

The background of the slide is a photograph of the New Mexico State Capitol building. The building is a light-colored, classical-style structure with a prominent entrance featuring columns and a pediment. Above the entrance is a large circular seal of the State of New Mexico, which depicts a figure holding a bow and arrow, surrounded by the text "THE GREAT SEAL OF THE STATE OF NEW MEXICO". The sky is clear and blue. A red horizontal bar is at the top of the slide, and a grey dotted pattern is at the bottom.

# **New Mexico Legislative Council Service Retirement Systems Solvency Task Force**

**September 10, 2010**

A Xerox Company

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# Agenda

- Introductions
- Overview of the Actuarial Process
  - What is an actuary and what do they do?
  - Valuation overview
  - Plan provisions
  - Assets
  - Assumptions
  - Liability and normal cost calculations
  - Contribution rates and funding period
- Problems Facing the PERA and ERB — Preliminary Evaluation of the Nature and Scope of Concerns
- Timing Issues: The Effect of Time Frame Decisions in Corrective Actions to Pension Plans
- Pension Reform Options That Provide the Greatest Opportunity for Improved Solvency

# Introductions

What do you want to learn about  
during this session today?

# Actuarial Process

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# What is an actuary and what do they do?

# Actuaries

- Trained in
  - Mathematics
  - Probability and statistics
  - Compound interest
  - Business
  - Finance
- Training programs
  - College classes
  - On-the-job
  - Exams from professional societies (Society of Actuaries and Joint Board of Enrolled Actuaries)

## Actuaries (cont'd)

- Work on problems in business and finance involving
  - Payment of money in the future that is contingent upon occurrence of unknown future events (retirement, death, injury, termination, etc.)
  - Risk management
- Work for
  - Insurance companies
  - Consulting firms
  - Retirement systems and boards

## Actuaries (cont'd)

- Work for retirement systems
  - Calculate contribution rates and/or funding period
  - Determine funded status
  - Prepare financial reporting information
  - Explain results
  - Special studies from time to time on legislative changes
  - Opinion on actuarial soundness
  - Projections of liabilities, contribution rates, and funding periods

# Valuation Overview

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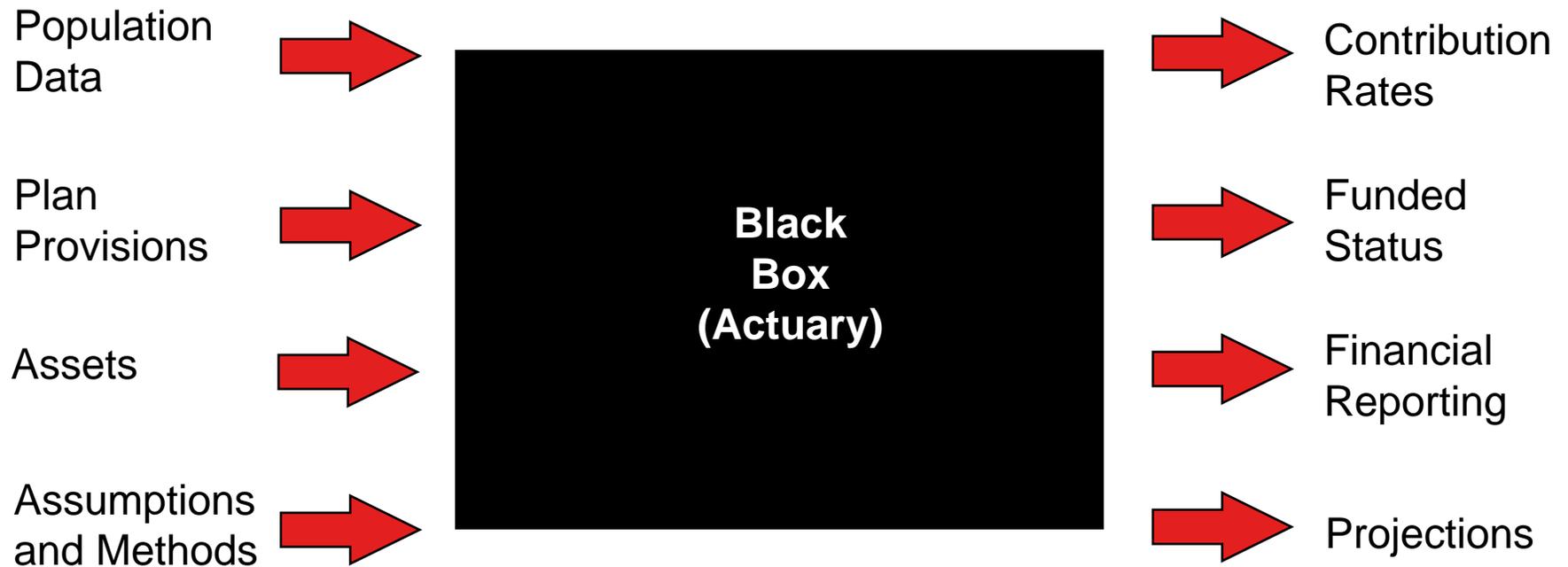
## Why Do We Value A Pension Plan?

- To have an idea of the size of the promise that has been made to employees
  - Year by year calculation
  - Total value of benefits promised
- To set aside funds for future payments while member is working
- To compare size of the promise against assets
- To determine what benefits cost
- Because it is required by GASB for reporting purposes

## Valuation Overview

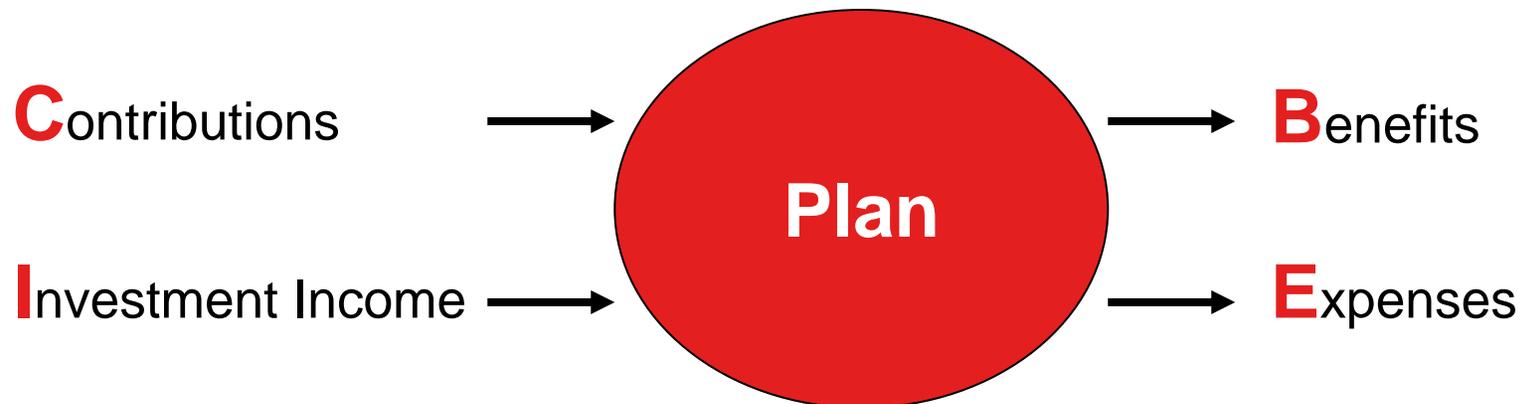
- Performed annually
  - Self-correcting
- Snapshot in time of the plan's assets and liabilities
- Expected benefit payments over future years are calculated and discounted back to the valuation date
- Calculations are performed on each member and summed

# Valuation Overview (cont'd)



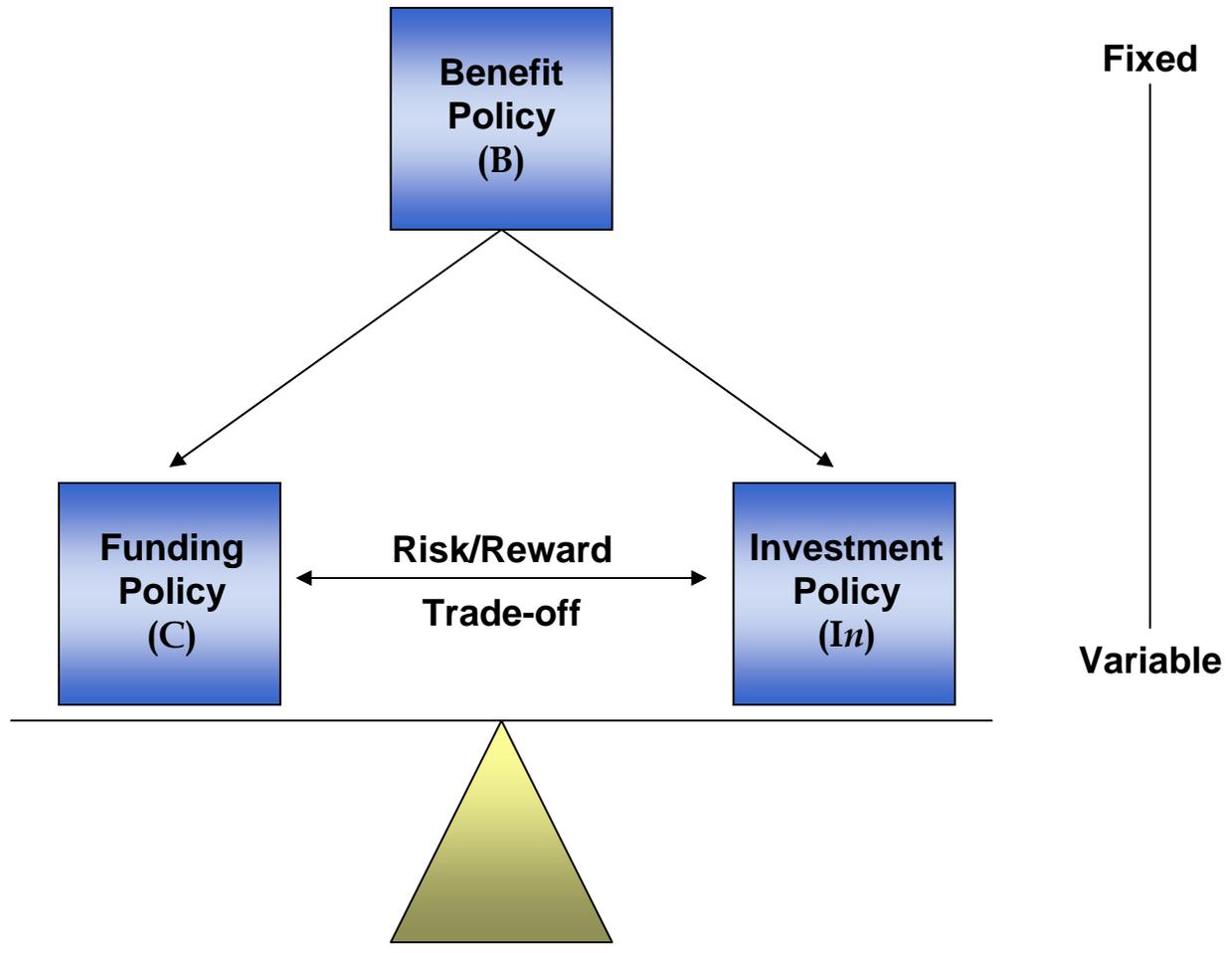
# Basic Retirement Funding Equation

$$C + I = B + E$$



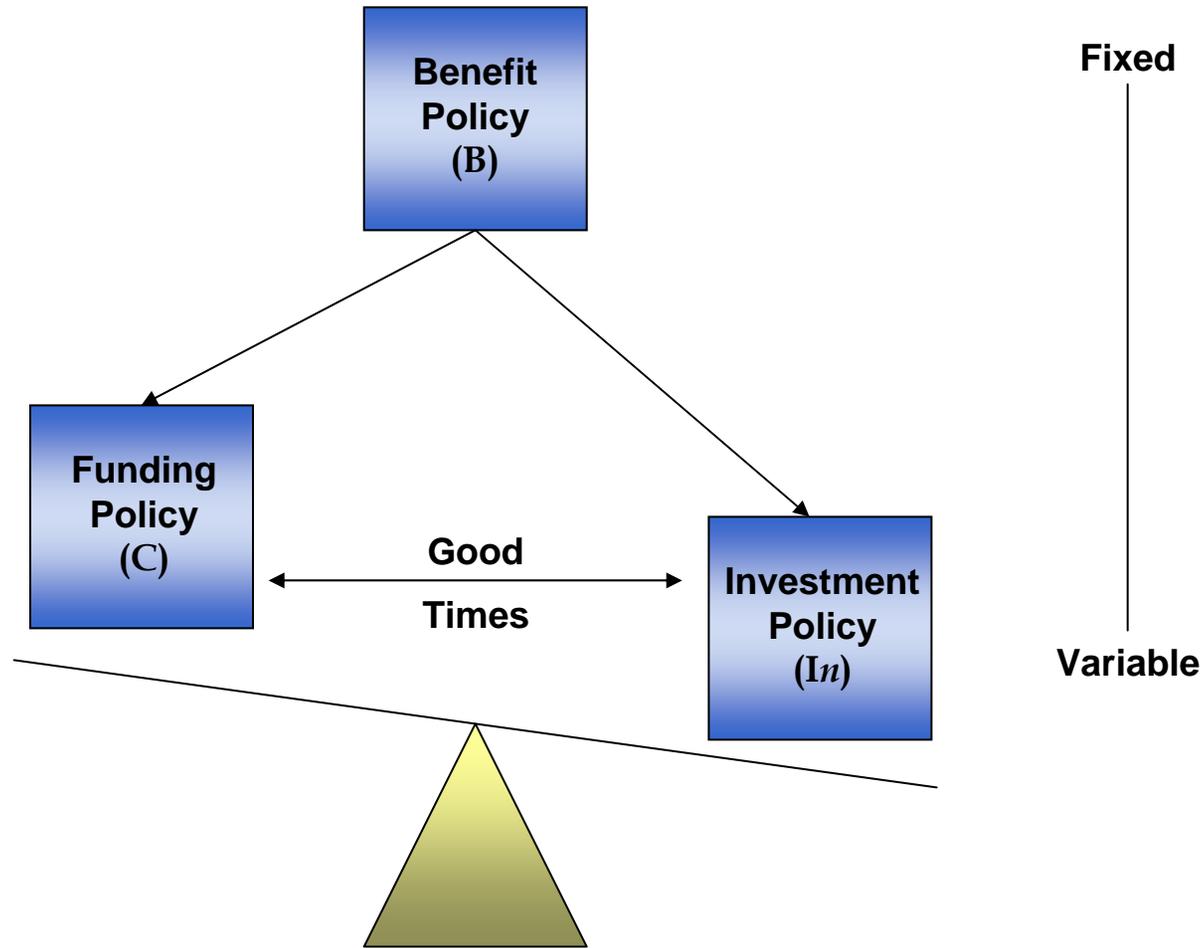
*Contributions depend on assumptions, methods and experience.  
Benefits depend on plan provisions, members and experience.*

# Pension Policy Framework



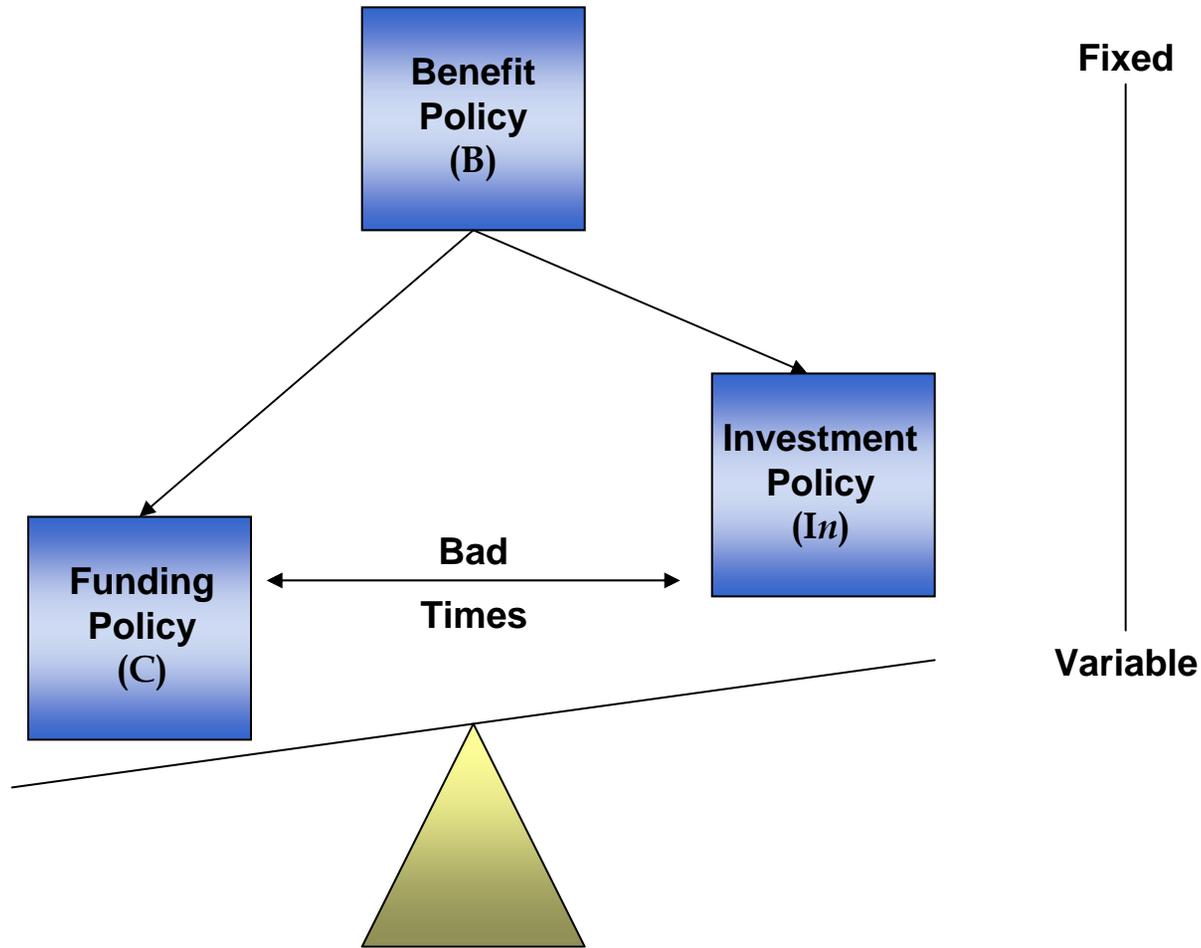
**Funding Equation:  $B = C + I_n$**

# Pension Policy Framework (cont'd)



**Funding Equation:  $B = C + I_n$**

# Pension Policy Framework (cont'd)



**Funding Equation:  $B = C + I_n$**

# Population Data Used in Valuation

- ID number – usually Social Security number
- Date of birth
- Date of hire / retirement / termination
- Salary / pension amount
- Plan code
- Contribution amounts
- Sex
- Status
- Form of benefit / beneficiary info

*This information is provided each year to the actuary*

# Plan Provisions

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# Plan Provisions

- How much, when and to whom are benefits paid at...
  - Retirement
  - Death before retirement
  - Death after retirement
  - Disability
  - Termination
- PERA benefits summary (State General)
  - 3% of final 3-year average salary times years of service
  - No early retirement benefits
  - Unreduced retirement at 30 years, 80 points or age 67 with 5 years (New Tier)
  - 3% COLA
- ERB benefits summary
  - 2.35% of final 5-year average salary times years of service
  - Early retirement benefits payable when member has 80 points (New Tier)
  - Unreduced retirement at 30 years, age 65 with 80 points or age 67 with 5 years (New Tier)
  - One-half the increase in cost-of-living increase, min 2%, max 4%

# Assets



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# Assets

- Value of funds held in trust called Market Value of Assets
- If use Market Value of Assets to set contributions
  - Market Value is volatile
  - Would result in volatile contribution rates
- To avoid volatility
  - Most systems “smooth” assets
  - Smoothed value called Actuarial Value of Assets

## Assets as of June 30, 2009

Actual Asset Allocation	PERA	ERB
Cash	<1%	1%
Domestic Equities	51%	30%
International Equities	19%*	17%
Fixed Income	16%	37%
Real Estate	0%	5%
Other	14%	10%
Total	100%	100%
Market Value	\$8,781.0 million	\$7,113.7 million

\*Includes international fixed income.

## Actuarial Value of Assets

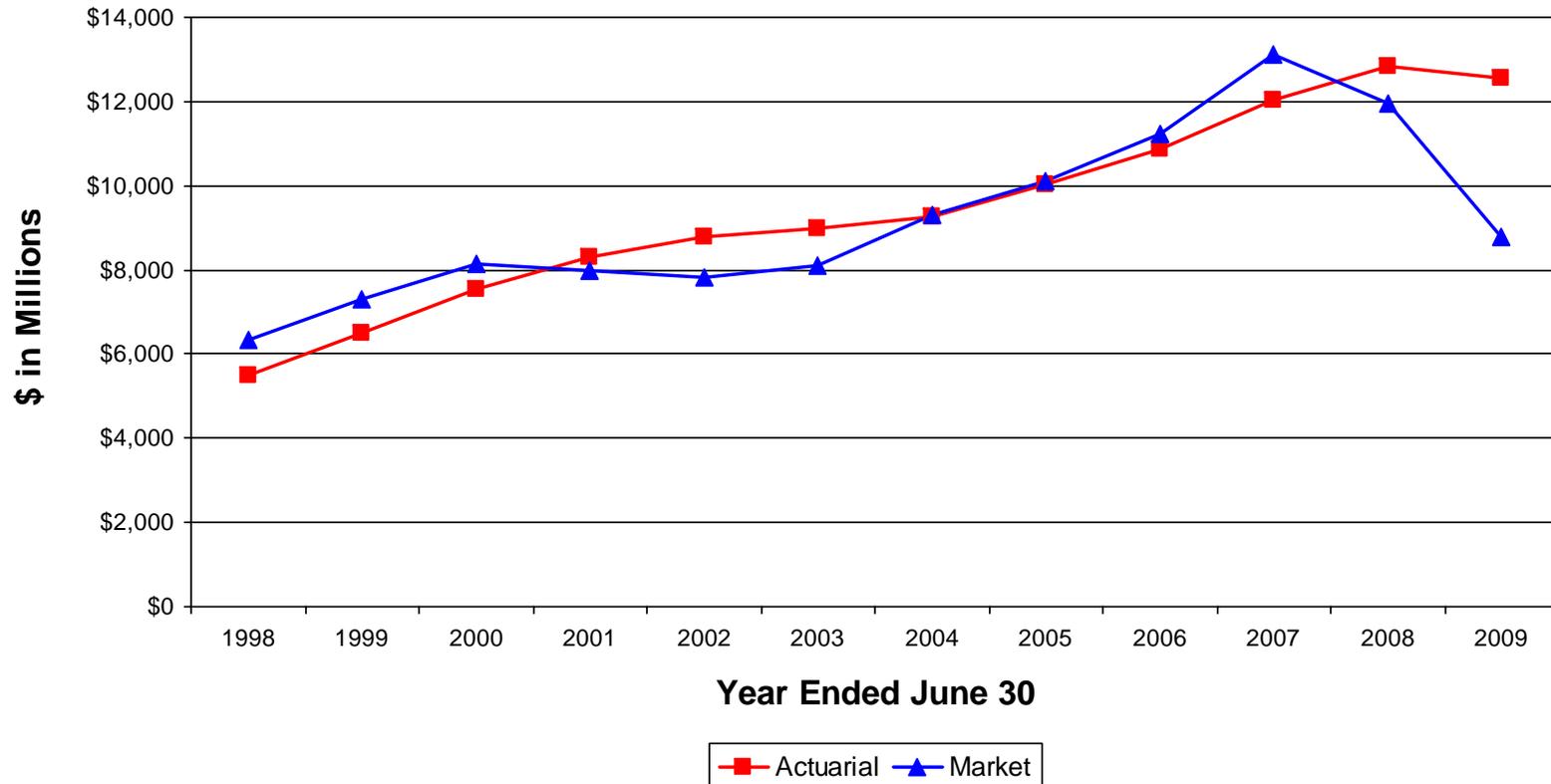
- PERA uses a 4-year smoothing method
- ERB uses a 5-year smoothing method
- Most common smoothing is for 4 to 6 years
- 60% of State retirement systems use 5-year smoothing and 74% use 4- or 5-year smoothing\*

<u>June 30, 2009</u>	<u>PERA</u>	<u>ERB</u>
MVA	\$8,781.0	\$7,113.7
AVA	\$12,554.0	\$9,366.3

*\*Information provided from the Public Fund Survey  
Summary of Findings for FY2004 from NASRA*

# PERA - Actuarial Value of Assets

## Actuarial Value vs. Market Value

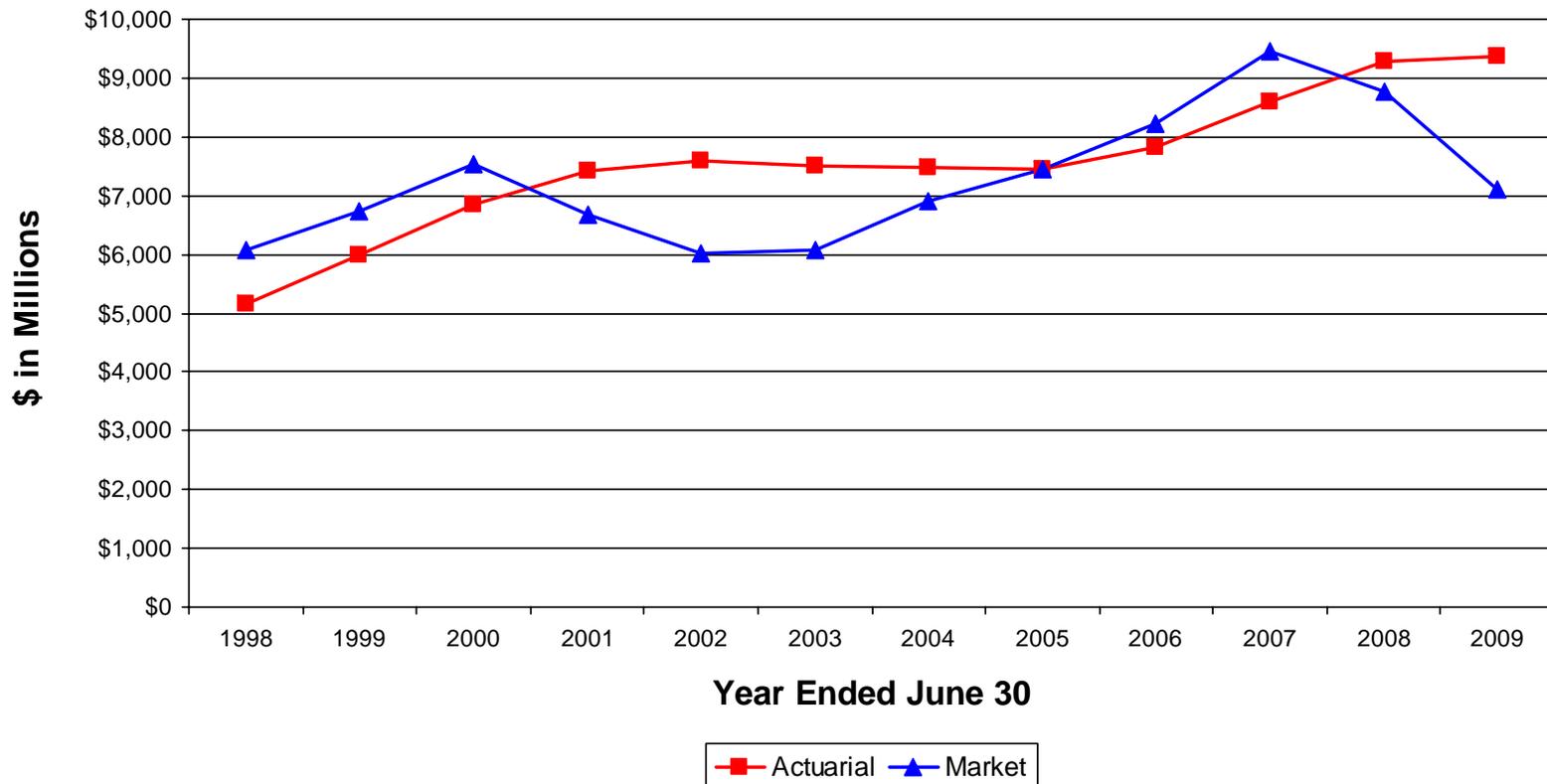


Actuarial Value is expected to be:

- ◆ Below Market Value when market is doing well
- ◆ Above Market Value when market is doing poorly

# ERB - Actuarial Value of Assets

## Actuarial Value vs. Market Value



Actuarial Value is expected to be:

- ◆ Below Market Value when market is doing well
- ◆ Above Market Value when market is doing poorly

# Assumptions

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# Actuarial Assumptions

## Things That Happen to People

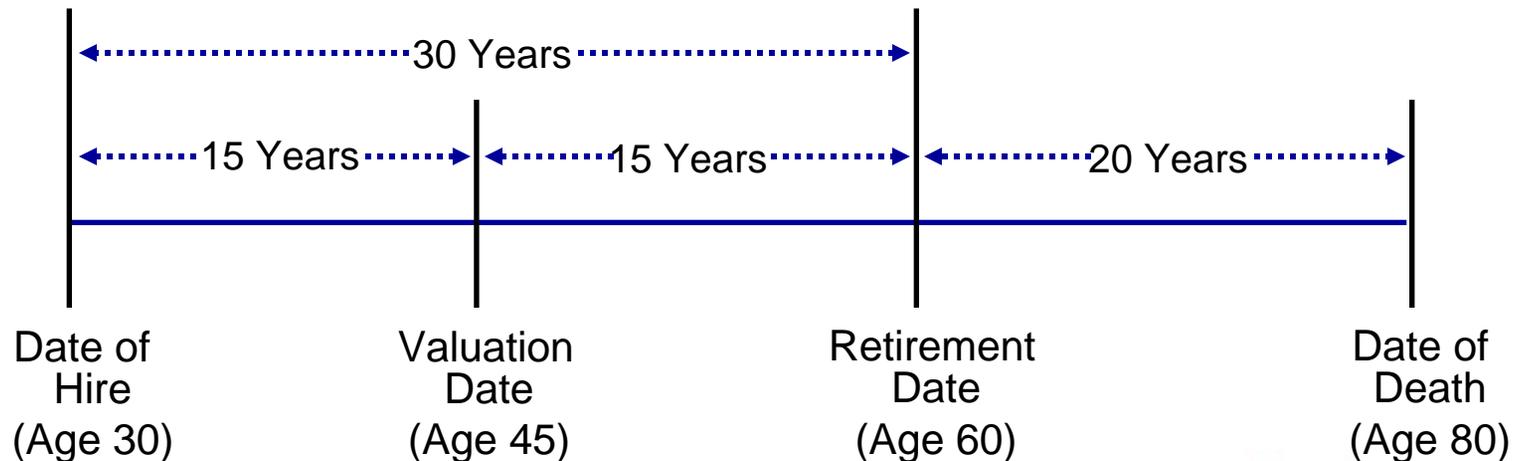
(Demographic)

### KNOWN at valuation date:

1. age
2. salary
3. sex
4. service to date
5. occupation

### 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



# Actuarial Assumptions

## Things That Happen to Money

(Economic)

### **KNOWN at valuation date:**

1. Market value of investment fund
2. Composition of investment fund
  - Stocks
  - Bonds
  - Short term
  - Long term
  - International

### **ASSUMED at valuation date:**

1. Future rates of investment return
2. Future rates of inflation
3. No change in investment policy

# Liability and Normal Cost Calculations

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## Method

- Allocates obligation to different time periods

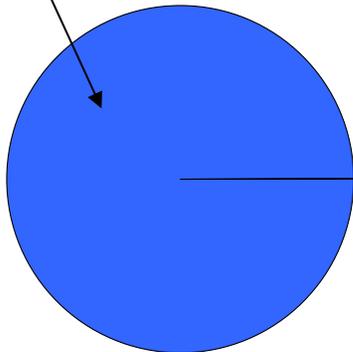
$$\begin{array}{r} \text{Past} - \text{Actuarial Liability} \\ + \text{Current} - \text{Normal Cost} \\ + \text{Future} - \text{Present Value of Future Normal Cost} \\ \hline = \text{Total Present Value of Benefits} \end{array}$$

- Different methods allocate costs differently
  - PERA and ERB use Entry Age Normal

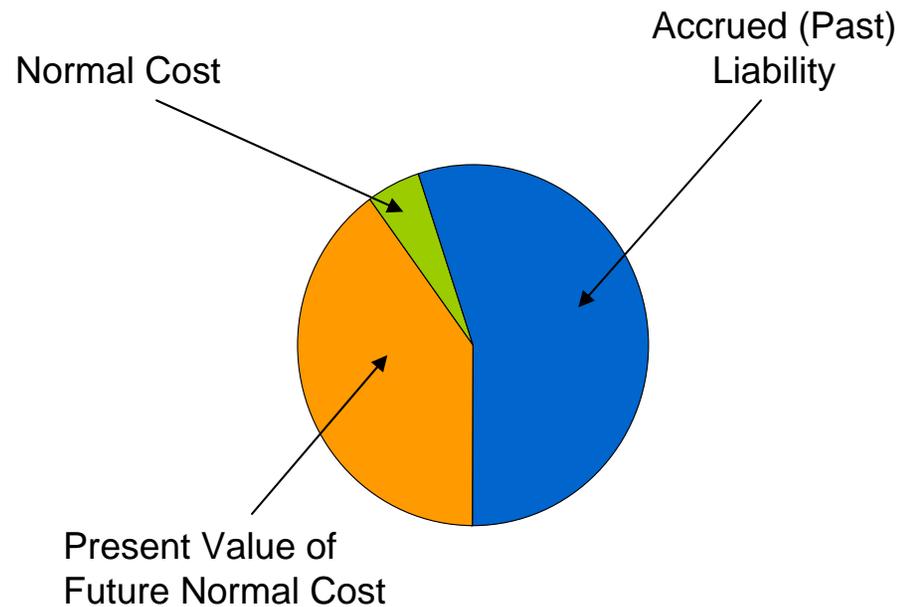
# Terminology

## Inactives

Total Present Value  
of Benefits



## Actives



### For Actives:

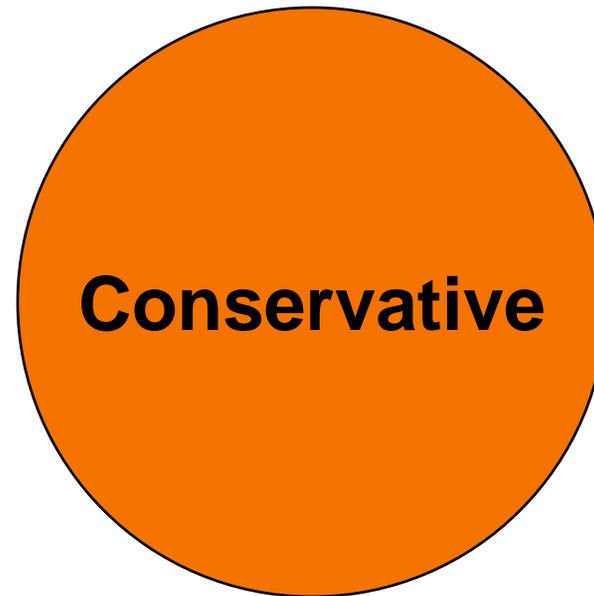
Total Present Value of Benefits = Accrued Liability + Normal Cost + Present Value of Future Normal Cost

### For Inactives:

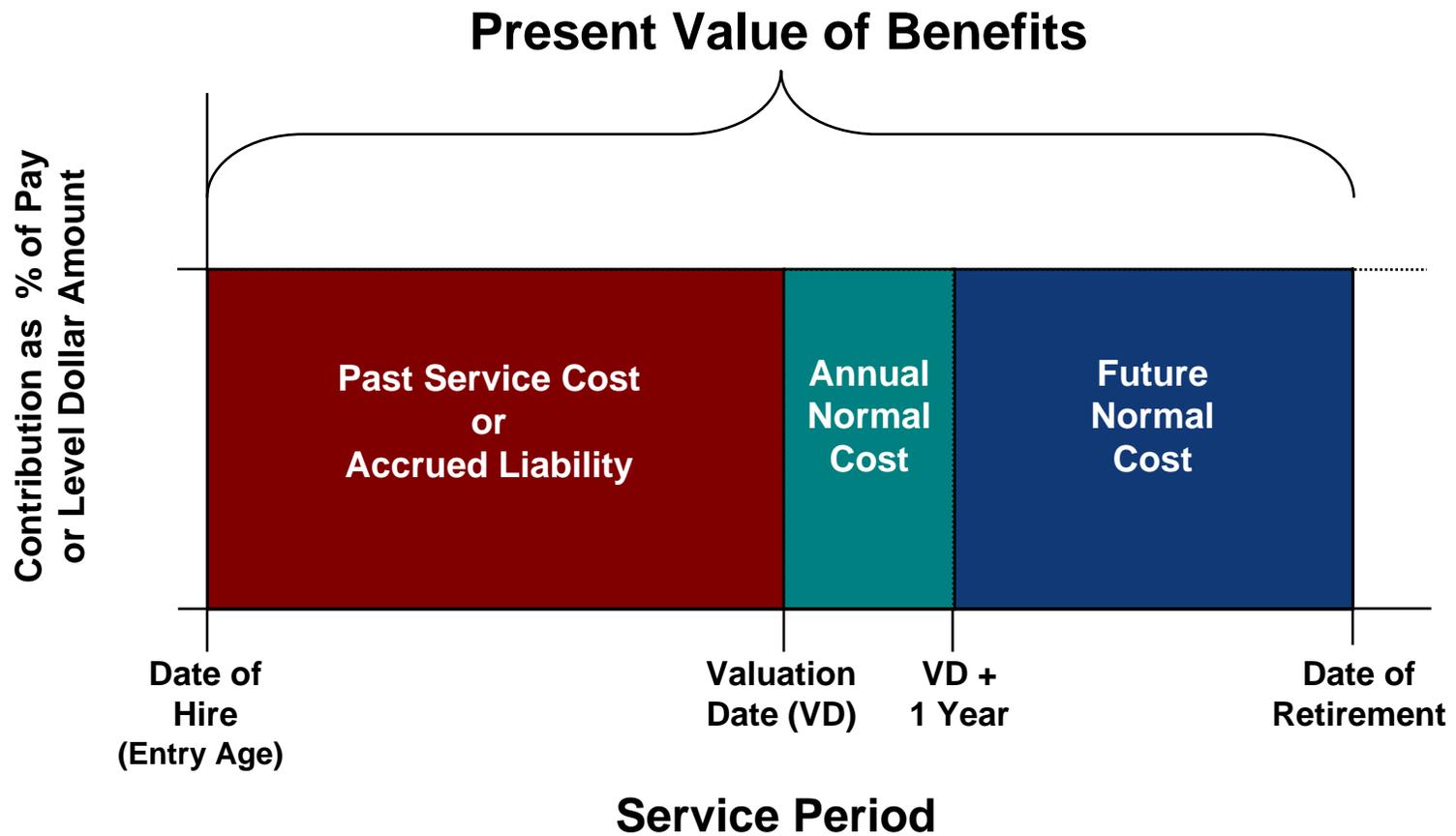
Total Present Value of Benefits = Accrued Liability. Normal Cost and Present Value of Future Normal Cost are \$0.

## Present Value of Benefits

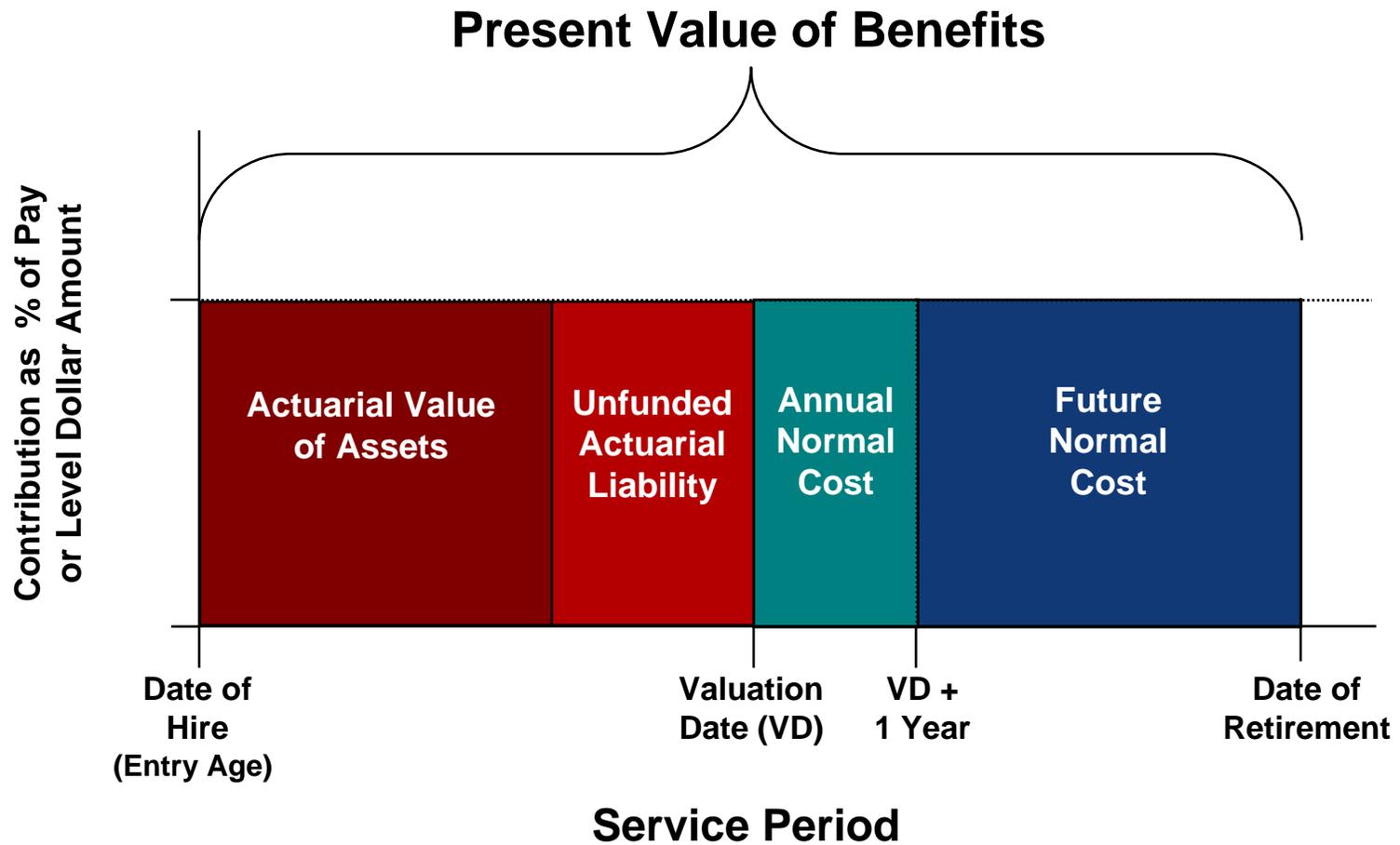
- Aggressive assumptions produce smaller present value
- Conservative assumptions produce larger present value



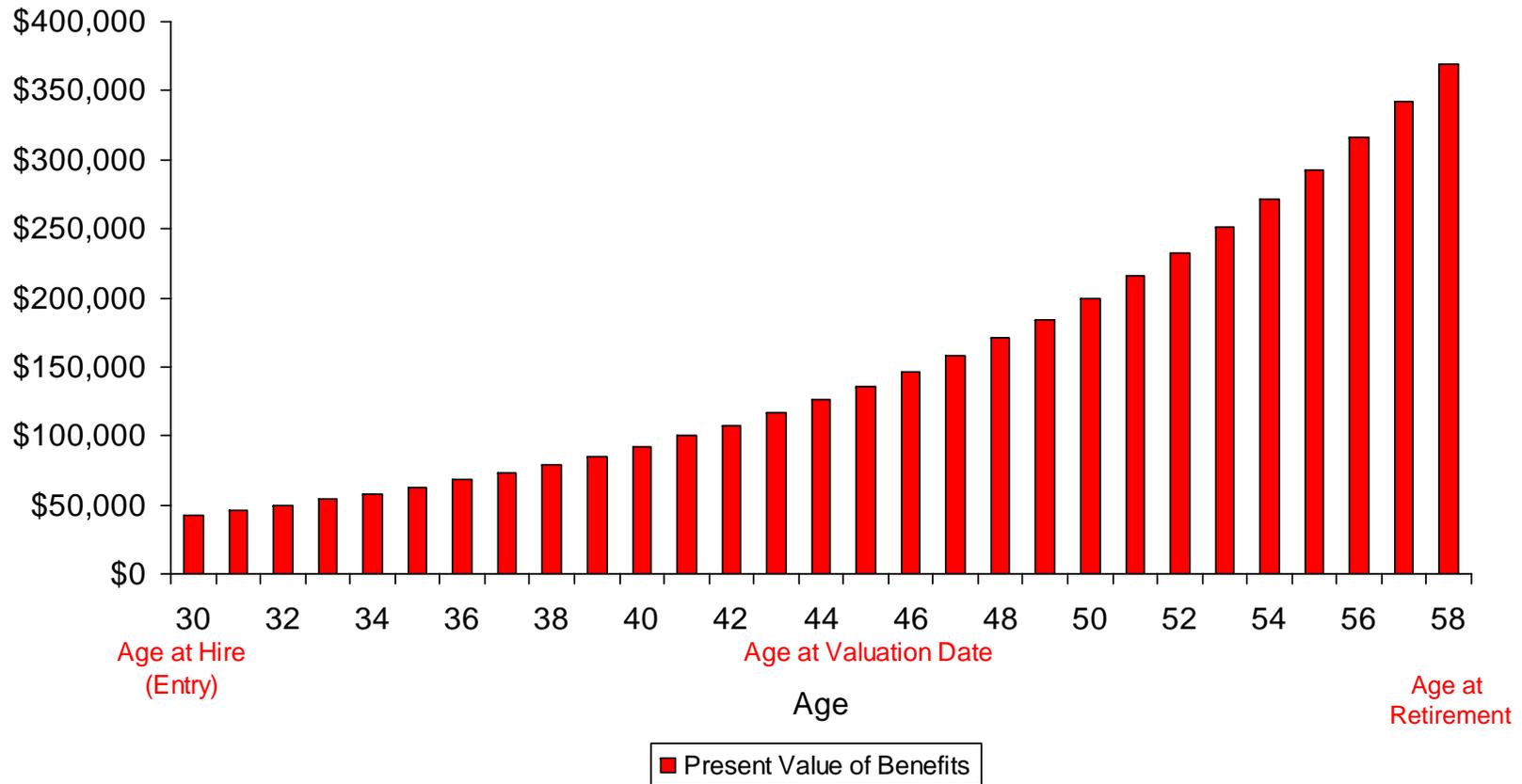
# Funding Process – Entry Age Normal



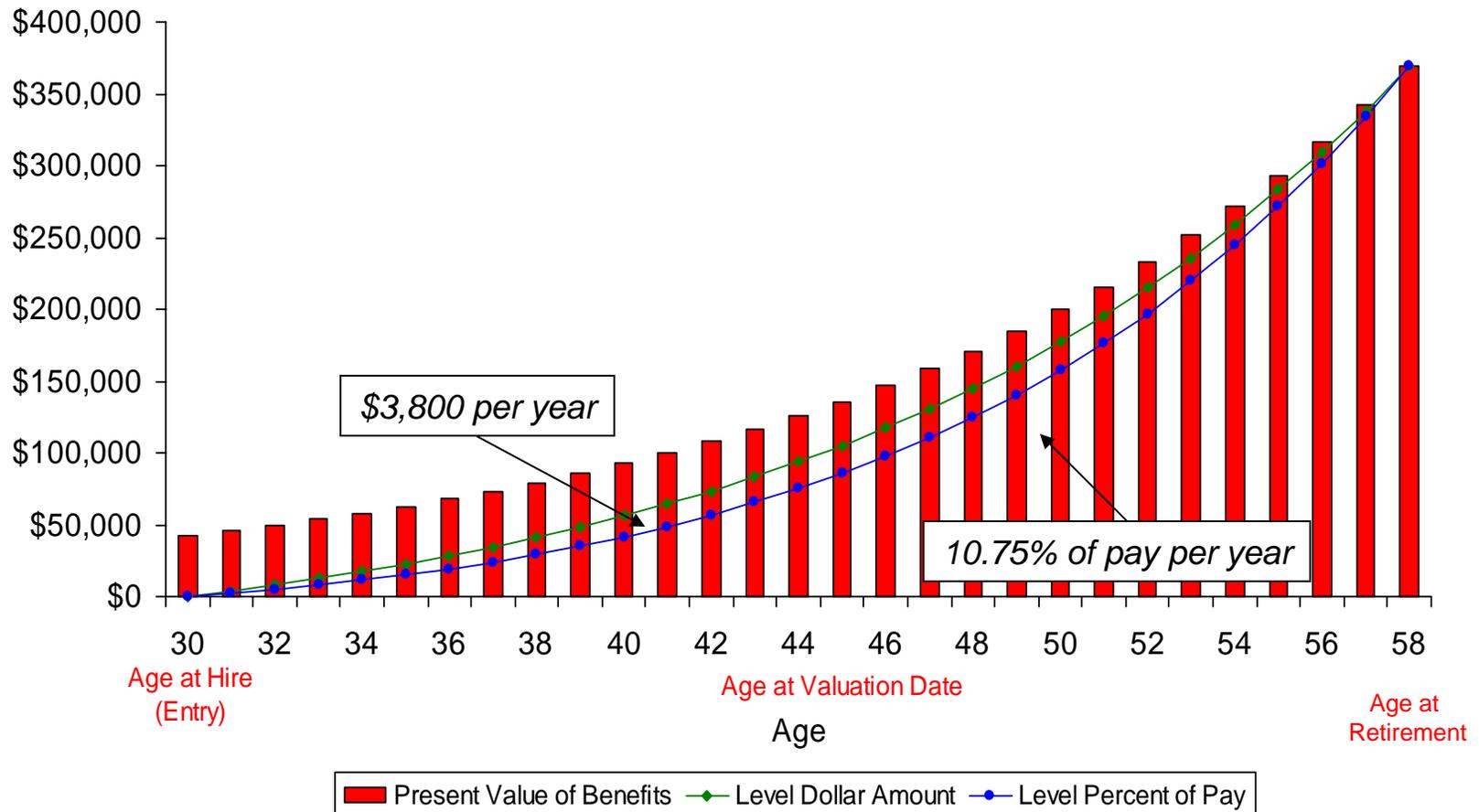
# Funding Process – Entry Age Normal



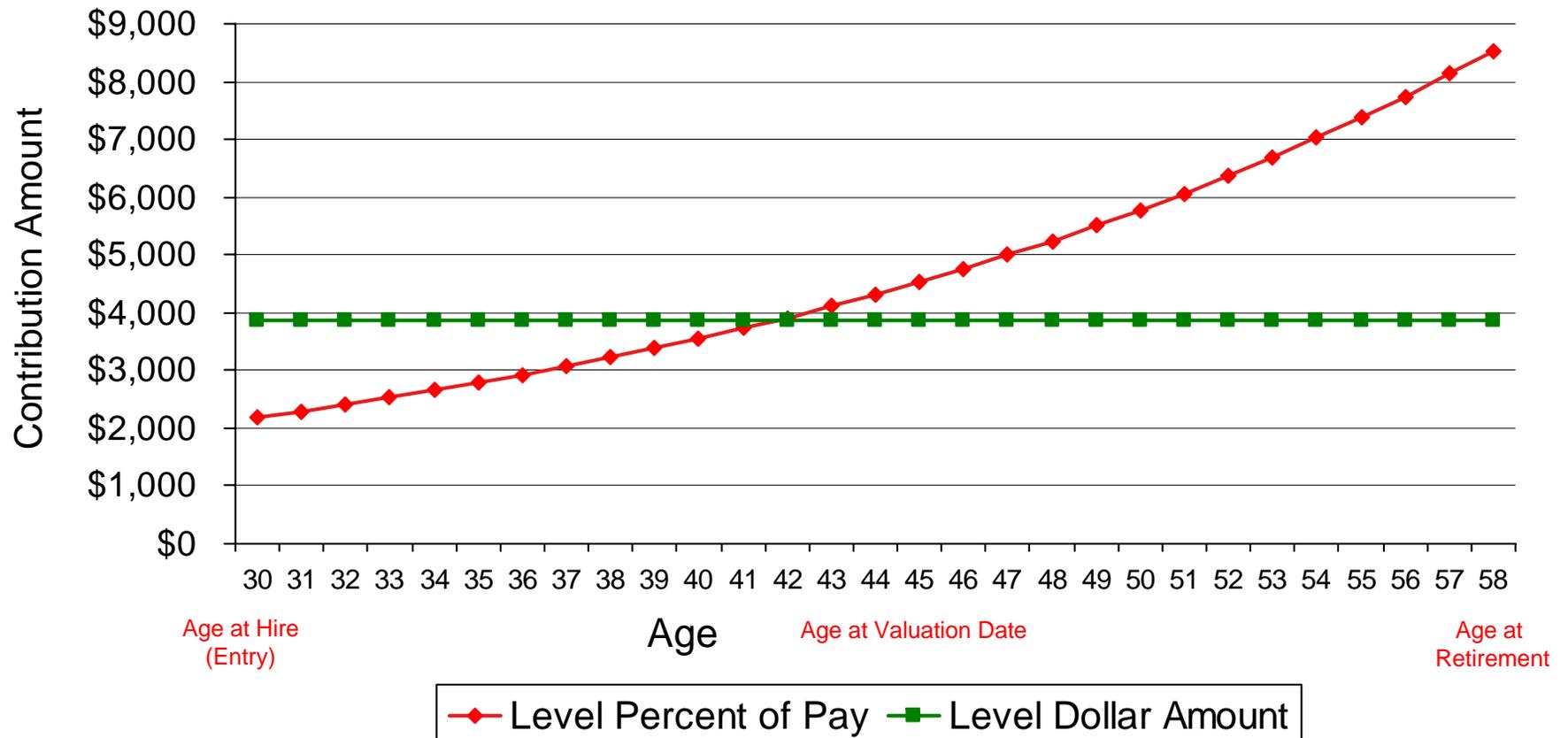
# Present Value of Benefits



# How to Fund Liability?



# Level Dollar or Level Percent of Pay



# Causes of Unfunded Actuarial Accrued Liabilities

1. Granting initial benefits or granting benefit increases for service already rendered
2. Actual experience which is less favorable than assumed.  
Examples follow:
  - a. lower rates of investment earnings
  - b. higher salary increases
  - c. lower death rates
  - d. lower rates of terminations
  - e. earlier retirement date(s)
3. Contributions that differ from actuarially calculated amounts

# Contribution Rates and Funding Periods

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# Contribution Rate

Normal Cost

Value of this year's expected benefit accruals

- Member Contributions

Contributions made by or on behalf of members

+ UAL Amortization

Unfunded liability amortization

+ Administrative Expenses

One-year cost of administering the plan

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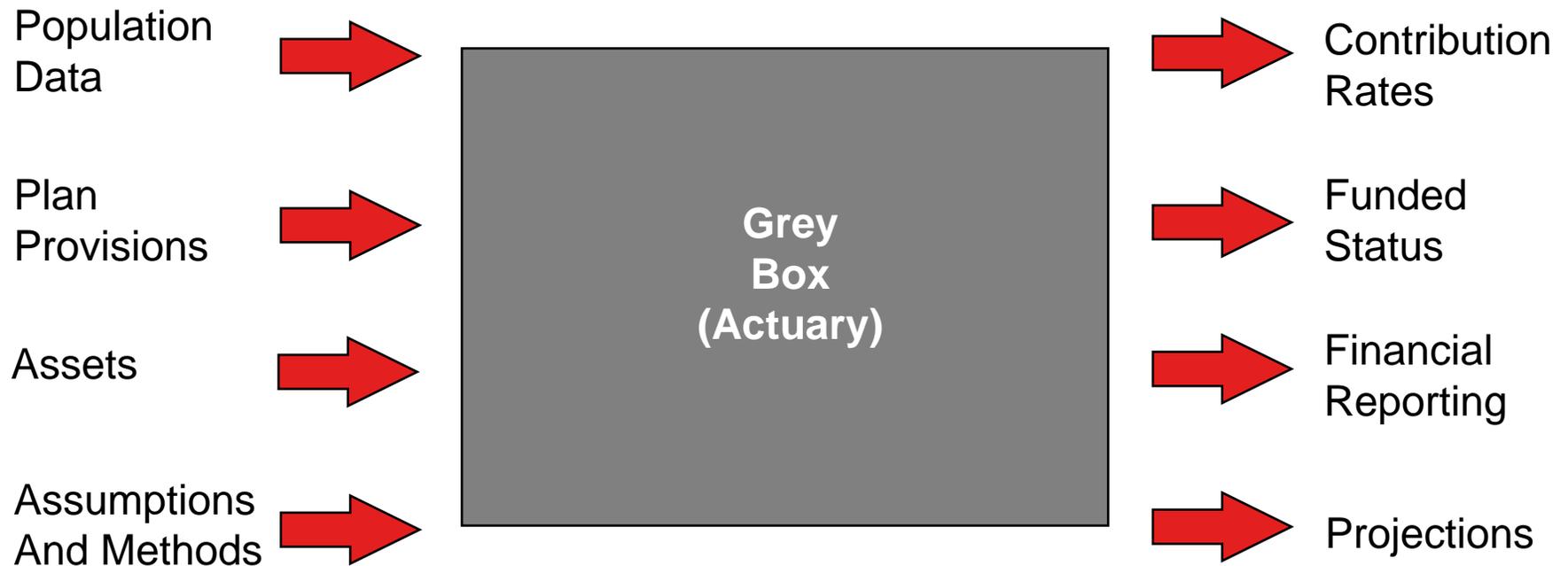
Contribution Rate

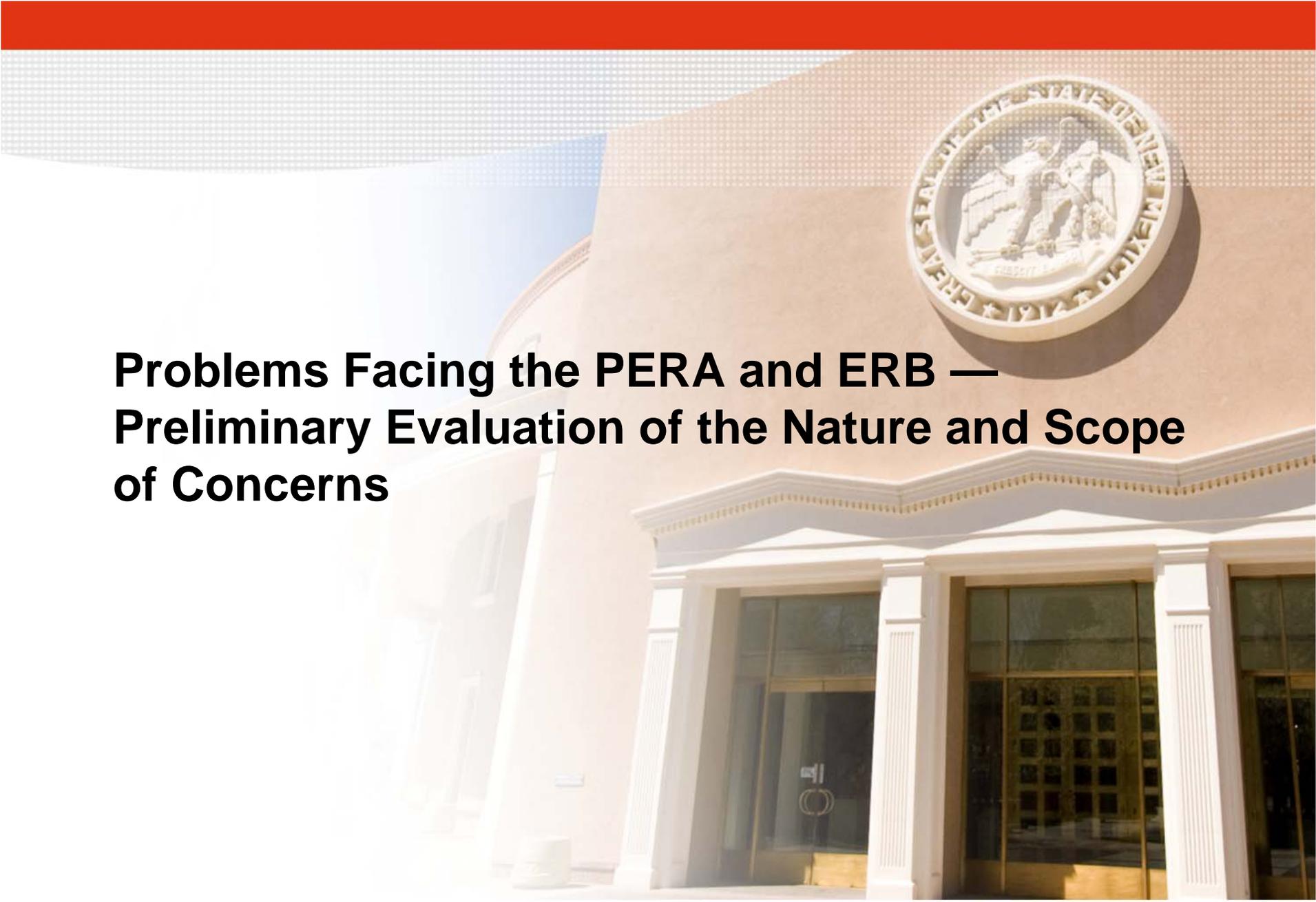
Total Employer Cost

## Funding Period

- Defines period of time it will take to pay off Unfunded Liability at Statutory Contribution Rates
- Typically assumes increasing payroll
- Standard policy of 30 years
  - Current GASB limit
  - Proposed changes to GASB likely to reduce this period for determining Pension Expense

# Valuation Overview





# Problems Facing the PERA and ERB — Preliminary Evaluation of the Nature and Scope of Concerns

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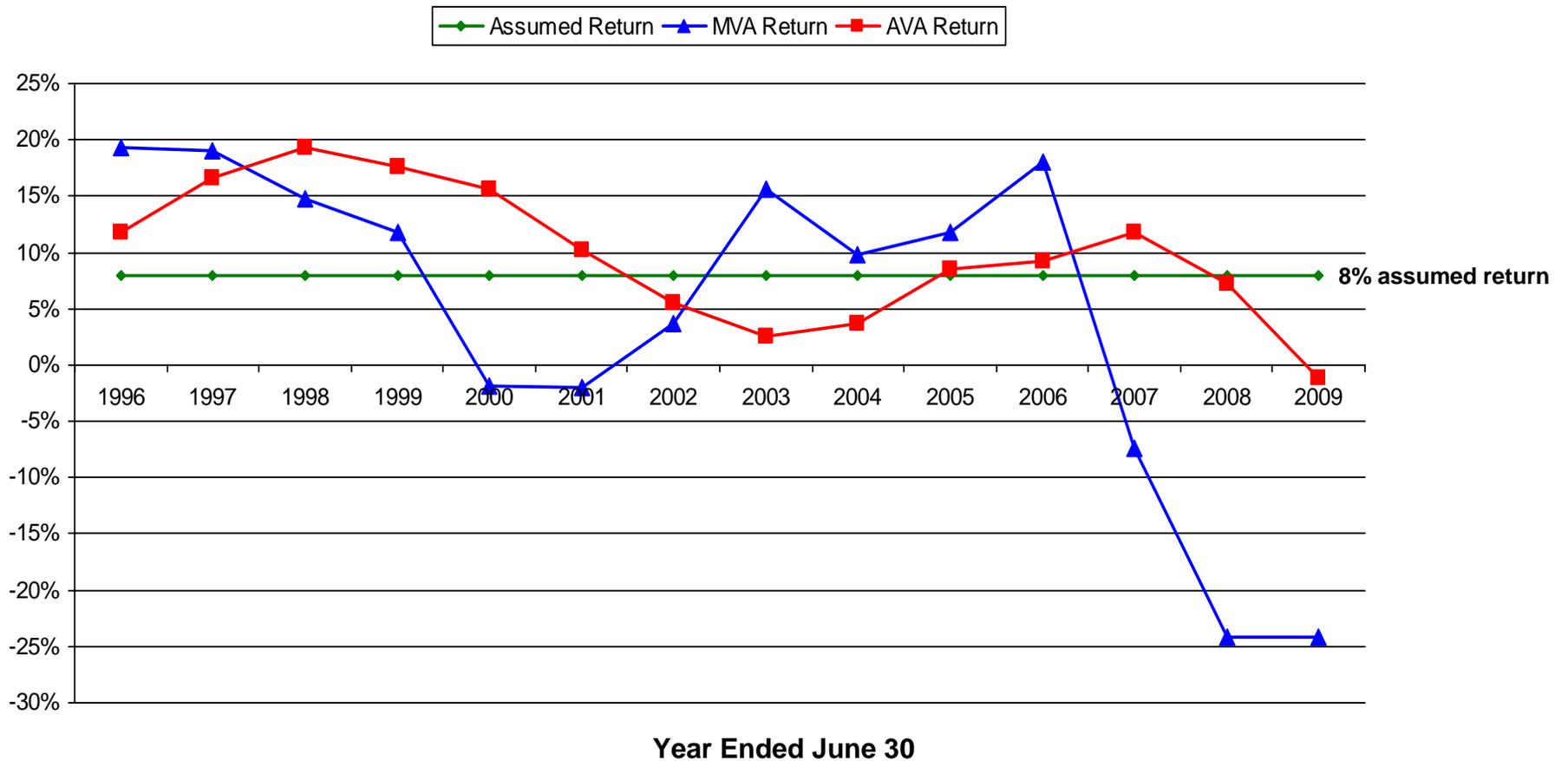
# Background

- Recent economic crisis has negatively impacted the funded status of most State Retirement Systems
- According to 2010 Wilshire Survey Report
  - 57 systems reported actuarial data for 2009
  - Average asset allocation was 67% equity/33% fixed income
  - Average funded ratio declined substantially between 2008 and 2009. Survey results with comparison to New Mexico Plans are as follows:

Based on	Funded Ratio		
	2008	2009	Decline
Market Value			
- Survey	79%	59%	(20%)
- ERB	68%	51%	(17%)
- PERA	87%	59%	(28%)
Actuarial Value			
- Survey	82%	72%	(10%)
- ERB	72%	68%	(4%)
-PERA	93%	84%	(9%)

- Increasing Unfunded Liabilities have increased required actuarial funding in many states, triggering legislative changes in 2010
- Recent market recovery likely to improve 2010 funded status disclosures, but more recovery needed to return to 2007 funding levels

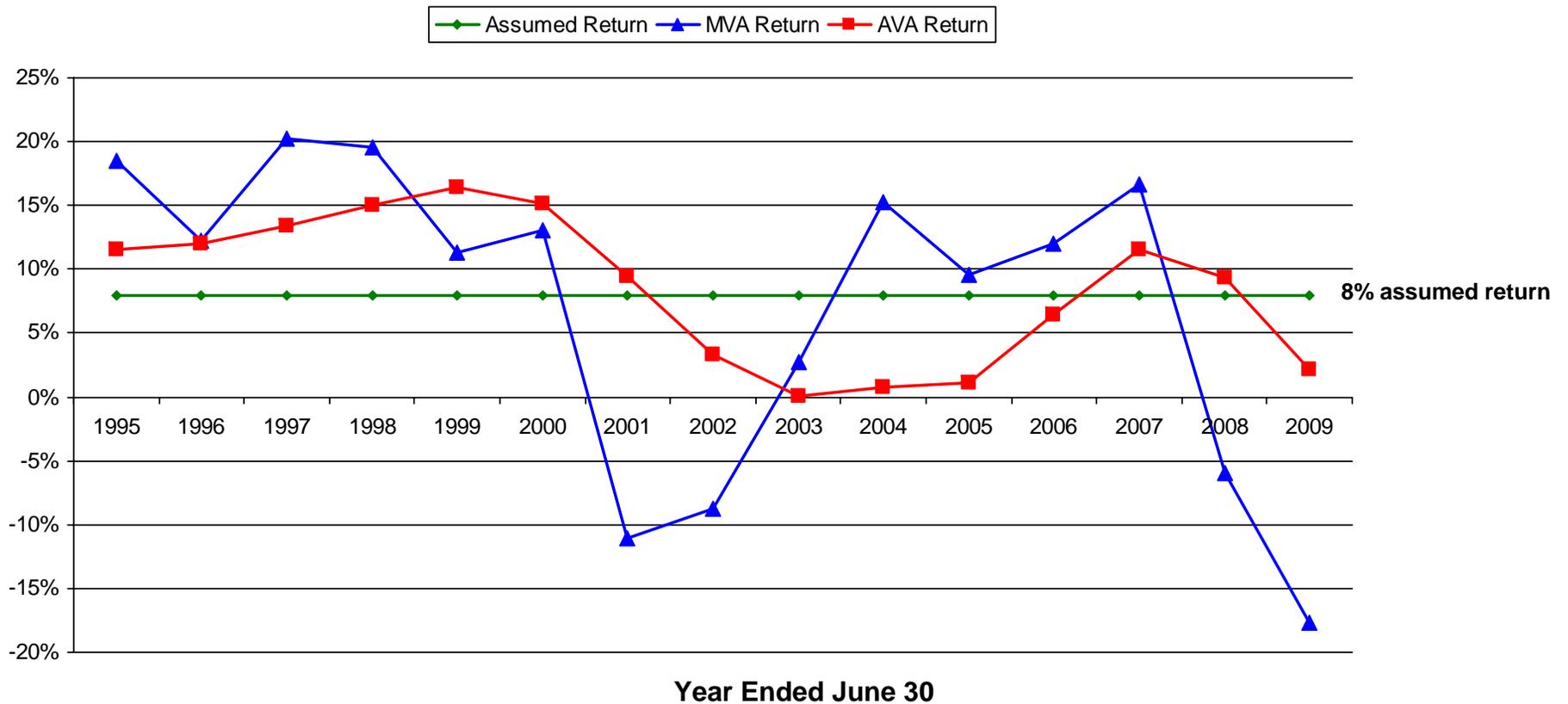
# PERA - Historical Returns



Average MVA return: 6.8%

Average AVA return: 9.7%

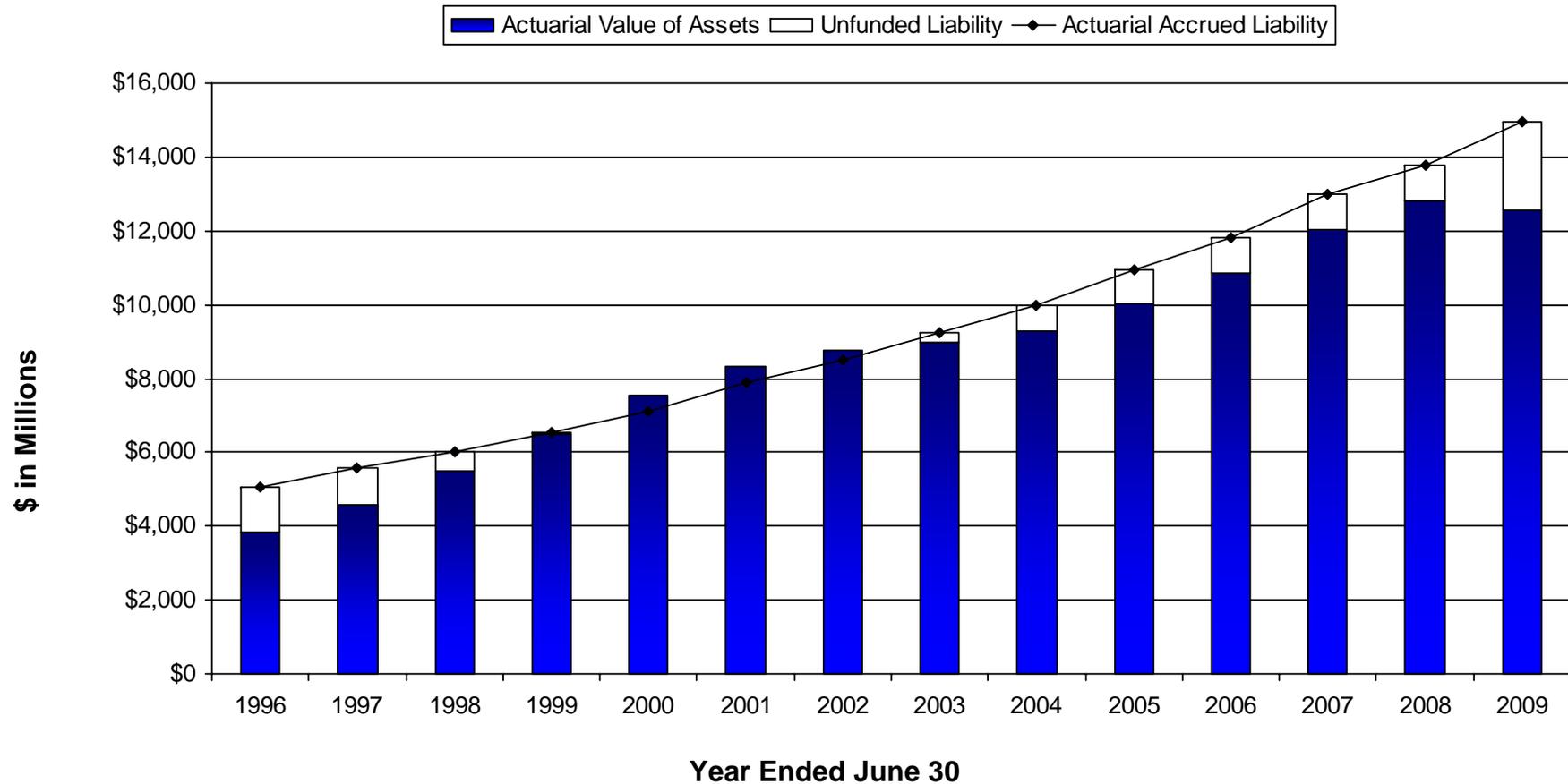
# ERB - Historical Returns



Average MVA return: 6.5%

Average AVA return: 8.4%

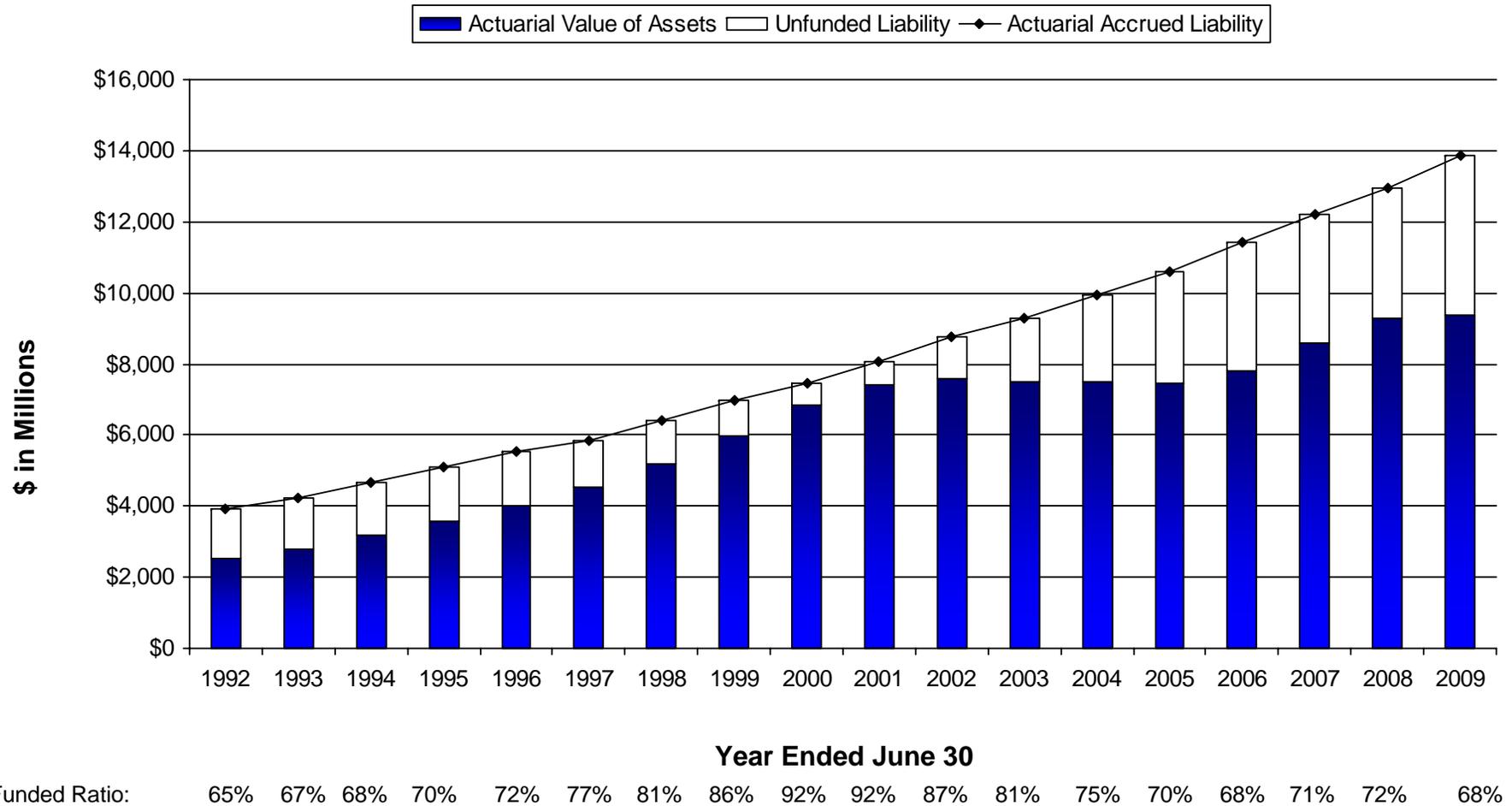
# PERA - History of Funded Status



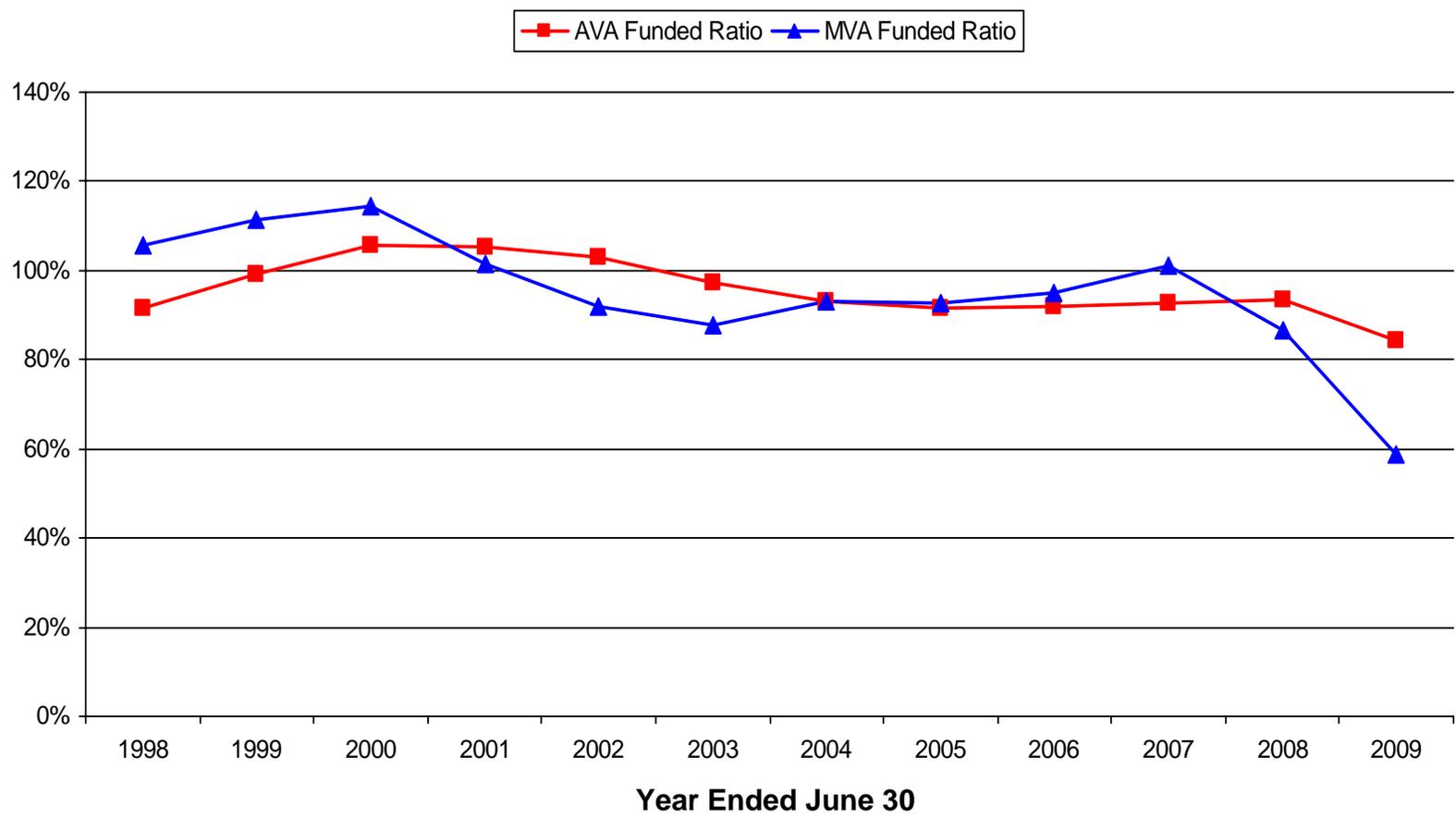
Funded Ratio: 76% 82% 91% 99% 106% 105% 103% 97% 93% 92% 92% 93% 93% 84%

Includes Legislative Division

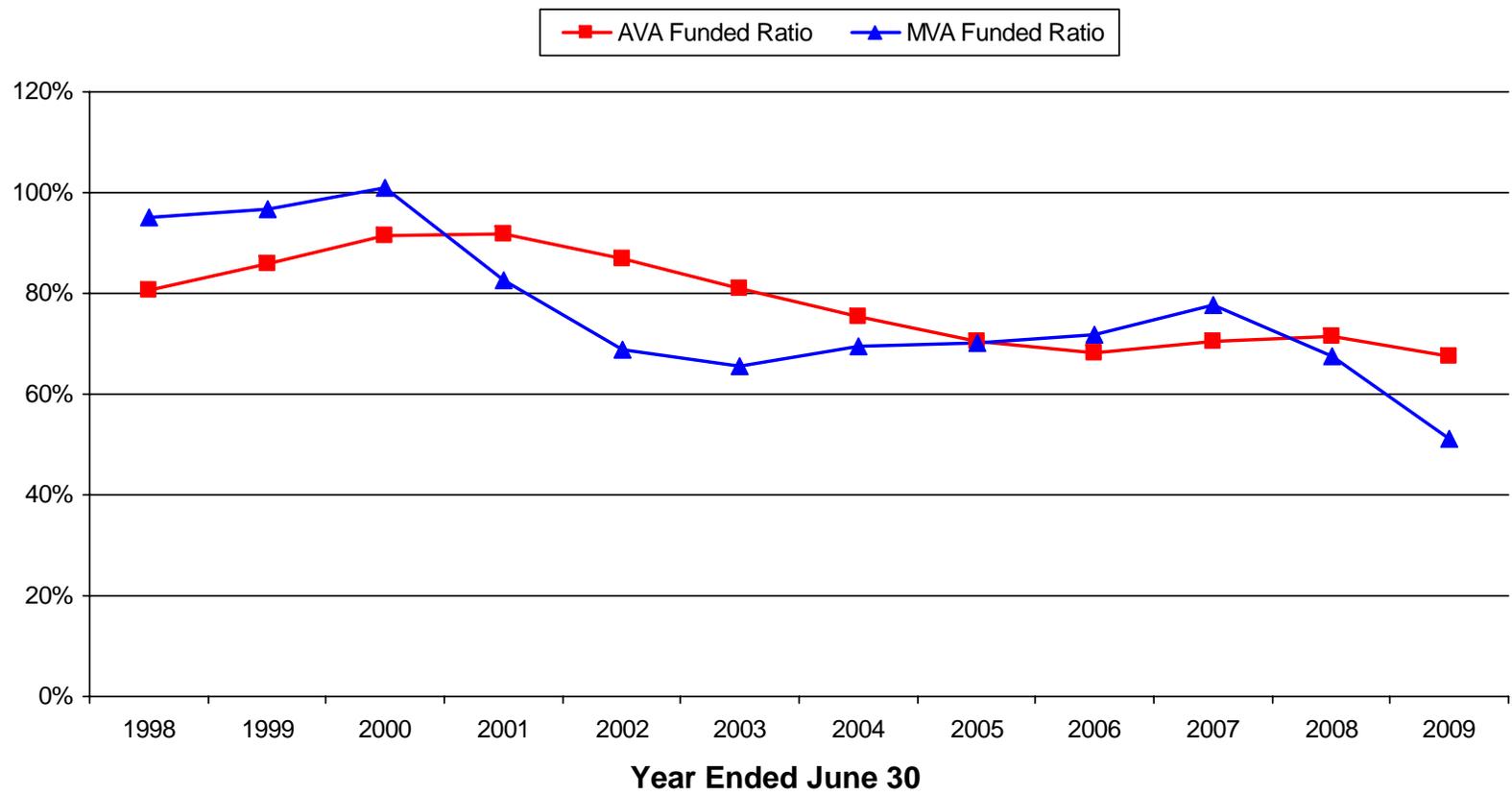
# ERB – History of Funded Status



# PERA - Historical Funded Status

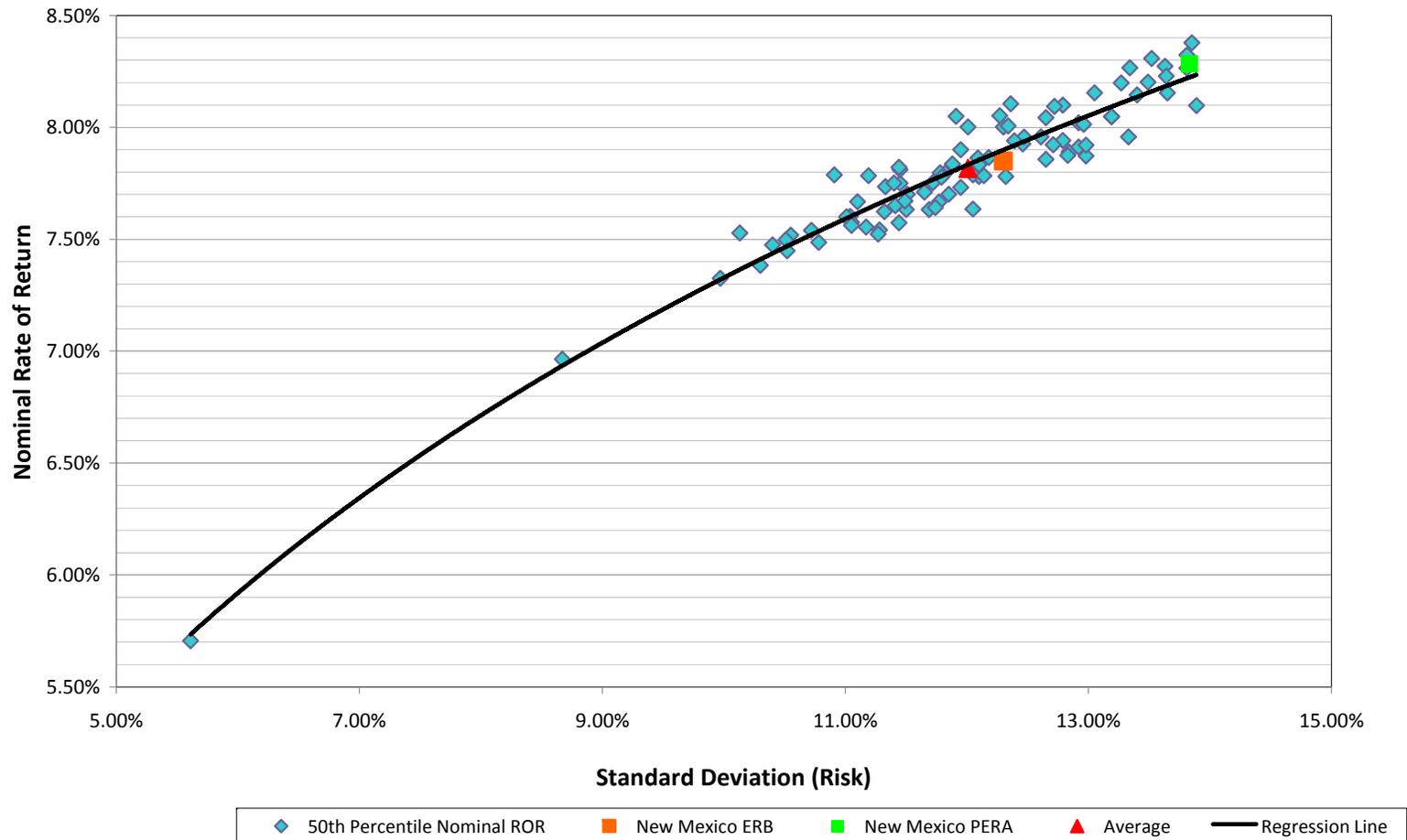


# ERB - Historical Funded Status



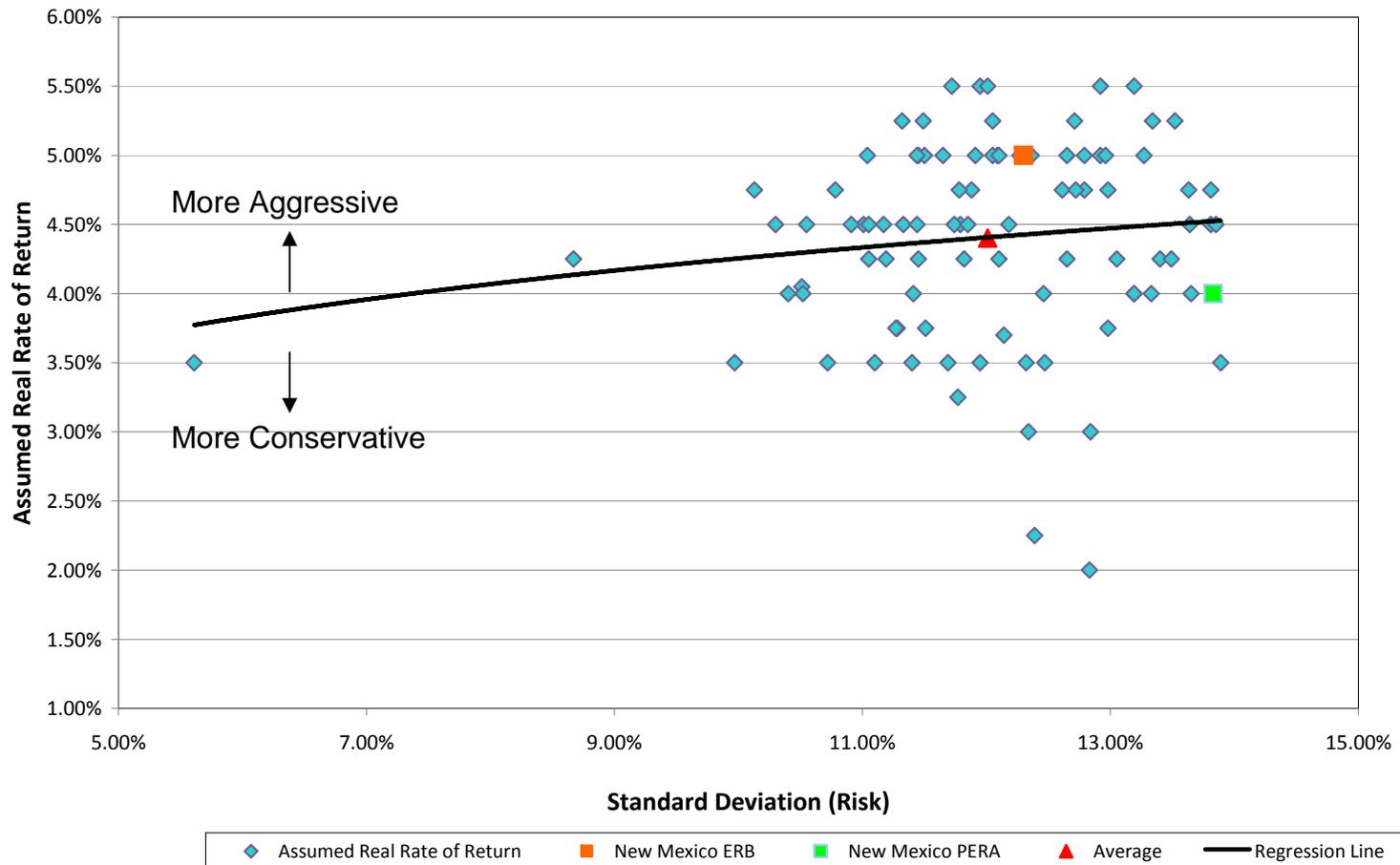
# Risk vs. Expected Nominal Rate of Return

## Based on 125 Plans Surveyed



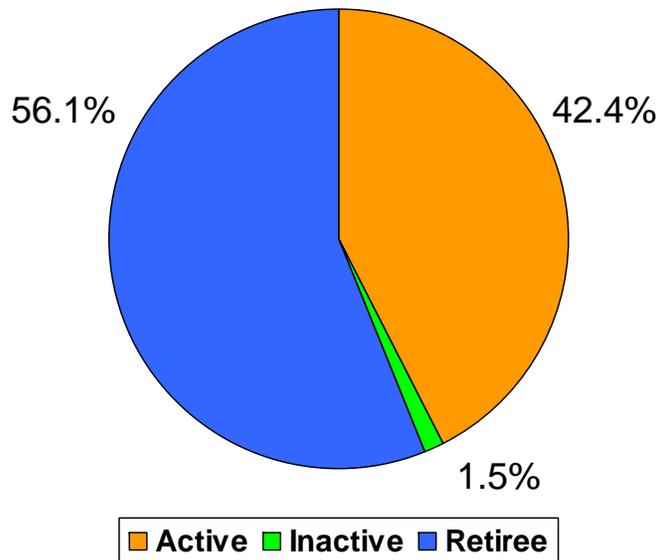
# Risk vs. Assumed Real Rate of Return

## Based on 125 Plans Surveyed



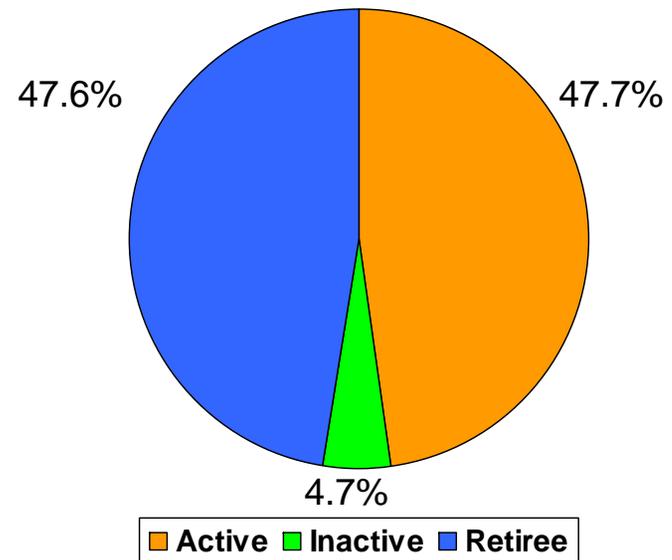
# Accrued Liability as of June 30, 2009

## PERA



Maturity Ratio: 57.6%

## ERB



Maturity Ratio: 52.3%

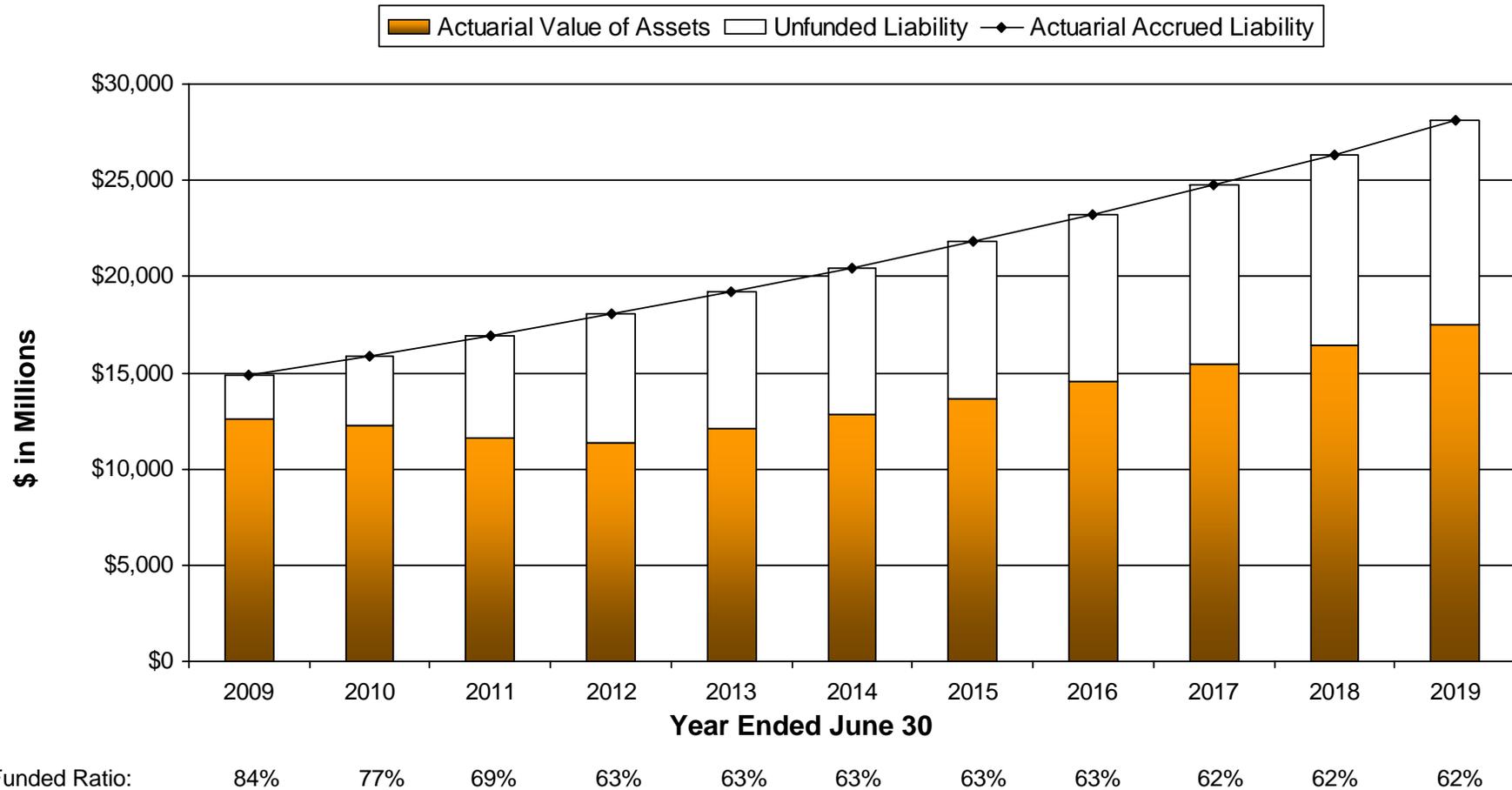
# Risk Indexes\*

		PERA	ERB
<b>Affordability Risk</b> = (one STD x MVA) / Payroll	Measures the percentage of payroll at risk for a 1 in 6 investment loss	58%	34%
<b>Debt Transfer</b> = UAL / Payroll	Measures the amount future taxpayers are committed to pay for past service benefits	113%	175%
<b>Funding progression</b> = (NC + interest on UAL)/Contributions	Measures whether UAL is expected to increase or decrease	124%	131%
<b>Liquidity</b> = MVA / Benefit Payments	Measures the approximate number of years of benefit payments that MVA can cover without future contributions. Trend shows solvency risk	13.8 years	11.0 years

*UAL is based on Actuarial Value of Assets.*

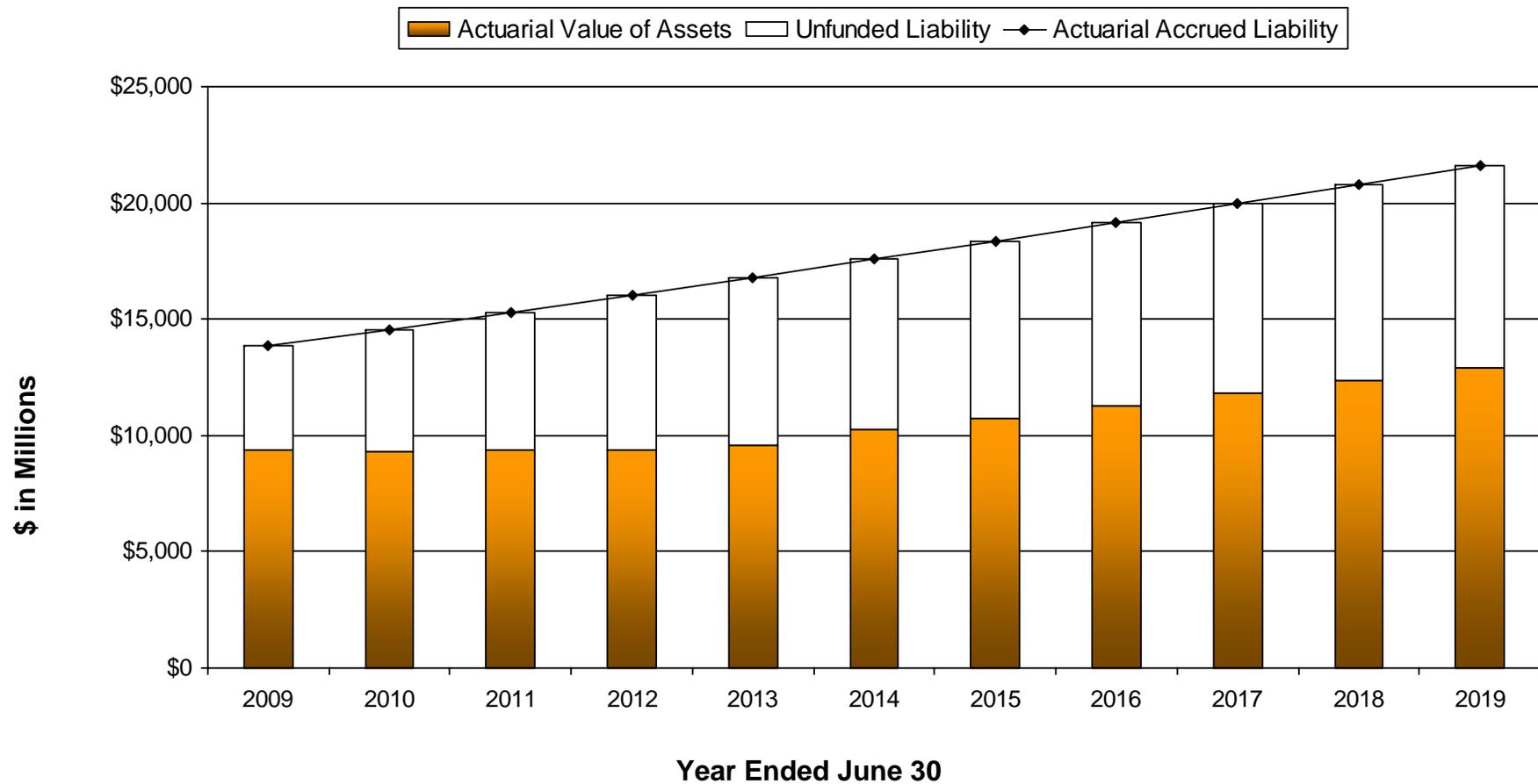
*\*From NASRA presentation on August 9, 2010 by Cheiron*

# PERA - Projection of Funded Status



Assumes 15.02% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010.

# ERB - Projection of Funded Status

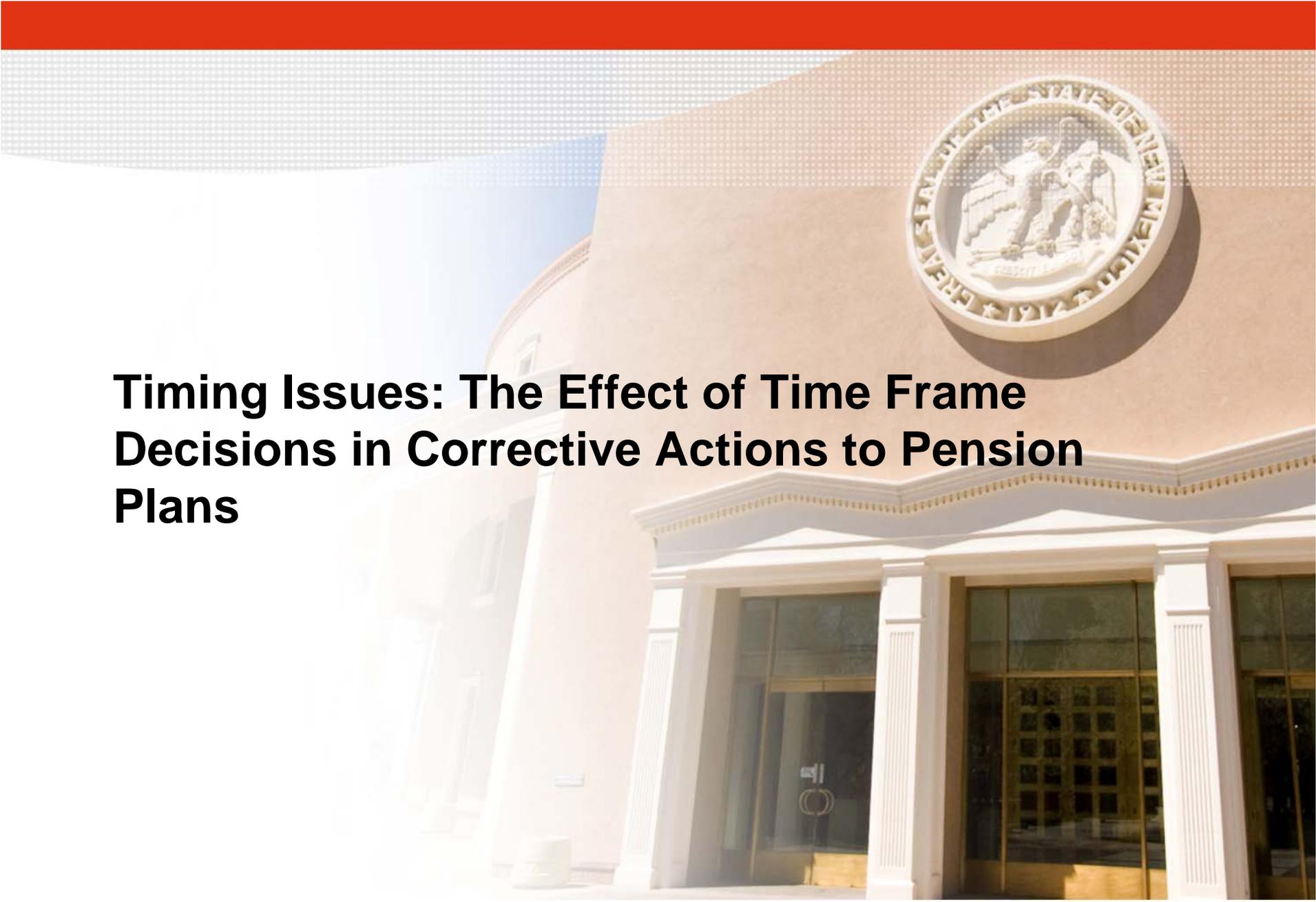


Funded Ratio:      68%      64%      62%      58%      57%      58%      59%      59%      59%      60%      60%

Assumes 18.6% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010.

## Conclusions

- Funded ratios expected to decline over the next 10 years without changes in contributions and / or significant market returns
- Short term funded ratios highly dependent on actual investment returns
- Benefit and funding policy changes are needed



# Timing Issues: The Effect of Time Frame Decisions in Corrective Actions to Pension Plans

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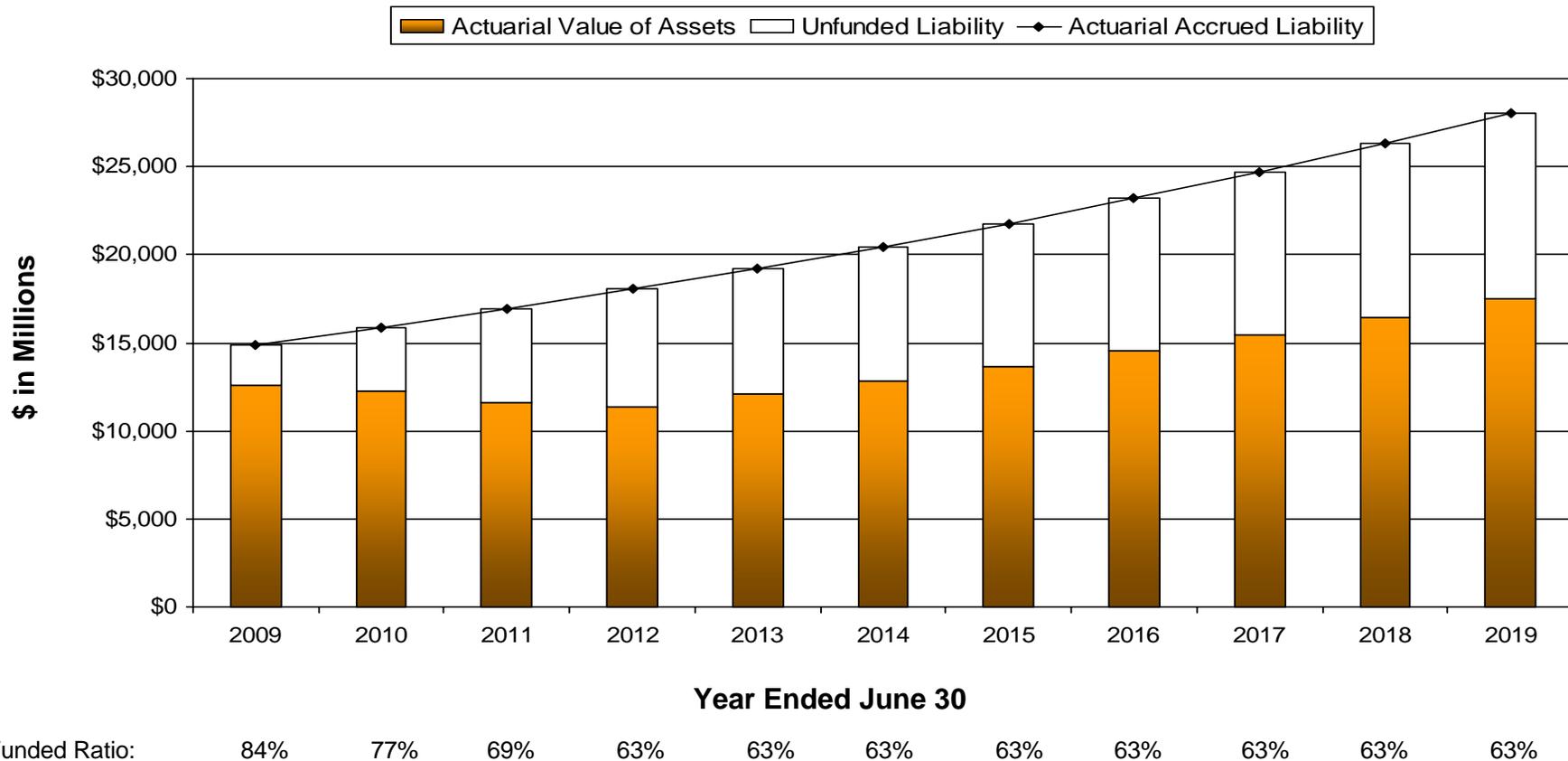
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## Importance of Timing

- Pay me now or pay me more later
- Changes in DB provisions often applied to new members only (new tier of benefits) with
  - Later retirement ages
  - Increased final average salary periods
  - Lower COLAs
  - Lower multipliers
  - Longer vesting schedules
  - Early retirement reductions
- Continuous monitoring and modeling essential
- Changes in benefits should be based on state's commitment for adequate benefit coverage, not necessarily based on funding policy

# PERA – Projection of Funded Status

Impact of new tier with a normal cost 2% lower than old tier

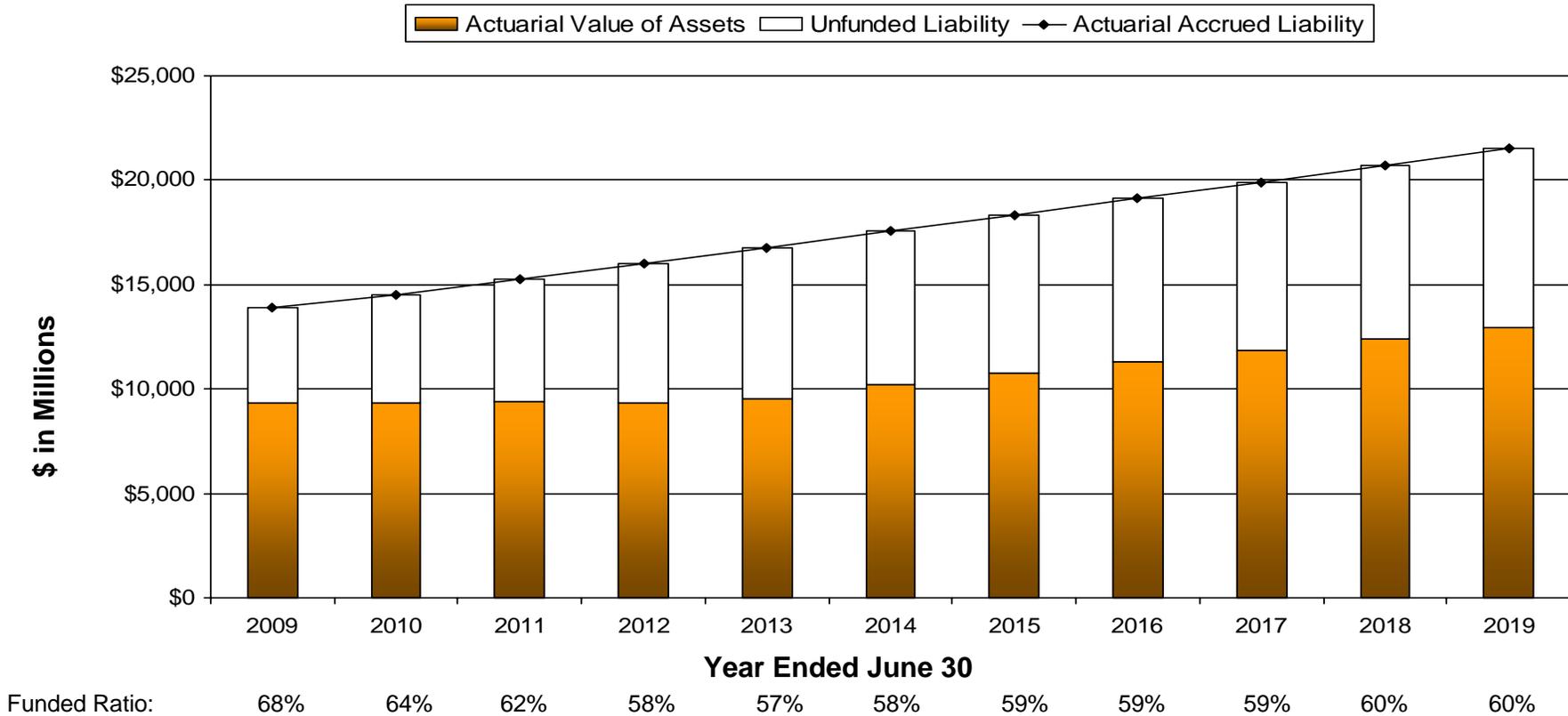


Assumes 15.02% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

Less than 1% change in funded status after 10 years.

# ERB – Projection of Funded Status

Impact of new tier with a normal cost 2% lower than old tier

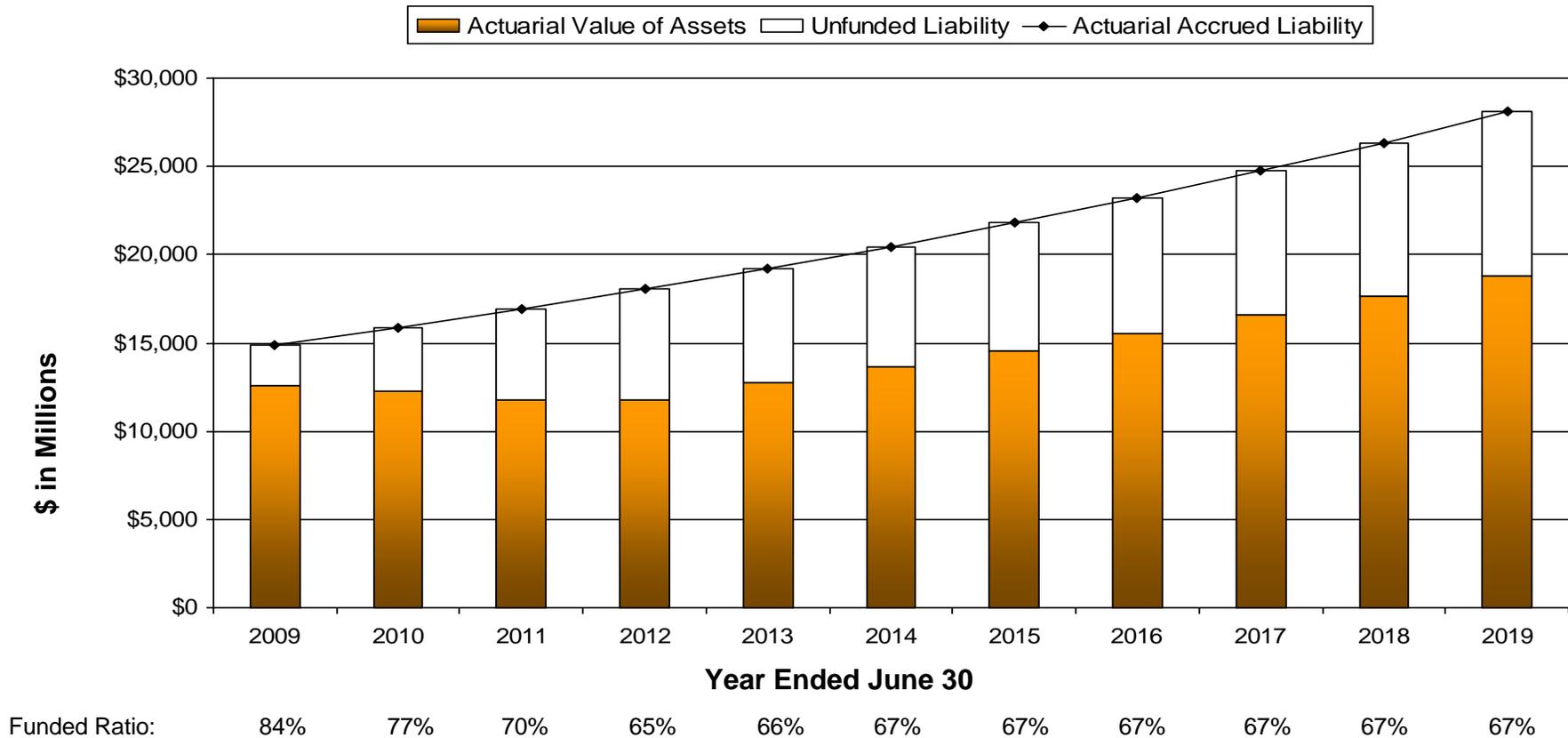


Assumes 18.6% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

No change in funded status after 10 years.

# PERA – Projection of Funded Status

Assumes FY10 return in FY11

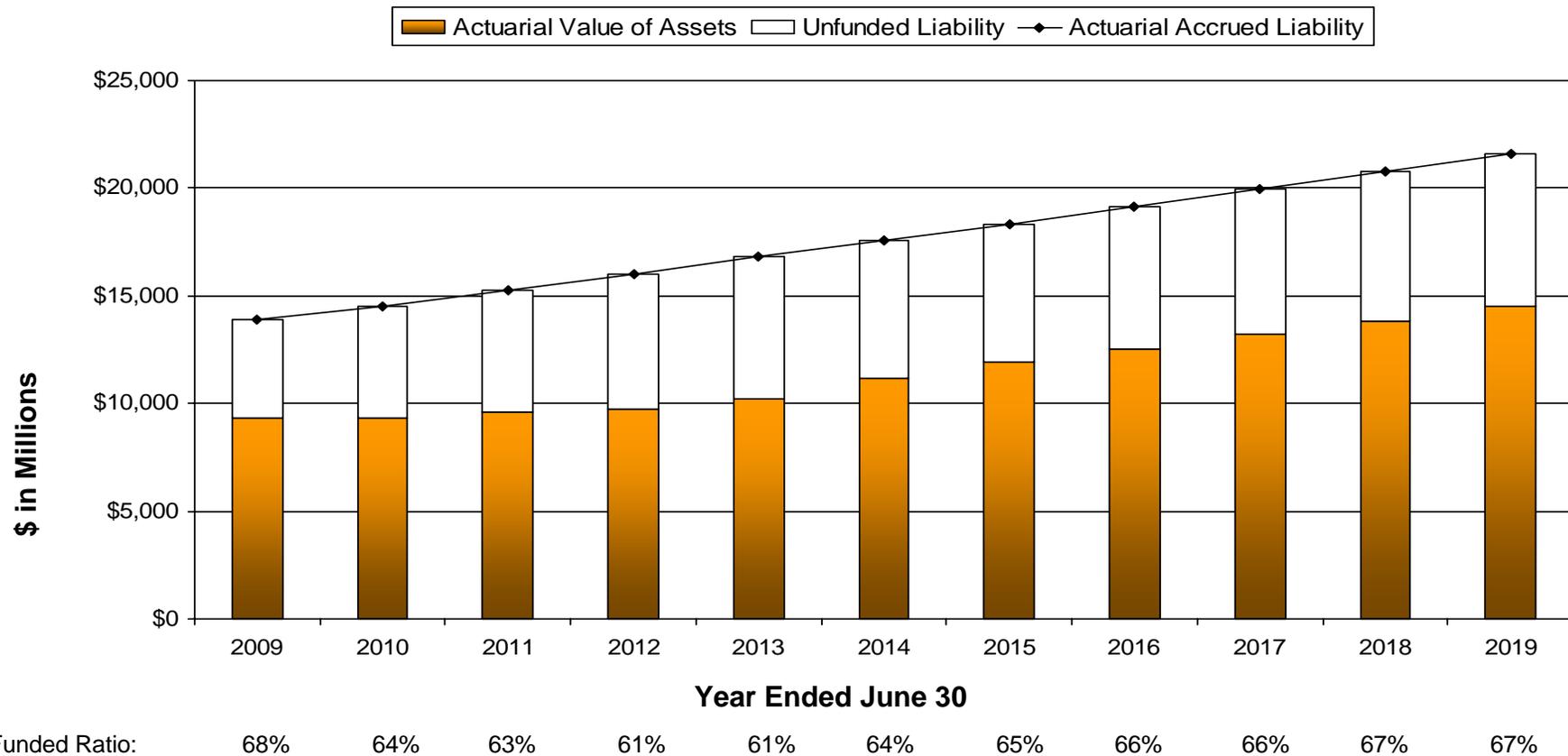


Assumes 15.02% for FY10 and FY11, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

5% increase in funded status after 10 years.

# ERB - Projection of Funded Status

Assumes FY10 return in FY11

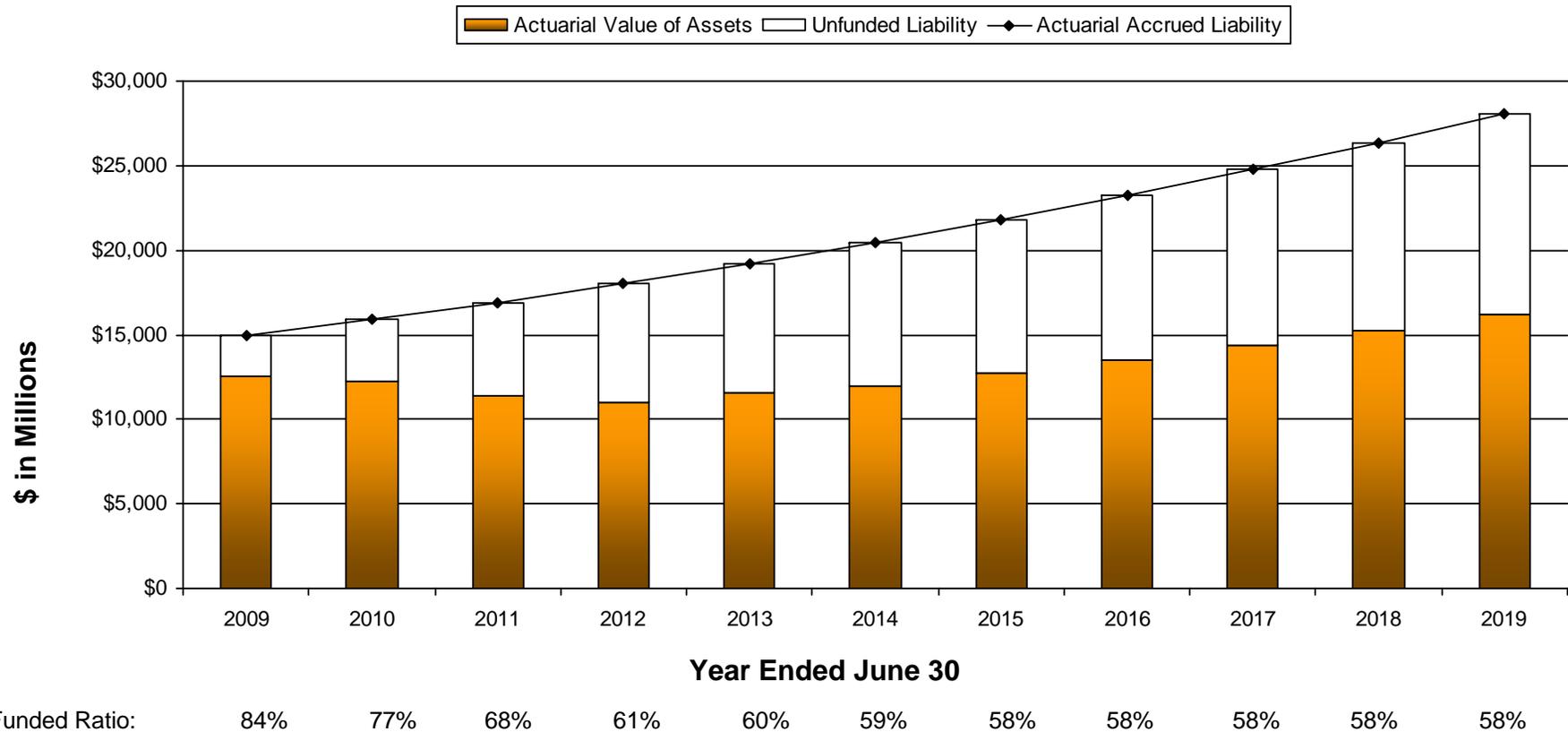


Assumes 18.6% for FY10 and FY11, 8% thereafter and all other assumptions are met. Does not include changes for new hires after June 30, 2010

7% increase in funded status after 10 years.

# PERA – Projection of Funded Status

Assumes FY10 return is negative in FY11

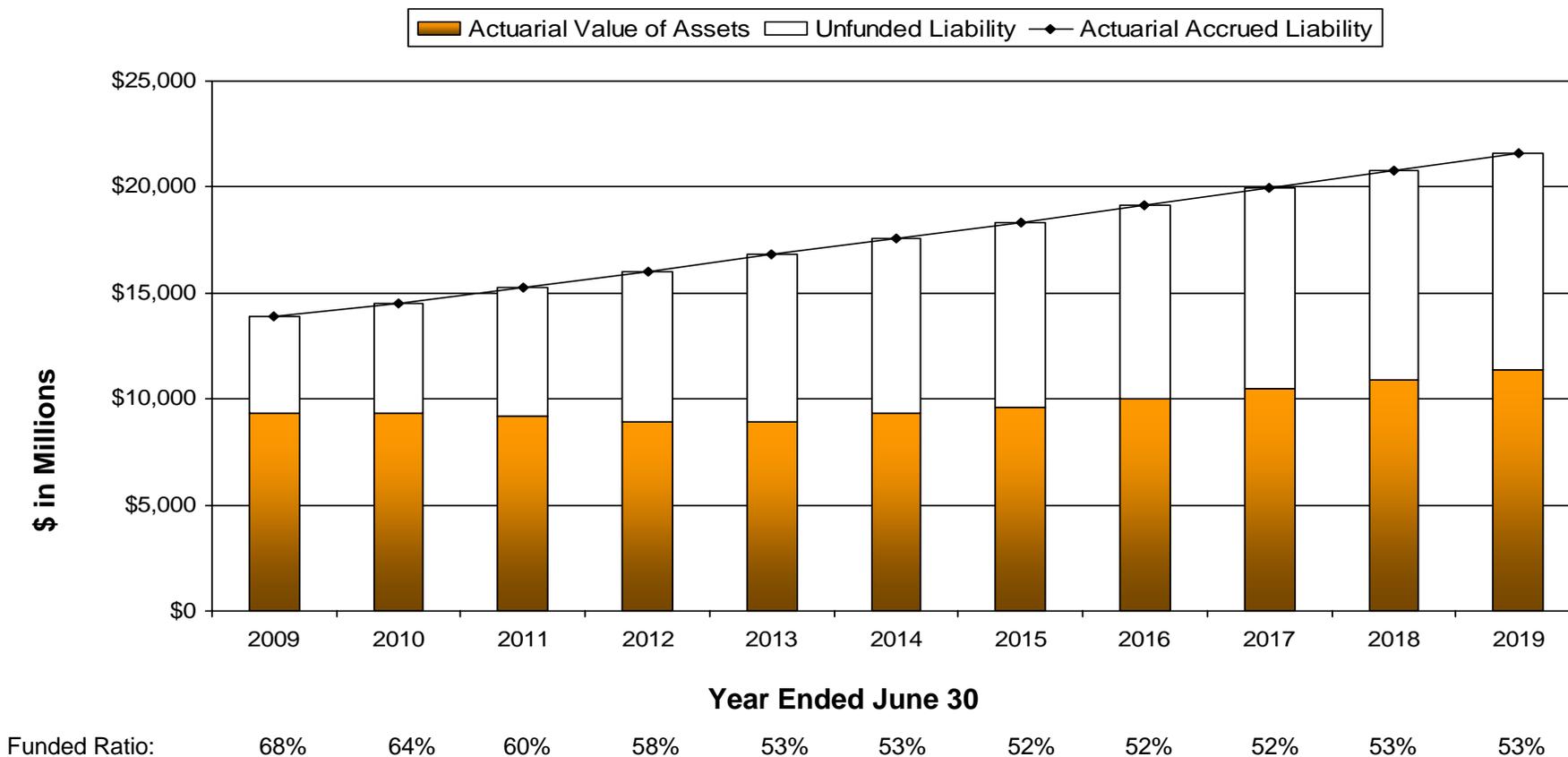


Assumes 15.02% for FY10 and FY11, 8% thereafter and all other assumptions are met. Does not include changes for new hires after June 30, 2010

4% decrease in funded status after 10 years.

# ERB – Projection of Funded Status

Assumes FY10 return is negative in FY11



Assumes 18.6% for FY10 and FY11, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

7% decrease in funded status after 10 years.

## Conclusions

- Long period of time before savings are realized with a new tier of benefits
- Investment returns have a significant impact (good or bad) on results
- The sooner changes are made, the better



# Pension Reform Options That Provide the Greatest Opportunity for Improved Solvency

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## Types of Changes Made in 2010 by Other State Systems

- Defined contribution and hybrid plans (Utah)
- Early retirement incentives (Iowa and New York)
- Defined benefit plan changes
  - Contribution rate changes
  - Increased eligibility for normal or early retirement
  - Increased period for final average salary
  - Increased service requirement for vesting
  - Formula multiplier changes
  - Reduced or limited COLAs
- Systems making changes to current members are facing lawsuits (South Dakota, Colorado, Minnesota)
  - Legal analysis needed to confirm changes are permissible
  - If allowed, decision on whether to make changes

# Changes to the Cost-of-Living Adjustment

- Current COLA provisions
  - PERA has 3% COLA
  - ERB has  $\frac{1}{2}$  the increase in the cost-of-living index with a minimum of 2% and a maximum of 4%
- Many systems putting in maximum COLA or tying the increase to an index (like ERB), or funded status (Colorado and South Dakota)
- Changes in the COLA provisions has significant compounded savings. A 1% decrease in the COLA could reduce the normal cost rate by 8% to 12%.

## Systems Changing Cost-of-Living Adjustments

	From	To	Members Affected
Colorado PERA	3.5% per year	Lesser of 2.0% per year CPI-W if negative return in last 3 years, with funded ratio rules	All members
Illinois	3.0% per year	Lesser of 3.0% per year or 50% of CPI	New members on or after January 1, 2011
Virginia RS	3.0% per year plus 50% of CPI over the next 4%	2.0% per year plus 50% of CPI over the next 8%	New members only
South Dakota RS	3.1% per year	3.1% if funded ratio (FR) > 90%, 2.6% if FR between 80%-90%, 2.1% if FR < 80%	All members

# Imposing a Minimum Retirement Age

- Many public retirement systems making this change
  - members are living longer and enjoying a lengthier retirement
  - challenge of funding for retirement benefits over a period of active service that is shorter than the period over which retirement benefits will be received
- Current eligibility

	PERA	ERB
Early Retirement	N/A	Tier 1: 75 points, reduced from age 60 Tier 2: 80 points, reduced from age 65
Unreduced Retirement	Tier 1: 25 years or graded points table Tier 2: 30 years or 80 points	Tier 1: 25 years or age 60 with 75 points Tier 2: 30 years or age 65 with 80 points
Normal Retirement	Tier 1: age 65 with 5 years Tier 2: age 67 with 5 years	Tier 1: age 65 with 5 years Tier 2: age 67 with 5 years

# Systems Changing Retirement Eligibility

	<b>From</b>	<b>To</b>	<b>Members Affected</b>
Arizona SRS	Rule of 80	Rule of 85	Members hired on or after July 1, 2011
Colorado PERA	55 / Rule of 80 50 / 30	58 / rule of 88 50 / 35	Members with less than five years of service as of January 1, 2011
Illinois SERS	Rule of 85 60 / 8	67 / 10	New members on or after January 1, 2011
Illinois TRS	62 / 5 60 / 10 55 / 35	67 / 10	New members on or after January 1, 2011
Mississippi PERS	Any / 30	Any / 33	Members hired on or after July 1, 2011
Vermont TRS	62 / Any Any / 30	65 / Any Rule of 90	Members who are more than five years away from NRA at date of enactment

## Changing the Multiplier

- Current multiplier:
  - PERA: 2% to 3.5% (State General has 3%)
  - ERB: 2.35%
- Most direct impact
- Reduces all benefits and ongoing costs by a proportional amount of the reduction
- Easiest to understand but new members will clearly understand that they are earning a lower benefit for the same contribution amount (assuming contributions are not changed)

# Systems Changing Formula Multipliers

	<b>From</b>	<b>To</b>	<b>Members Affected</b>
New Jersey PERS/TPAF	1.82%	1.67%	New members only
Vermont TRS	1.67%	2.0% after 20 years of service	Members more than five years from NRA

## Changing the Calculation for Final Earnings

- Benefits are defined as a % of average pay
  - PERA uses 3 years in the average
  - ERB uses 5 years in the average
- Some systems increasing the averaging period to 5 years or even 7 years
- Reduces costs by reducing the benefit amount
- Minimizes the impact of large compensation increases in members' final year or two of service
- Changing from a 3 year final average to a 5 year final average could reduce the normal cost rate by 3% to 5%

# Systems Changing Final Average Earnings

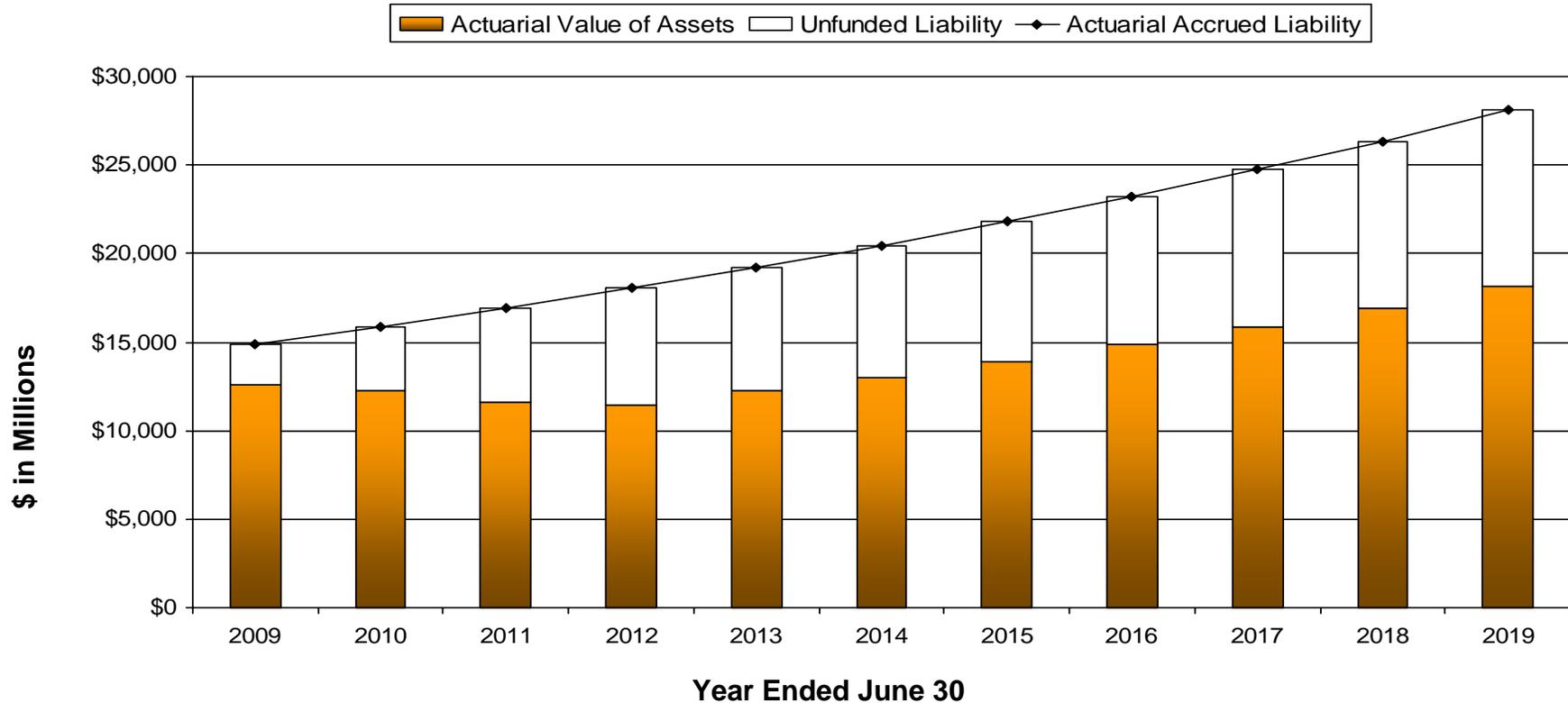
	<b>From</b>	<b>To</b>	<b>Members Affected</b>
Arizona SRS	3 years	5 years	New members on or after July 1, 2011
Illinois SERS/TRS	4 years	8 years and maximum \$106,000 FAS	New members on or after January 1, 2011
Iowa PERS	3 years	5 years – minimum of 3 year FAS if vested on July 1, 2012	All members
New Jersey PERS/TPAF	3 years	5 years	New members only
Virginia RS	3 years	5 years	New members only

## Changing Contribution Rates

- PERA contribution rates (State General)
  - Employers: 15.09%
  - Members: 8.92%
- ERB contribution rates
  - Employers: 10.90%, increases to ultimate of 13.90% in FY2012
  - Members: 9.40%, reduces to 7.90% in FY2012
- Significant way to reduce the unfunded liability since increased contributions immediately reduce the unfunded liability
- Further increases in contributions may be burdensome for members participating in Social Security

# PERA - Projection of Funded Status

Increase contributions by 1% in FY12 and later for both employer and member



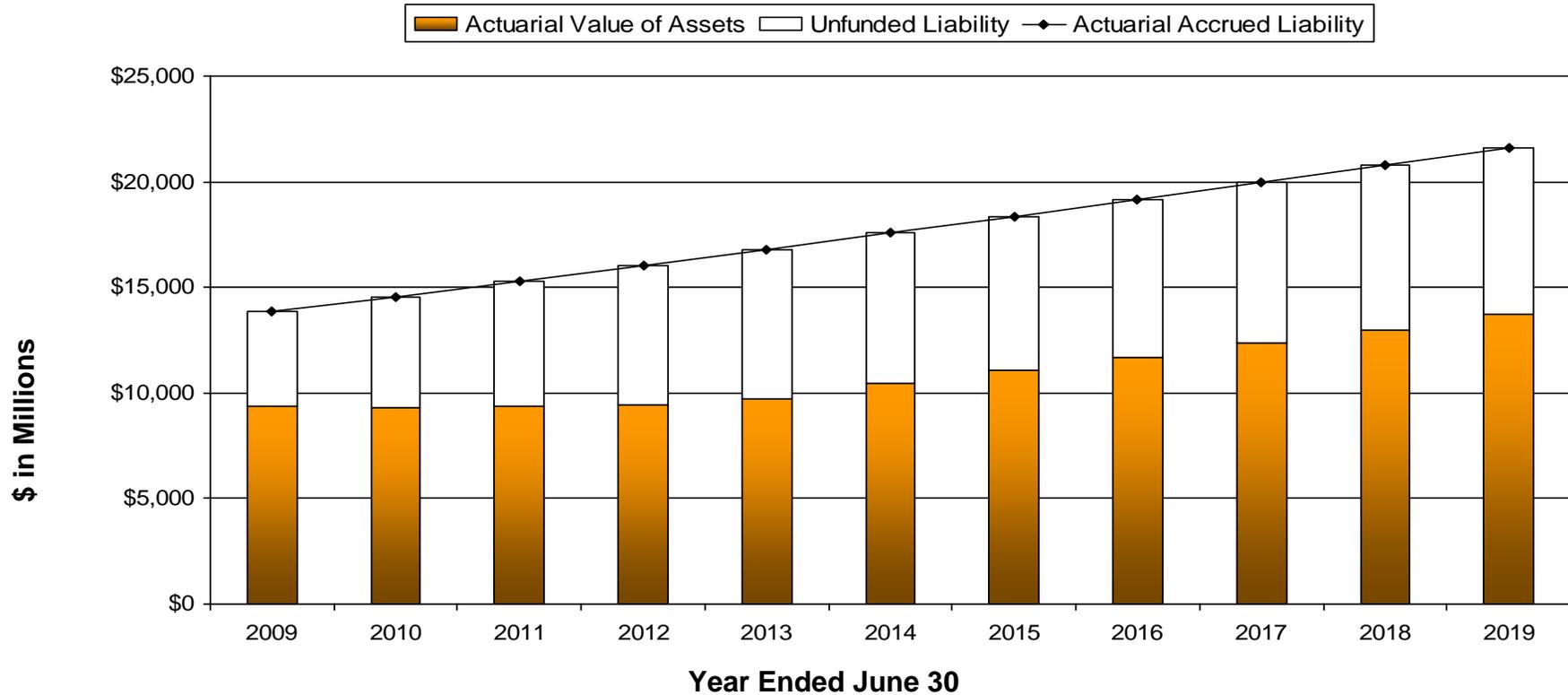
Funded Ratio: 84% 77% 69% 63% 64% 64% 64% 64% 64% 64% 65%

Assumes 15.02% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

3% increase in funded status after 10 years.

# ERB - Projection of Funded Status

Increase contributions by 1% in FY12 and later for both employer and member



Funded Ratio: 68% 64% 62% 59% 58% 60% 60% 61% 62% 63% 63%

Assumes 18.6% for FY10, 8% thereafter and all other assumptions are met.  
Does not include changes for new hires after June 30, 2010

3% increase in funded status after 10 years.

# Systems Changing Member Contribution Rates

	<b>From</b>	<b>To</b>	<b>Change</b>	<b>Members Affected</b>
Colorado (State)	11.00% by FY13	13.00% by FY17	+2.00%	All
Colorado (School)	11.00% by FY13	13.50% by FY18	+2.50%	All
Iowa PORS	9.35%	11.35% by FY13	+2.00%	All
Iowa PERS	4.70% by FY12	5.38% by FY12	+0.68%	All
Mississippi PERS	7.25%	9.00%	+1.75%	All
Vermont TRS	3.54%	5.00%	+1.46%	All
Virginia RS	0.00%	5.00%	+5.00%	New members only
Wyoming RS	5.57%	7.00%	+1.43%	All

# Systems Changing Employer Contribution Rates

- Employer contribution rates

	<b>From</b>	<b>To</b>	<b>Change</b>	<b>Members Affected</b>
Colorado (State)	13.15% by FY13	15.15% by FY17	+2.00%	All
Colorado (School)	13.55% by FY13	14.65% by FY16	+1.10%	All
Iowa PORS	27.00% by FY13	37.00% by FY18	+10.00%	All
Iowa PERS	7.25% by FY12	8.07% by FY12	+0.82%	All
New Mexico ERB	13.15%	12.40% FY11 only	-0.75%	All
Wyoming (Non-State ERs)	5.68%	7.12%	+1.44%	All

## Other Options

- Early retirement reduction factors
  - PERA has no early retirement reductions
  - ERB has 2.4% for first 5 years, 7.2% for years after 5 years early
  - Increasing early retirement reductions can decrease normal cost rate by up to 7%
- Vesting requirements
  - PERA and ERB have 5 year cliff vesting
  - Change to 10 year cliff vesting would impact the normal cost rate by 3% to 5%

# Systems Changing Vesting Schedule

	<b>From</b>	<b>To</b>	<b>Members Affected</b>
Iowa PERS	55 / Any Any / 4	65 / Any Any / 7	Members not vested by July 1, 2012
Missouri SERS	Any / 5	Any / 10	Members hired on or after January 1, 2011

## Conclusions

- Reduced benefits under a new tier and/or contribution increases will improve long-term funding, but will occur slowly
- Benefit reductions to current members would have a greater immediate impact on funding, but face legal challenges
- Investment returns in short and long term will determine ultimate cost, and have a significant impact on contribution rates/funding period
- Pay me now or pay me more later
- Continue to monitor progress

# Questions?

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