



# TMRS Board Meeting

## Asset Smoothing

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# Agenda

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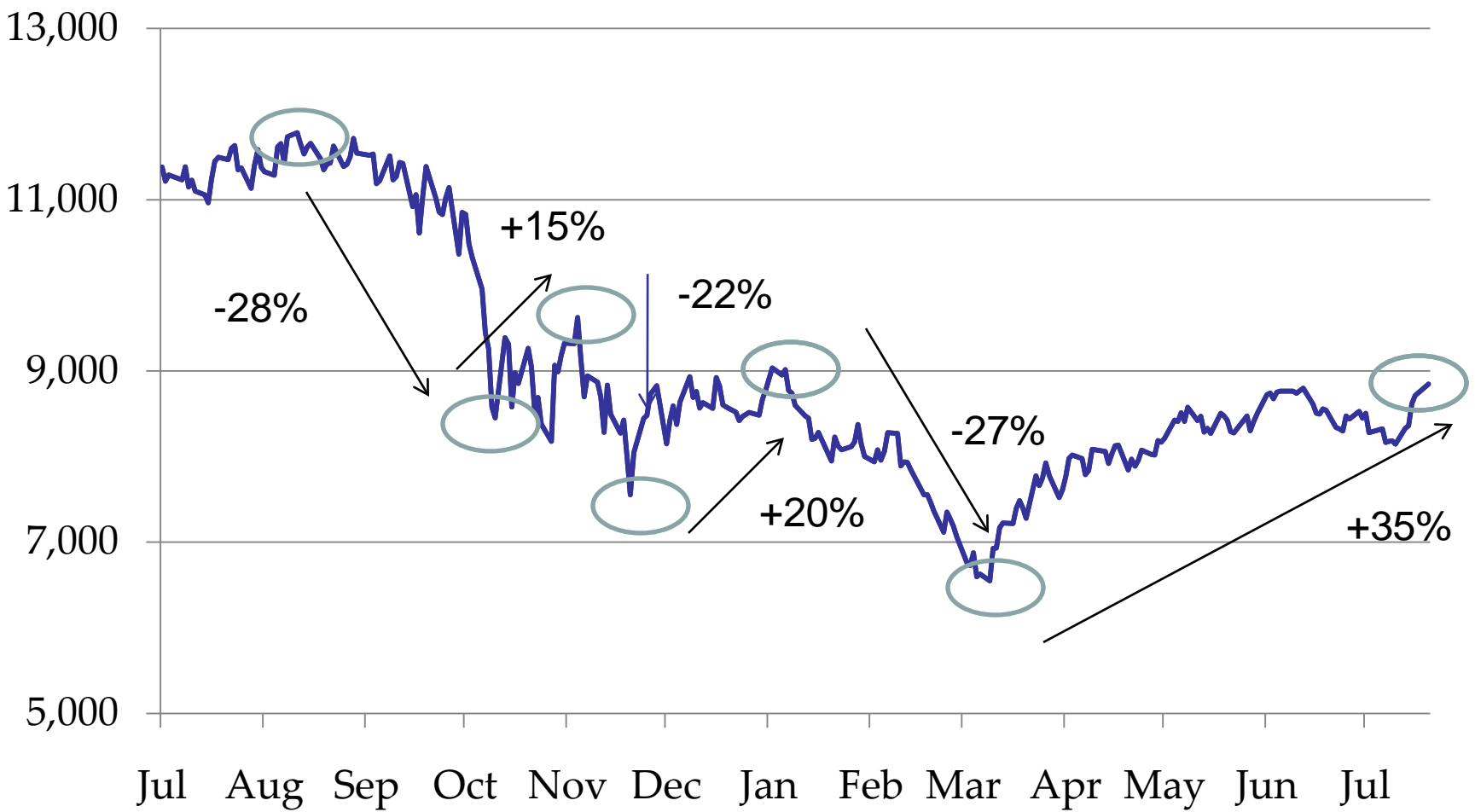
- ◆ What is asset smoothing?
- ◆ How does asset smoothing really apply to a retirement system?
- ◆ Key components of asset smoothing
  - Smoothing Period
  - Corridor
  - Amortization Period
- ◆ What do other Systems use?
- ◆ Measuring Risk versus Reward

# Dow Jones Industrial Average: Over the last year





# Dow Jones Industrial Average: Over the last year





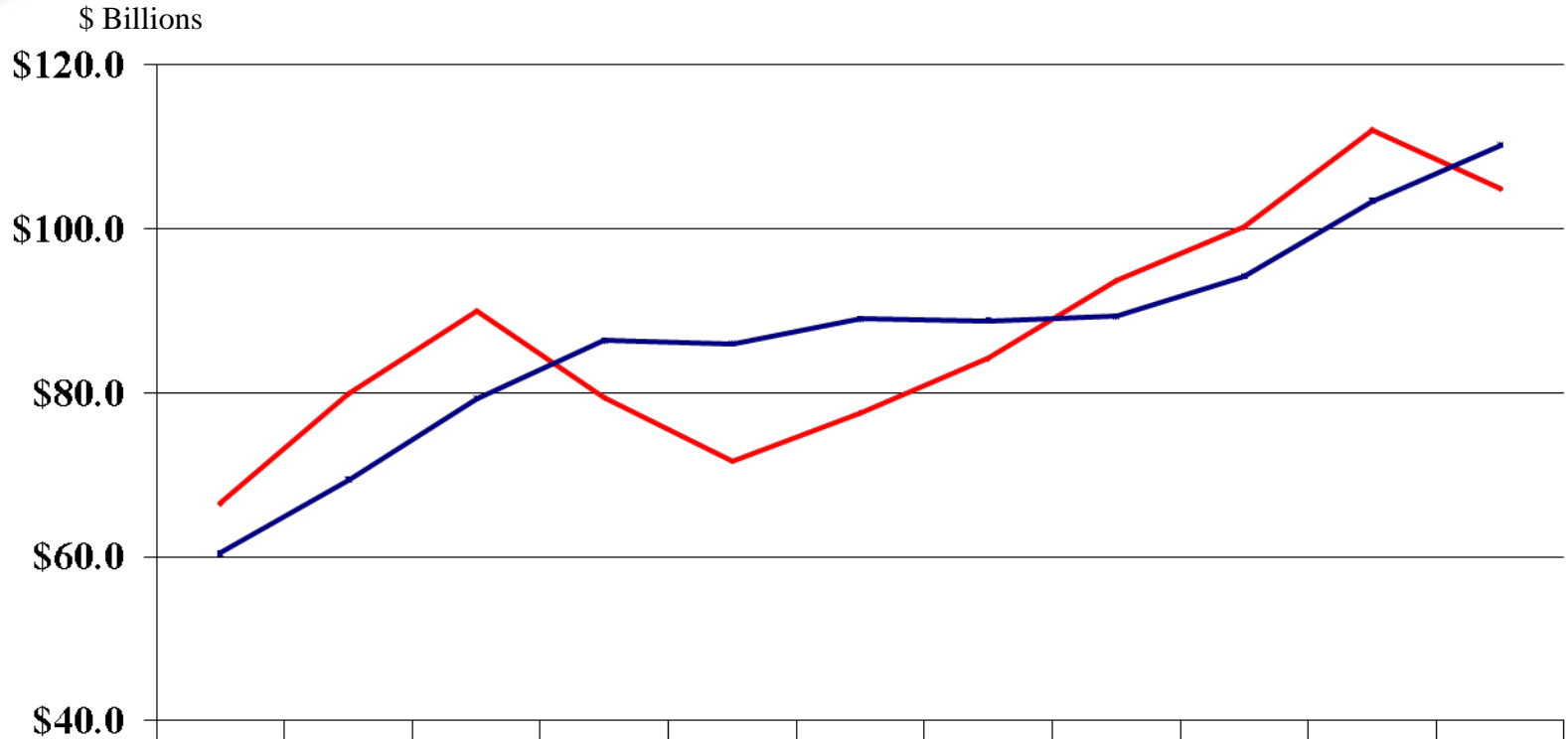
# Asset Smoothing

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- ◆ Annual fluctuation in the investment performance is averaged over a period of years
- ◆ Smoothing is a method used to focus the decision making process on the long term
  - ▶ Consistency in funding
  - ▶ Consistency in reporting
  - ▶ Consistency in benefit provisions
- ◆ However, smoothing does not impact long term costs or funded positions
  - ▶ Only impacts timing

# Market and Actuarial Values of Assets

(Sample retirement system)

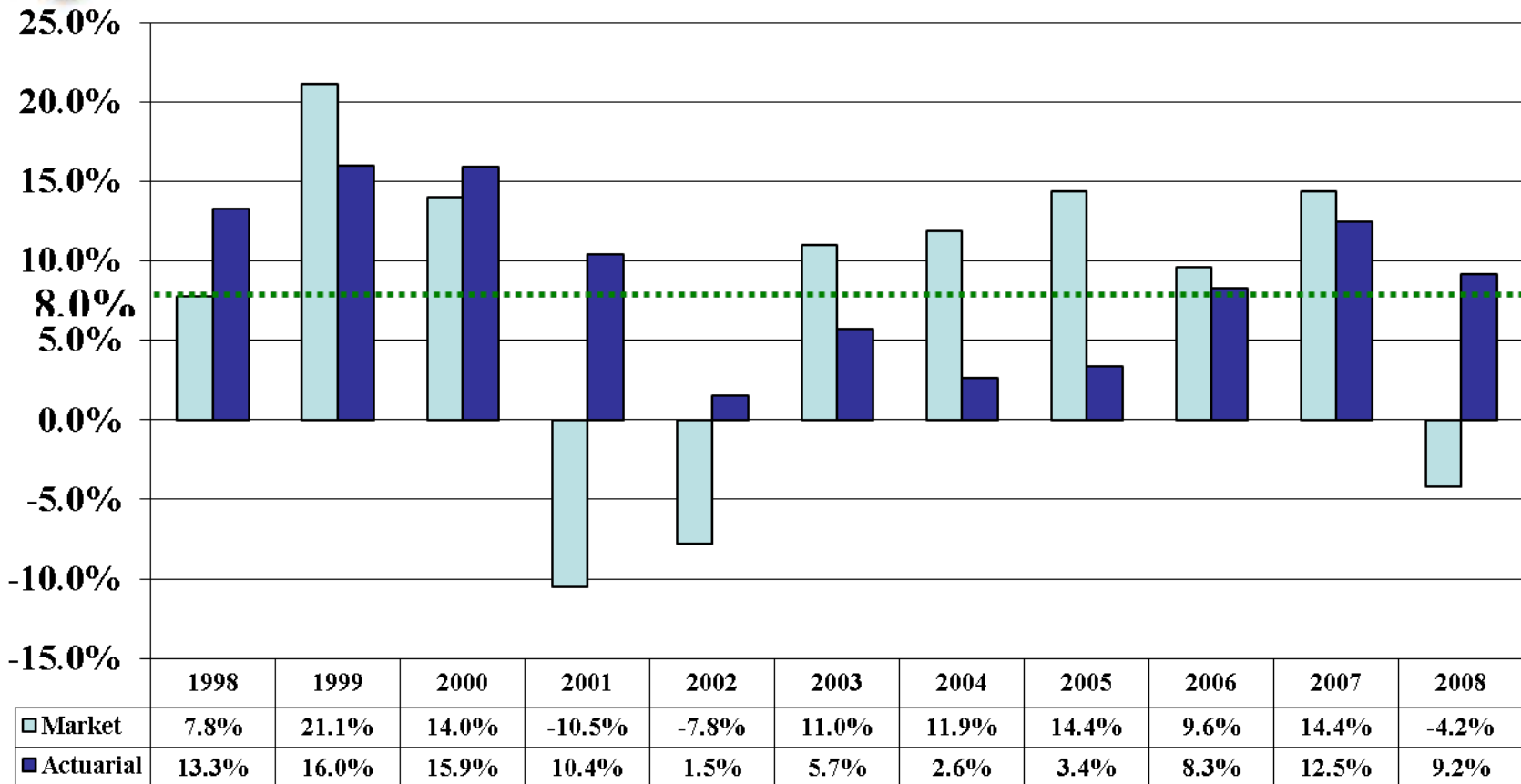


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Market	\$66.5	\$79.9	\$90.0	\$79.4	\$71.7	\$77.6	\$84.2	\$93.7	\$100.2	\$112.1	\$104.9
Actuarial	\$60.4	\$69.4	\$79.3	\$86.4	\$86.0	\$89.0	\$88.8	\$89.3	\$94.2	\$103.4	\$110.2

AVA is currently 105.1% of MVA, was 92.2% last year

# Estimated Yields Based on Actuarial and Market Value of Assets

(Sample retirement system)



6.9% average compound return (on market value) over last 10 years. 9.8% over last 20 years.

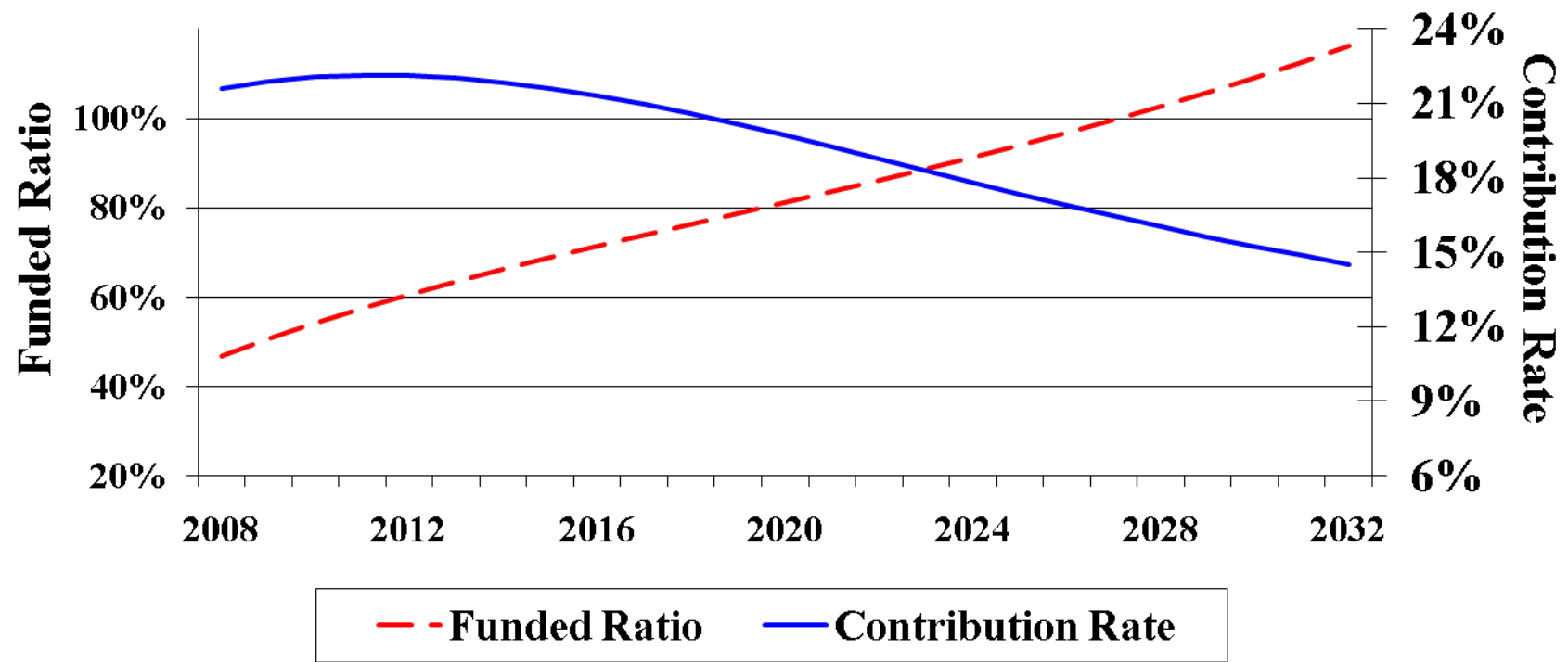
8.4% average compound return (on actuarial value) over last 10 years.



# Optimal Scenario

(Sample retirement system)

## Projection with Assumptions Exactly Matched

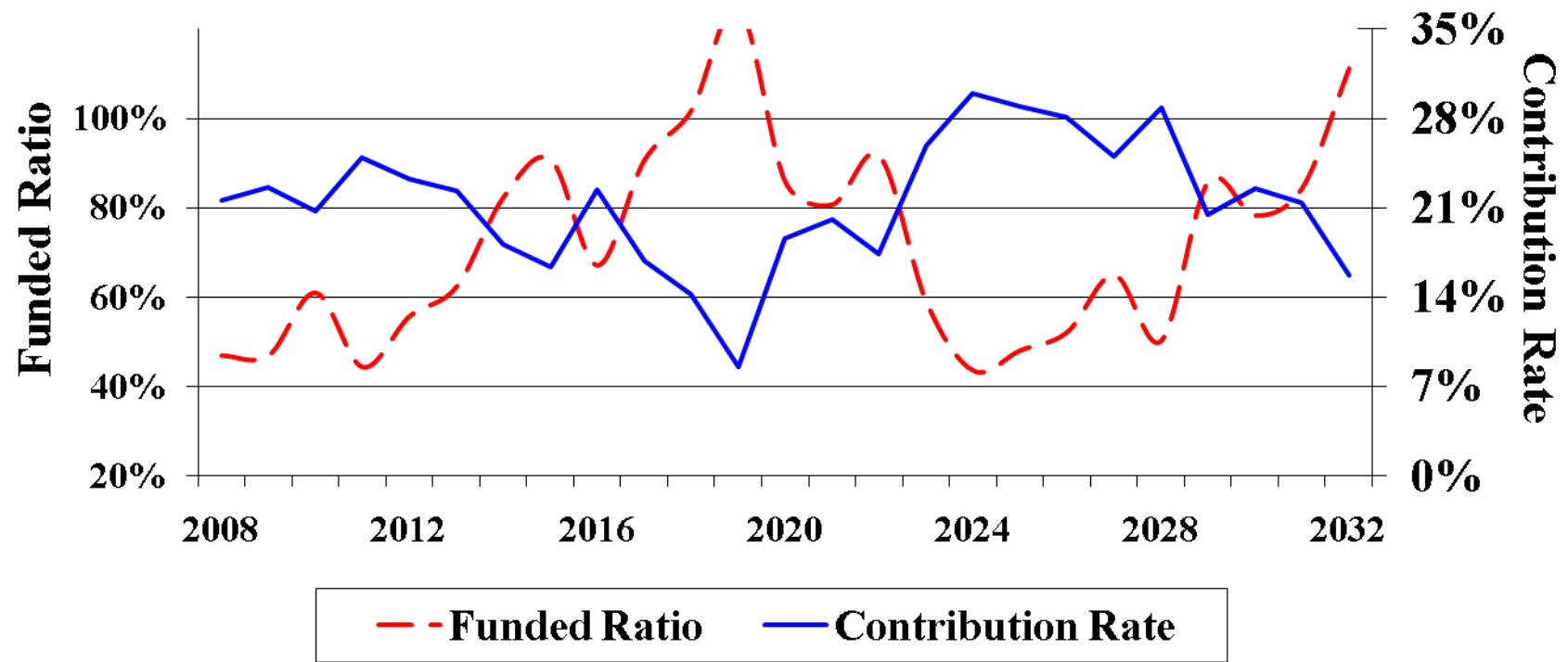


- Expected Funded Ratio at each valuation date based on expected return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Stochastic Scenario – expected return met over 25 years, no smoothing

## Projection with Assumptions Exactly Matched No smoothing

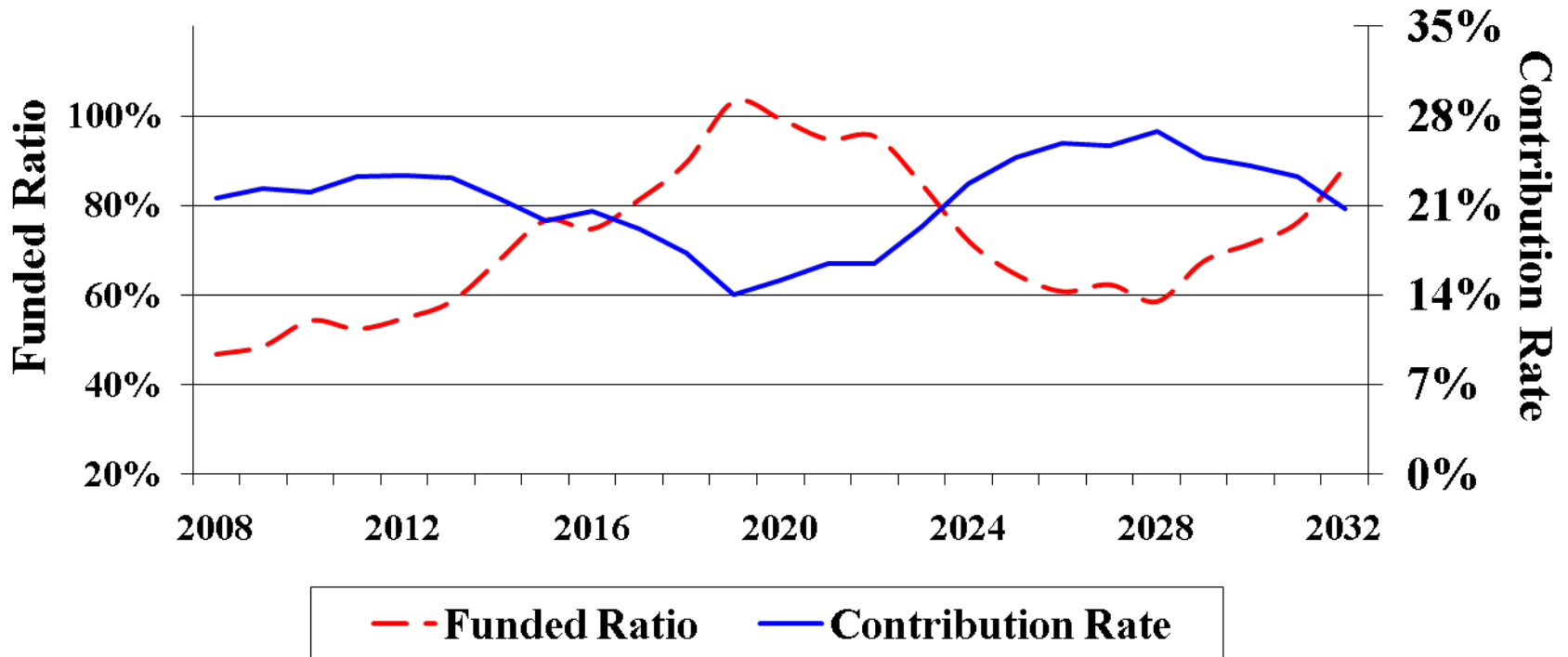


- Expected Funded Ratio at each valuation date based on simulated return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Stochastic Scenario – expected return met over 25 years, 3 year smoothing

## Projection with Assumptions Exactly Matched 3 year Smoothing

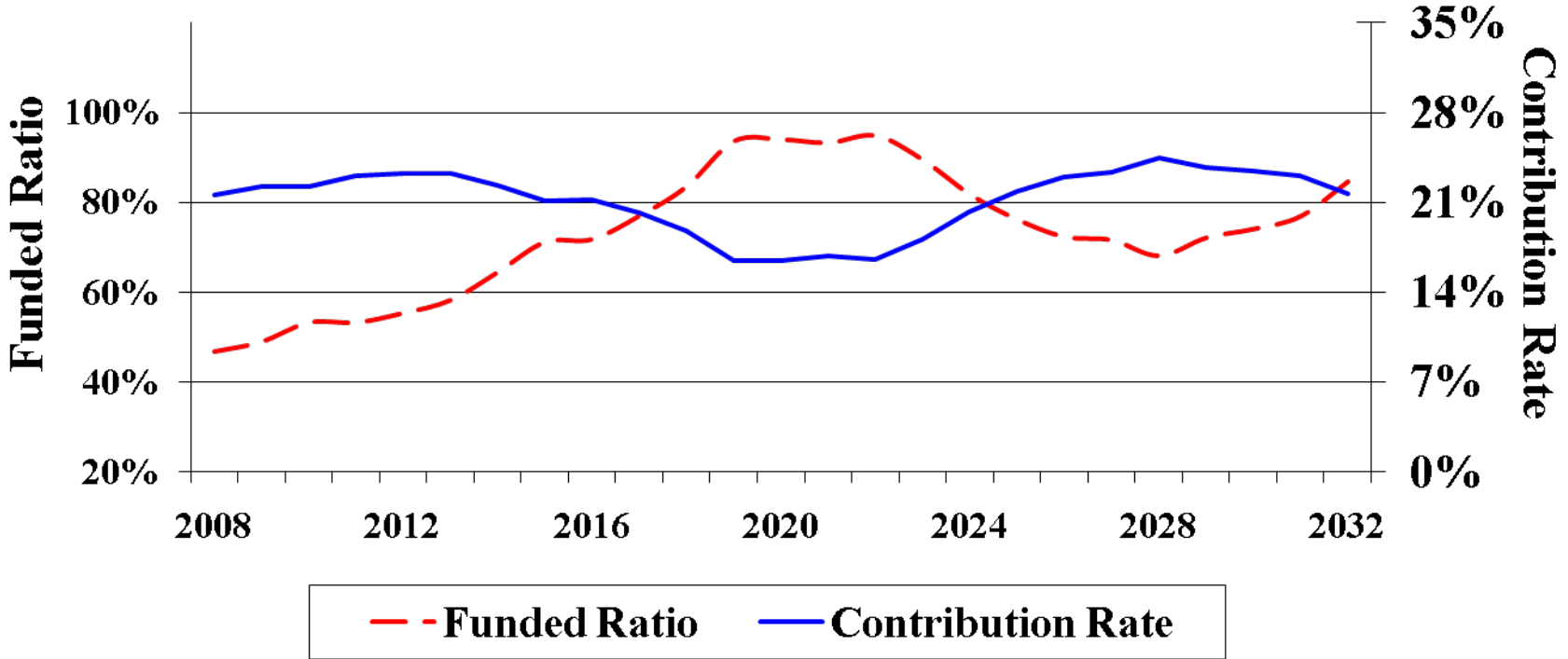


- Expected Funded Ratio at each valuation date based on simulated return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Stochastic Scenario – expected return met over 25 years, 5 year smoothing

## Projection with Assumptions Exactly Matched 5 Year Smoothing

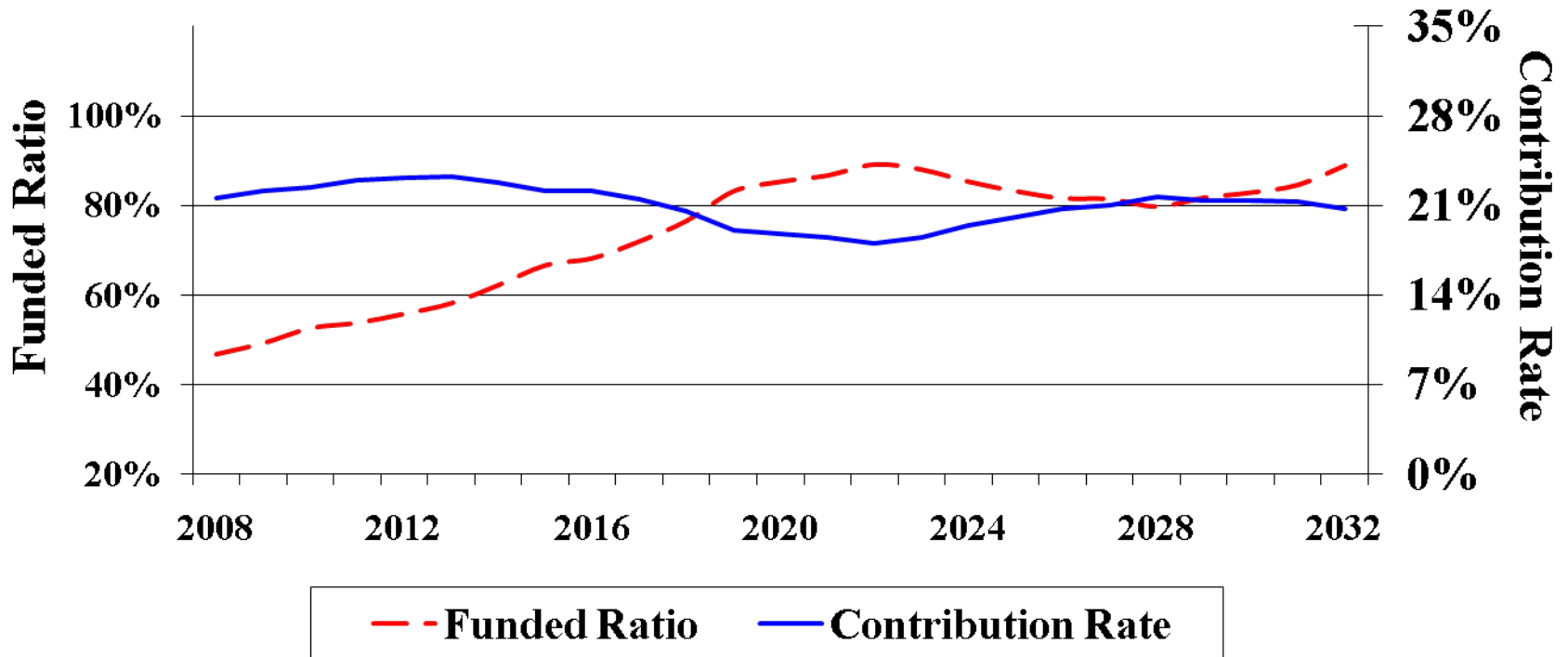


- Expected Funded Ratio at each valuation date based on simulated return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Stochastic Scenario – expected return met over 25 years, 10 year smoothing

## Projection with Assumptions Exactly Matched 10 Year Smoothing

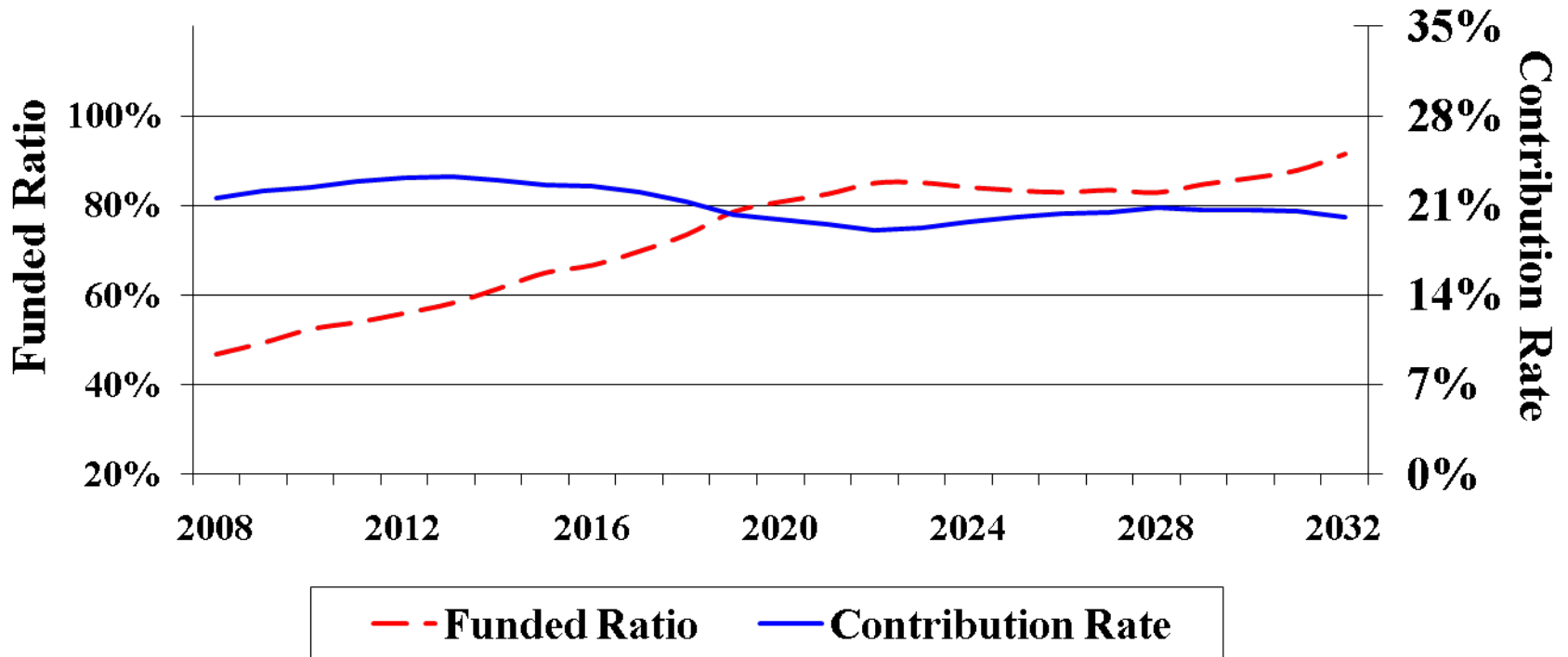


- Expected Funded Ratio at each valuation date based on simulated return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Stochastic Scenario – expected return met over 25 years, 15 year smoothing

## Projection with Assumptions Exactly Matched 15 Year Smoothing



- Expected Funded Ratio at each valuation date based on simulated return during each year
- Contribution rate expected to be equal to the actuarial determined rate
- Assumes all other assumptions are exactly met



# Three components of smoothing

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## ◆ Asset smoothing period

- ▶ How long an assets gain/loss is to be reflected in the Actuarial Value of Assets (AVA)
  - Funding value of assets

## ◆ Corridors

- ▶ Keeps the AVA within a certain range of the Market Value

## ◆ Amortization period

- ▶ Determines how quickly the gain/loss is “paid for”



# Actuarial Standards of Practice

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- ◆ An appropriate asset valuation method is likely to produce actuarial values of assets:
  - ▶ that are sometimes greater than and sometimes less than the corresponding market values
  - ▶ that fall within a reasonable range around the corresponding market values
  - ▶ that will recognize any differences between the actuarial value of assets and the market value within a reasonable period of time

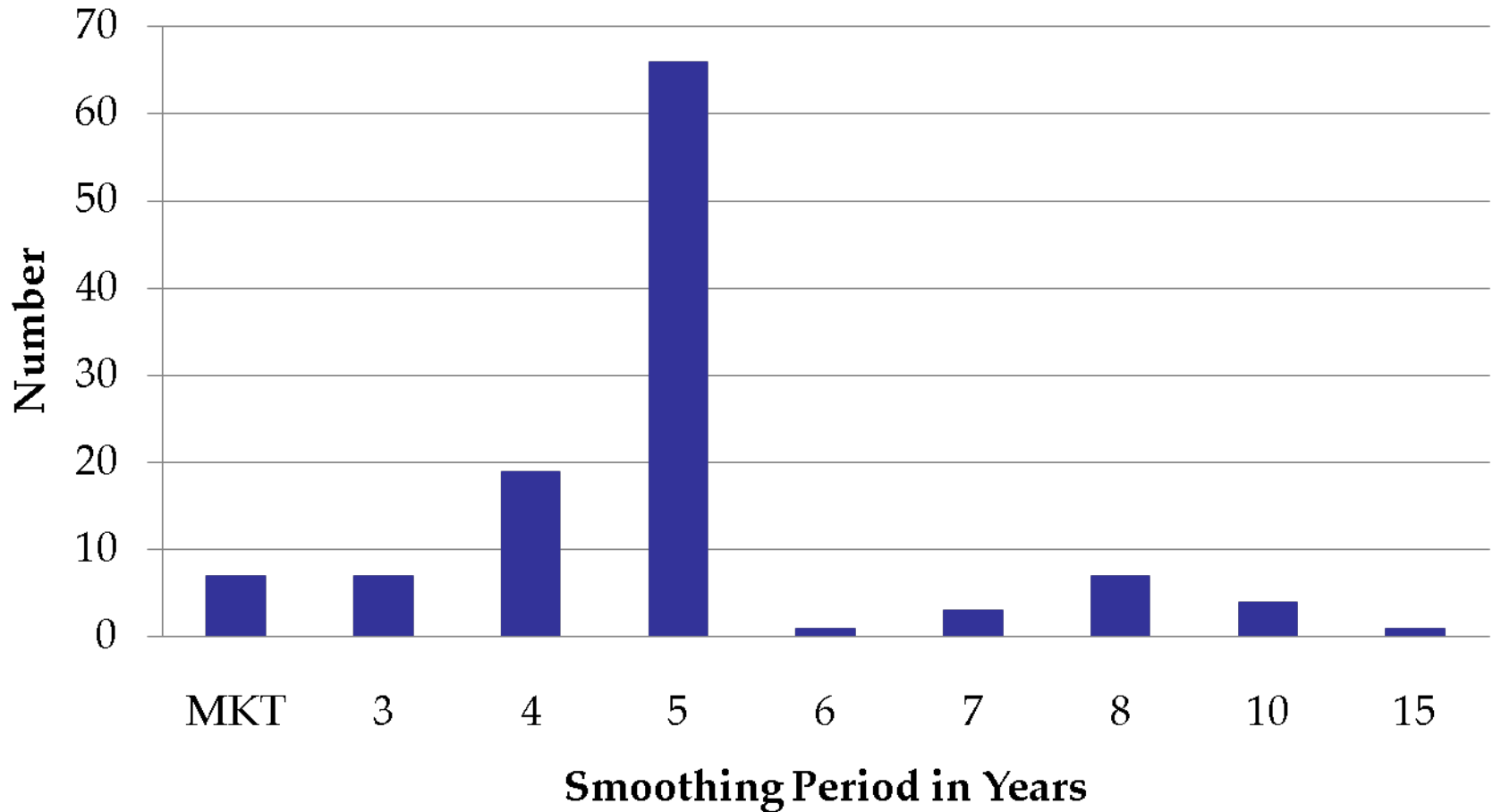


# What are other Systems using?

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- ◆ Practice varies widely among retirement systems
- ◆ Most common is a 5 year smoothing period without a corridor
- ◆ Many systems use smoothing periods between 4 and 8 years with corridors ranging from 10% to 30%
  - ▶ CalPERS employs a 15 year smoothing period with a 20% corridor, although they are reconsidering this policy
  - ▶ TRS uses 5 year smoothing with a 20% corridor

# Smoothing Periods used by other Systems



Source: The 2007 NASRA Public Fund Survey



# Correlation of Smoothing Periods and Corridors

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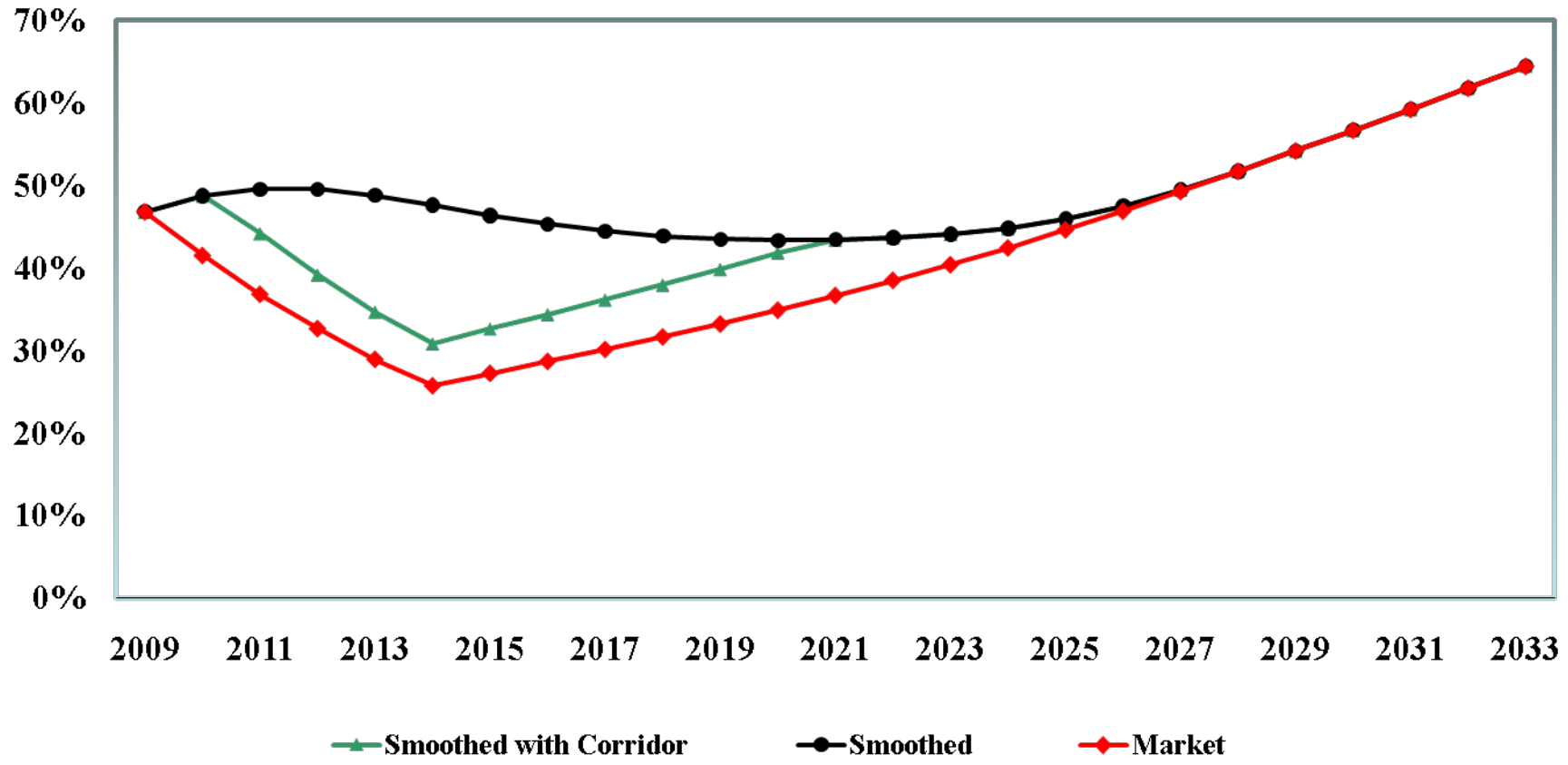
- ◆ Some Retirement Systems establish an asset ‘corridor’ (Example: using a 20% corridor – Funding Value cannot be greater than 120% of Market Value or lower than 80% of Market Value)
- ◆ The longer the smoothing period, the stronger the need for a tighter corridor
- ◆ The shorter the smoothing period, the less need for a tight corridor and perhaps no corridor is needed
- ◆ Corridor can be “hard” or “soft”
  - ▶ Recognize “all” or “some”



# Sample retirement system

(Assumes -10% return for 2009-2014, 7.5% per year thereafter)

## 15 Year Smoothing, Corridor Comparison





# Ramifications of a Corridor

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- ◆ Provides some downside protection to the funded status
- ◆ More volatility in contribution rates
- ◆ Objective of stable contribution rates more difficult to achieve
- ◆ Once funding value exceeds corridor, effect of asset smoothing is negated



# Reward vs. Risk/Cost

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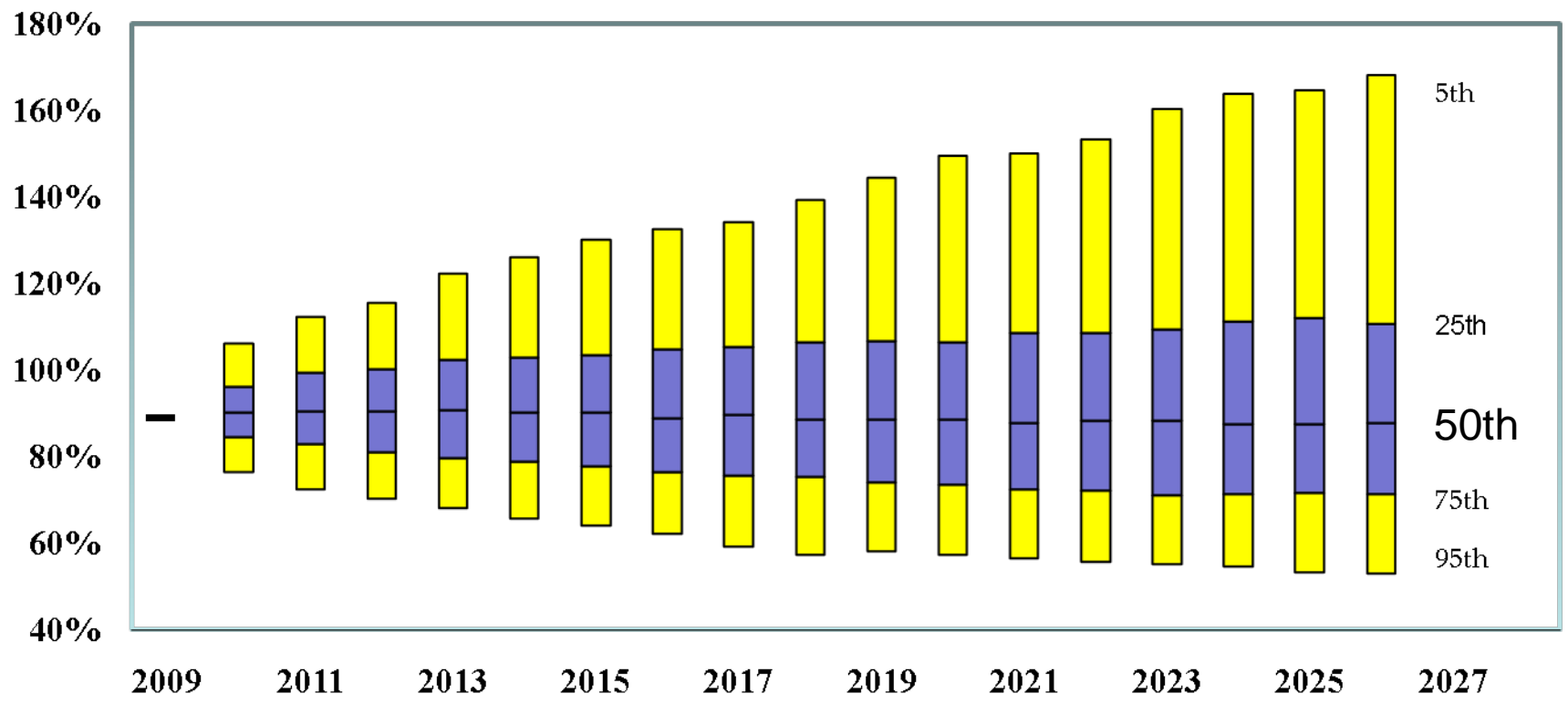
- ◆ When deciding between methods/policies, a given reward will come with a certain level of risk
  - ▶ increased risk should be offset by a greater reward
- ◆ In choosing a smoothing method, the reward is less volatility in the contribution rate
  - ▶ But what is the risk?
  - ▶ And what is the cost?



# Range of Expectations

(Sample retirement system)

## Projected Funding Ratio



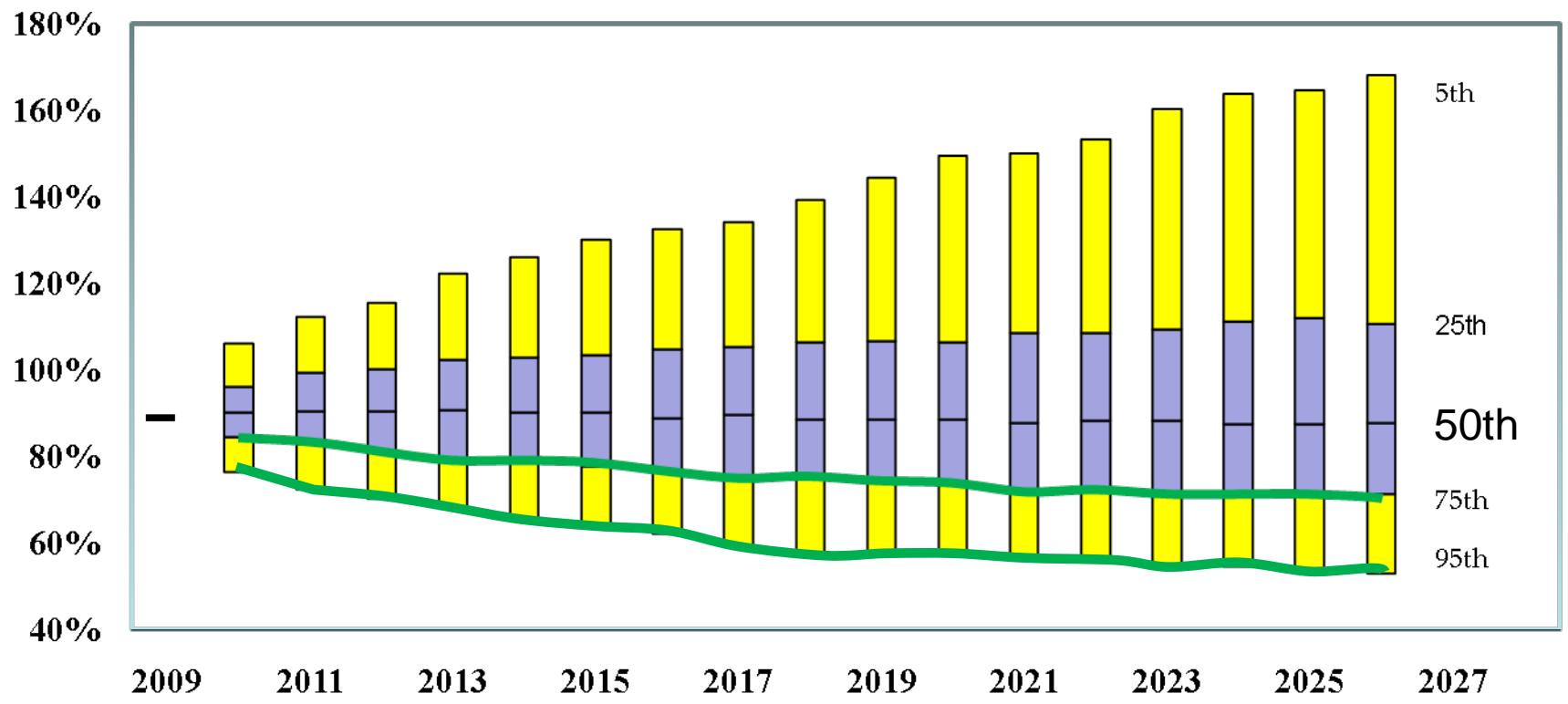
Future investment returns are uncertain,  
therefore, future funding outcomes are also uncertain



# Range of Expectations

(Sample retirement system)

## Projected Funding Ratio



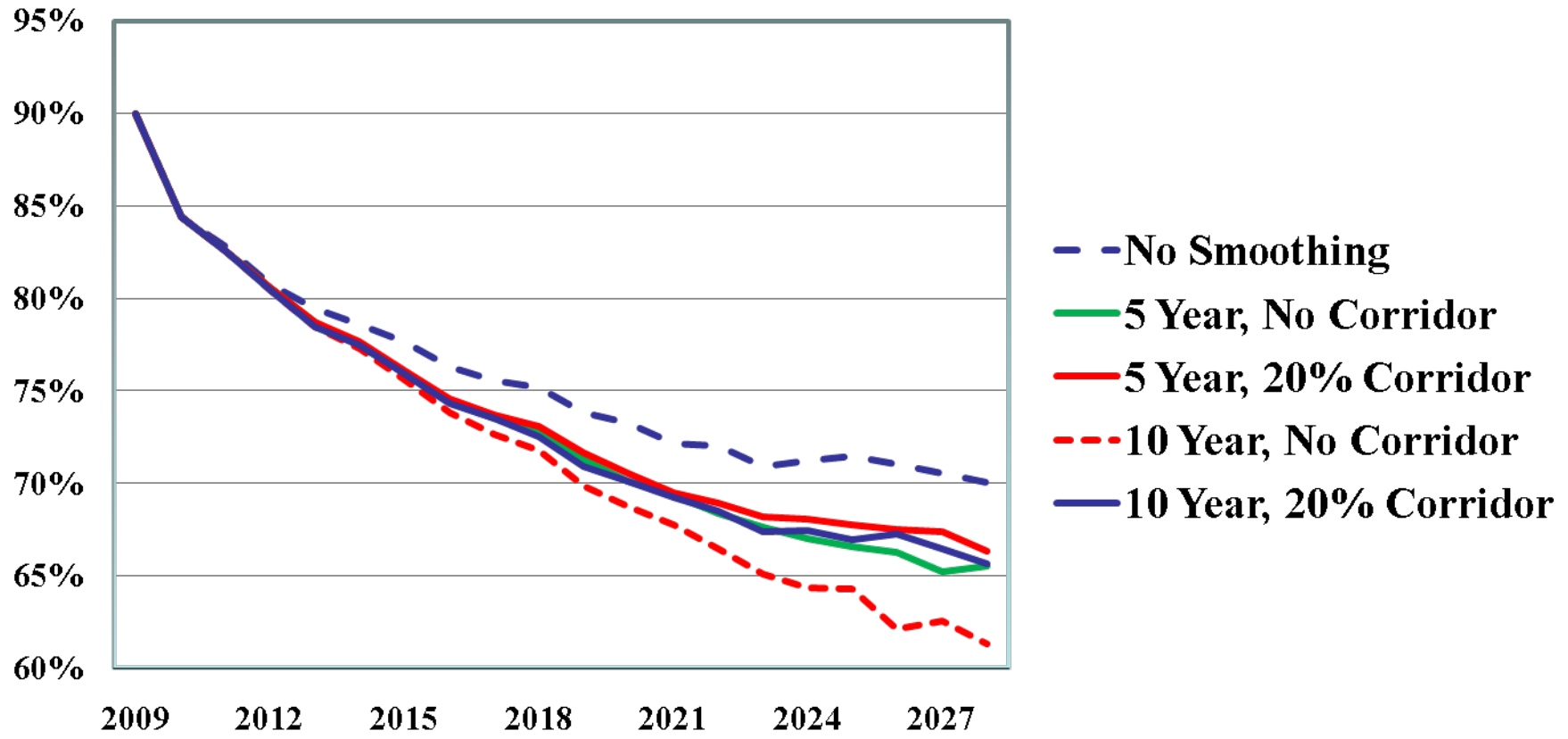
For risk management, we want to focus on downside risk, and the bottom ¼ of possibilities. Corridors provide some protection on the downside.



# Impact of Periods/Corridors combinations

(Sample retirement system)

## Projected Funding Ratio based on Market Value of Assets – 75<sup>th</sup> percentiles

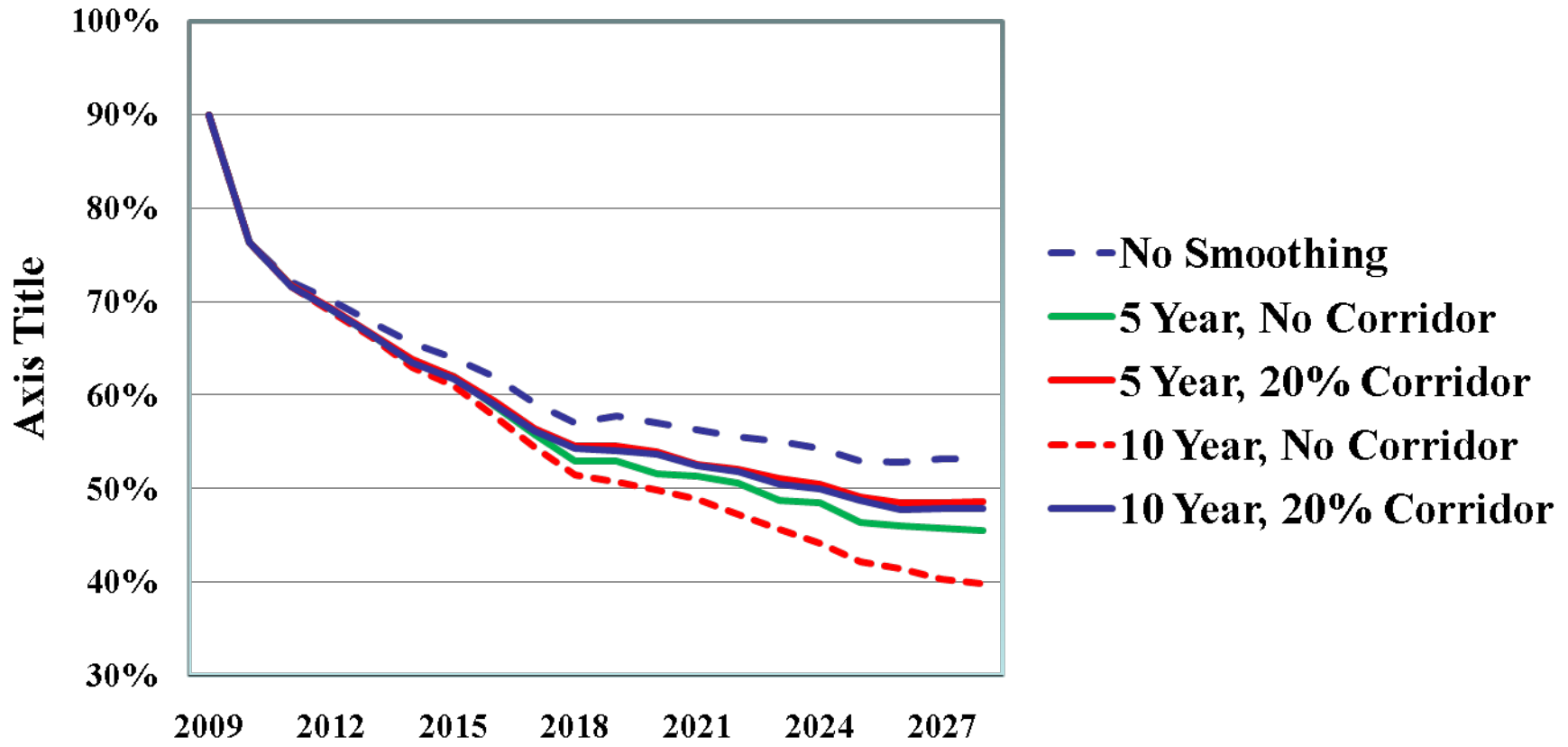




# Impact of Periods/Corridors combinations

(Sample retirement system)

## Projected Funding Ratio based on Market Value of Assets – 95<sup>th</sup> percentiles





# Reward vs. Risk

(sample retirement system)

Smoothing Period	Corridor	Average Rate Volatility	75 <sup>th</sup> Percentile of Funded Ratio	95 <sup>th</sup> Percentile of Funded Ratio
		Reward	Risk	Risk
None	None	+/- 1.53%	56.3%	43.0%
5 Year	None	+/- 0.52%	51.1%	36.9%
5 Year	20%	+/- 0.55%	52.5%	39.3%
10 Year	None	+/- 0.34%	46.9%	30.5%
10 Year	20%	+/- 0.44%	51.8%	39.0%

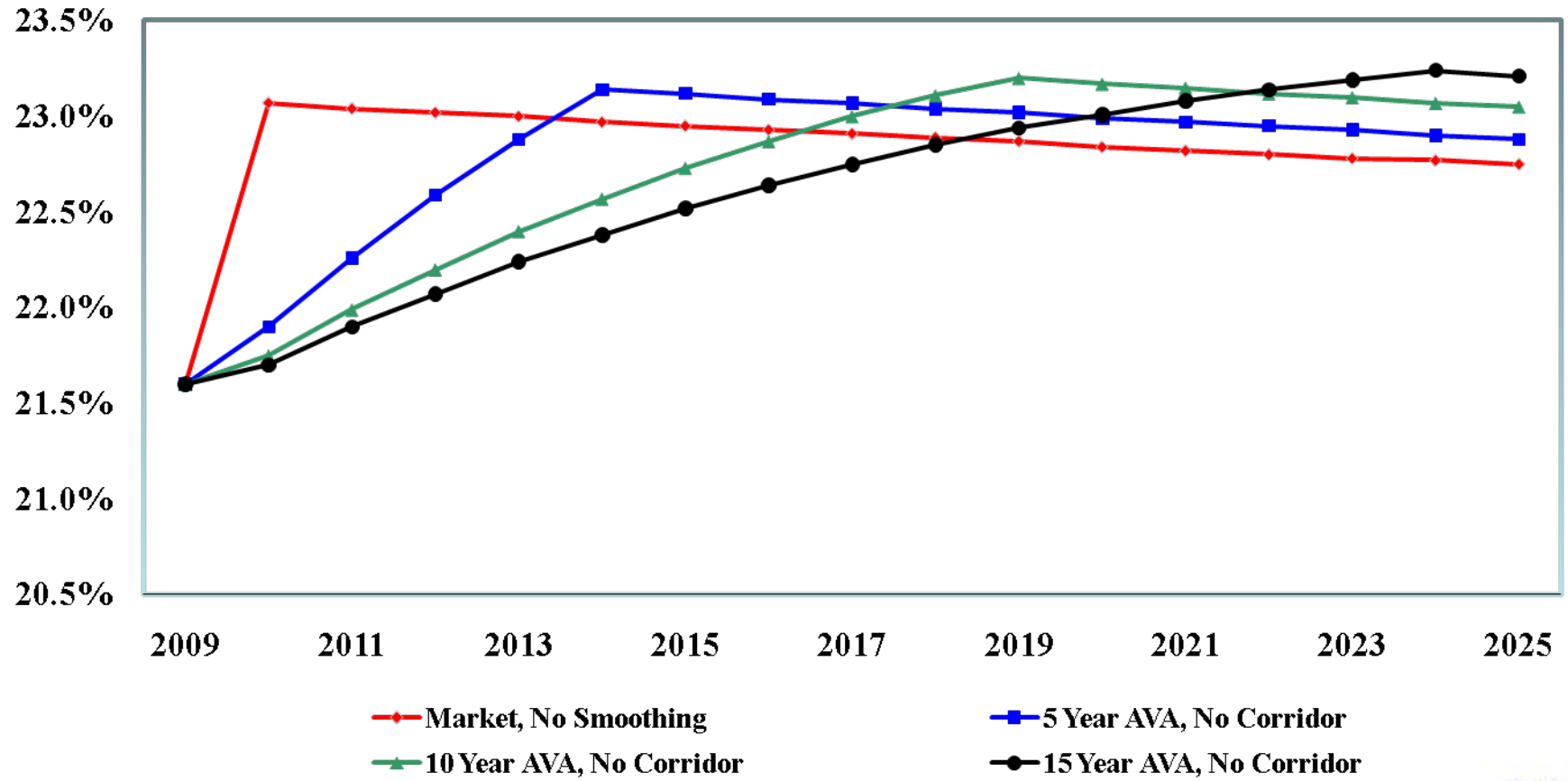
Numbers above reflect a more typical plan structure, they do not necessarily reflect the results based on a TMRs structure



# Sample retirement system

(Assumes -10% return in 2009, 7.5% return per year thereafter)

## Employer Contribution Rate

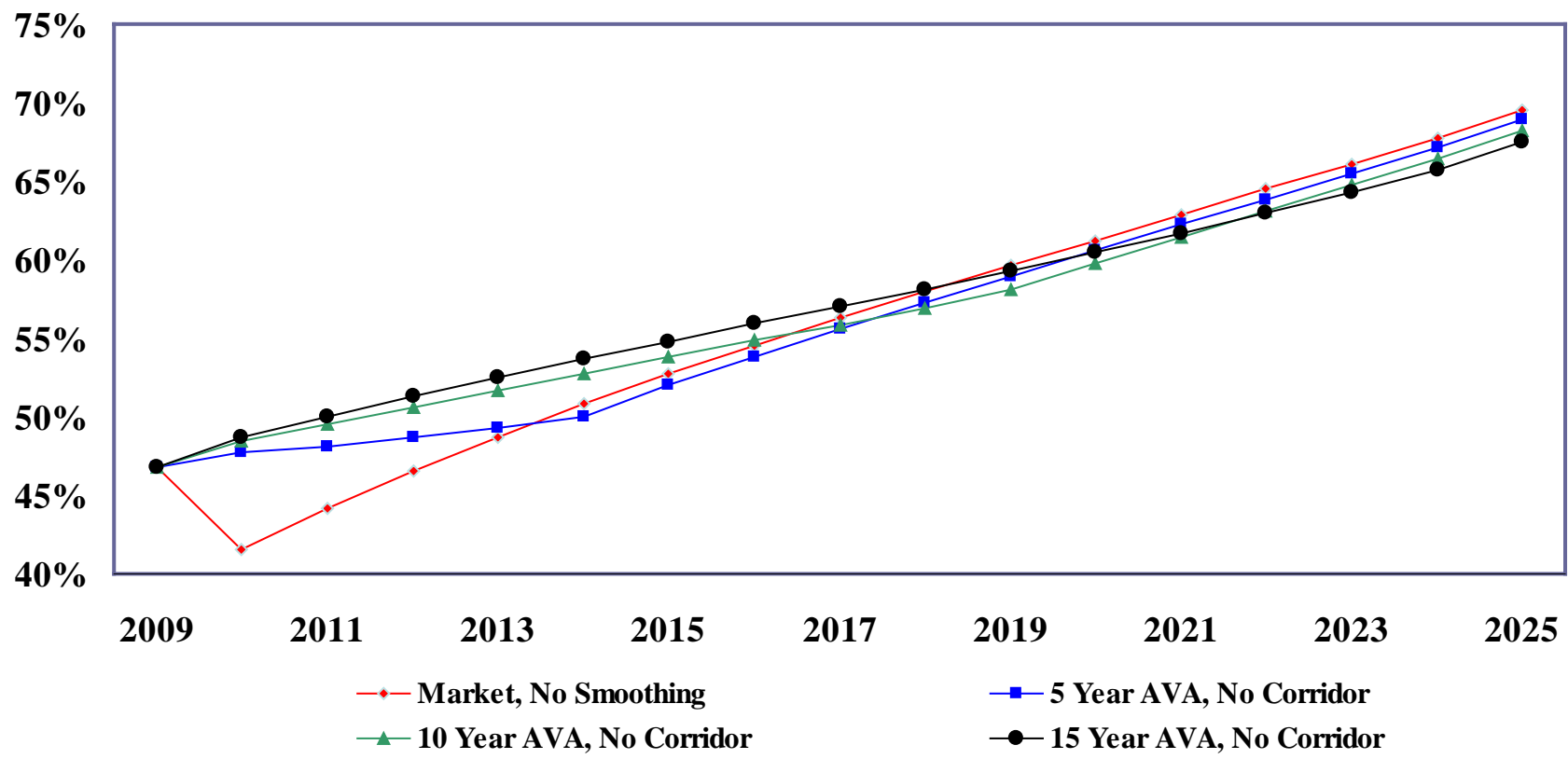




# Sample retirement system

(Assumes -10% return in 2009, 7.5% return per year thereafter)

## Funding Ratio (AVA)

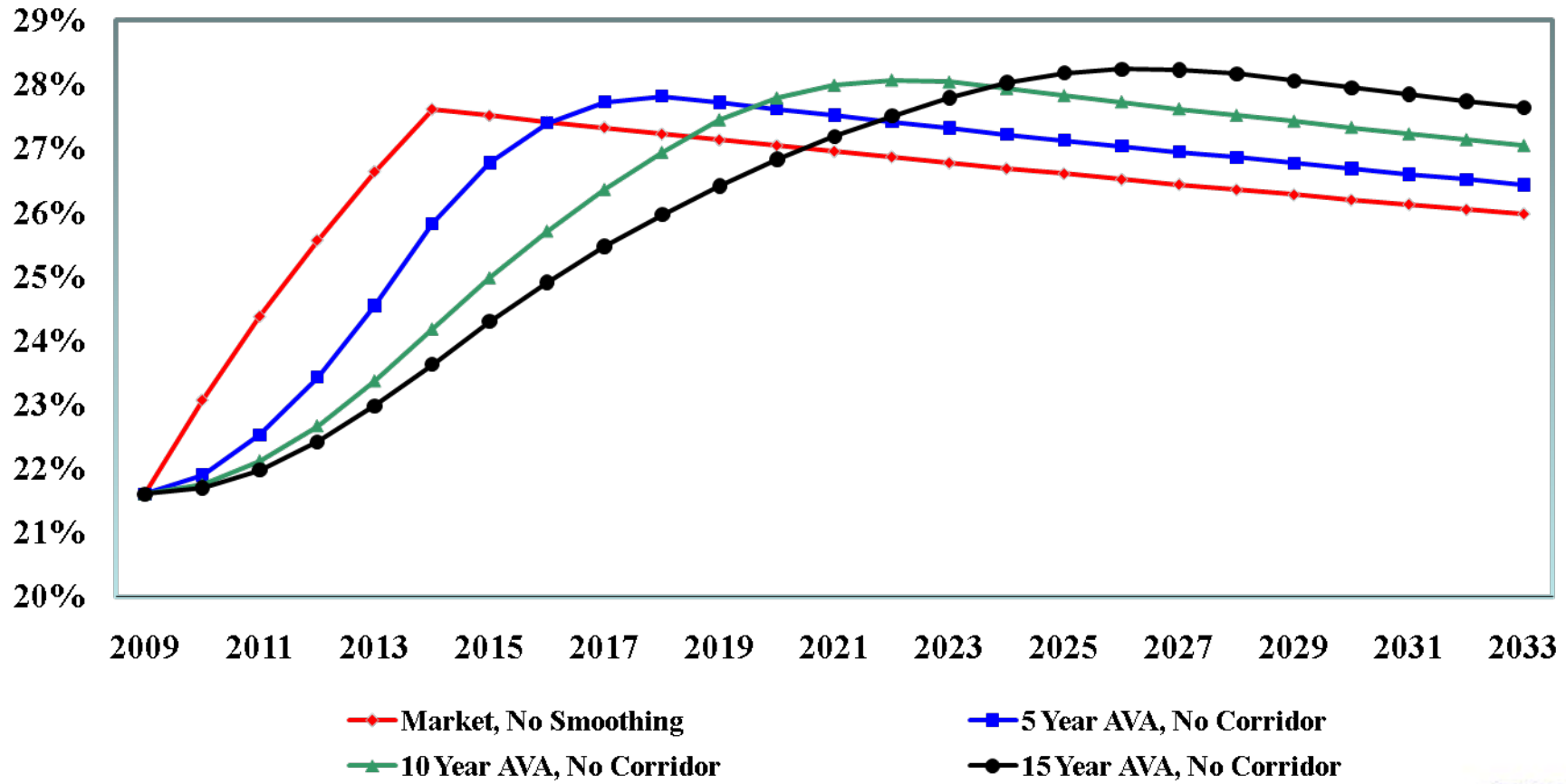




# Sample retirement system

(Assumes -10% return in 2009-2014, 7.5% return per year thereafter)

## Employer Contribution Rate

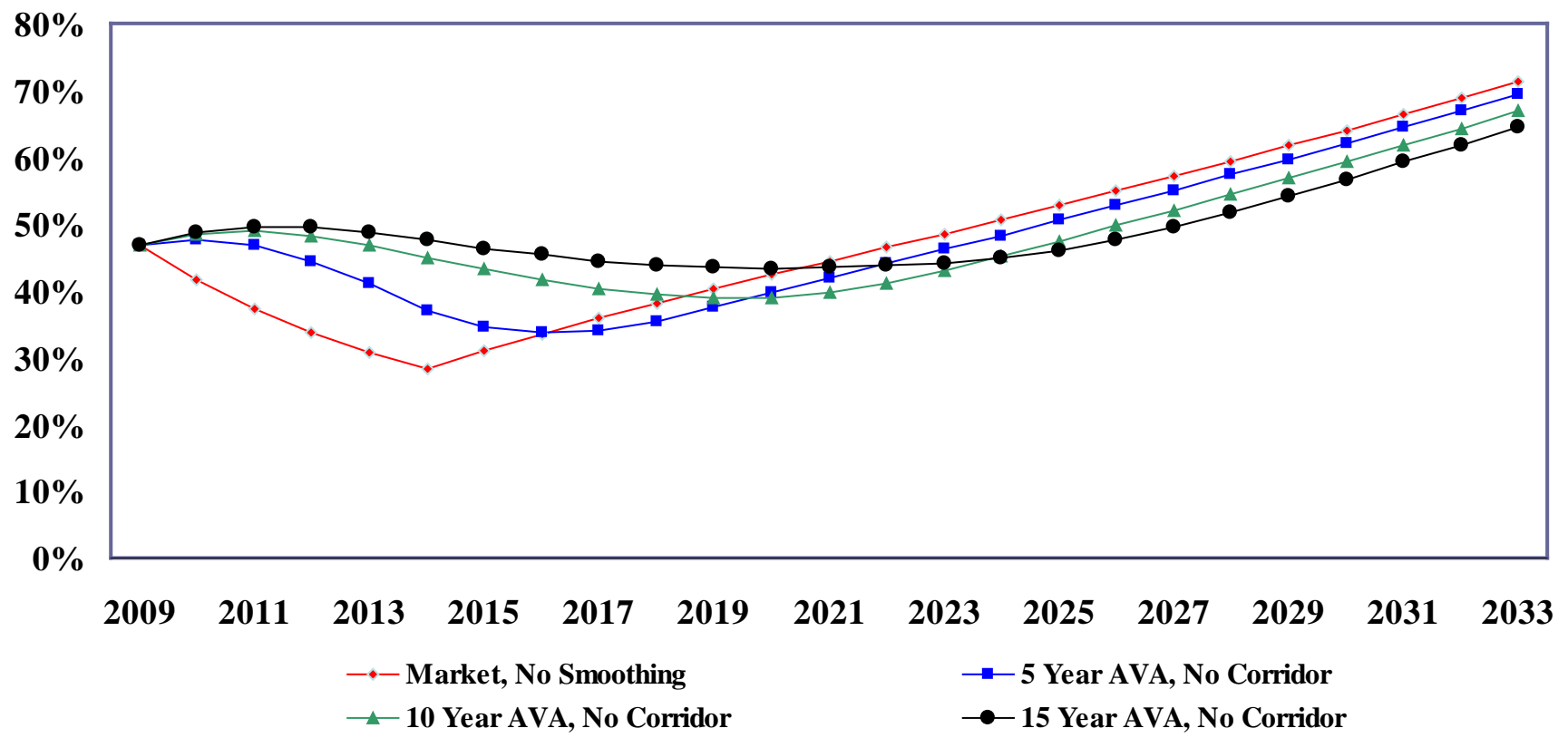




# Sample retirement system

(Assumes -10% return in 2009-2014, 7.5% return per year thereafter)

## Funding Ratio (AVA)

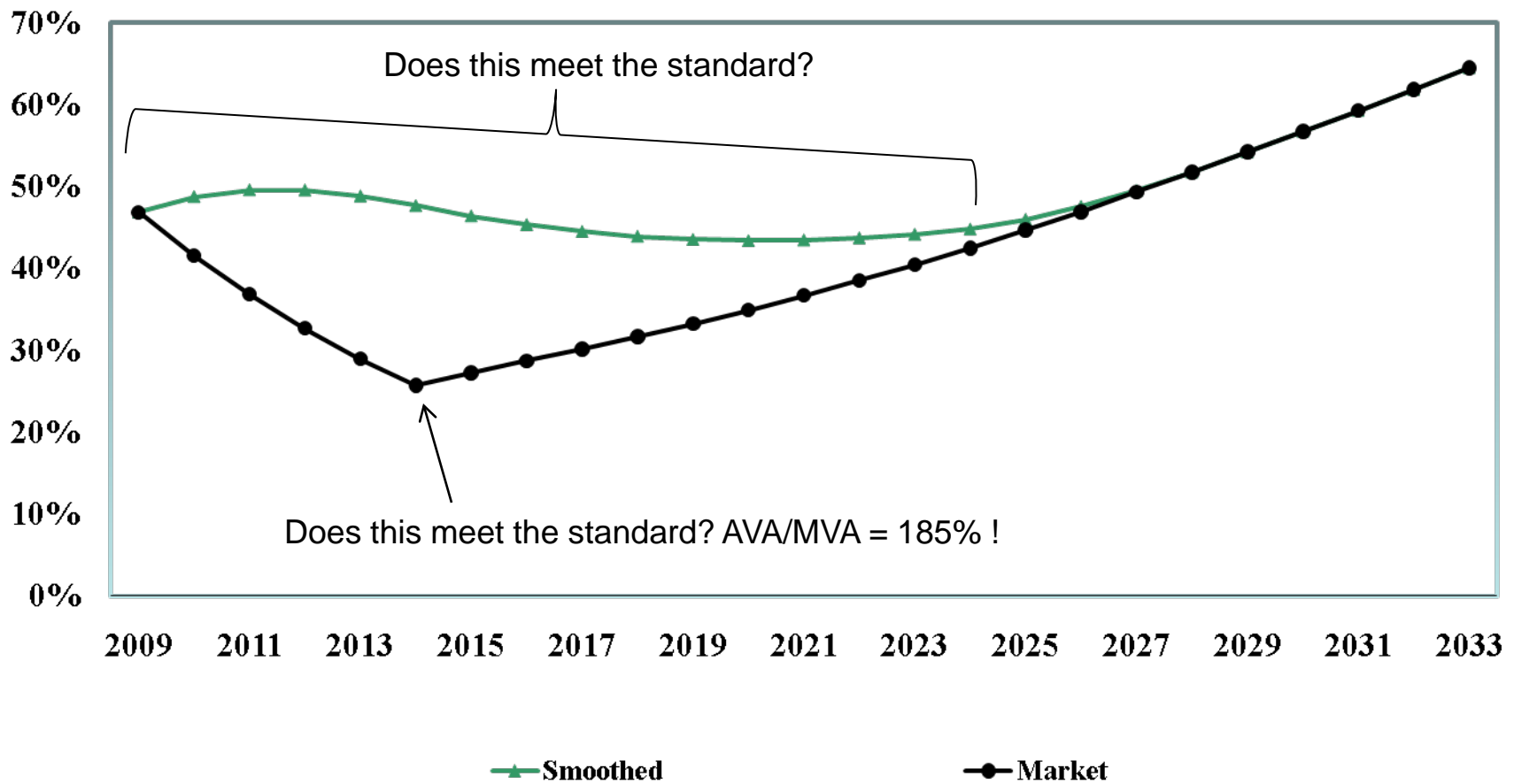




# Sample retirement system

(Assumes -10% return in 2009-2014, 7.5% return per year thereafter)

## 15 Year Smoothing, Funding Ratio Comparison

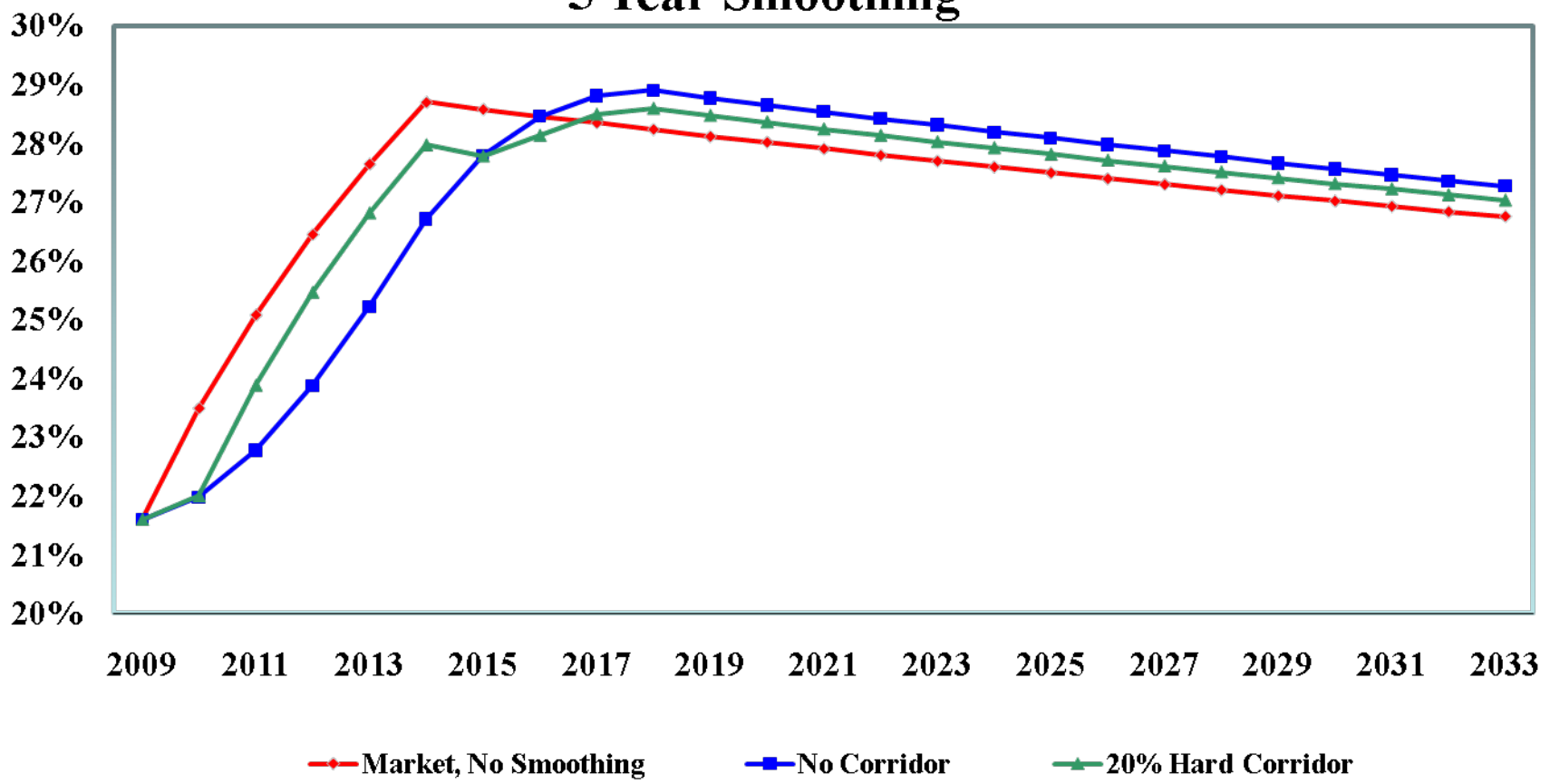




# Sample retirement system

(Assumes -10% return in 2009-2014, 7.5% return per year thereafter)

## Employer Contribution Rate 5 Year Smoothing





## Reward vs. Risk/Cost

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- ◆ The reward is less volatility in the contribution rate
- ◆ The risk is more downside exposure
- ◆ The cost is paying more later with interest if there is no recovery



## In Summary

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- ◆ Pension Plan funding is a long term financial arrangement
- ◆ Using the market value of assets as of a specific date may place too much emphasis on the short term
  - ▶ Emotion and short term budgets may then control the decision making process
    - Can cause over-reaction and instability



# In Summary

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- ◆ Assets Smoothing is a method used to focus the decision making process on the long term
  - ▶ Consistency in funding
  - ▶ Consistency in reporting
  - ▶ Consistency in benefit provisions