Addressing Employer Rate Fluctuation

October 25, 2004

What's So Bad About Rate Fluctuation?

- Employer's contributions can be very unpredictable
- Employer contributions run counter cyclically with the employer's ability to pay
- Is smoothing what we're after or is it matching the required contribution to the employer's economic cycle?

What are the Answers?

- To be very clear, we don't have a recommendation to deal with this issue as yet.
- This session will present:
  - The actuarial offices' view of the major causes of the problem.
  - A survey of the alternatives that the actuaries have explored to address the problem.

Smoothing Vs Funding

- ANY smoothing of employer rates comes at the expense of maintaining 100% funding at all times.
- The opposite of smoothing would be to charge the employer whatever it would take to get the plan from where it is to 100% funded by the end of the year.

Criteria for Smoothing Employer Rates

- Smoothing criteria to be developed should measure:
  - how smooth the employer's projected rates are predicted to be
  - the impact on the plan's funded status.

The Causes of Employer Rate Fluctuation

- Caused by planned and unplanned events.
- Planned events include:
  - Changing the "target" by changing benefit provisions.
  - Changing the "target" by changing actuarial assumptions or methods.
- Unplanned events include changes in liability or assets due to actual experience different from that assumed.

Unplanned Liability Volatility

- Occurs whenever actual demographic experience differs from the actuarial demographic assumptions
- For example:
  - Retirements, disabilities, deaths, or terminations in numbers or at ages other than those assumed.
  - Salary increases other than those assumed

Unplanned Liability Volatility

- Current attempts to "smooth" the impact of liability gains and losses include:
  - Funding method (Entry Age Normal)
  - Amortization of liability gains and losses (10% of unamortized balance)
  - Pooling of "small" plans

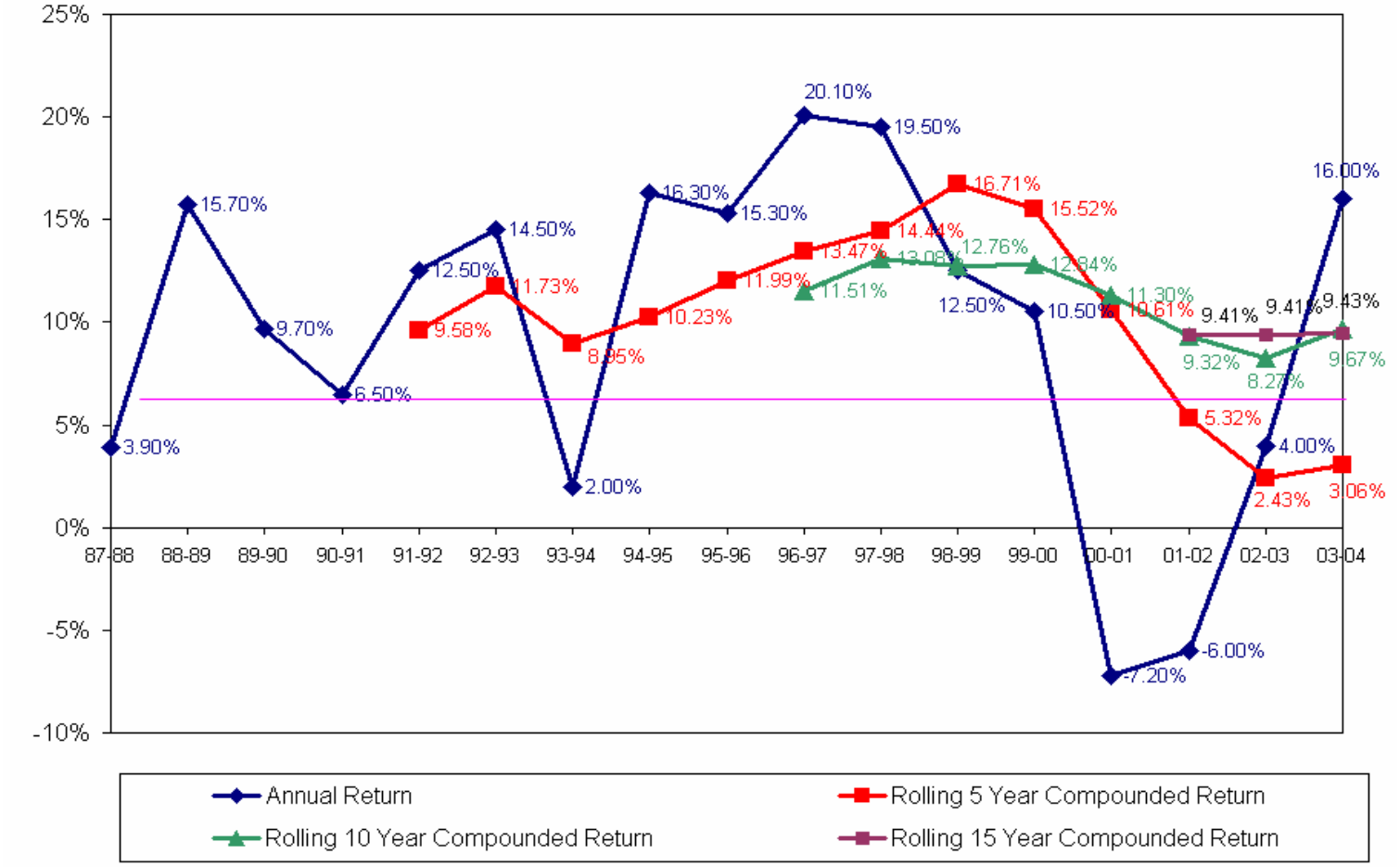
Unplanned Liability Volatility

- Opportunities for additional smoothing are limited
- Possibilities include:
  - "Open group" valuation where we anticipate future hires
  - Modify the amortization of liability gains and losses

Unplanned Asset Volatility

- Occurs when the actual "smoothed" actuarial value of assets differs from the value predicted by the investment return assumption.
- Assumed investment return is a very long estimate
- Highly unlikely that each year's annual return will be "close" to this long term compound average.

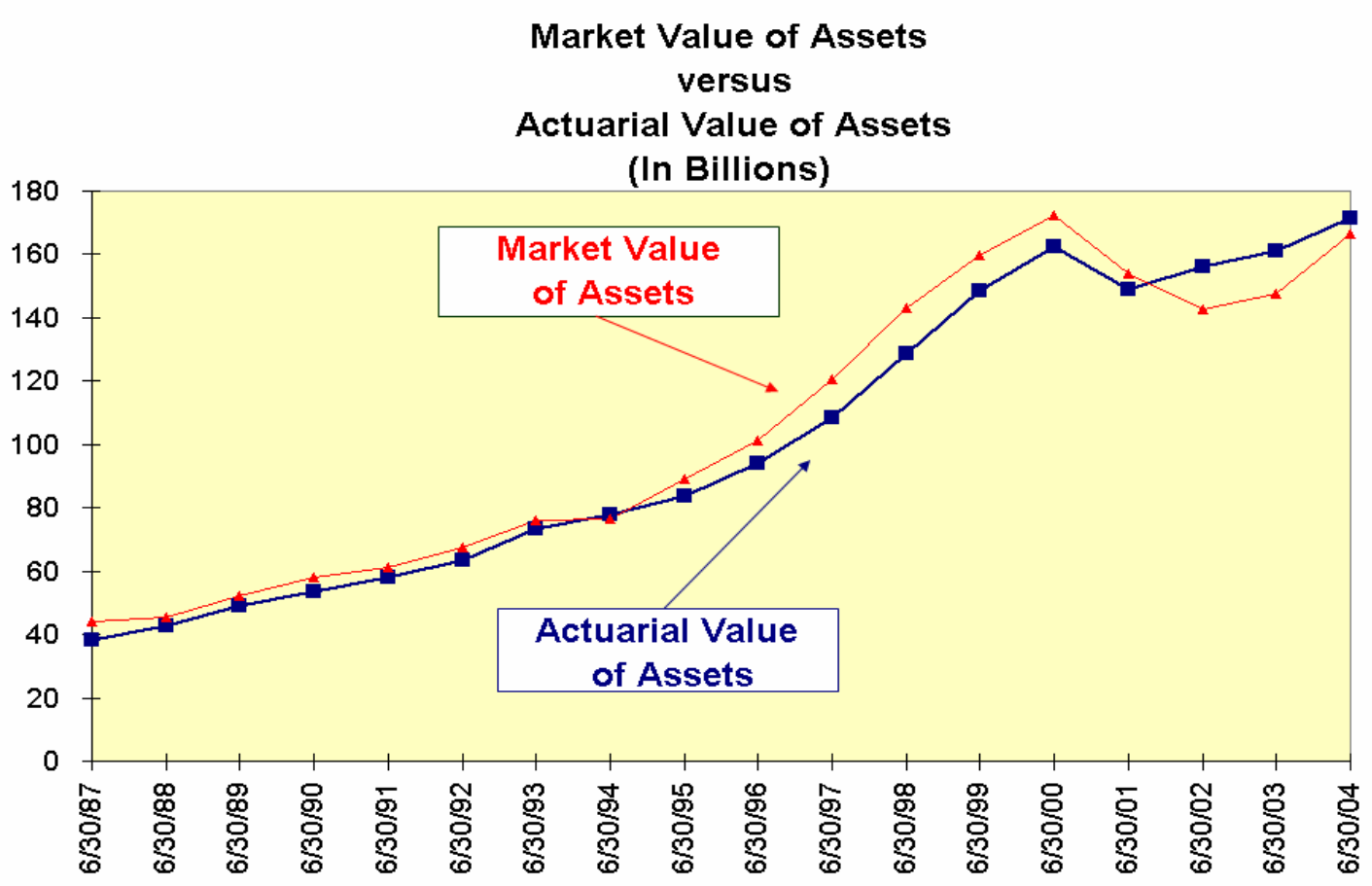
Investment Return History



Unplanned Asset Volatility

- Current attempts to "smooth" the impact of asset gains and losses include:
  - Diversified asset allocation.
  - Asset smoothing method
    - Market gains and losses spread over 3 years
    - Corridor of 90%-110% of market value
  - Amortization of asset gains and losses (10% of unamortized balance)

Results of Past Asset Smoothing



Unplanned Asset Volatility

- Possible alternative to "smooth" asset gains and losses include:
  - More conservative asset mix
  - Modify Asset Smoothing
    - Spread gains and losses over 10 years
    - Corridor of 80%-120% of market value
    - Eliminate the Corridor
  - Modify the amortization of asset gains and losses

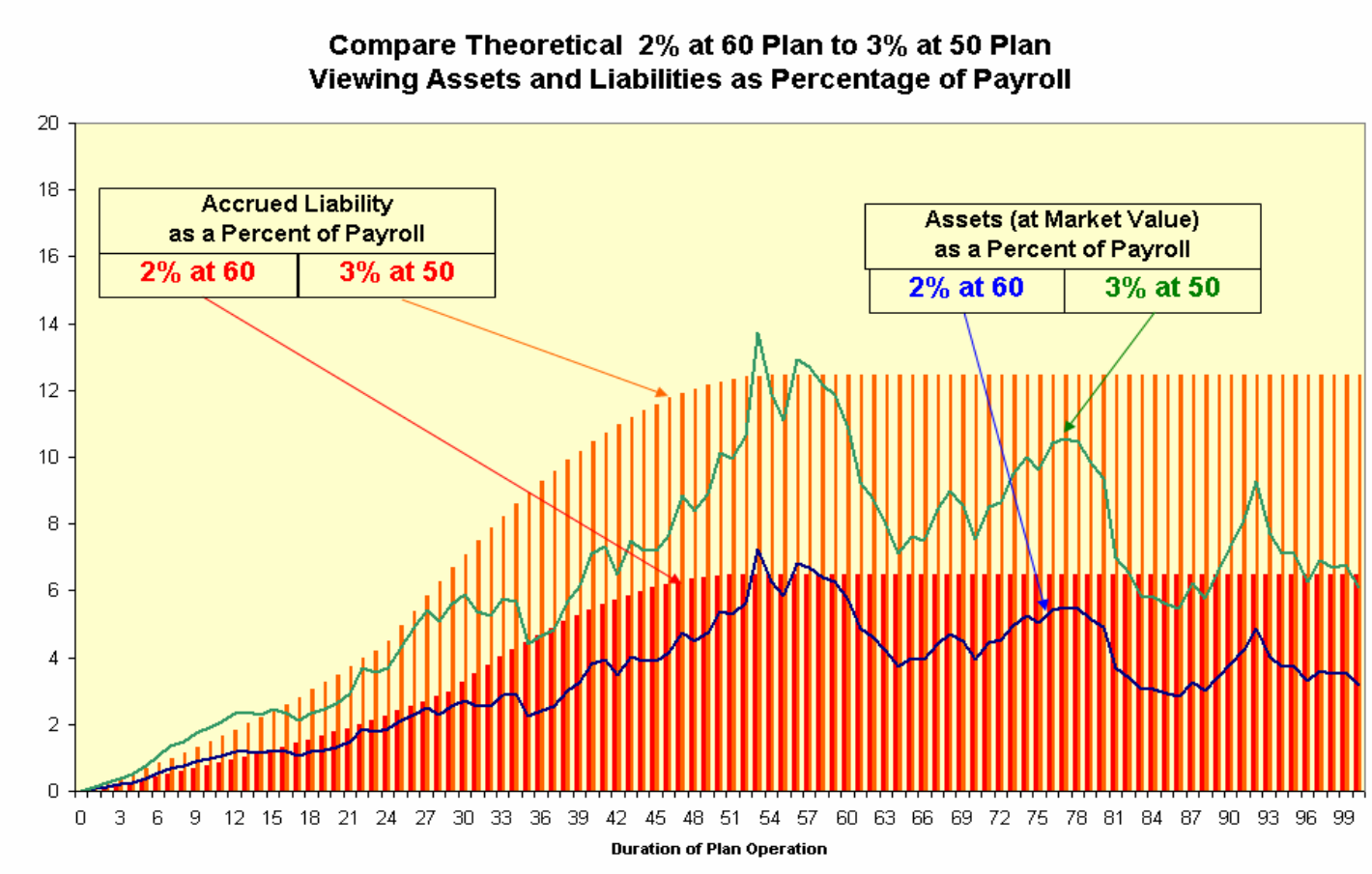
Unplanned Asset Volatility

- Asset fluctuations causes the largest swings in employers contribution rates.
- Asset volatility impacts different plans at CalPERS quite differently

Percent of Payroll View

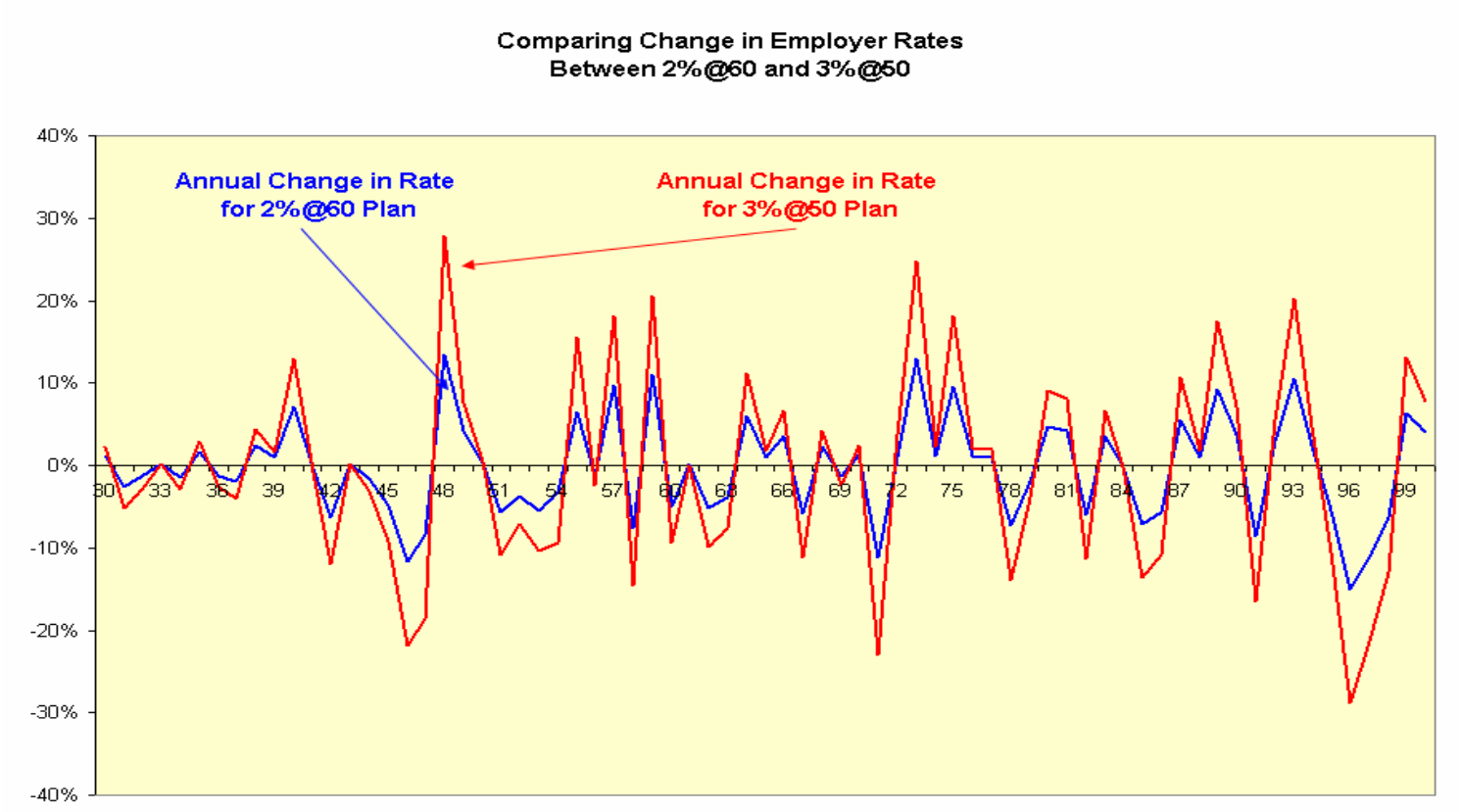
- If one divides both assets and liabilities by the payroll of active members for an ongoing plan, the reason for the differing impact of asset fluctuations on rates becomes more clear.

Percent of Payroll View



Percent of Payroll View

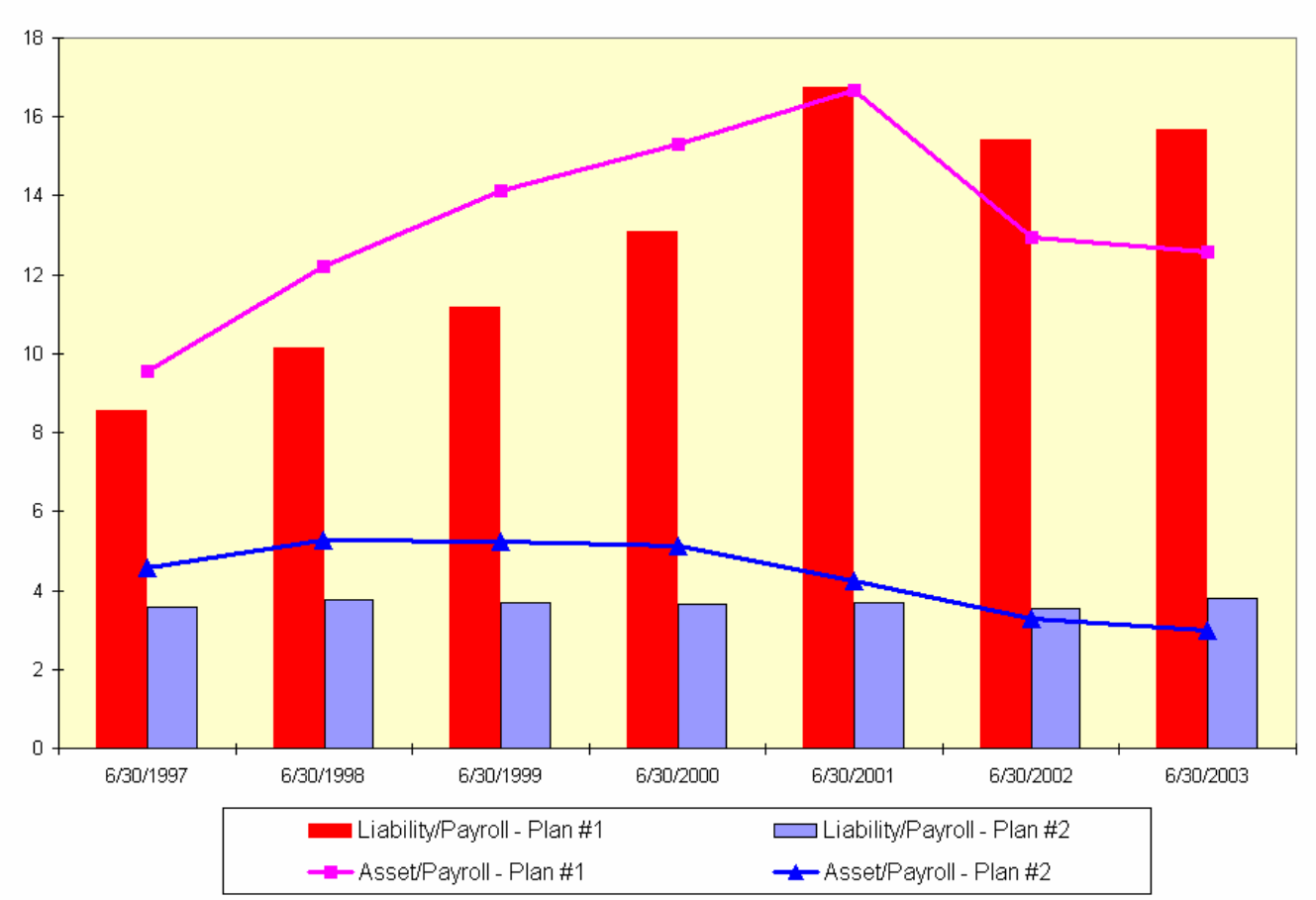
- The volatility of employer contribution rates as a percentage of payroll is directly related to that plan's asset (or liability) to payroll ratio.



From Theory to Reality

- So far, this has been theoretical. What about reality?

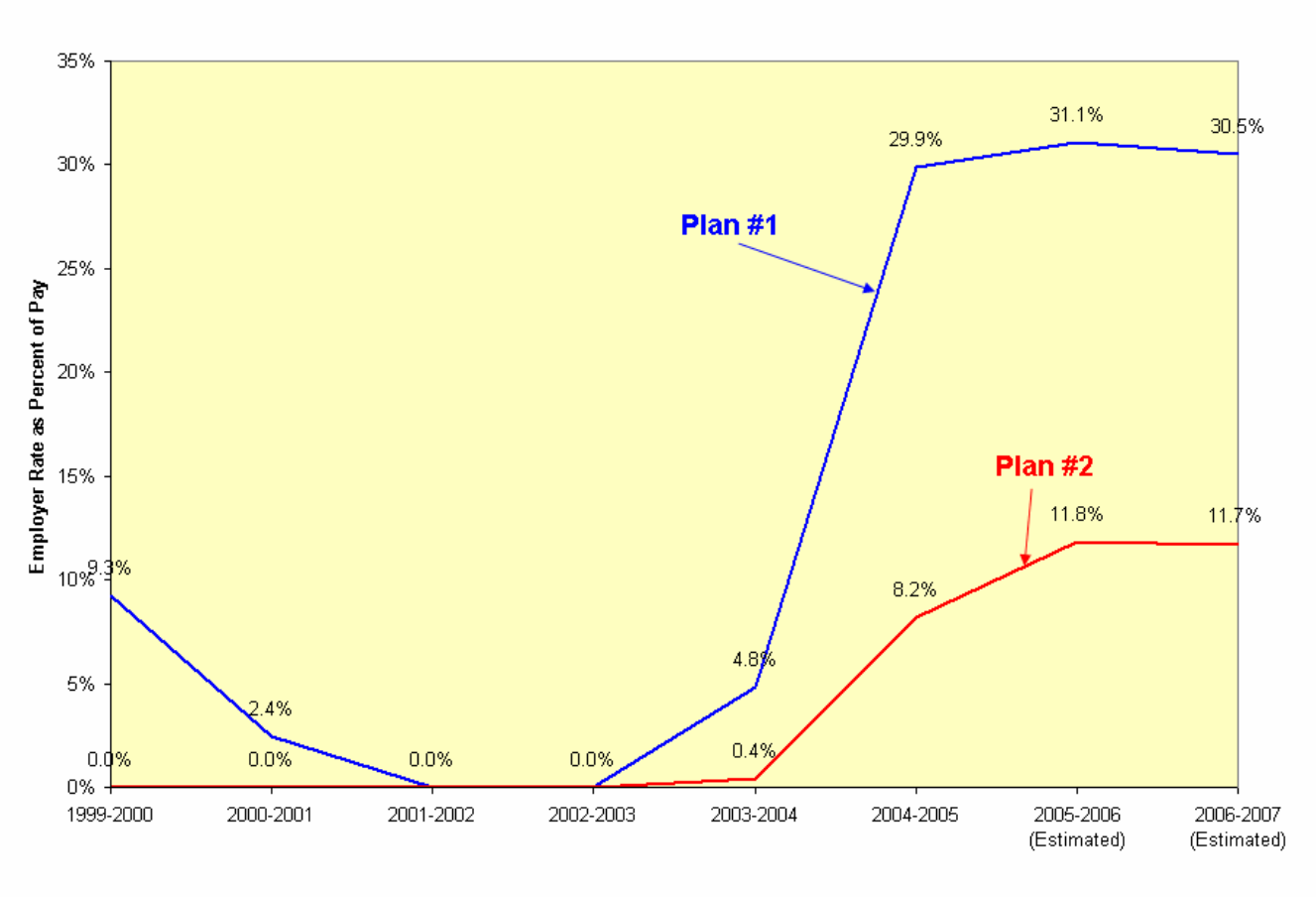
Sample Public Agencies at the Extremes



Public Agency Extremes

- When both of these public agency plans were about 100% funded on June 30, 2001, Plan #1 had a ratio of assets and liabilities to payroll of about 17 while Plan #2 had a ratio of about 4.
- Look at how the investment returns, even with asset smoothing, impacted each plan.

Impact of Recent Asset Returns on Different CalPERS Plans



Distribution of Liability to Payroll Ratio Risk Pools

Risk Pool	Liability to Payroll Ratio
Pool #1 - 2% at 60 Miscellaneous Pool	2.7
Pool #2 - 2% at 55 Miscellaneous Pool	3.6
Pool #3 – 2.5% at 55 Miscellaneous Pool	4.3
Pool #4 – 2.7% at 55 Miscellaneous Pool	4.3
Pool #5 - 3% at 60 Miscellaneous Pool	4.5
Pool #6 - 2% at 55 Miscellaneous Pool	3.0
Pool #7 - 2% at 50 Miscellaneous Pool	6.6
Pool #8 - 3% at 55 Miscellaneous Pool	8.1
Pool #9 - 3% at 50 Miscellaneous Pool	8.9

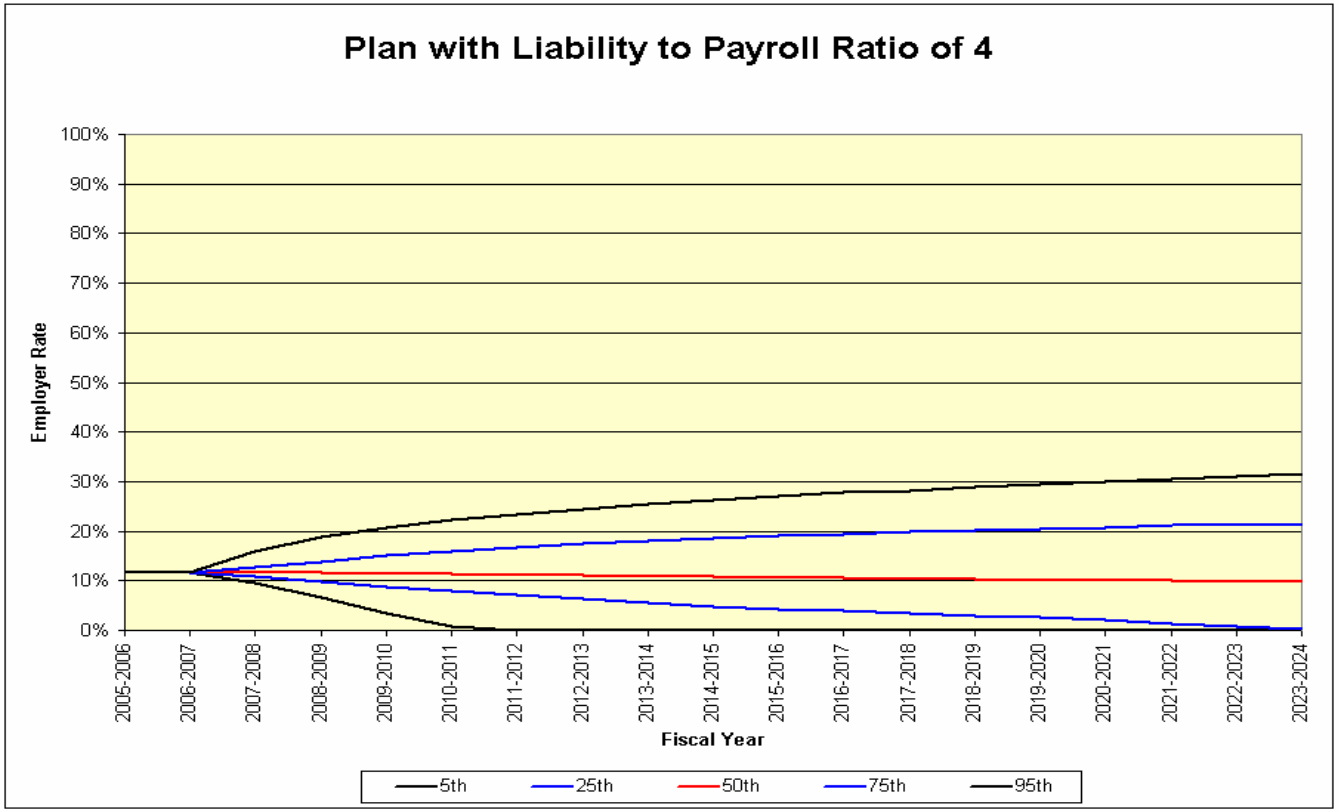
Distribution of Liability to Payroll Ratio Non-Pooled Plans

Liability to Payroll Ratio	Percentage of Non-Pooled Plans
Less than 2	7%
Between 2 and 4	25%
Between 4 and 6	37%
Between 6 and 8	15%
Between 8 and 10	8%
Between 10 and 12	7%
More than 12	1%

About 450 plans will not be mandated in a risk pool

Projected Impact of Asset Returns on Future Employer Rates

- Below are various "confidence intervals" showing the impact of our current asset mix on future employer rates.



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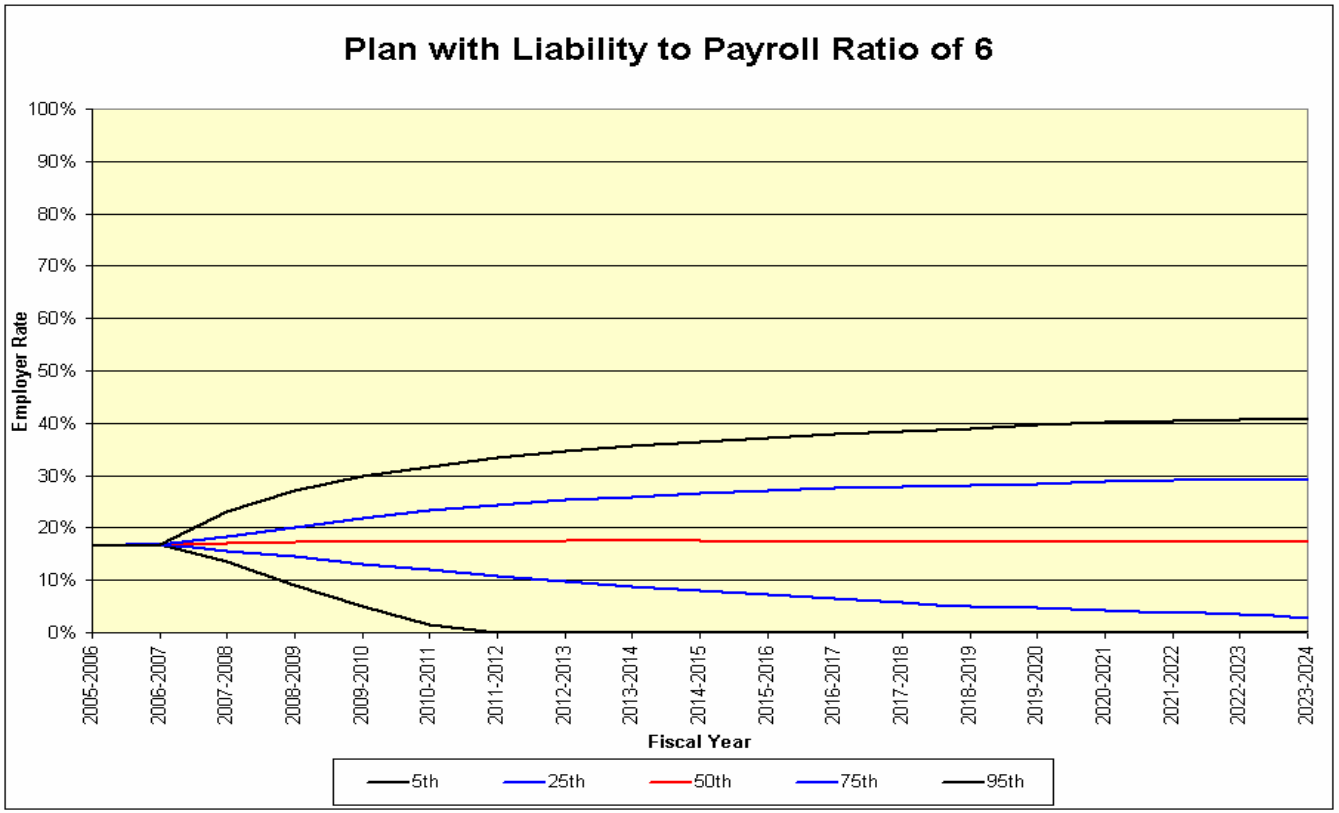

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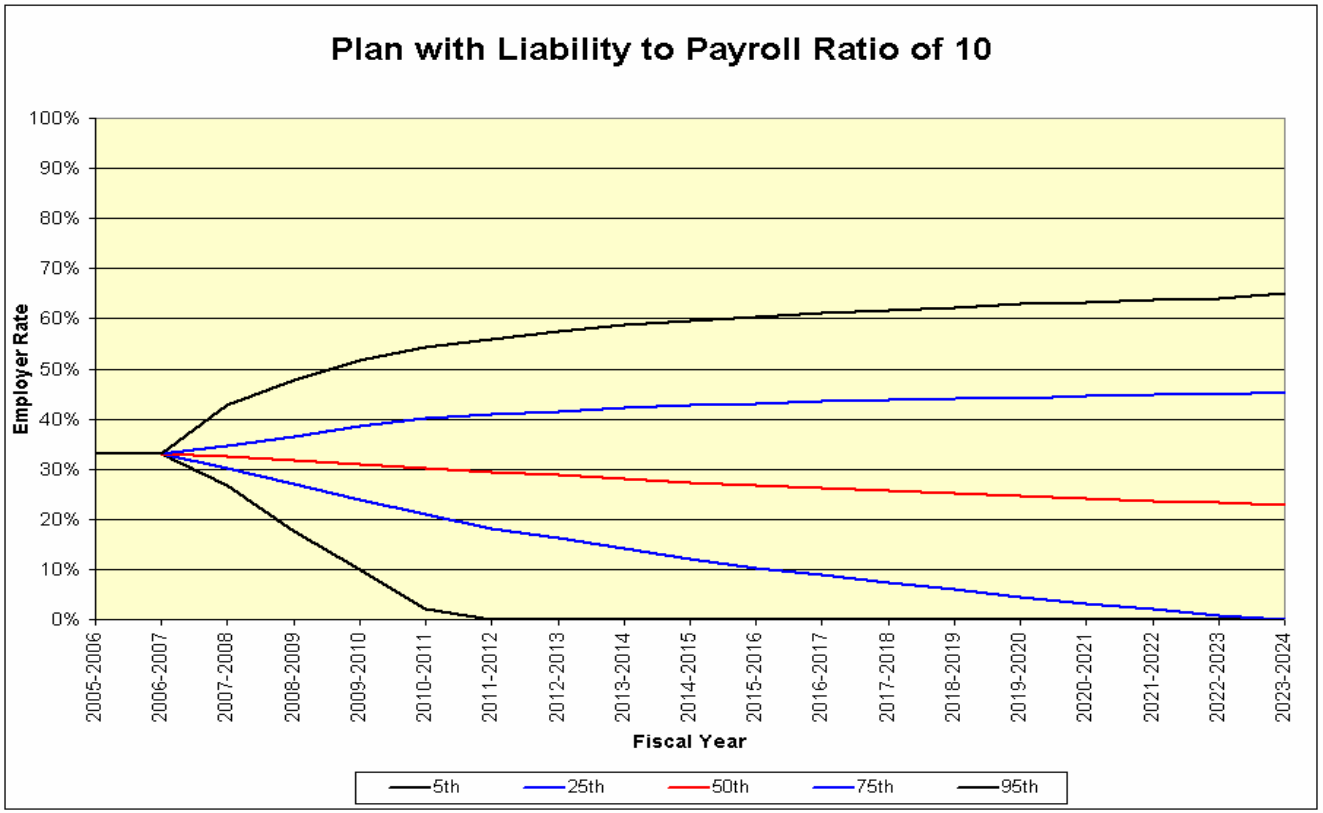

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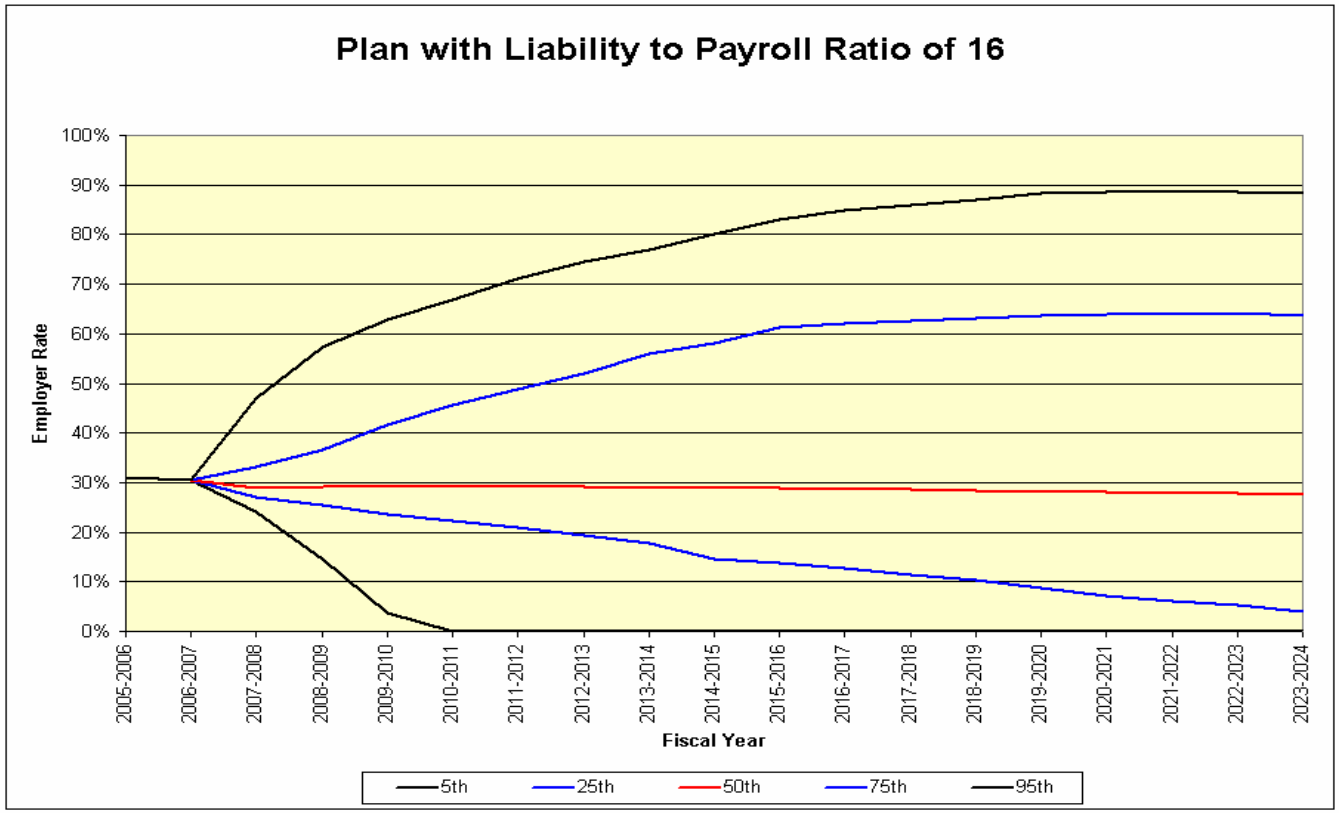


Projected Impact of Asset Returns on Future Employer Rates

Difference Between ***75% Percentile*** Rate and 05-06 Rate

	Potential Increase in Employer Rate		
Liability to Payroll Ratio	**5 Years from Now**	**10 Years from Now**	**20 Years from Now**
4	4%	6%	8%
6	6%	9%	11%
10	11%	17%	19%
16	19%	27%	30%

Projected Impact of Asset Returns on Future Employer Rates

Difference Between ***95% Percentile*** Rate and 05-06 Rate

	Potential Increase in Employer Rate		
Liability to Payroll Ratio	**5 Years from Now**	**10 Years from Now**	**20 Years from Now**
4	11%	14%	18%
6	16%	21%	24%
10	25%	33%	37%
16	40%	52%	56%

Causes of Rates Fluctuations Summary

- With pooling, unplanned liability volatility is not a big issue
- Asset fluctuations causes the largest swings in employers contribution rates.
- Plans are impacted differently

What Can be Done to Reduce Rate Fluctuation?

- Change to a more conservative asset mix
- Modify Asset Smoothing
- Modify the amortization of asset gains and losses
- Invoke a minimum and/or a maximum employer contribution rate
- Direct rate smoothing
- Institute Pension Contribution Stabilization Accounts

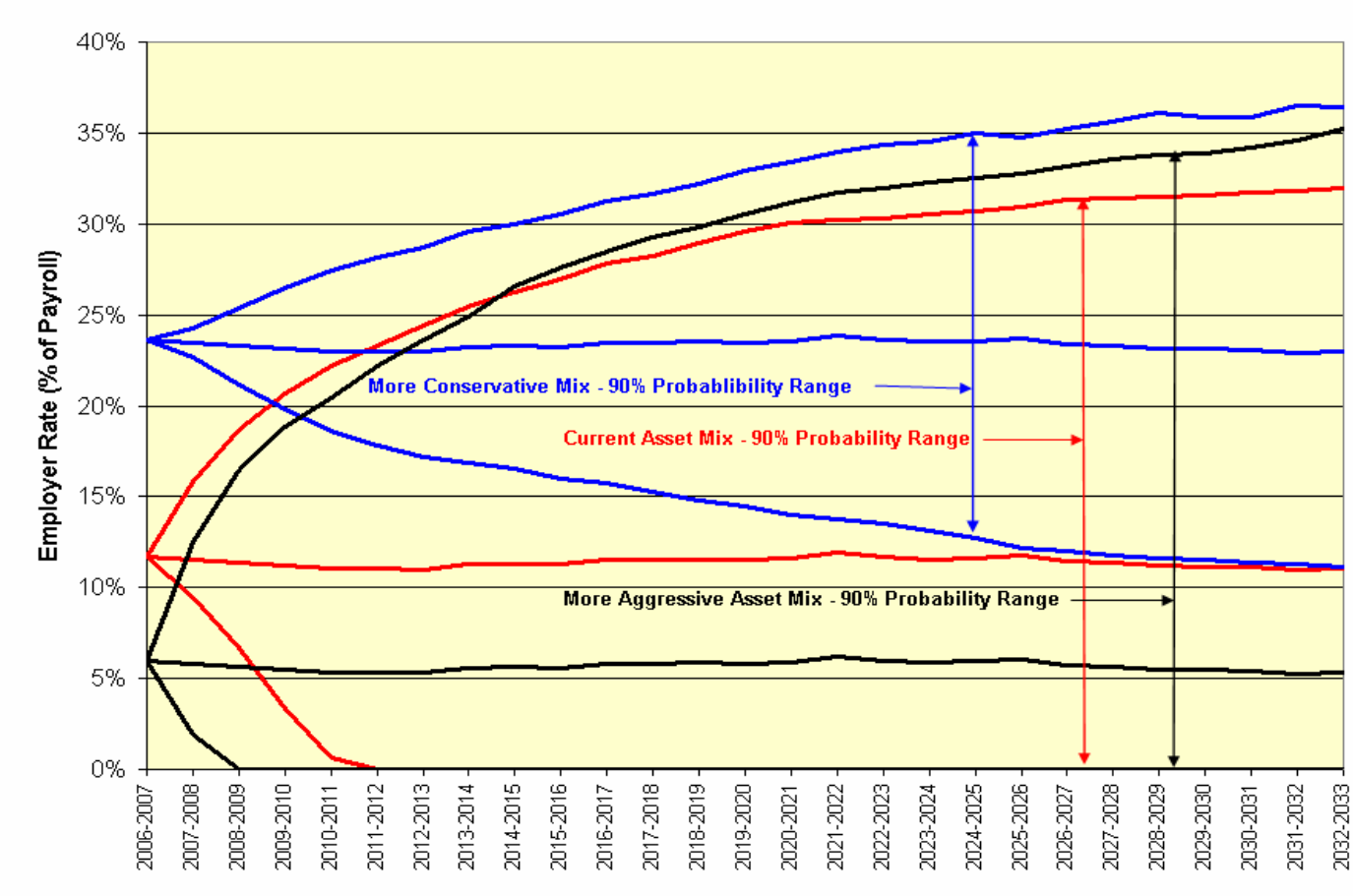
Change Asset Mix

- All plans or through multiple asset pools
- Require different investment return assumptions
- More stable rates but higher on average

Change Asset Mix

- Current asset mix
  - Mean: 7.75%
  - Standard deviation (volatility): 12%
- More conservative asset mix
  - Mean: 6%
  - Standard deviation (volatility): 6%
- More aggressive asset mix
  - Mean: 9%
  - Standard deviation (volatility): 14%

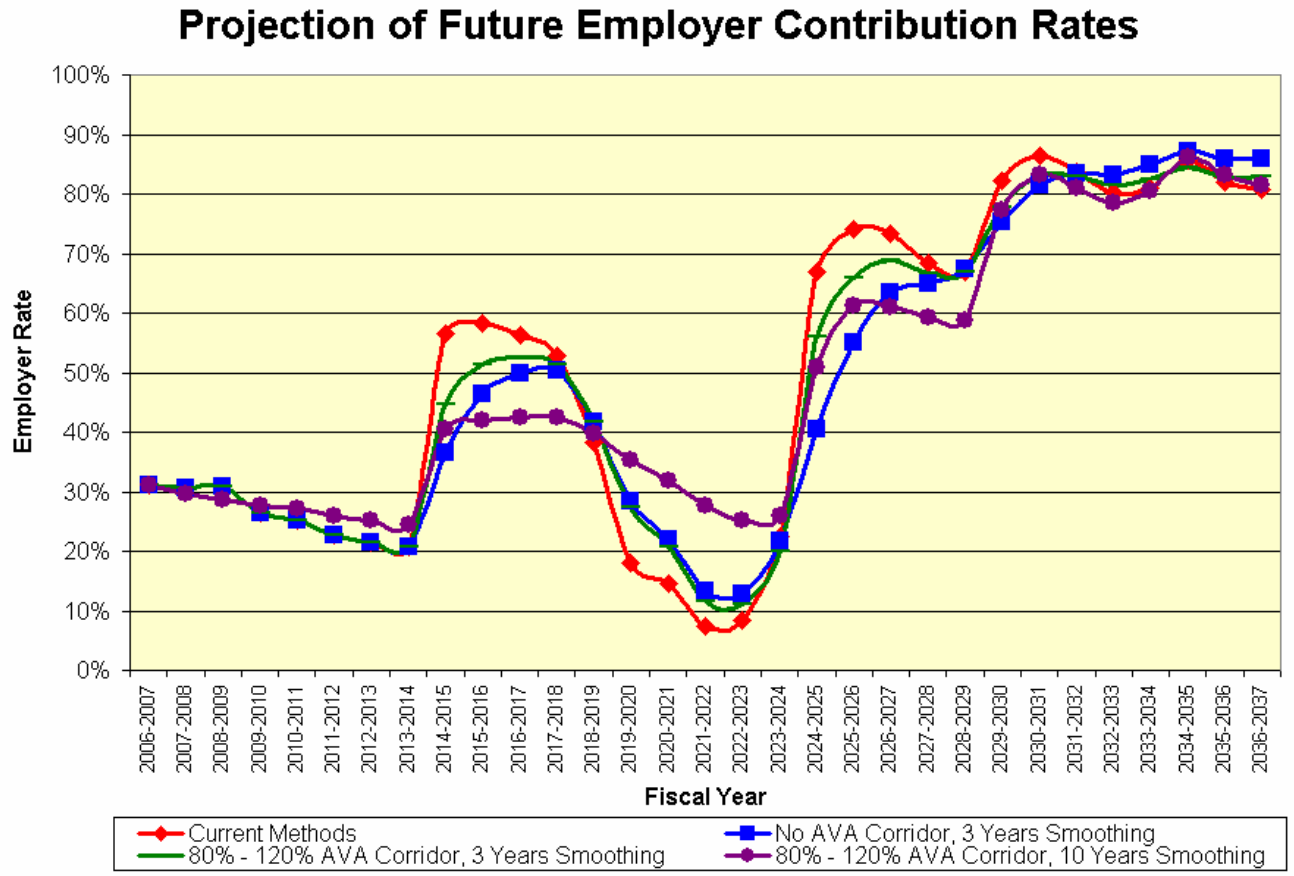
Change Asset Mix



Modify Asset Smoothing

- Options include:
  - Spread gains and losses over 10 years
  - Corridor of 80%-120% of market value
  - Eliminate the Corridor
- Easy to implement right away
- Limited impact

Modify Asset Smoothing



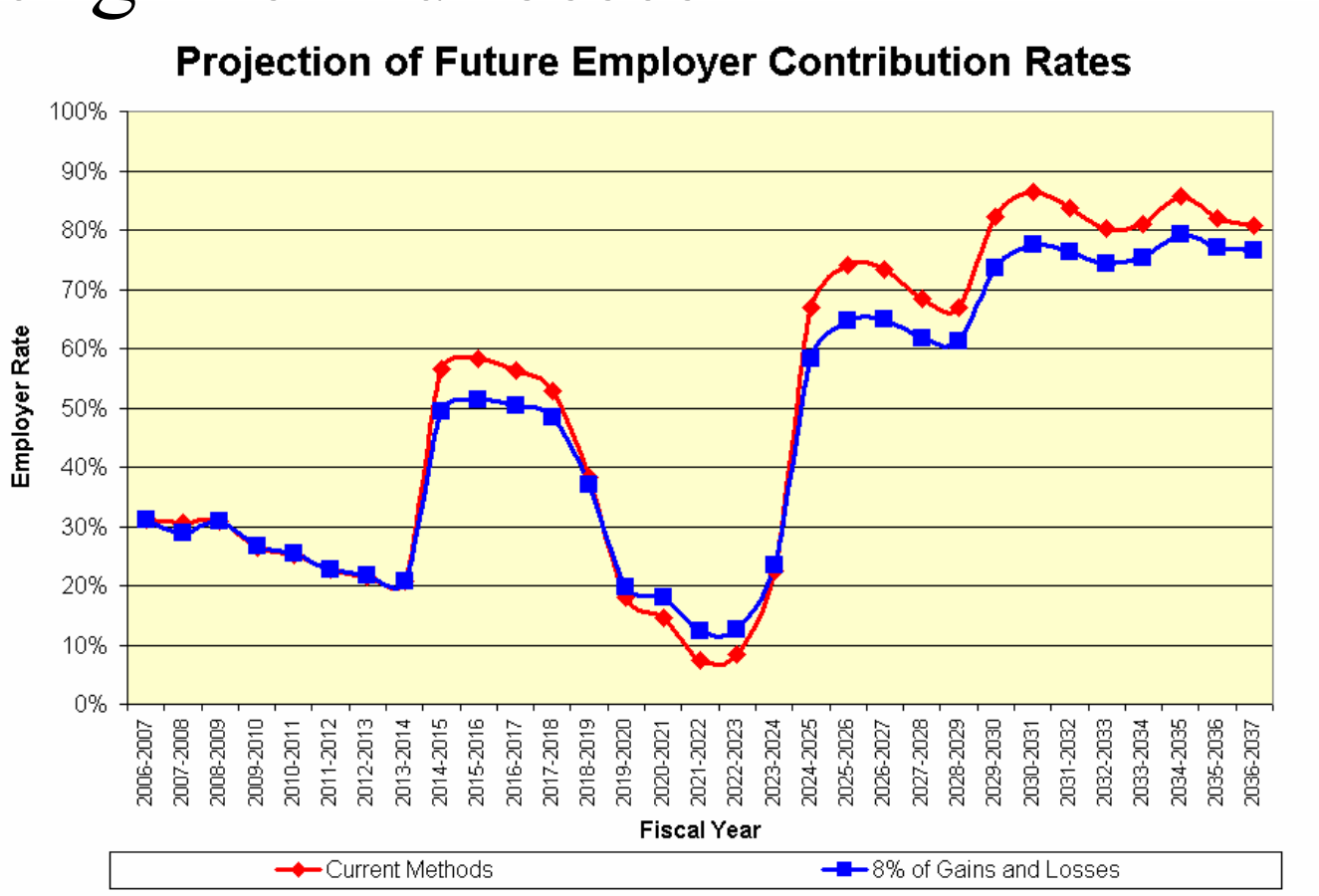
Modify Asset Smoothing

	Average Annual Change in Rate	Probability of Funded Ratio Falling Below 50% Over 50 Years
Current Methods	4.2%	13%
80% - 120% AVA Corridor, 3 Years Smoothing	3.6%	14%
80% - 120% AVA Corridor, 10 Years Smoothing	2.8%	13%
No AVA Corridor, 3 Years Smoothing	3.4%	14%

Modify the amortization of gains and losses

- Current approach
  - 10% of unamortized gains and losses
- Potential new approach
  - 8% of unamortized gains and losses

Modify the amortization of asset gains and losses



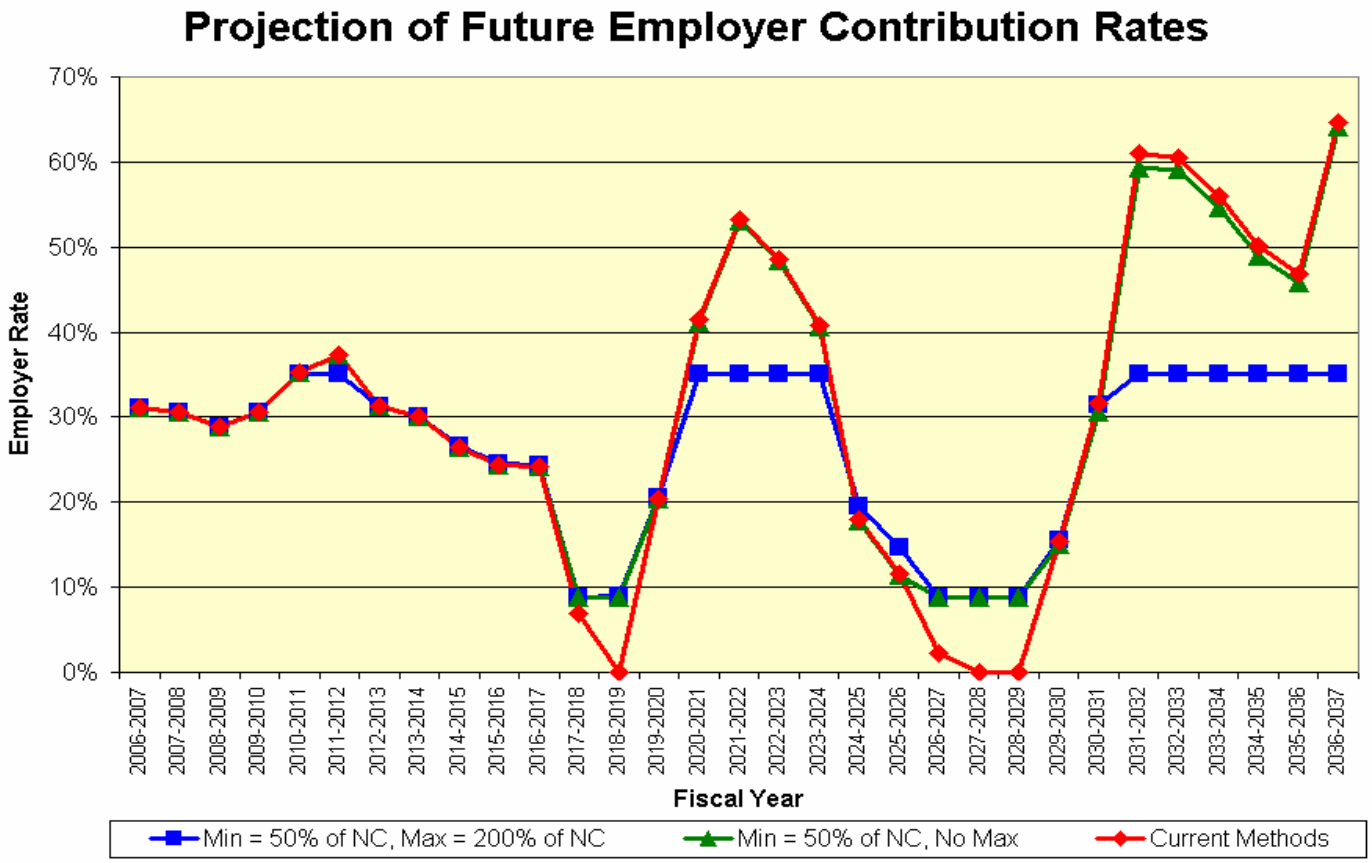
Modify the amortization of asset gains and losses

	Average Annual Change in Rate	Probability of Funded Ratio Falling Below 50% Over 50 Years
Current Methods	4.2%	13%
Gains and Losses Amortized at a Rate of 8%	3.4%	14%

Minimum and/or a Maximum Employer Contribution Rate

- Use traditional methods to develop employer rate but subject the results to some minimum employer rate, e.g. 50% of normal cost, and/or some maximum employer rate, e.g. 200% of normal cost.
- Causes GASB accounting problems
- Might prove more "psychologically" useful than practically useful

Minimum and/or a Maximum Employer Contribution Rate



Minimum and/or a Maximum Employer Contribution Rate

	Average Annual Change in Rate	Probability of Funded Ratio Falling Below 50% Over 50 Years
Current Methods	4.2%	13%
Min = 50% of NC, Max = 200% of NC	0.9%	25%
Min = 50% of NC, No Max	3.7%	12%

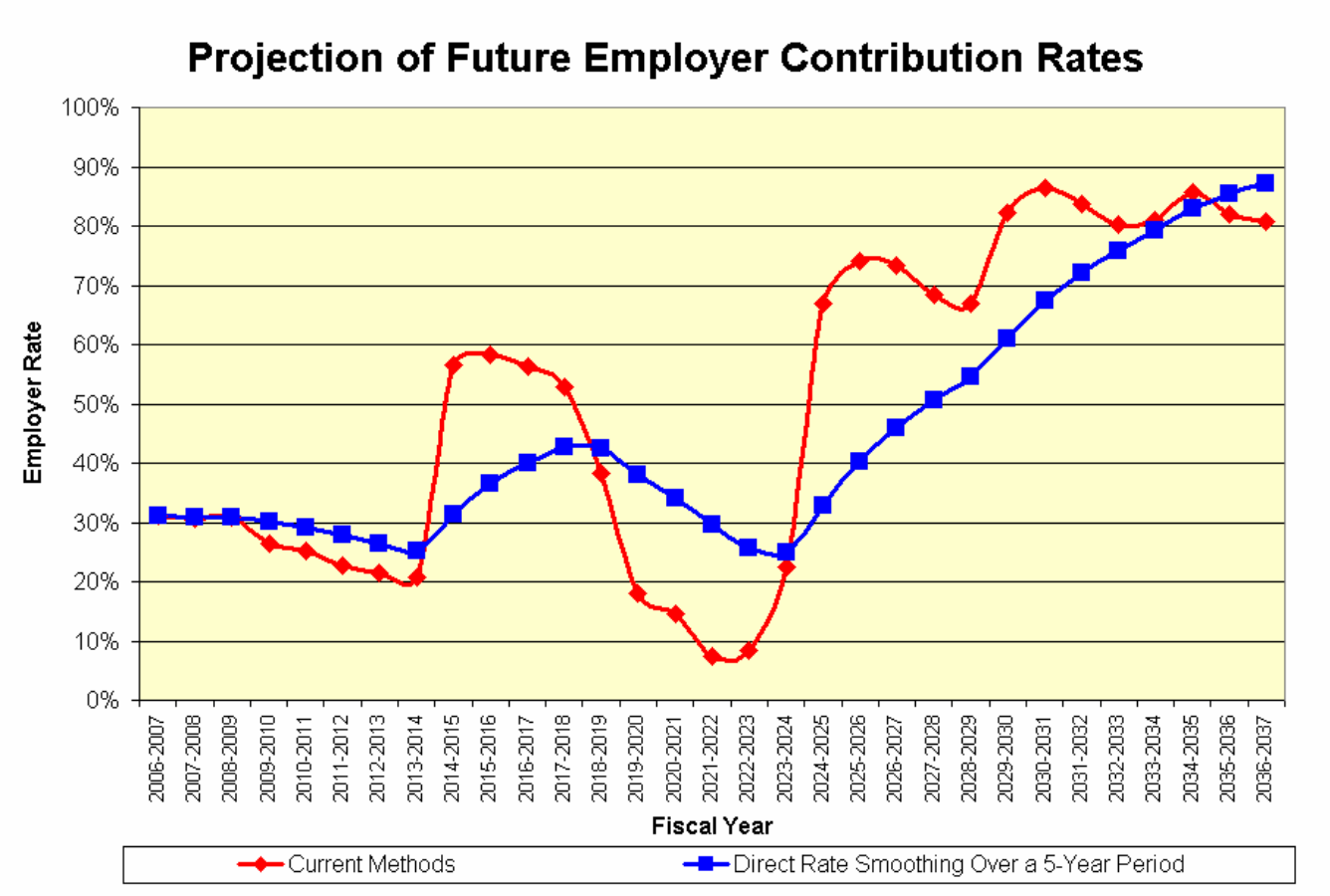
Direct rate smoothing

- Use traditional methods to develop employer rate
- If the change in rate (up or down) was “too” large, would establish a final rate somewhere between the current rate and the new rate.
- Causes GASB accounting problems

Direct rate smoothing

- Example of a 5 Year Direct Smoothing
  - Current rate under traditional method = 10%
  - New rate under traditional method = 20%
  - Increase in rate is 10%
  - Only charge one fifth of the increase i.e. 12%
- Would actually end up at a rate slightly higher (or lower when ramping down) than the traditional new rate because of missed investment opportunities during the “ramping” period.

Direct rate smoothing



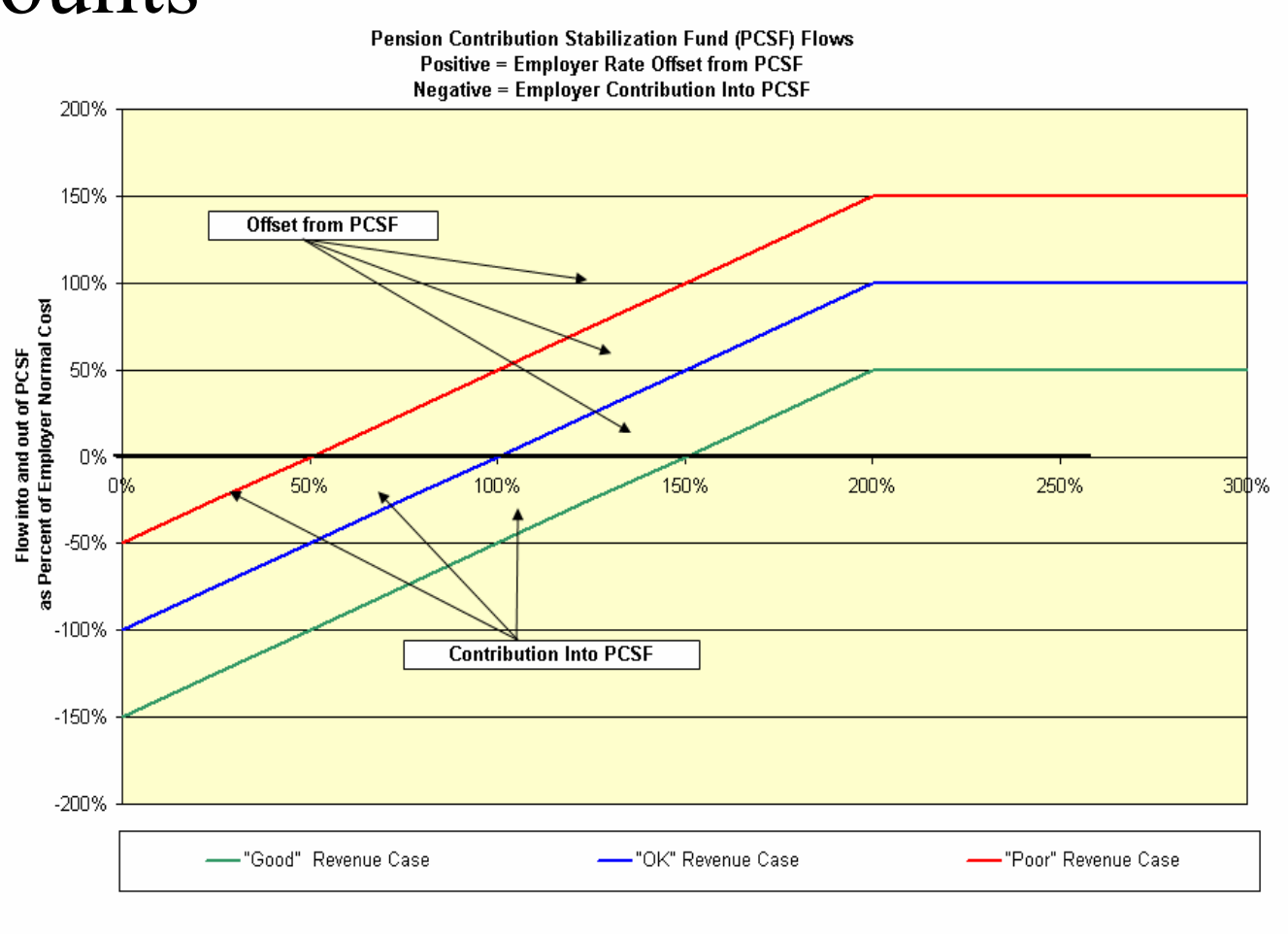
Direct rate smoothing

	Average Annual Change in Rate	Probability of Funded Ratio Falling Below 50% Over 50 Years
Current Methods	4.2%	13%
Direct Rate Smoothing Over a 5-Year Period	2.1%	13%

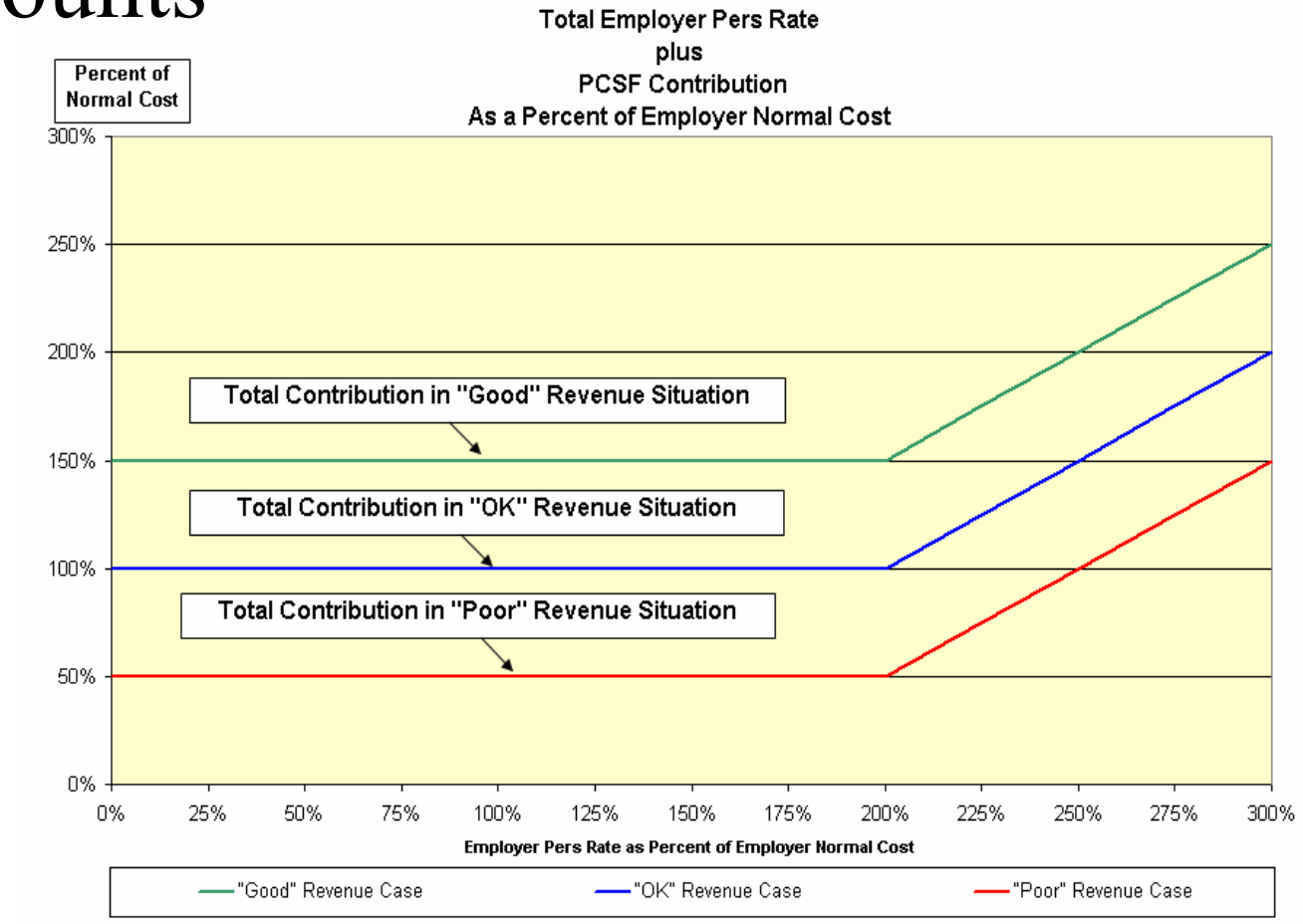
Pension Contribution Stabilization Accounts

- Account which could be used only for rate stabilization purposes.
- In “good” years, a contribution would be made into their stabilization account over and above their required contribution into the PERF.
- In “bad” years, money would flow from the employer’s stabilization account into the PERF as an offset to the otherwise required employer contribution.

Pension Contribution Stabilization Accounts



Pension Contribution Stabilization Accounts



Pension Contribution Stabilization Accounts

- No evidence that this would work
- Issues:
  - How do you define what is a “good” or “bad” year?
  - Will there be enough good years to offset the bad years?