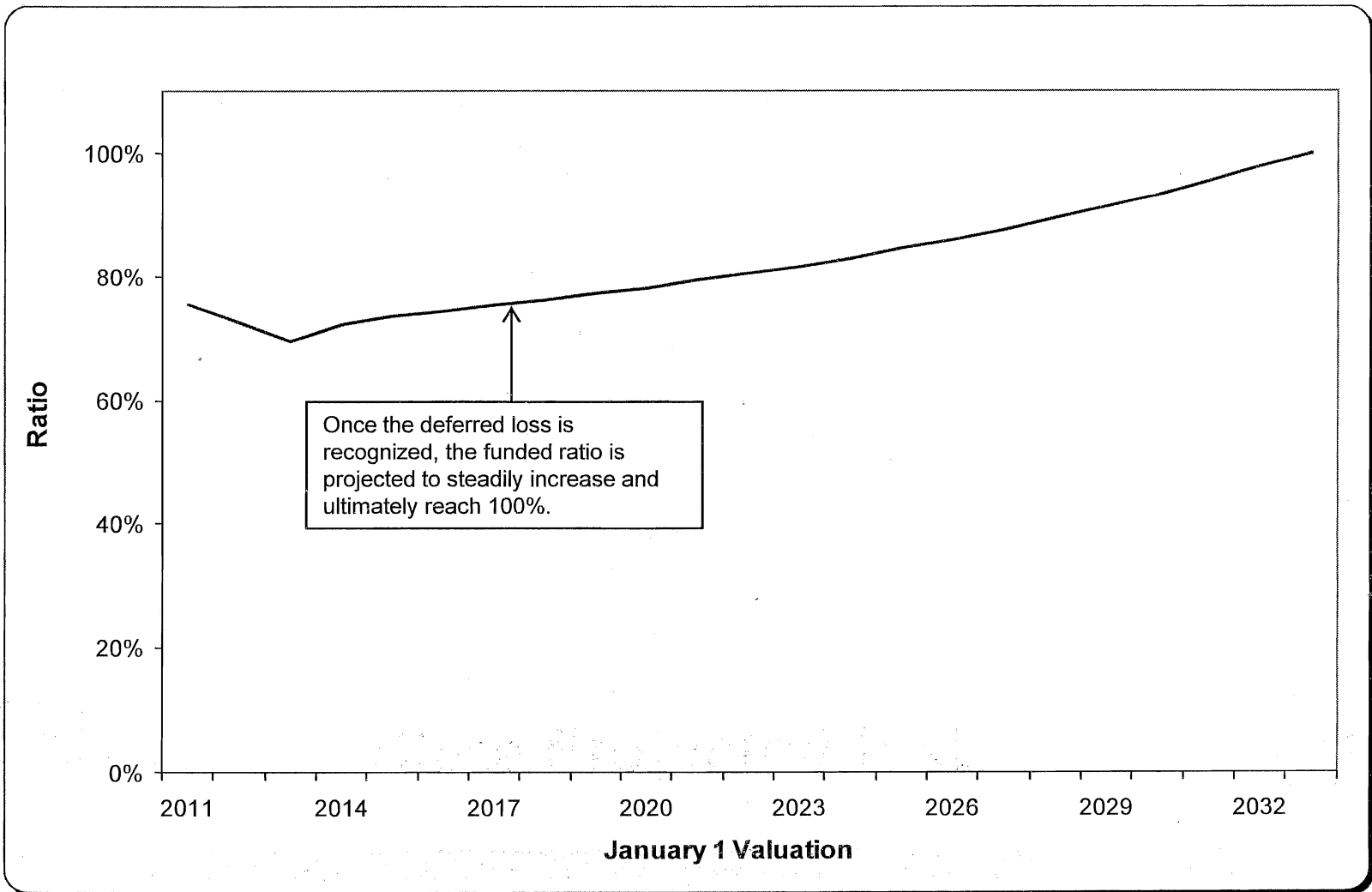
- Date: FY2014
- Rate: 9.82%

# Projected State Employer Contribution Rates









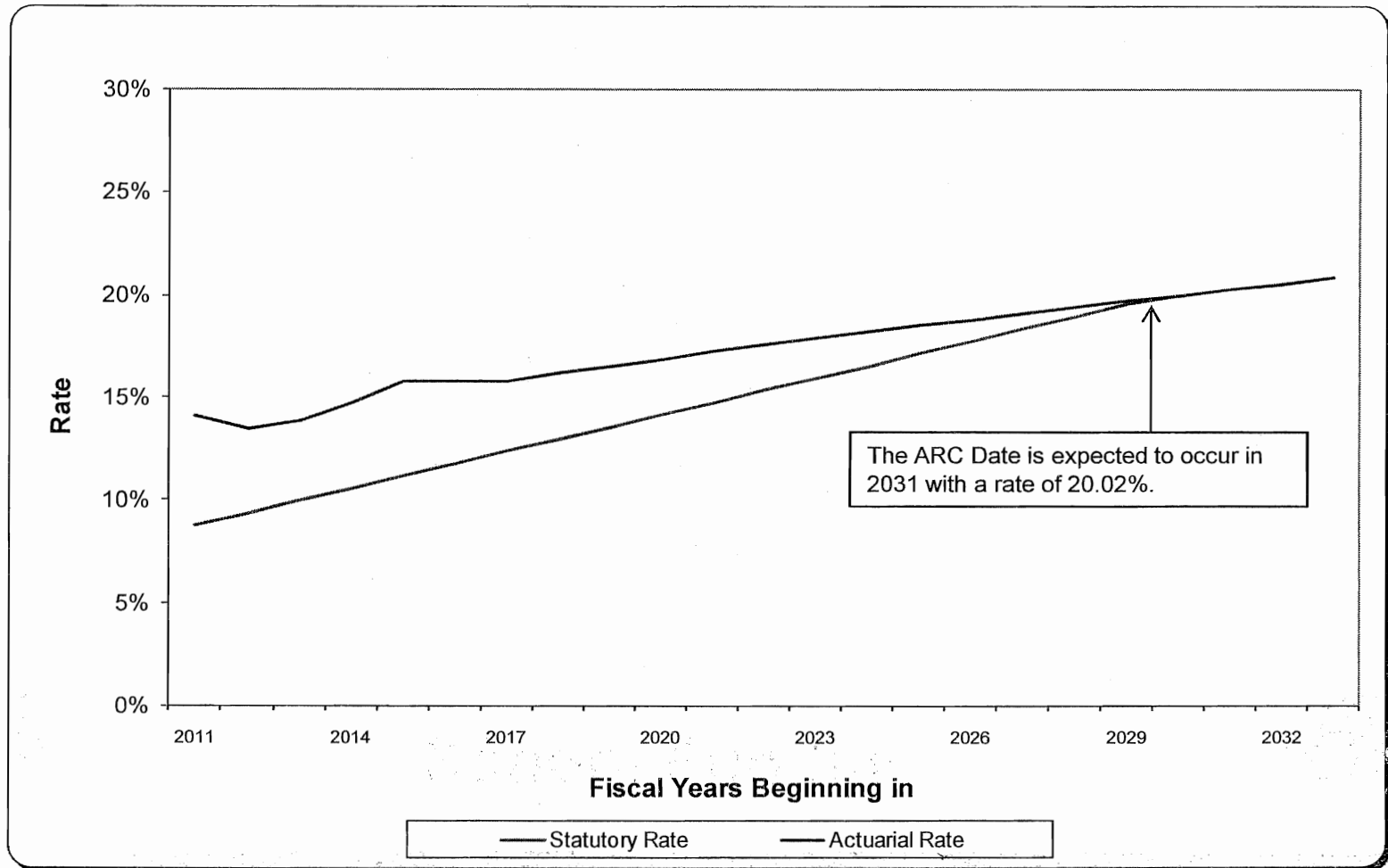
## ➤ 12/31/10 Valuation

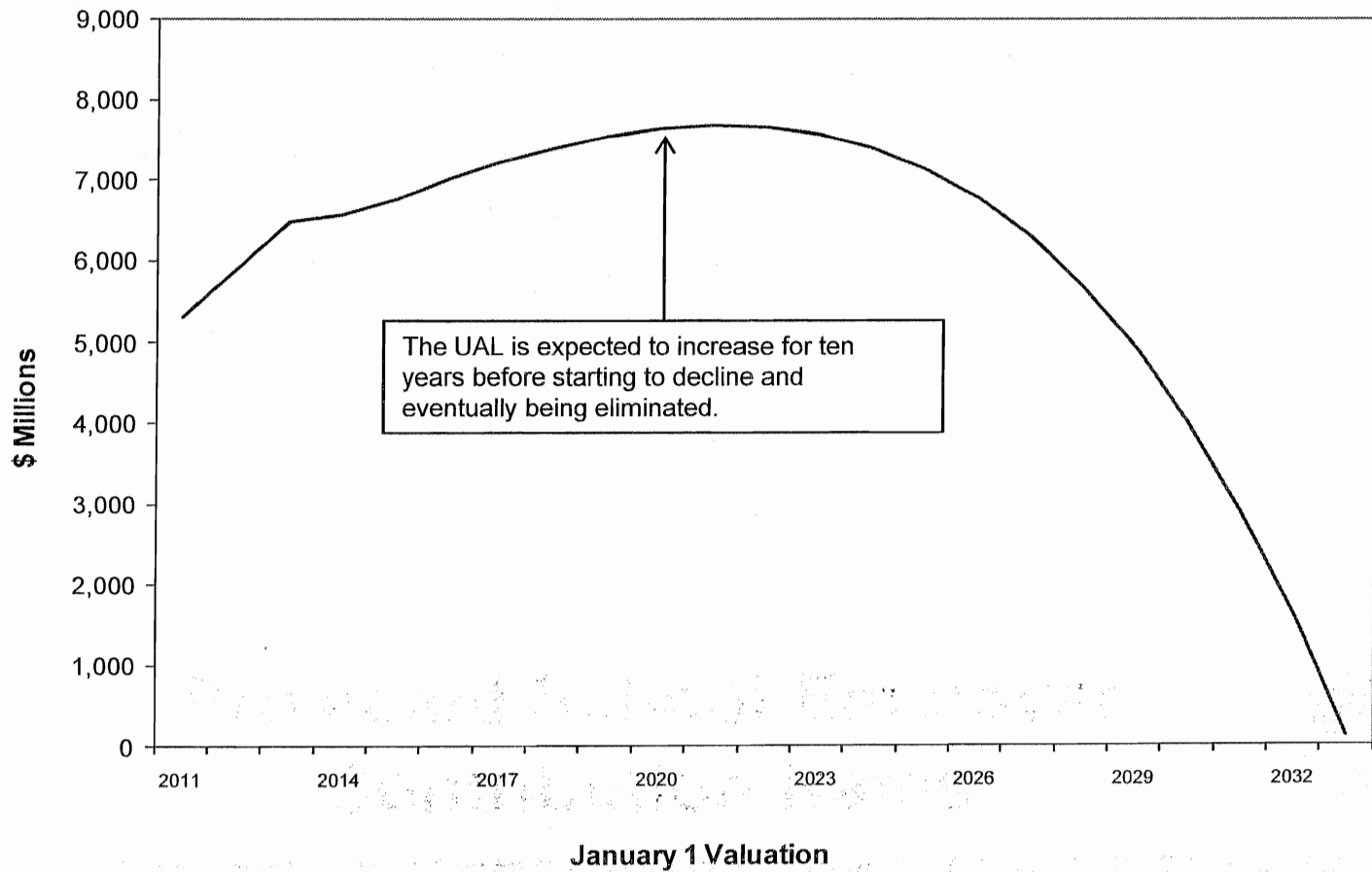
- Funded Ratio: 55%
- Actuarial rate: 15.12%
- Statutory rate: 9.97%

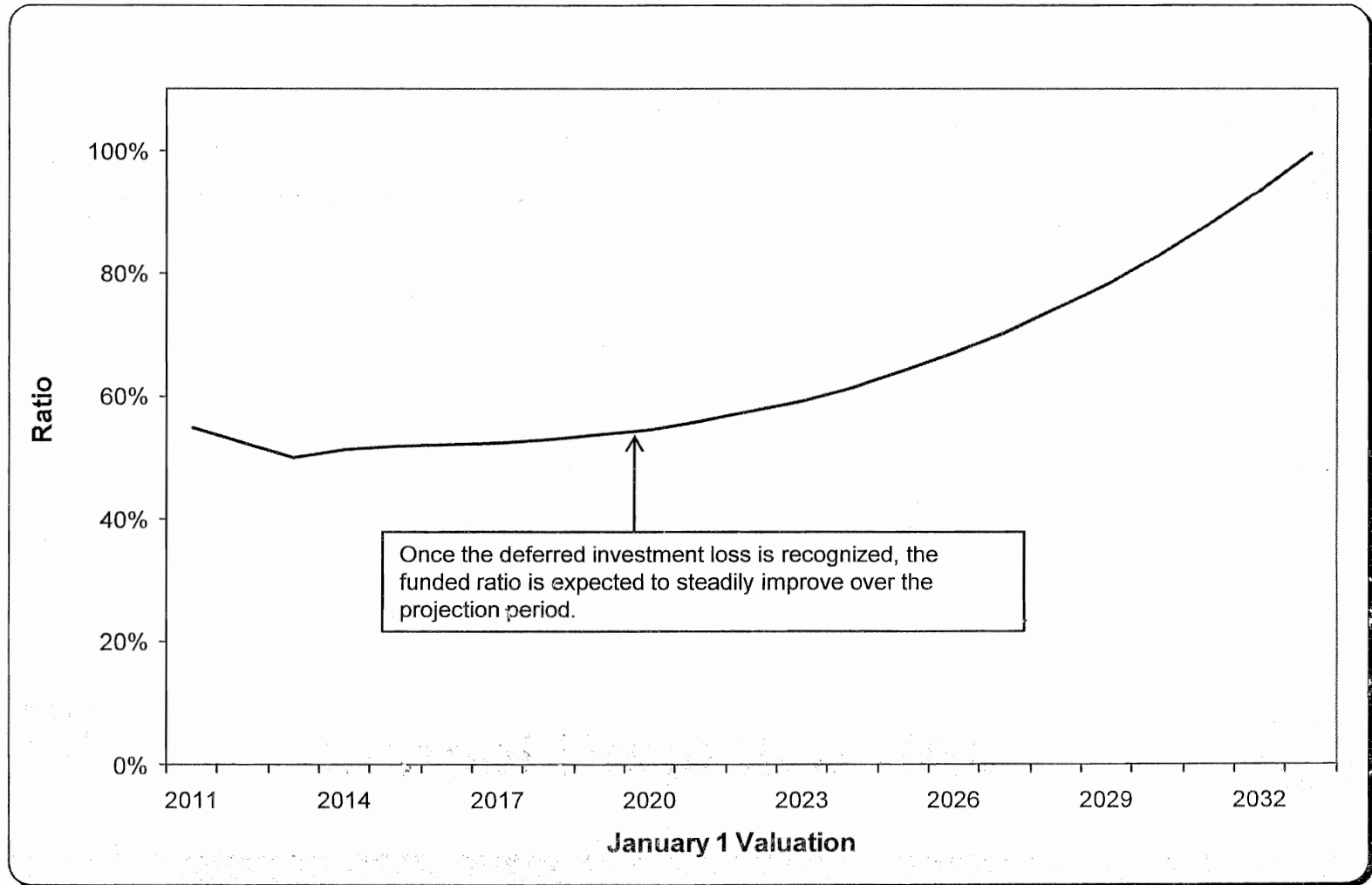
## ➤ Projected ARC Date/Rate

- Date: FY 2031
- Rate: 20.02% (State/School rate)

# Projected School Employer Contribution Rates

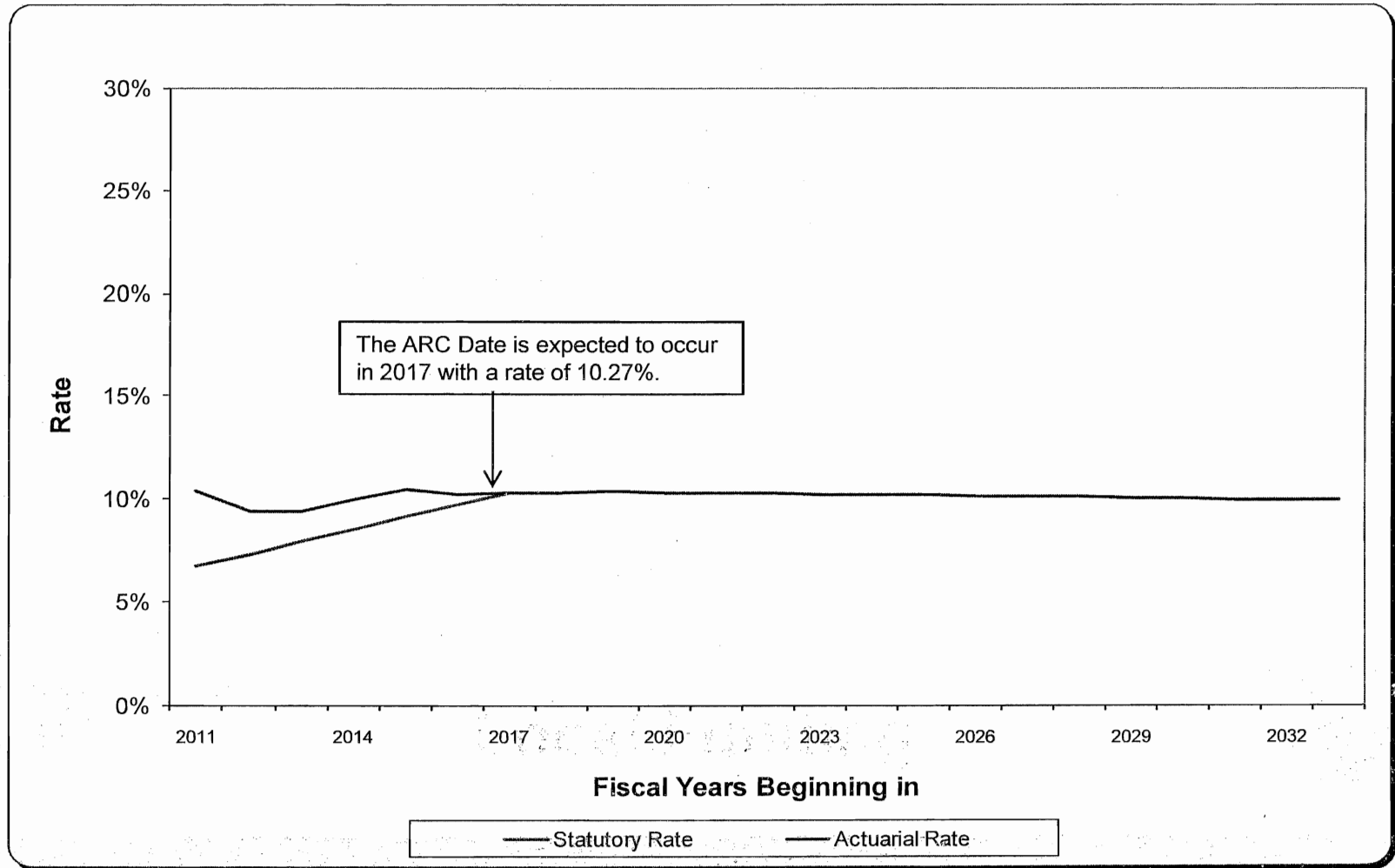




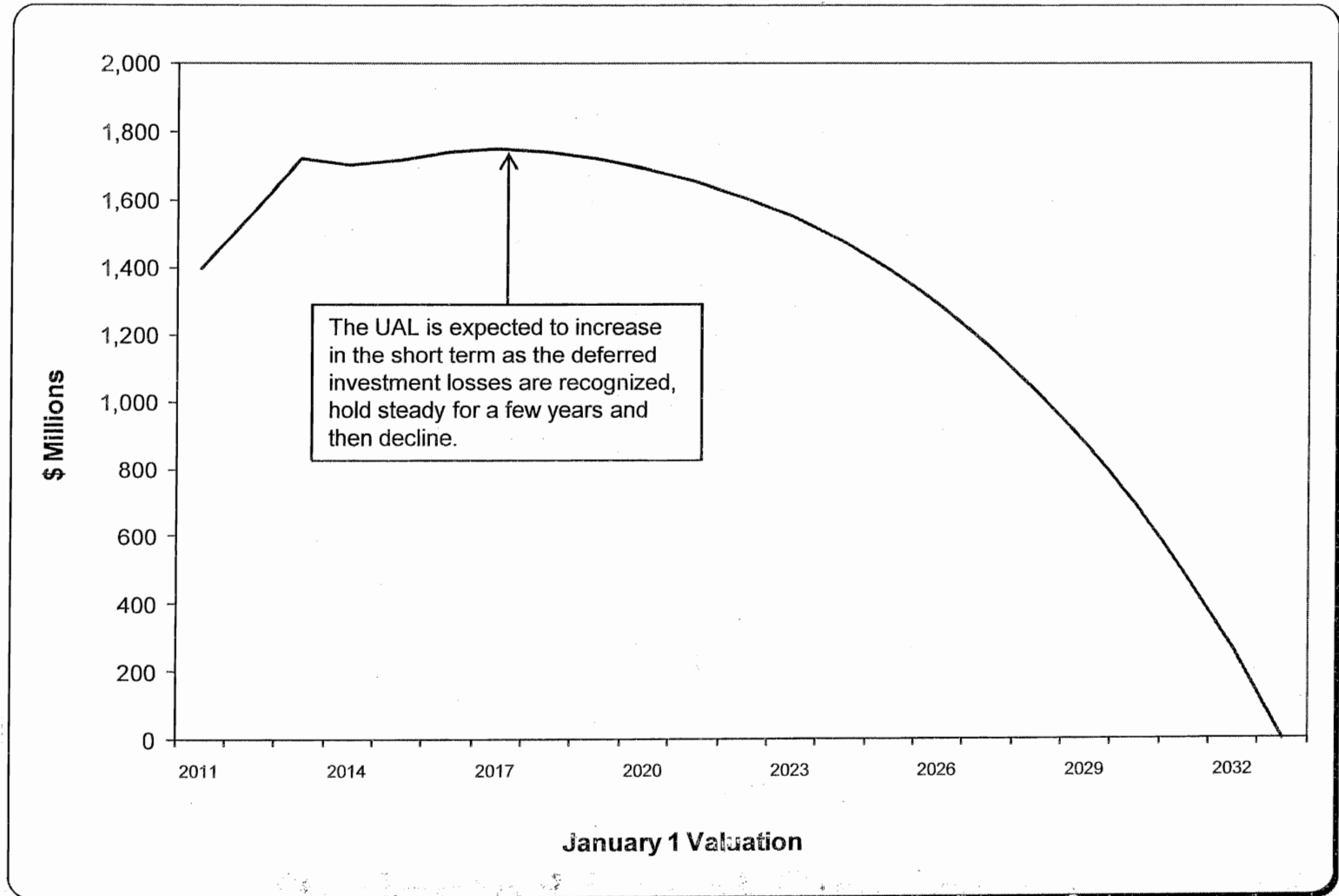


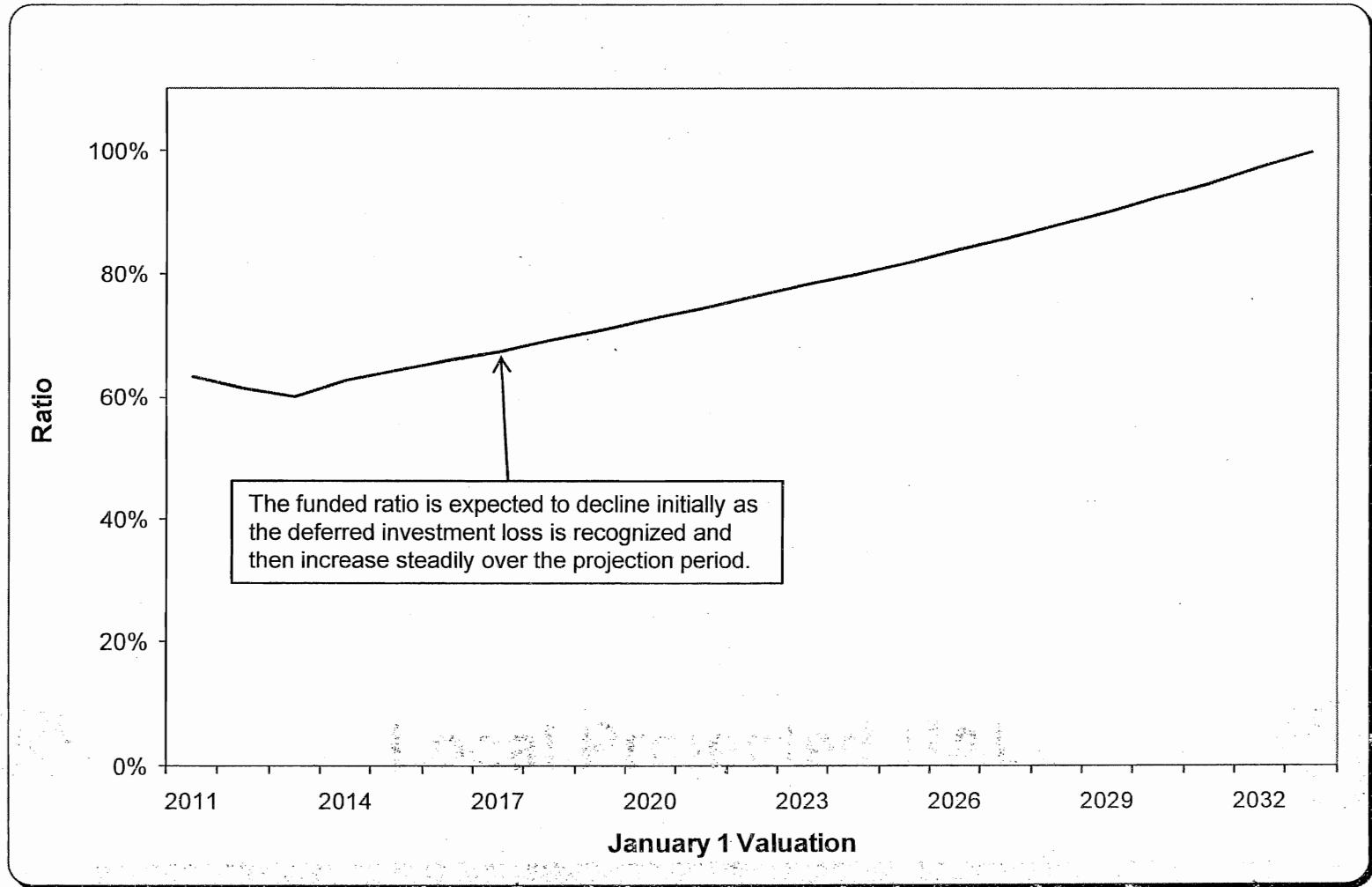
- 12/31/10 Valuation
  - Funded ratio: 63%
  - Actuarial rate: 9.43%
  - Statutory rate: 7.94%
- Projected ARC Date/Rate
  - Date: FY 2017
  - Rate: 10.27%

# Projected Local Employer Contribution Rates









# Short Term Projections – Total System



## Return in 2011

Valuation Date (12/31)	8%		0%		-8%	
	<u>UAL</u>	<u>Funded Ratio</u>	<u>UAL</u>	<u>Funded Ratio</u>	<u>UAL</u>	<u>Funded Ratio</u>
2010	8,264	62%	8,264	62%	8,264	62%
2011	9,271	60%	9,475	59%	9,680	58%
2012	10,261	57%	10,752	55%	11,242	53%
2013	10,198	60%	10,979	57%	11,759	53%

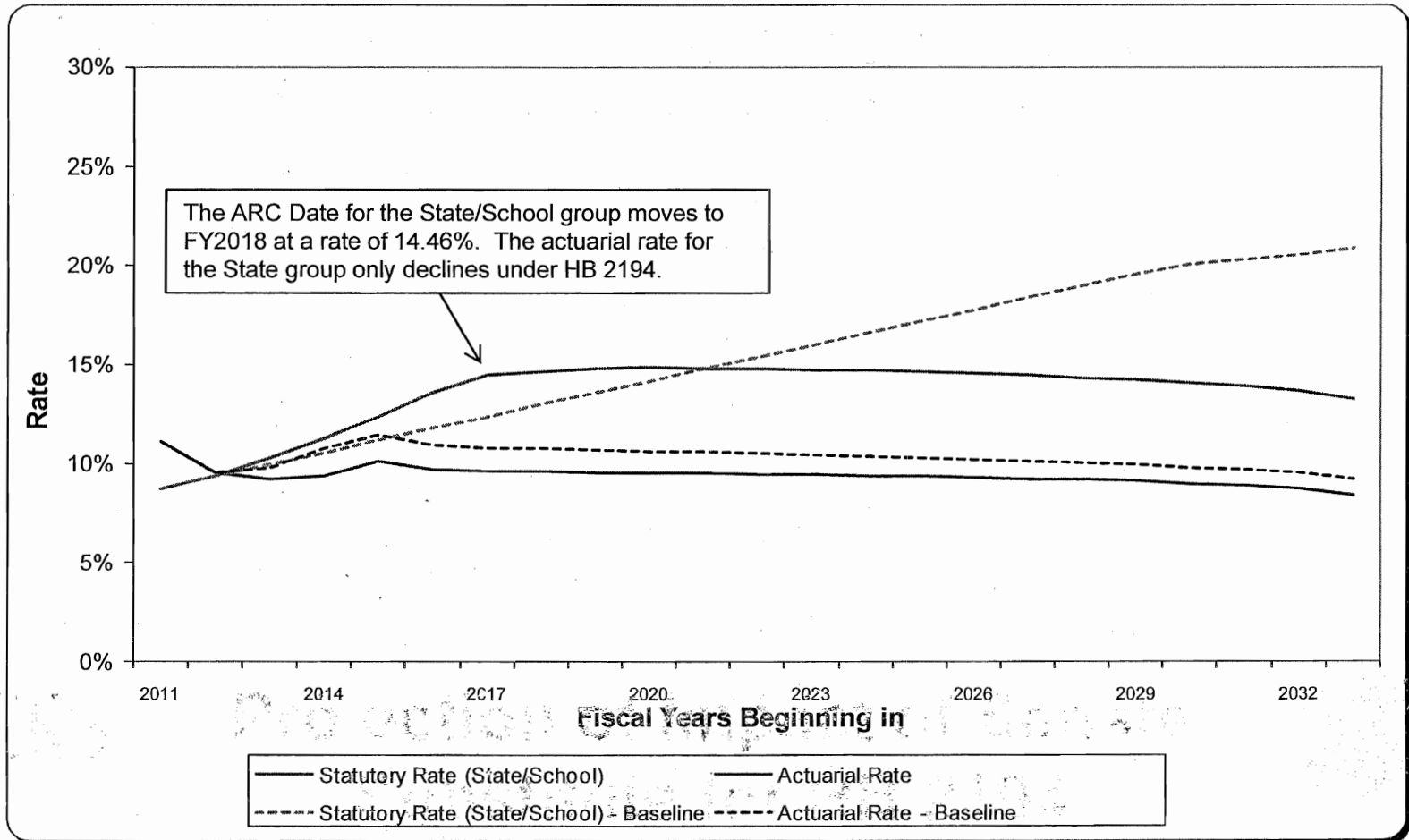
- Increased caps on employer contribution (0.9% in FY2014 up to 1.2% in FY2017)
- Tier 1 members:
  - Increase employee contribution from 4% to 6% with increase in benefit multiplier from 1.75% to 1.85% for future service **(DEFAULT)**
  - OR
  - Remain at 4% contribution with 1.4% multiplier for future service
- Tier 2 members
  - Remain at 1.75% benefit multiplier and lose COLA on all service **(DEFAULT)**
  - OR
  - Lower benefit multiplier to 1.4% for future service and keep COLA

## Projection of Impact of Senate Substitute for HB 2194

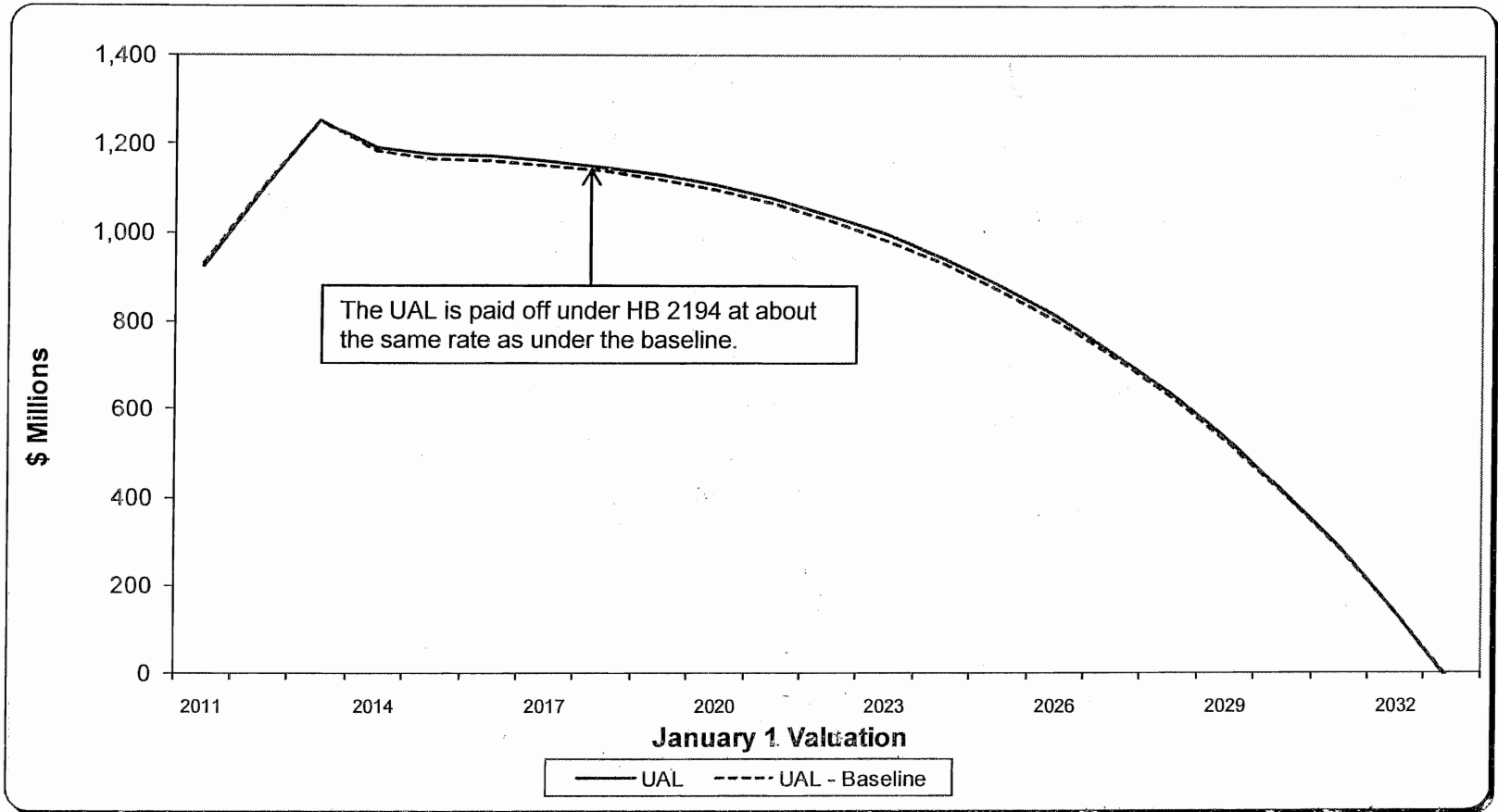


- Assumes everyone elects the default provision in both Tier 1 and Tier 2
- Don't expect significant impact if elections vary from default
- All other assumptions are the same as baseline projections
- As with all projections, focus should be on long term trends,

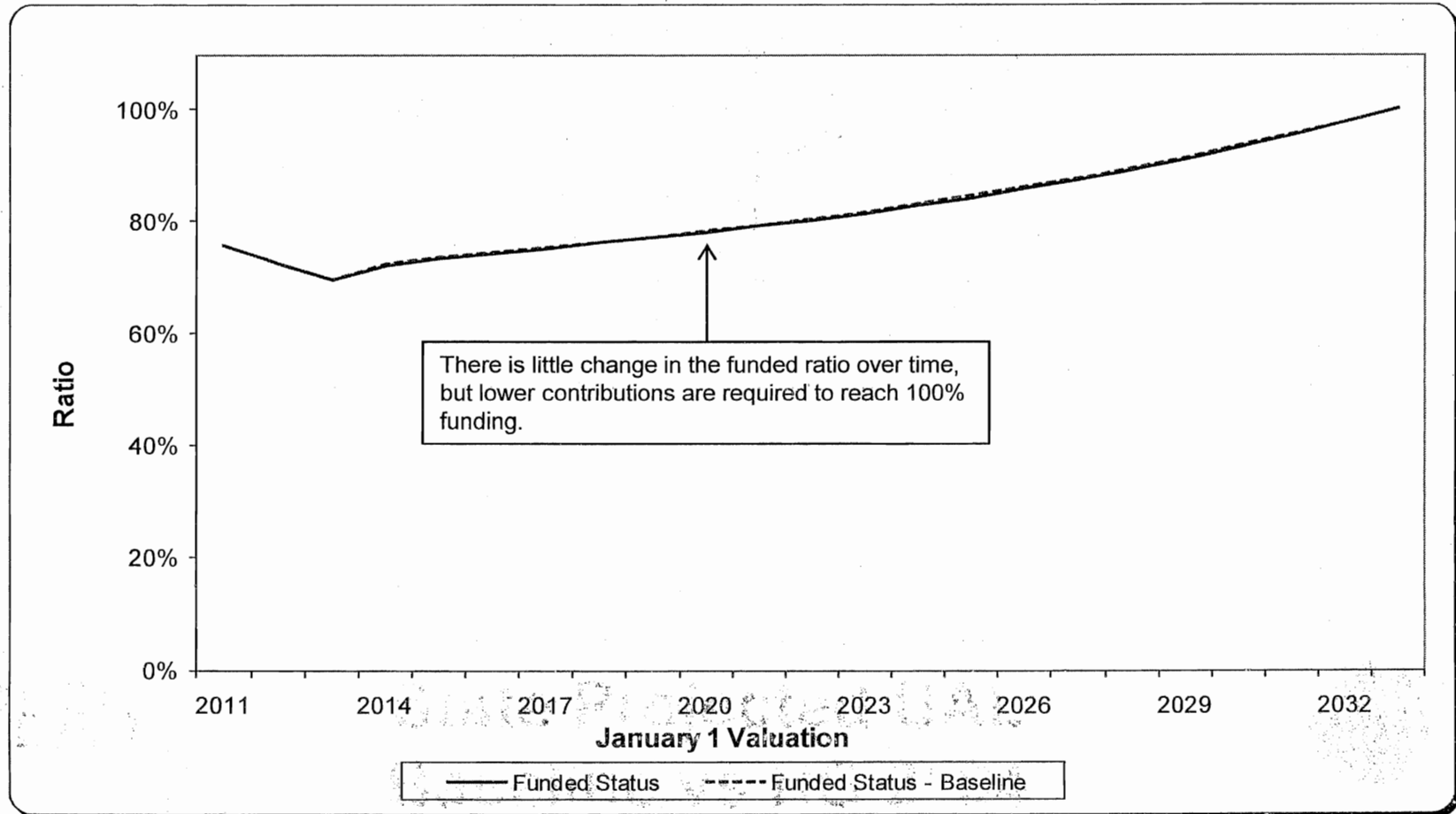
# Projected State ER Contribution Rates – Baseline vs HB 2194



# State Projected UAL Baseline vs HB 2194



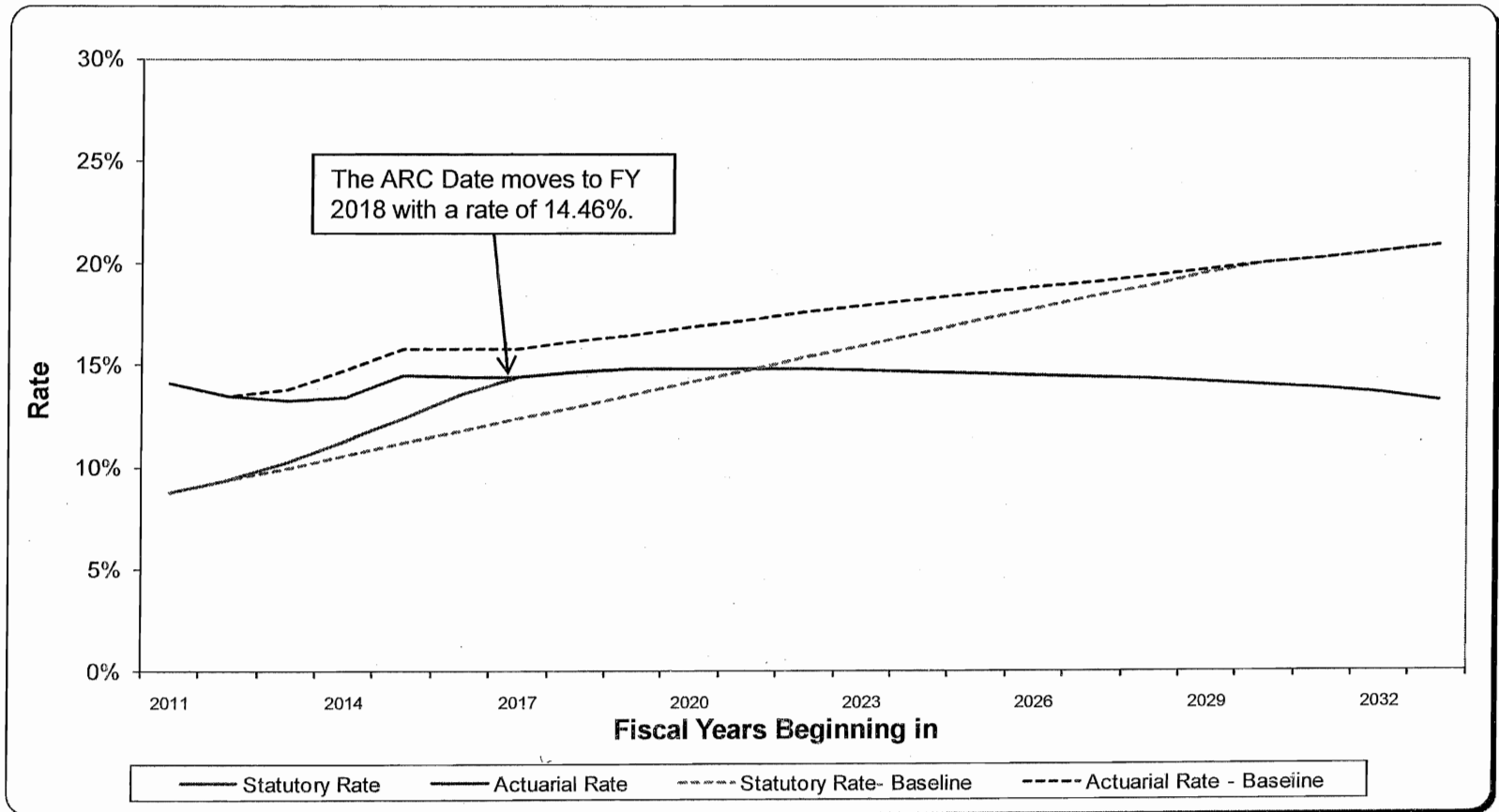
# State Projected Funded Ratio Baseline vs HB 2194



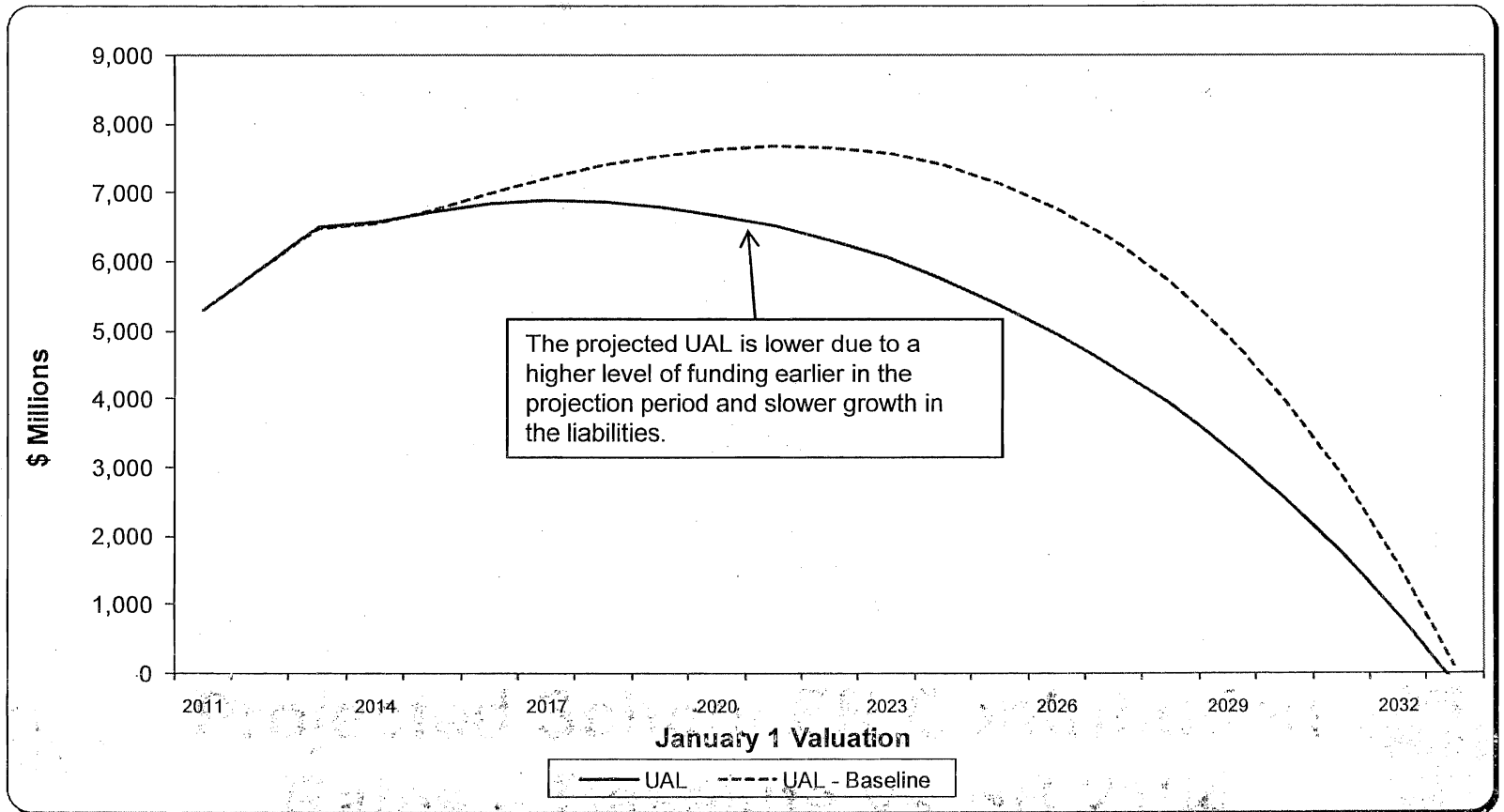




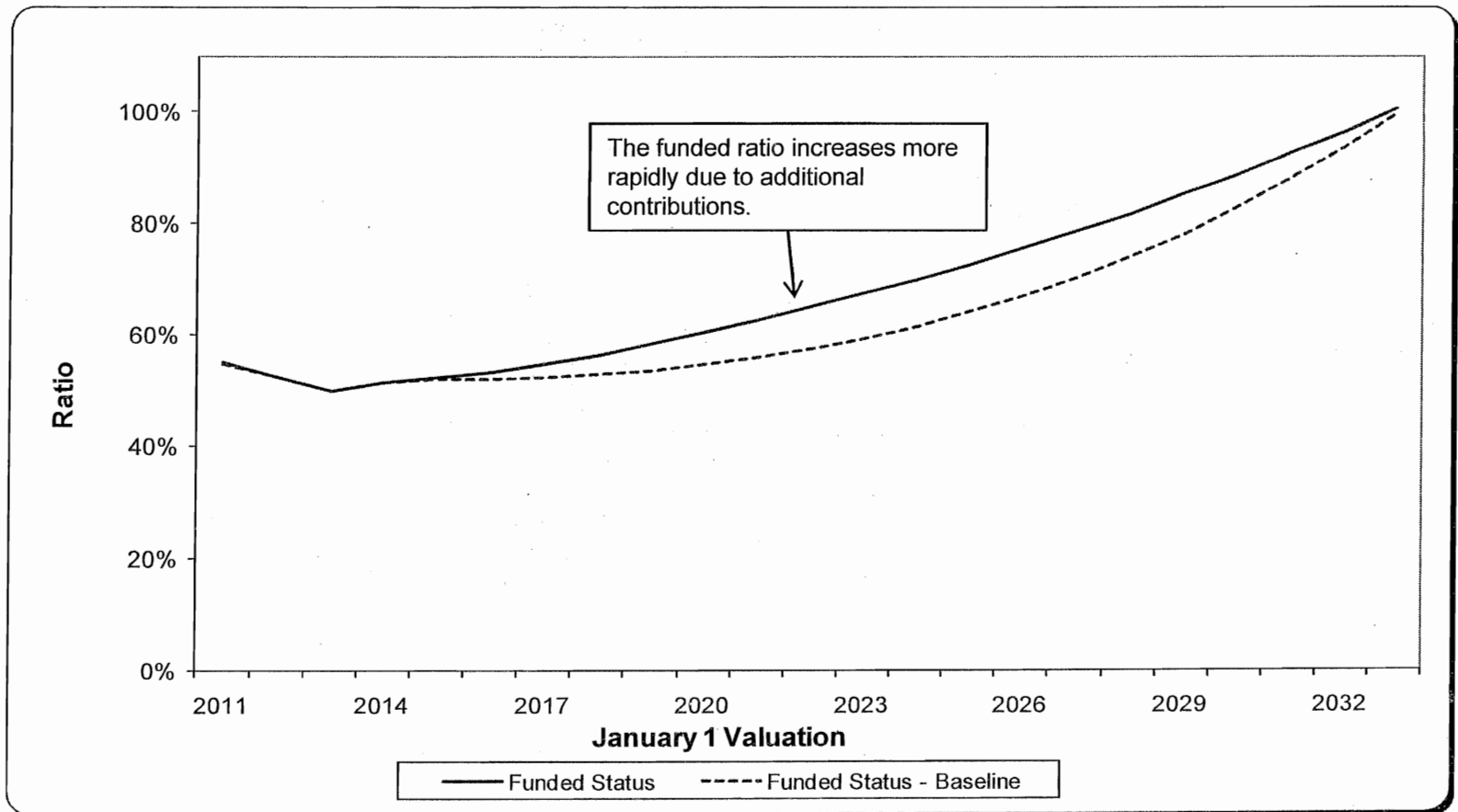
# Projected School ER Contribution Rates – Baseline vs HB 2194



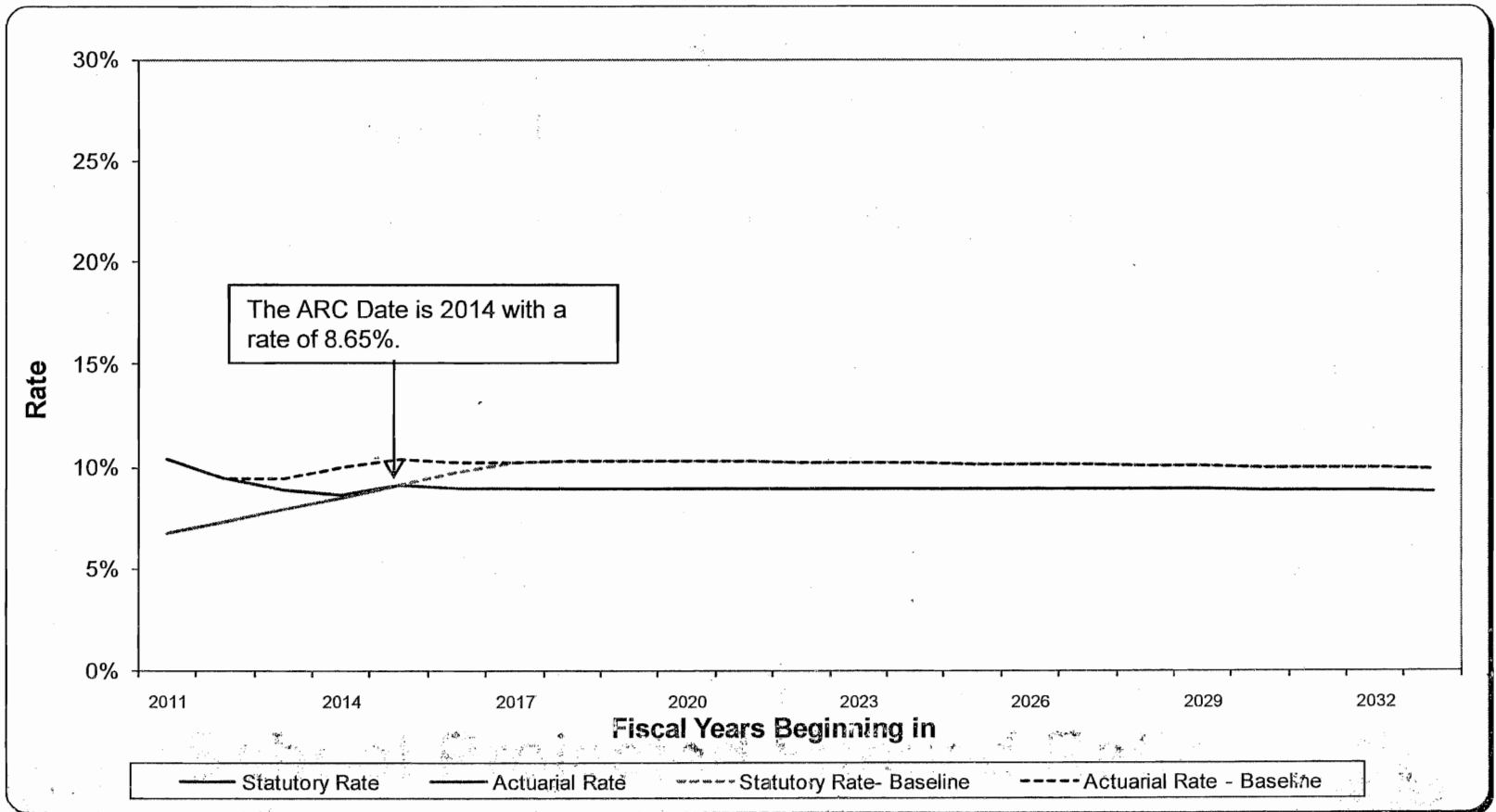
# School Projected UAL Baseline vs HB 2194



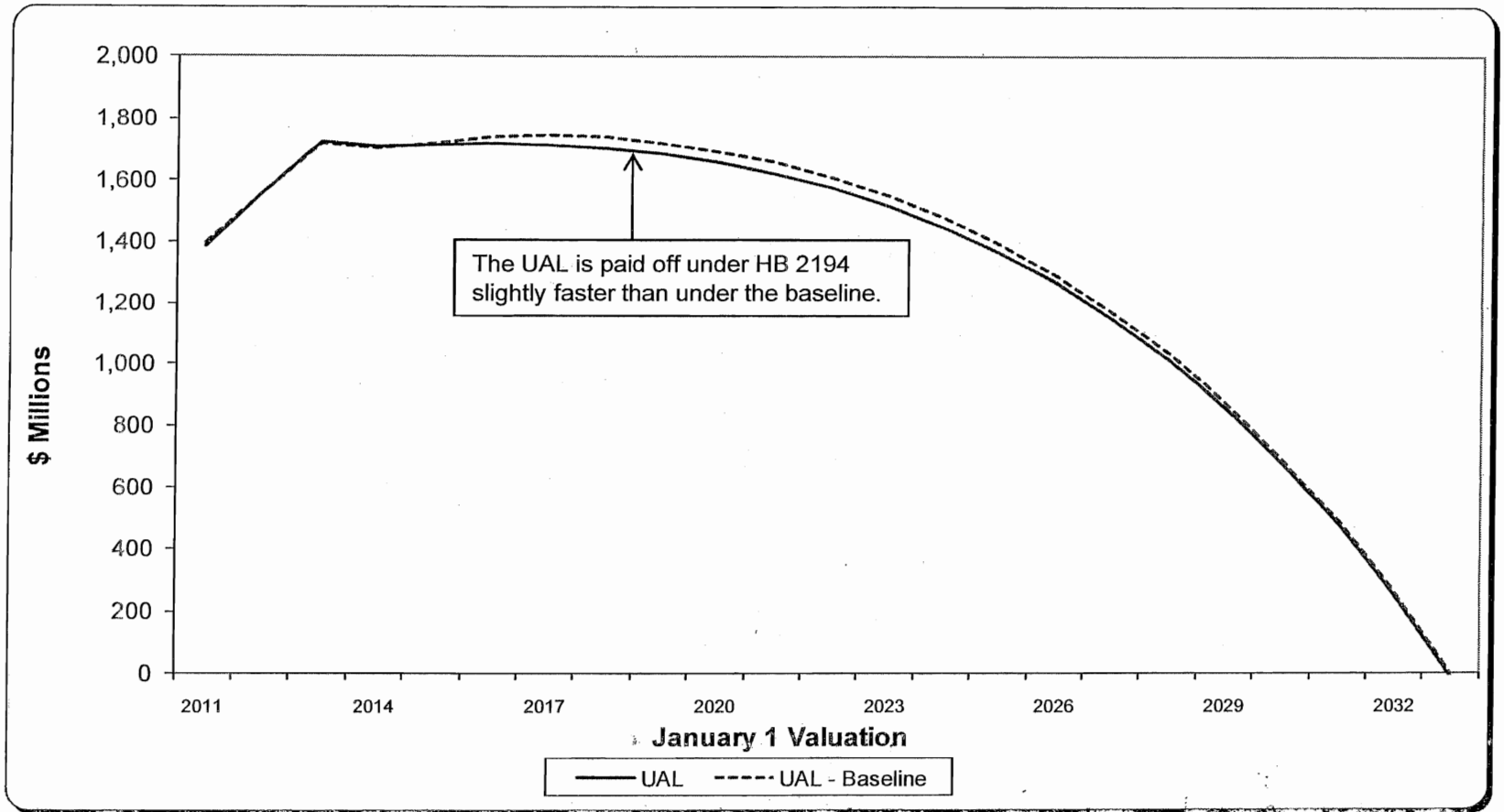
# School Projected Funded Ratio Baseline vs HB 2194



# Projected Local ER Contribution Rates – Baseline vs HB 2194



# Local Projected UAL Baseline vs HB 2194



# Local Projected Funded Ratio – Baseline vs HB 2194

