Texas Municipal Retirement System Actuarial Valuation Report as of December 31, 2014

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Today's Agenda

- Summary of System-wide Results
- Asset Performance
- Funded Status
- Contribution Requirements
- Future Expectations
- Upcoming Experience Study
- Summary

Summary of System-wide Results

$ amounts in millions	Dec 31, 2013 Valuation	Dec 31, 2014 Valuation
Actuarial Accrued Liability (AAL)	$25,320	$26,647
Actuarial Value of Assets	$21,293	$22,861
Unfunded Actuarial Accrued Liability (UAAL)	$4,027	$3,786
Funded Ratio	84.1%	85.8%
Full Contribution Rates:		
Straight Average	8.58%	8.39%
Payroll Weighted Average	12.97%	12.63%
Normal Cost %	7.83%	7.86%
Prior Service %	5.14%	4.77%

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Aggregate BAF Valuation ($ in millions)

Reconciliation of Unfunded Actuarial Accrued Liability ("UAAL")

	Change in UAAL	Impact on Funded Ratio	Impact on Full Rate
UAAL @ BOY	$4,027	84.1%	12.97%
Interest (7.00%)	286		
Amortization Payments*	(286)	0.7%	
Asset Performance	(96)	0.4%	(0.12%)
Benefit Changes	64	(0.2%)	0.13%
Assumption/Legislative Changes	-	0.0%	0.00%
Contributions different than Actuarially Determined	(18)	0.1%	(0.03%)
Liability (Gains)/Losses	(191)	0.7%	(0.32%)
UAAL @ EOY	3,786	85.8%	12.63%

*No longer have "negative" amortization as the funding period has reached approximately 21 years

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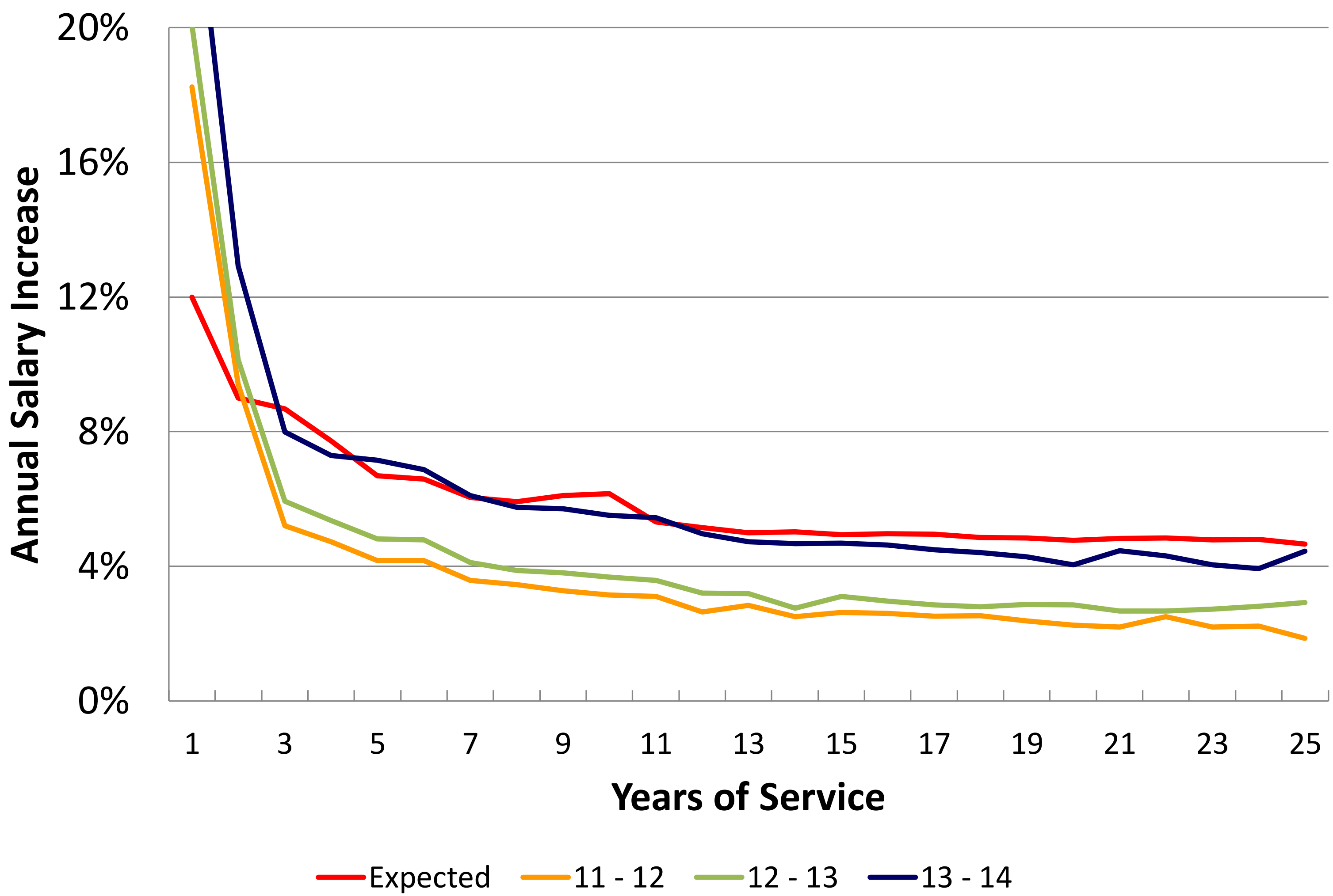
Non-Investment Experience

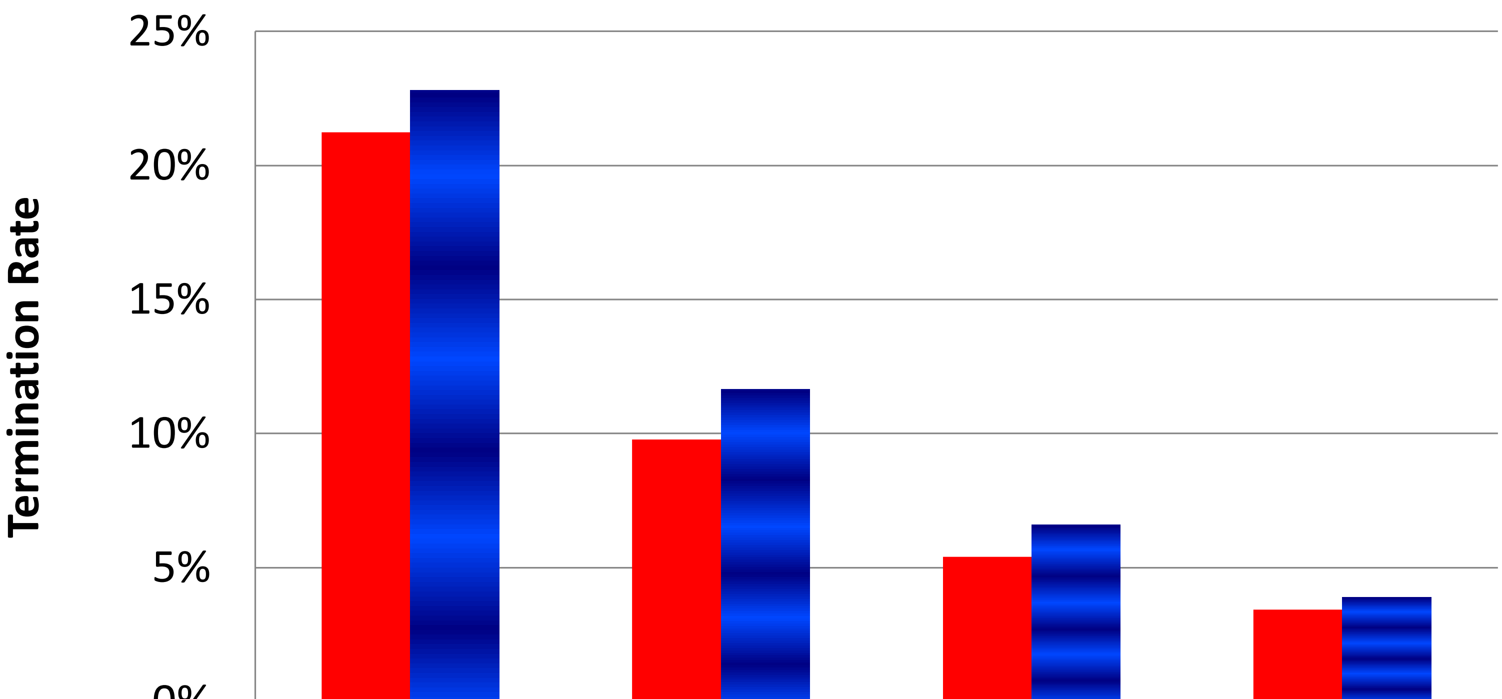
- Actual CPI of 0.76% was less than the 3.00% assumption, so liability for repeating COLAs was less than expected
  - System-wide, created a Liability Gain of about $100 million
  - 2013 CPI of 1.50% resulted in a system-wide gain of about $60 million
  - 2012 CPI of 1.74% resulted in a system-wide gain of about $45 million
- Valuation uses 3-year smoothing on salaries
  - The 2013-2014 salary experience was close to expected, still some deferred gains from prior valuations are being reflected in this valuation
  - System-wide, created a Liability Gain of about $145 million
- For active employees:
  - Average age remained steady at 43.3 years
  - Average service is 10.7 years and decreased by 0.1 from last year

Salary Increases for Continuing Active Members Distributed by Years of Service



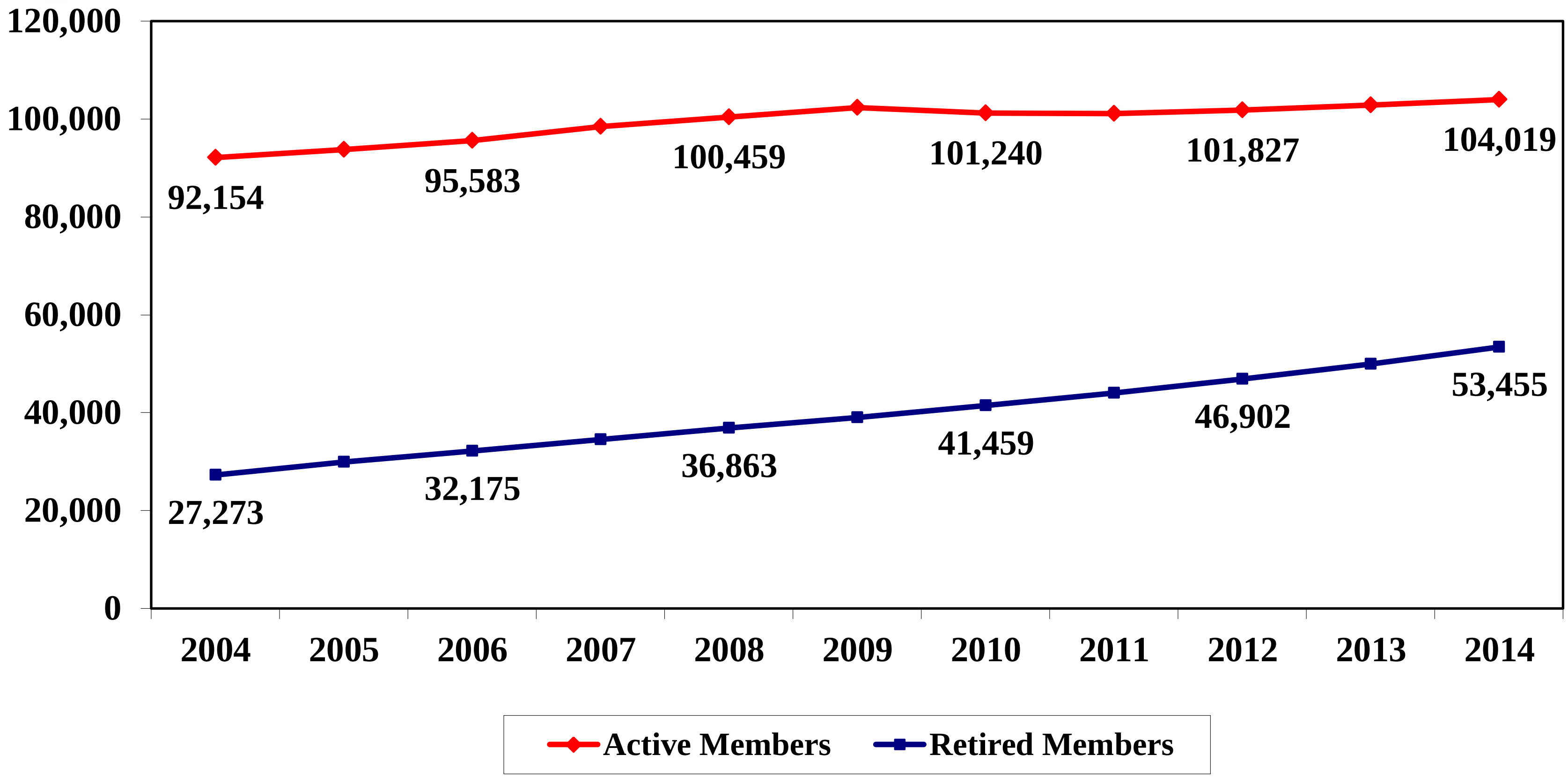
Salary increases continue to be less than historical patterns but are "normalizing"

Termination Experience for Active Members Distributed by Years of Service



	1 - 4	5 - 9	10 - 14	15 - 19
Expected	21.2%	9.8%	5.4%	3.4%
Actual	22.8%	11.7%	6.6%	3.9%
A/E	107.4%	119.1%	122.1%	113.6%

Active Members & Retired Members



1.22% average increase in active members since 2004; 1.1% increase in 2014

6.96% average increase in retired members since 2004; 7.0% increase in 2014

There are currently 1.9 actives for every retiree, down from 3.4 in 2004

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Summary of Benefit Changes

- Total Changes

  46 cities made changes that impacted the total retirement rate since the last valuation

  - Increases in Benefits 44
  - Decreases in Benefits 2

- Number of cities changing matching ratio, deposit rate, and eligibilities 26

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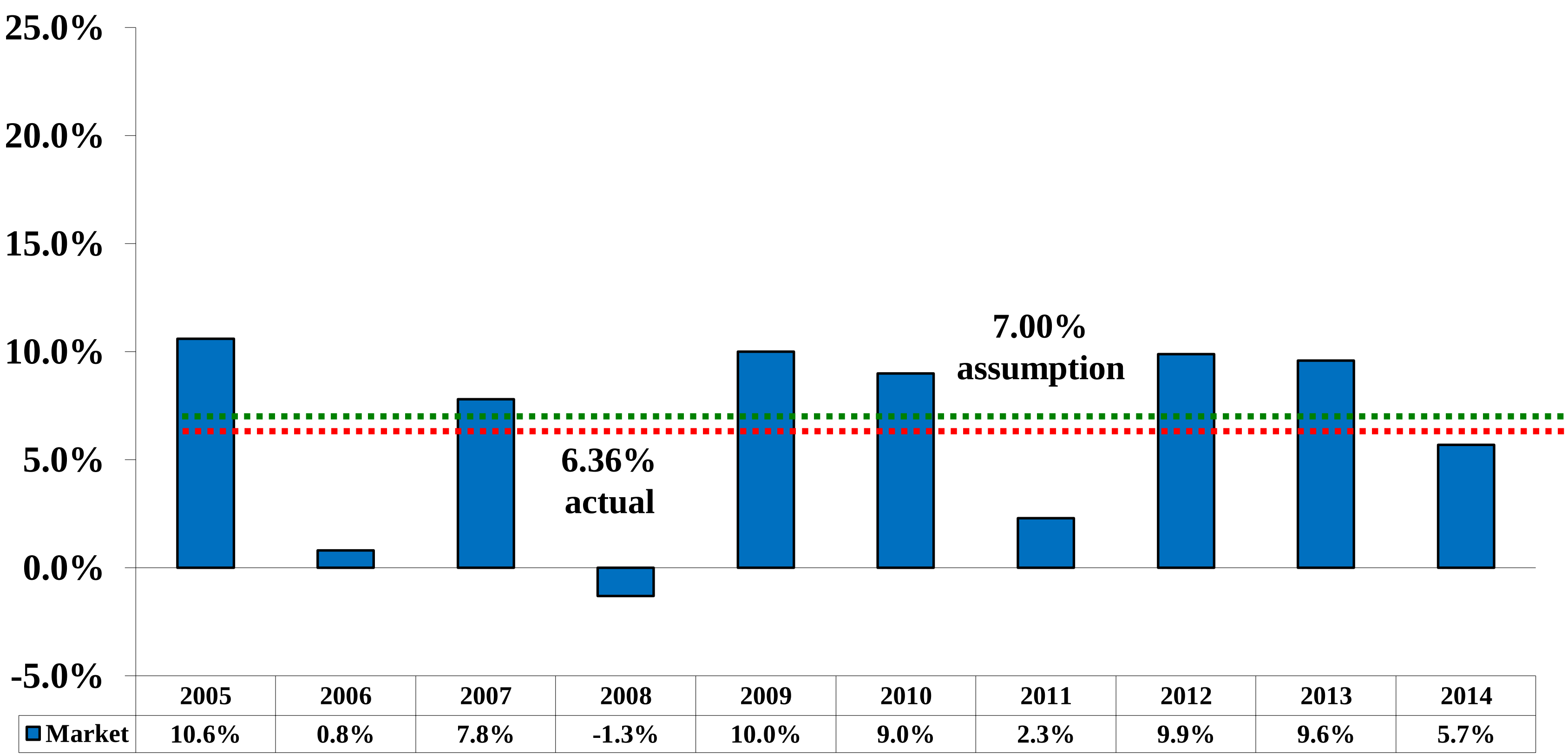
Summary of Benefit Changes (cont)

- USC Changes
  - Ad Hoc USC 14
  - New/Reauthorize Repeating USC 3
- COLA Changes
  - Ad Hoc COLA 14
  - New/Reauthorize Repeating COLA 2
  - Rescind/Decrease Repeating COLA 2

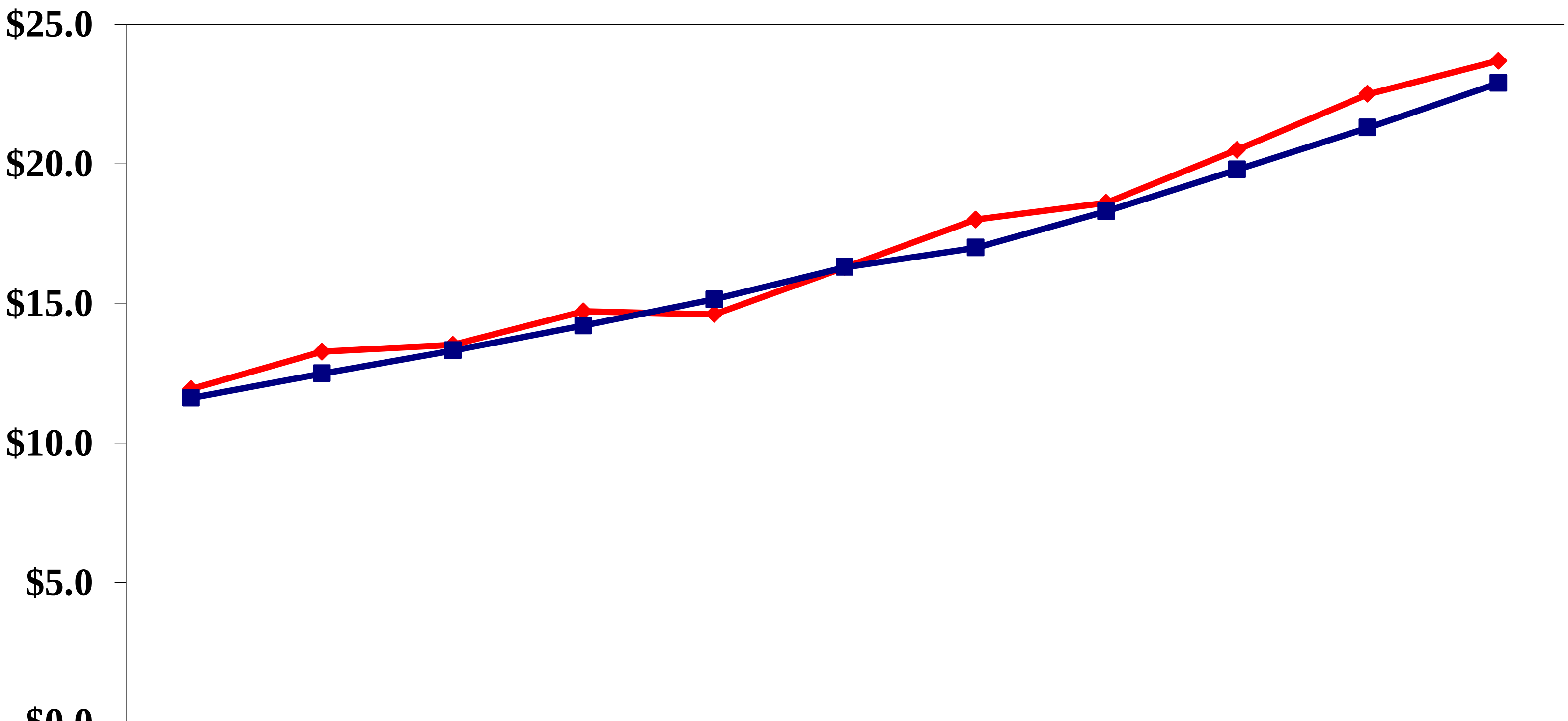
Yields based on Market Value of Assets



6.36% average compound return (on market value) over the last 10 years

Market and Actuarial Values of Assets

$ amounts are in Billions



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Market	$11.9	$13.3	$13.5	$14.7	$14.6	$16.3	$18.0	$18.6	$20.5	$22.5	$23.7
Actuarial	$11.6	$12.5	$13.3	$14.2	$15.1	$16.3	$17.0	$18.3	$19.8	$21.3	$22.9

- AVA is currently 96.6% of MVA, was 94.7% last year

  AVA was Book Value prior to 2009

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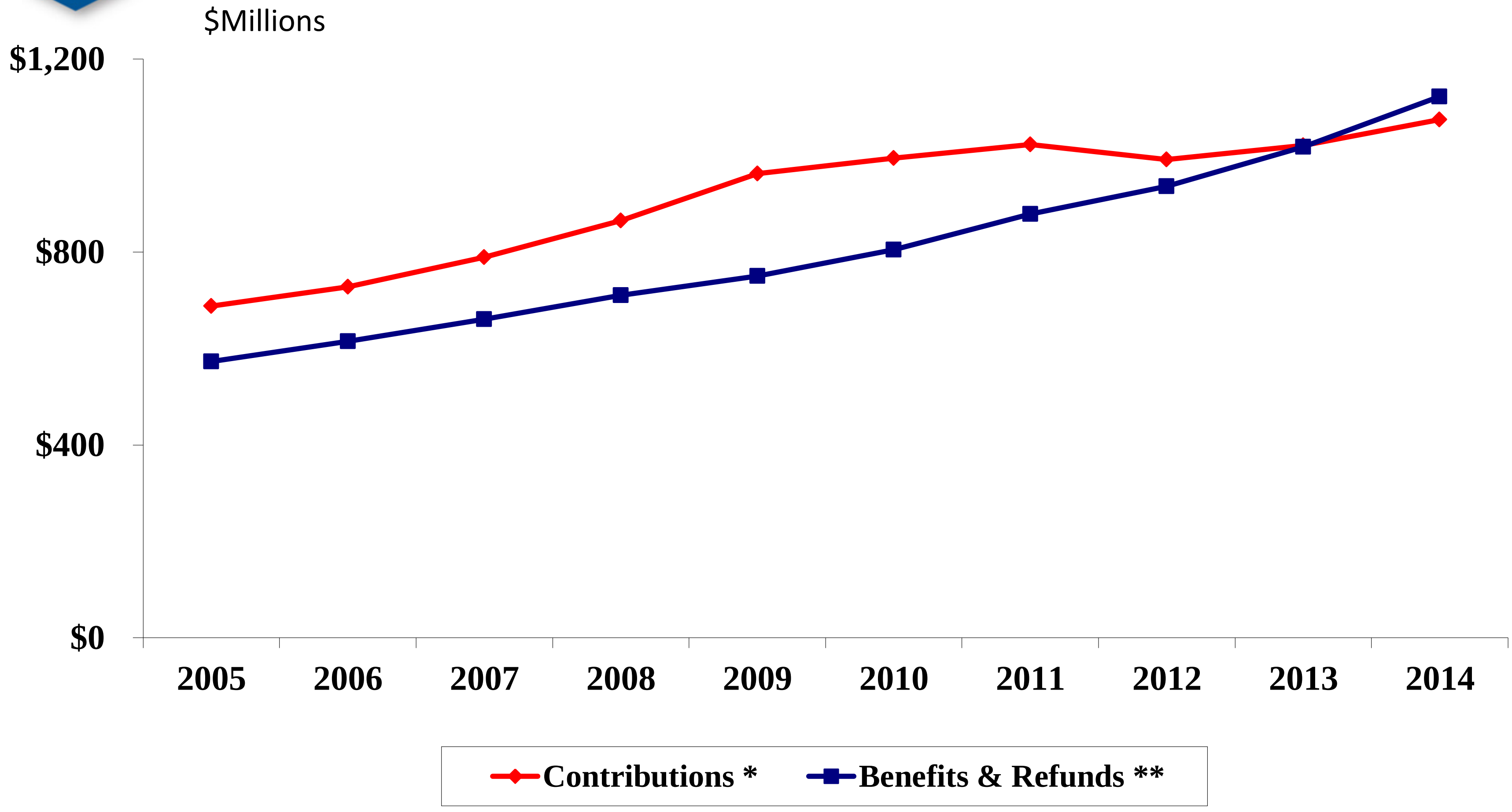
Contributions vs. Benefits and Refunds



* Includes member and employer contributions

** Includes administrative and investment expenses

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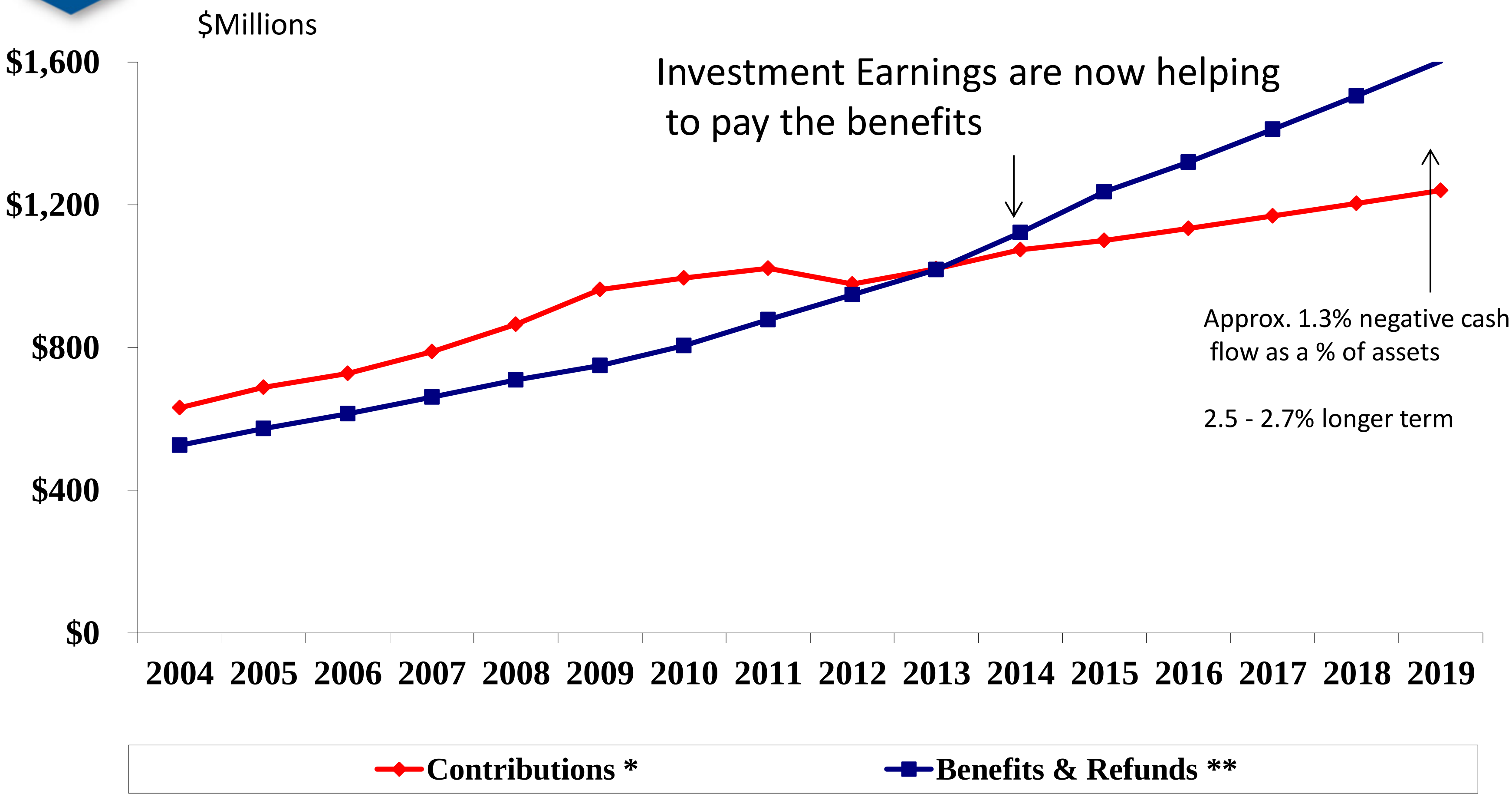
Projected Contributions vs. Benefits and Refunds



* Includes member and employer contributions

** Includes administrative and investment expenses

Assumes no recognition of current deferred investment gains/losses

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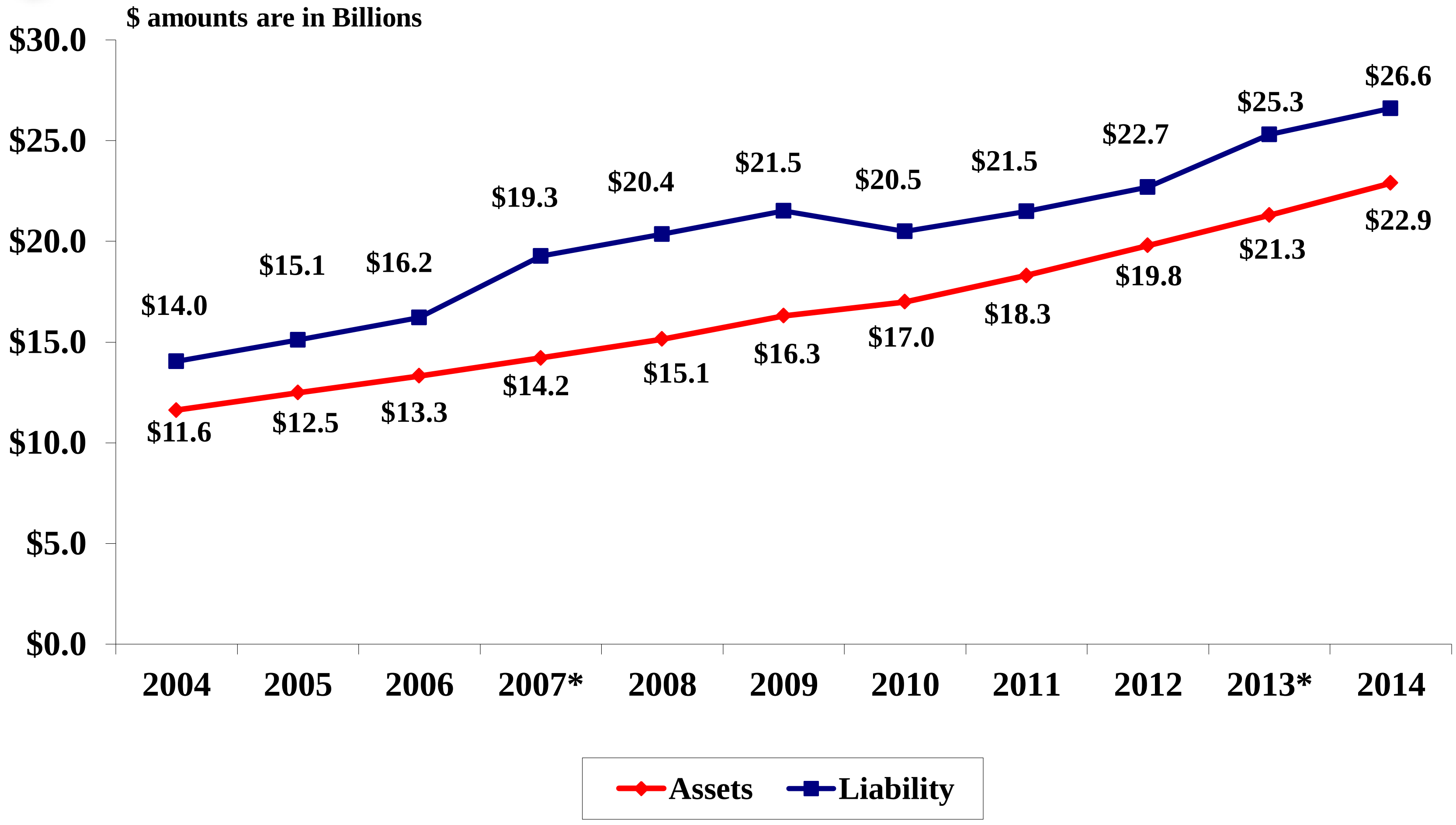
Actuarial Value of Assets (Smoothed) vs. Actuarial Accrued Liability (AAL)



*Liabilities for years prior to 2013/2007 reflect PUC/UC method and prior assumptions

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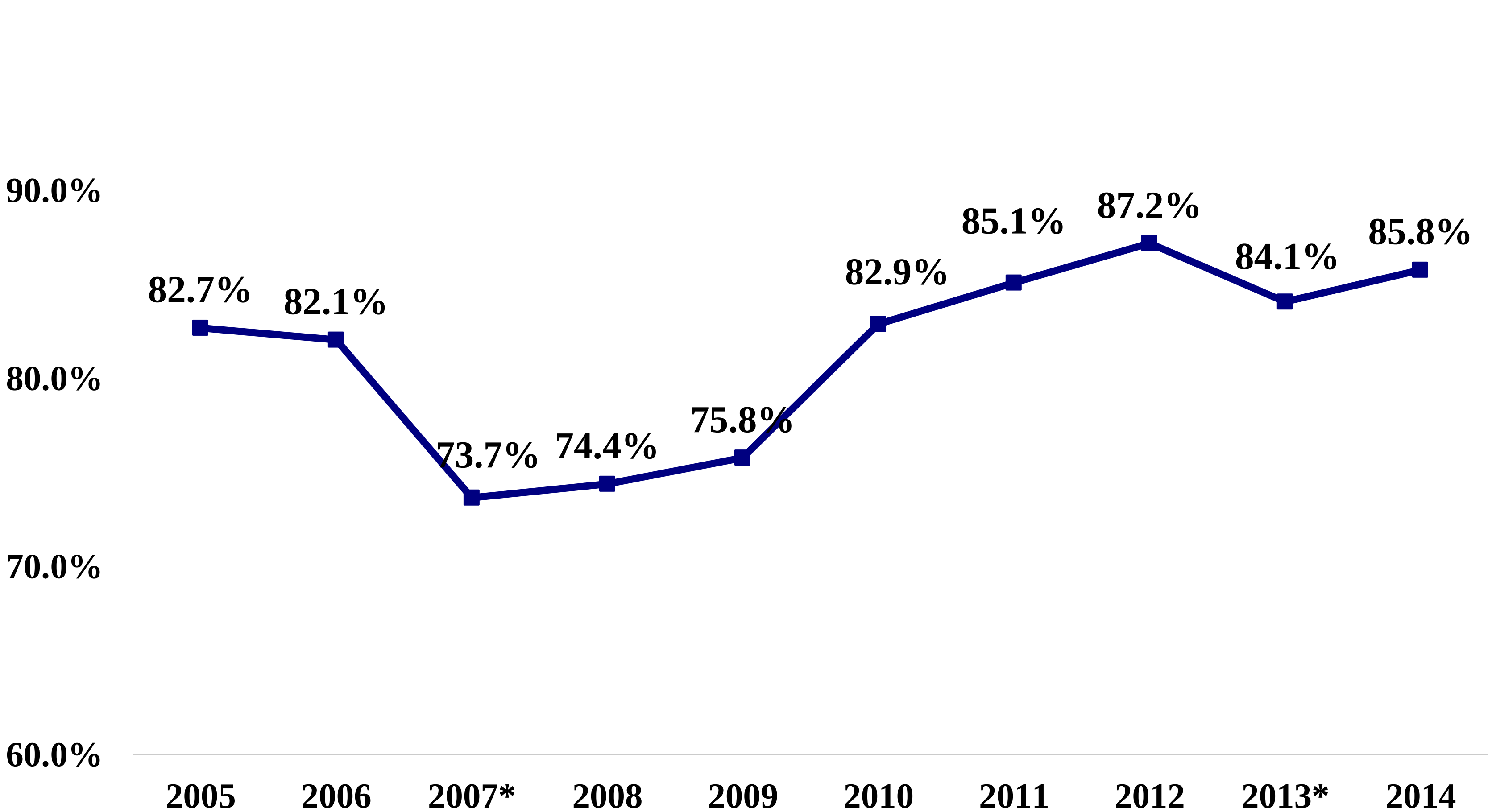
Funded Ratio Percentages



*Years prior to 2013/2007 reflect PUC/UC method and prior assumptions

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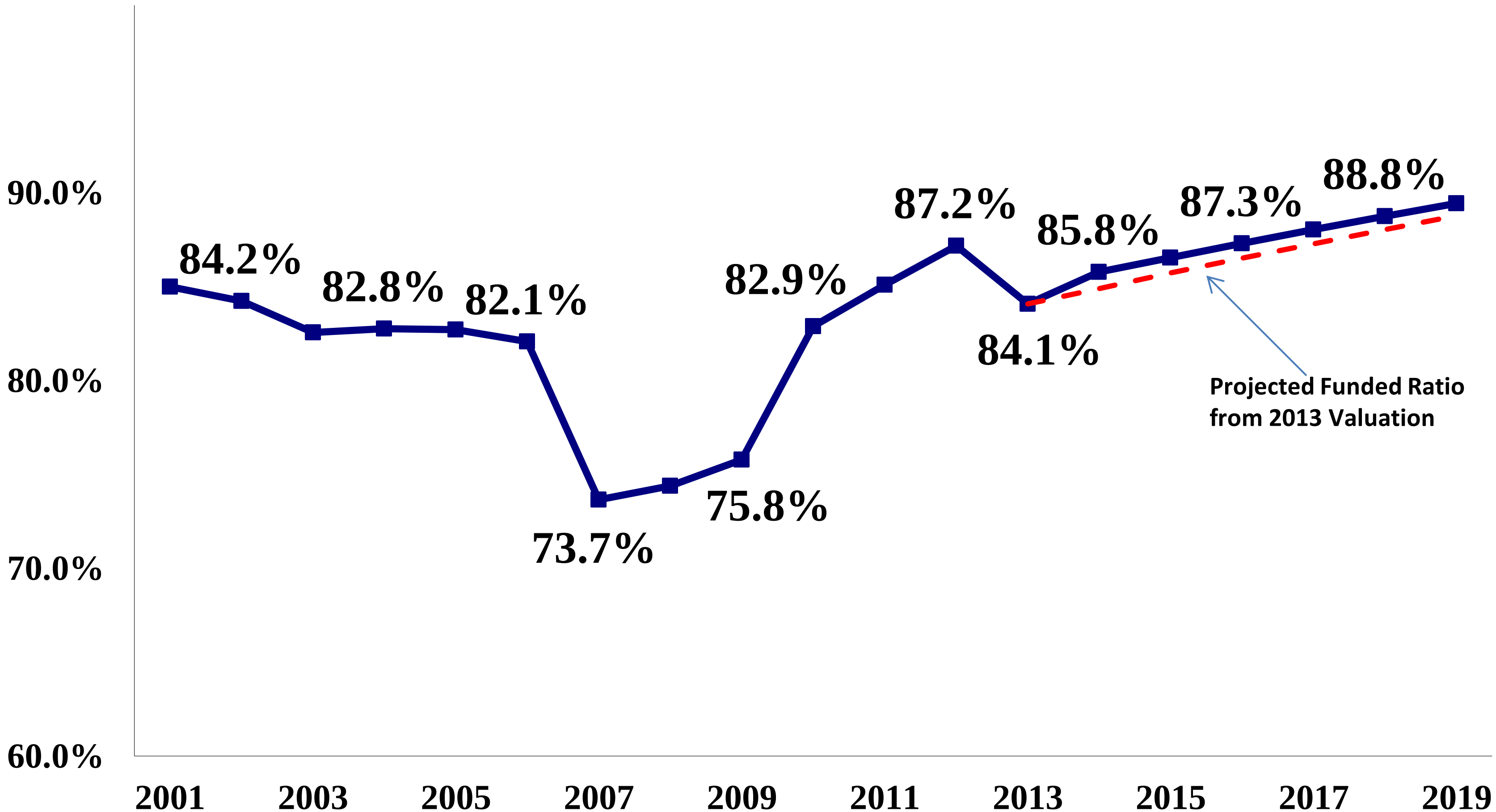
Projected Funded Ratio



Assumes all assumptions are met in future years

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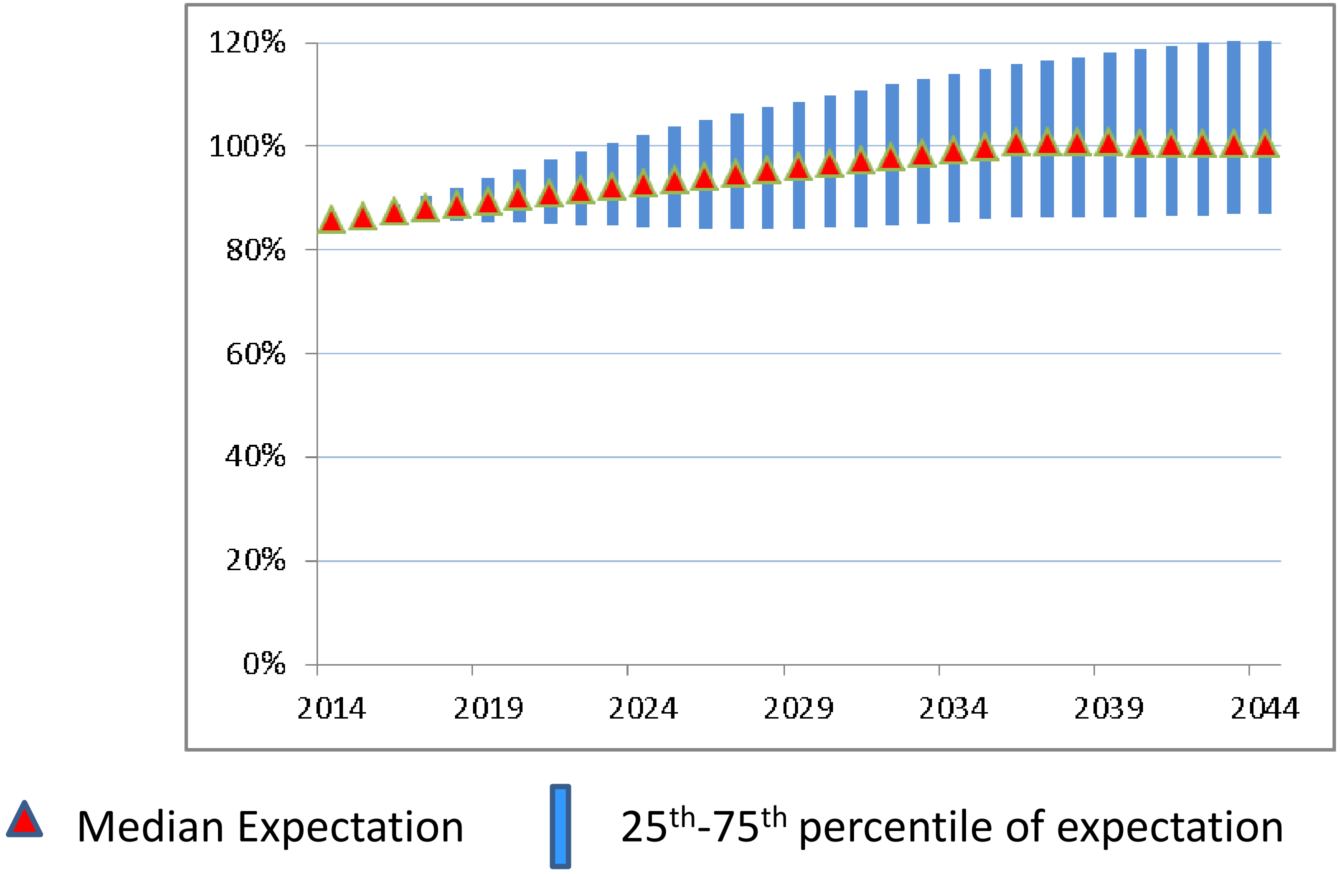
Projected Funded Ratio: System-wide



- **Assumes ADEC met each year**
- **Assumes continuation of current amortization policy & payroll grows at 3.00% per year**
- **Investment returns are variable in the stochastic process**

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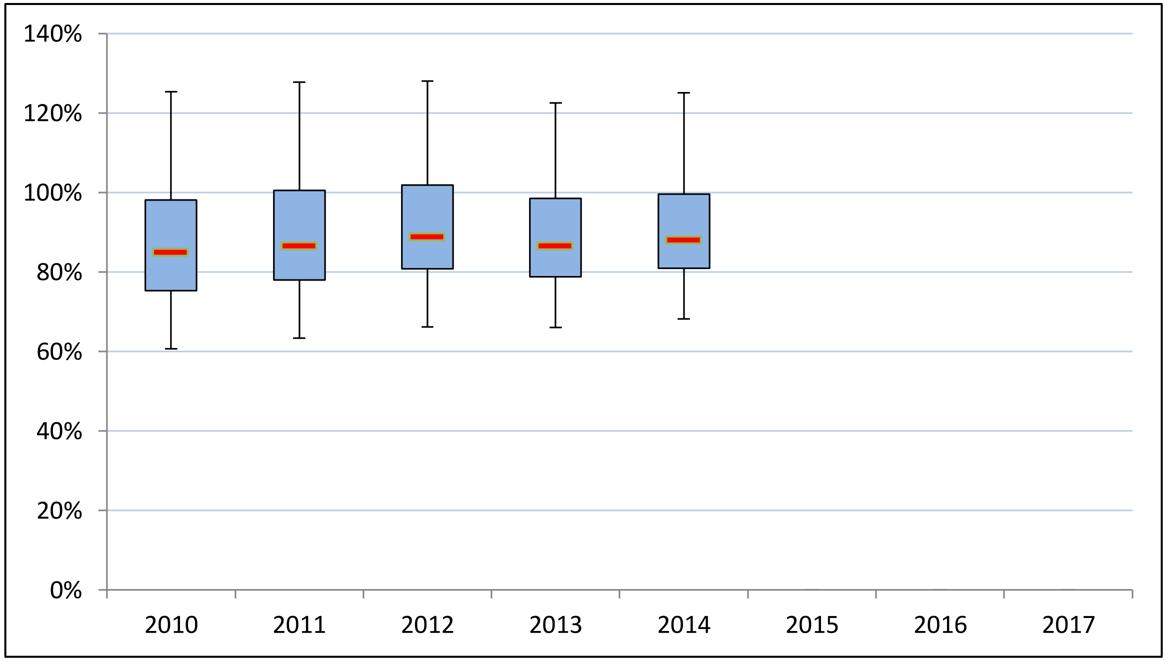
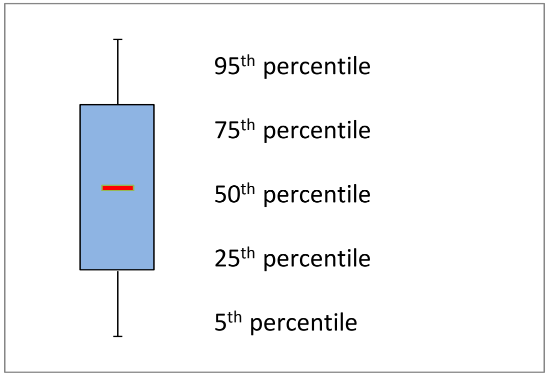
Distribution of Funded Ratio Percentages





The percentile represents the proportion of employers below the point. For example, the 75th percentile is 100%, meaning that 75% of cities have a funded ratio less than 100%. Conversely, 25% of the cities have a funded ratio of 100% or greater.

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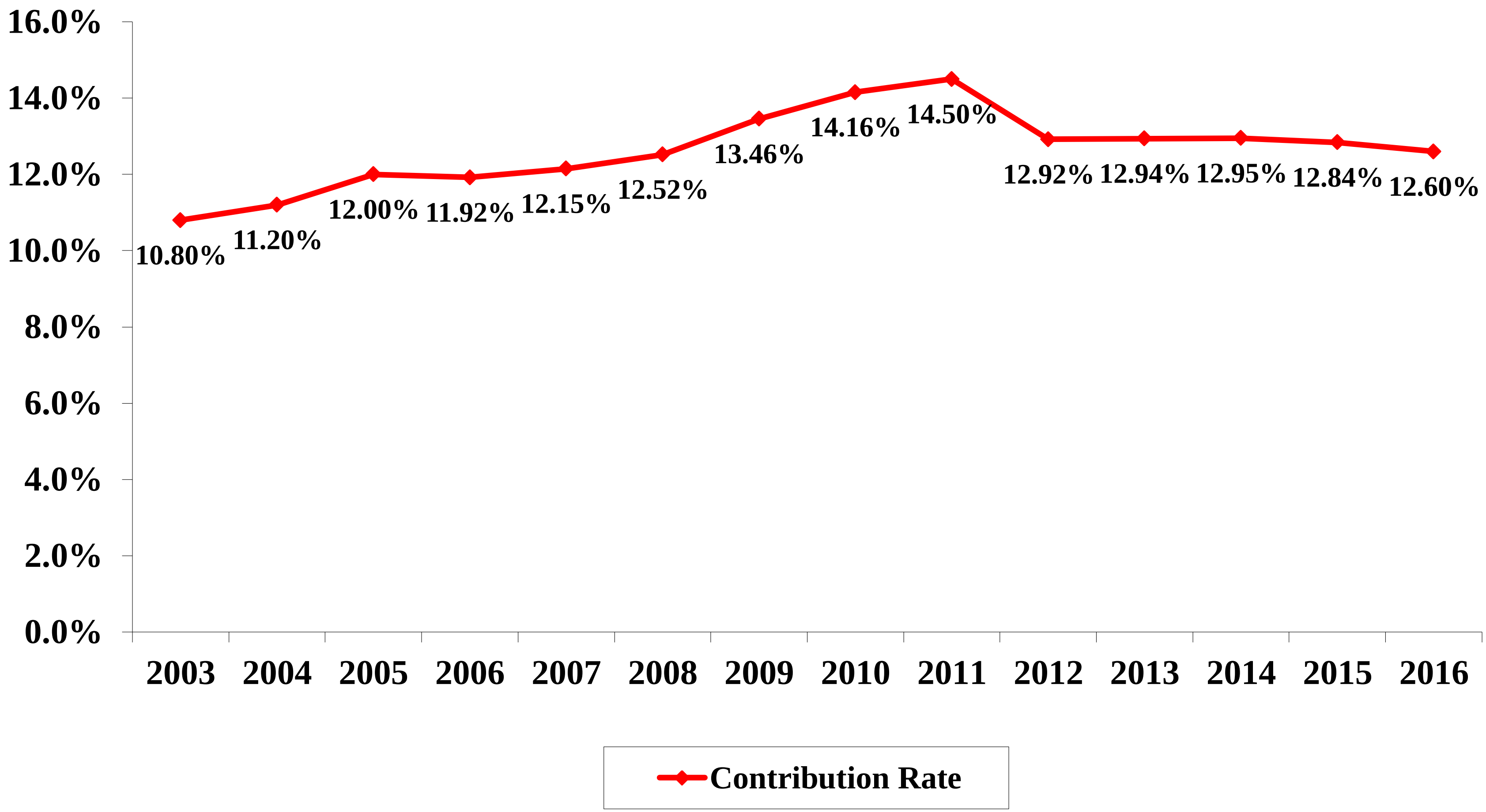
Historical Dollar Weighted Contribution Rates for TMRS



2015 and 2016 are projected rates based upon phase-in minimum

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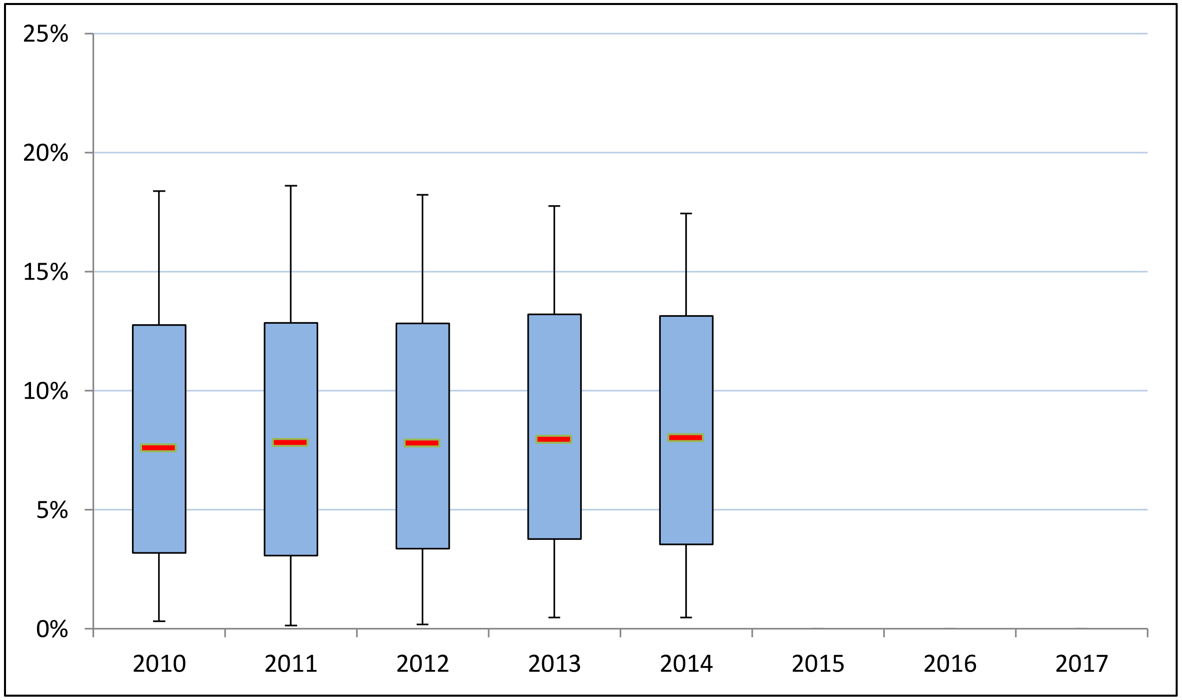
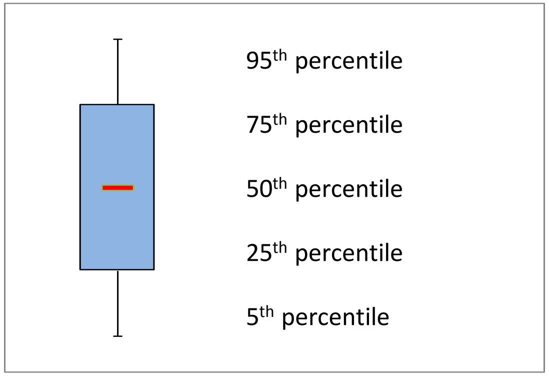
Distribution of Full Retirement Rate





The percentile represents the proportion of employers below the point. For example, the 75th percentile is 13.13%, meaning that 75% of cities have a rate less than 13.13%.

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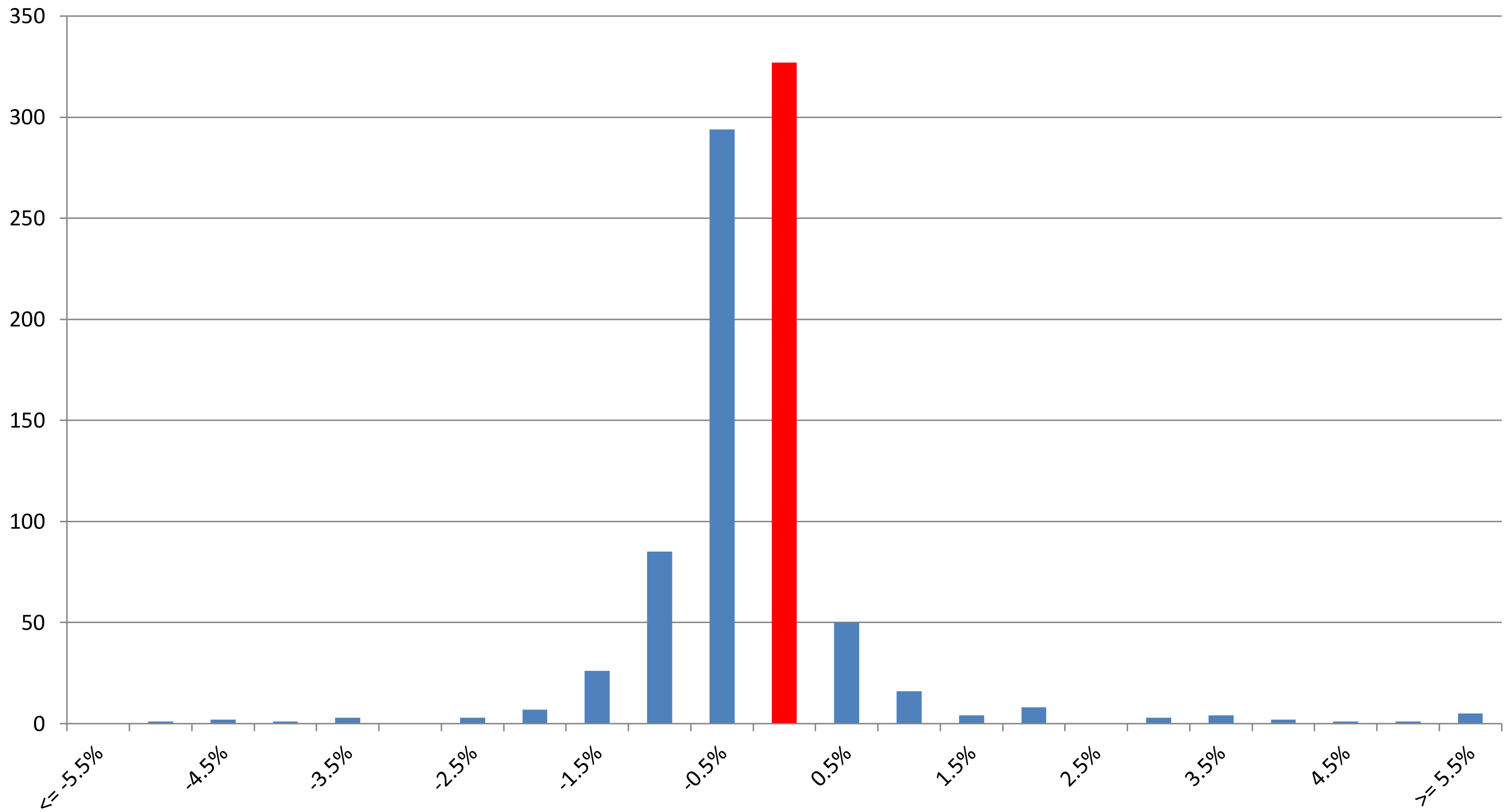
Distribution of Changes: By City
Total Changes in Full Retirement Rate



Rounded to nearest 0.5% change in rate

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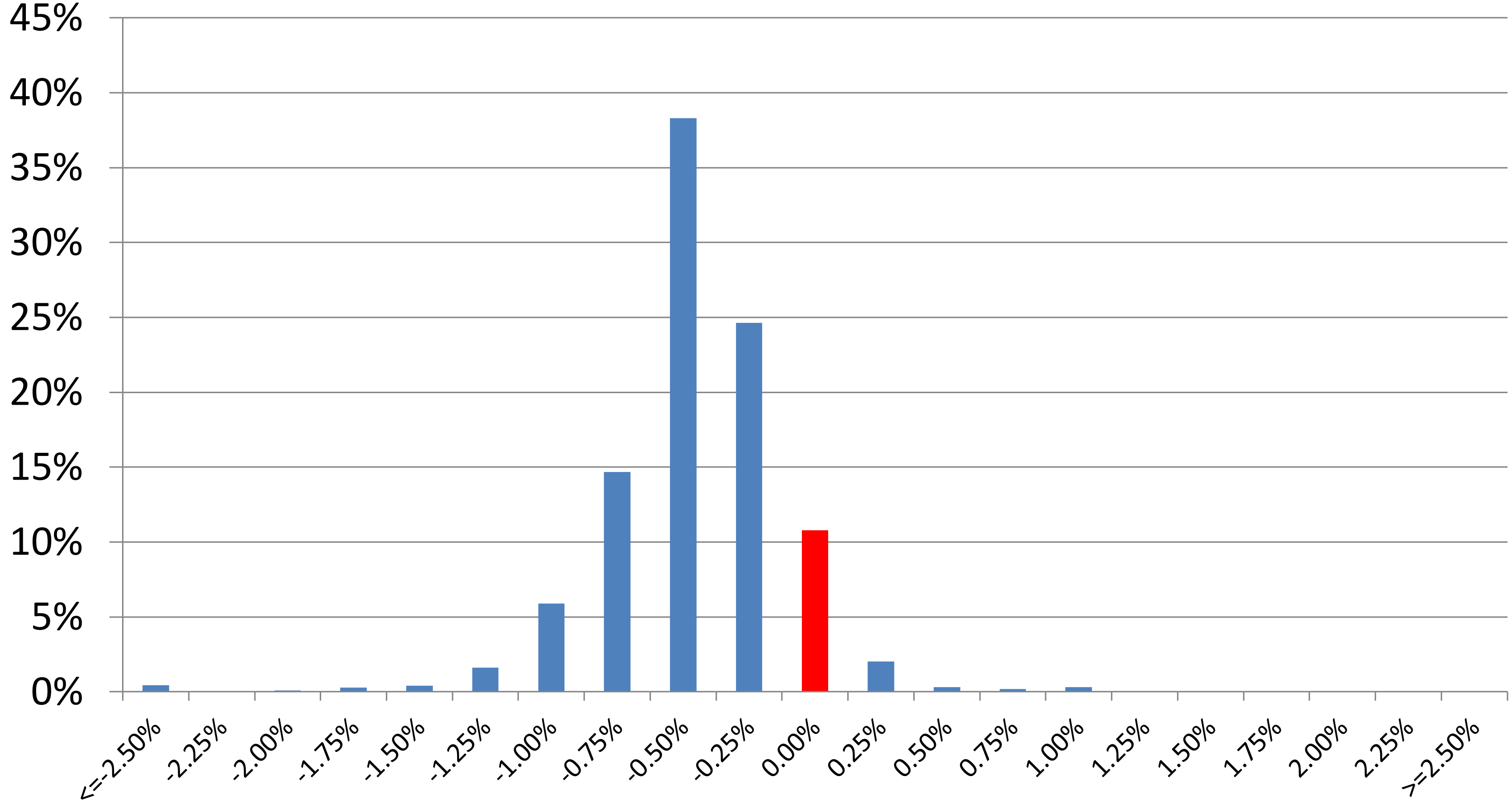
Distribution of Changes: Payroll Weighted Total Changes in Full Retirement Rate



Rounded to nearest 0.25% change in rate

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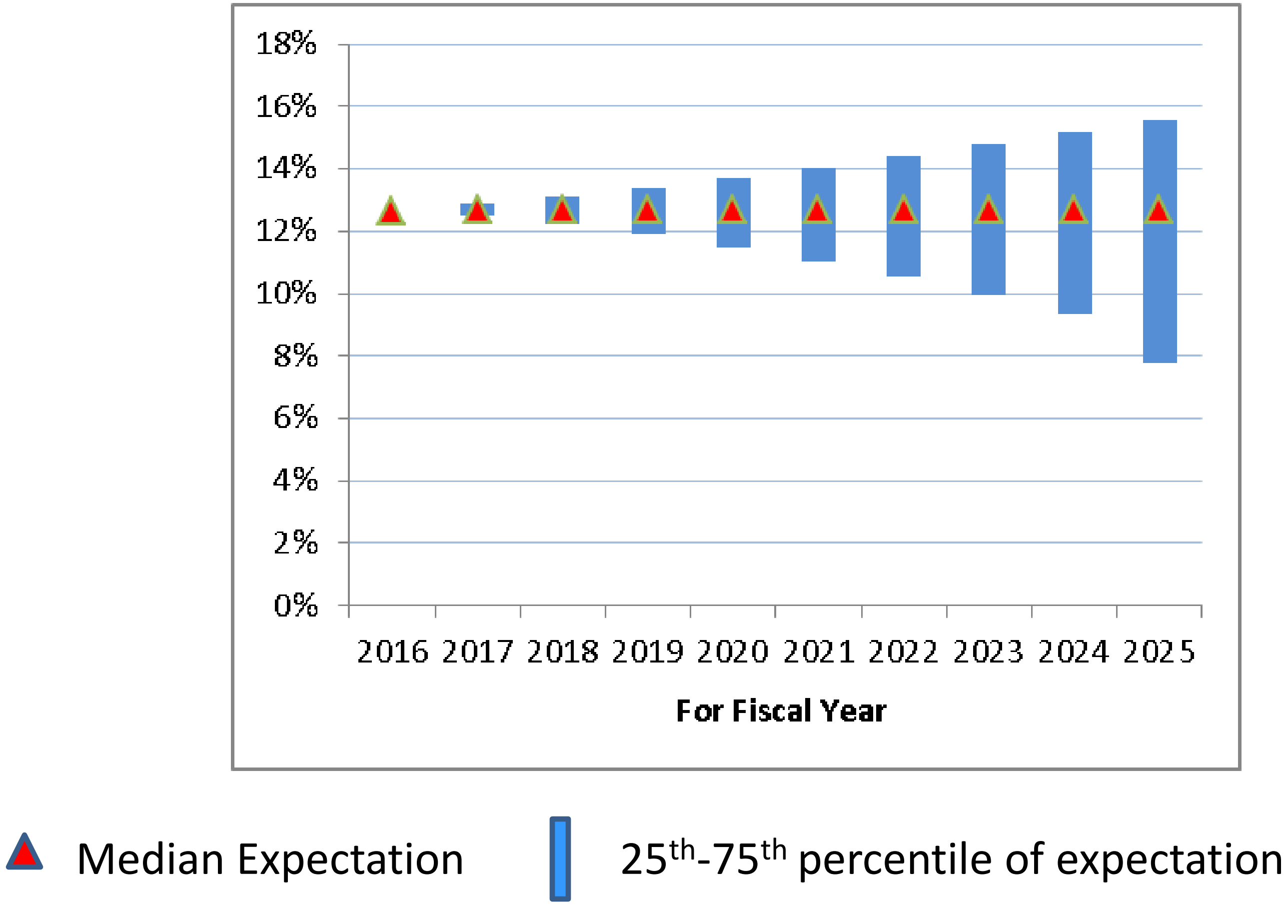
Projected Aggregate Employer Contribution Rate



- **Assumes ADEC met each year, projected from market value of assets as of December 31, 2014**
- **Assumes continuation of current amortization policy & payroll grows at 3.00% per year**
- **Investment returns are variable in the stochastic process**

Phase-In

- As of this valuation, 157 TMRS cities still had phase-in bases from the 2013 changes
- If the changes in 2013 to actuarial assumptions & methods caused a City's rate to increase by 0.50% or more, the City could phase-into that increase by 0.50% per year
  - 129 cities fall into this category
  - Average phase-in base for these cities is 1.16%
  - Expected Runoff:
    - 129 cities with a phase-in in 2014 valuation (5% of overall payroll)
    - 71 cities with a phase-in in 2015 valuation (3% of overall payroll)
    - 34 cities with a phase-in in 2016 valuation (1% of overall payroll)
    - 16 cities with a phase-in in 2017 valuation (0% of overall payroll)
    - 4 cities with a phase-in in 2018 valuation (0% of overall payroll)
- We continue to recommend cities contribute their full rate

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Strengths and Risks

- In relation to its peers, TMRS has several specific attributes that provide strong stability and sustainability to its contribution rates and benefits
- Other attributes create risks against achieving the current goals
- We will use this time to discuss several of these items with the Board

Upcoming Experience Study

- This Fall, GRS will be performing another five-year actuarial experience study investigation and making recommendations for the actuarial assumptions and methods to be used in future valuations

- TMRS just updated its funding method (from the Projected Unit Credit to the Entry Age Normal cost method) and mortality assumptions, therefore, we anticipate no material changes to these assumptions

- However, since inflation expectations and bond yields continue to track at historically low levels, a change to some of the current economic assumptions may be warranted

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Actuarial Valuations

- A defined benefit plan makes a promise to pay benefits to members at some point in the future
- The benefits are a function of the member's pay, service, and projected account balances
- The amount and form of payment depend on future contingencies such as:
  - salary increases
  - length of service
  - whether the member lives, dies, retires, becomes disabled, or leaves employment for another reason
  - when this occurs
- i.e., these are *uncertain* future *financial* events

Purpose of Experience Study

- Assumptions are not static; they should occasionally change to reflect:
  - New information
  - Changing patterns of mortality, retirements, terminations, etc.
  - Changing economic environments
  - Implementation of improved technology and processes
- Recent experience provides strong guidance for some assumptions (for example, turnover) and weak guidance for others (for example, the investment return rate)
- Based on results of our experience study:
  - Actuary recommends revised actuarial assumptions
  - Board considers recommendations for adoption

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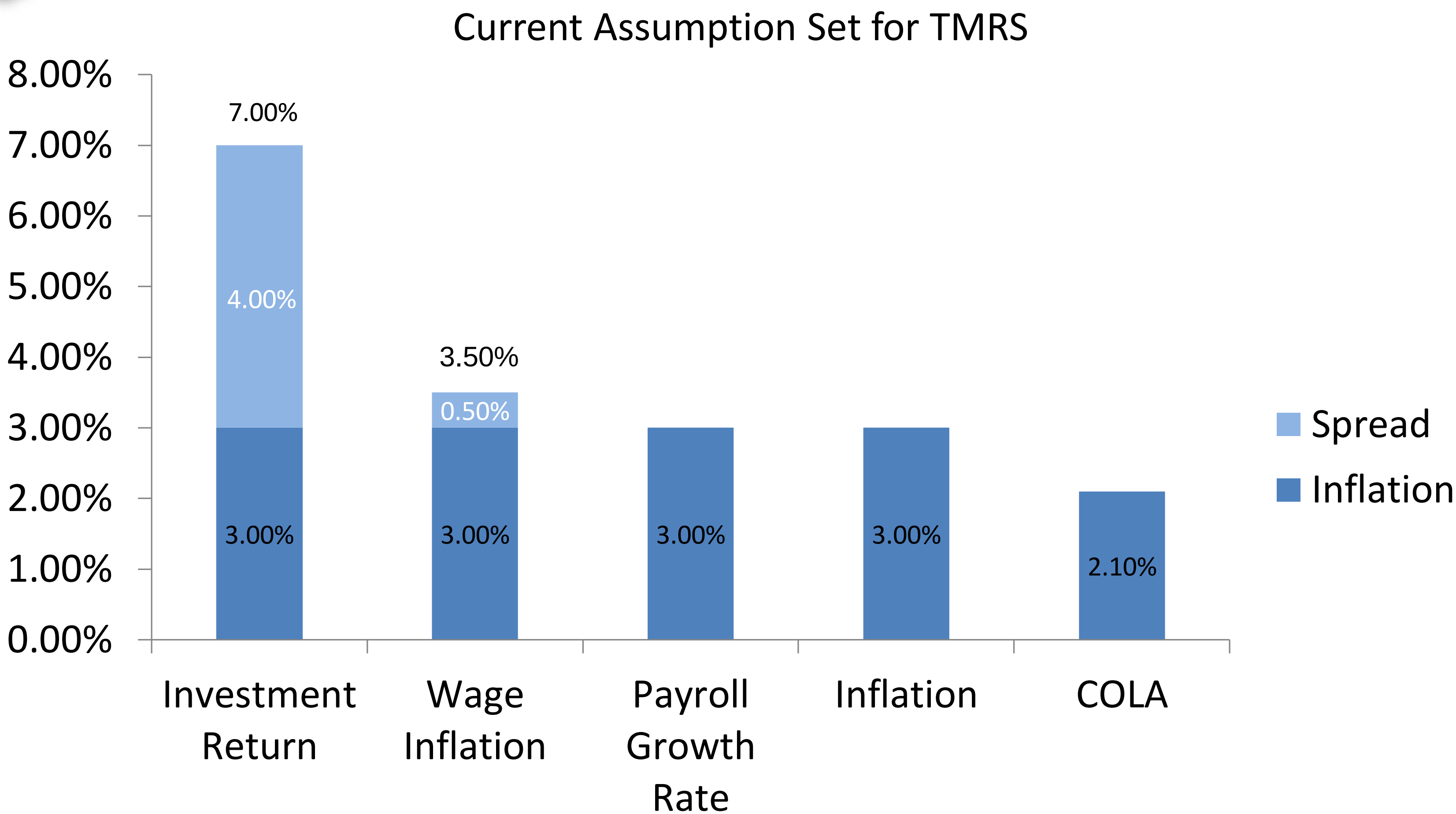
Inflation is the first "building block" for other economic assumptions



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Inflation

- The assumed inflation rate (currently 3.00% per year) is not used directly in the actuarial valuation, but it impacts the development of:
  - Investment return assumption
  - Salary increase assumptions
  - Payroll growth rate
  - COLA increases
- Actual inflation measured by the CPI-U during:
  - Last 5 years: 2.02%
  - Last 10 years: 2.31%
  - Last 25 years: 2.64%

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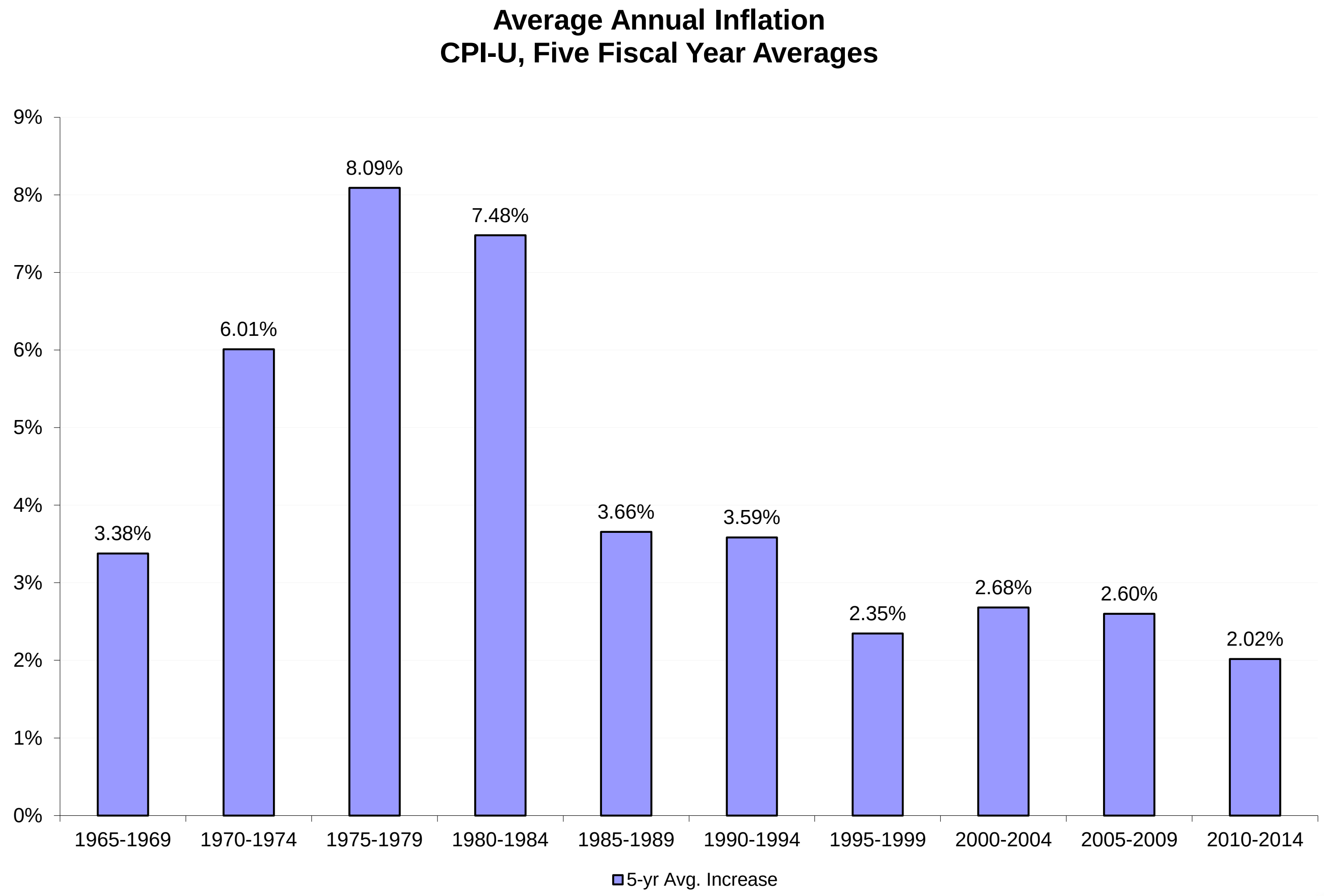
Historical Inflation



Inflation Rates

- We will look at several current indicators
  - Investment firms: 2.11% - 2.50% annual rate
    - RV Kuhns: 2.50%
  - Social Security Trustee's Report: 2.80% (intermediate, unchanged for over 10 years)
  - TIPs vs. Nominal US Treasuries (20 Year): 1.84%
  - Professional forecasters: 2.10%
  - Public Funds Survey: 3.14%
- If the inflation assumption were lowered to 2.50%, with no other changes:
  - It would lower the investment return assumption to 6.50%
  - It would lower the wage inflation to 3.00%
  - It would lower the COLA assumption proportionately
- The net impact would be an increase to contribution rates, especially for Cities that do not have repeating COLAs

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In Summary

- Overall System-wide "health" continues to improve
  - Overall assets growing faster than expected
  - Overall liabilities growing slower than expected
  - Strong funding policy
- With no changes in assumptions, the expectation is for an increasing funded ratio over the next few valuations and continued stability in the contribution rates, System-wide

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