

Asset Smoothing for Public Plans

2009 CCA Annual Meeting

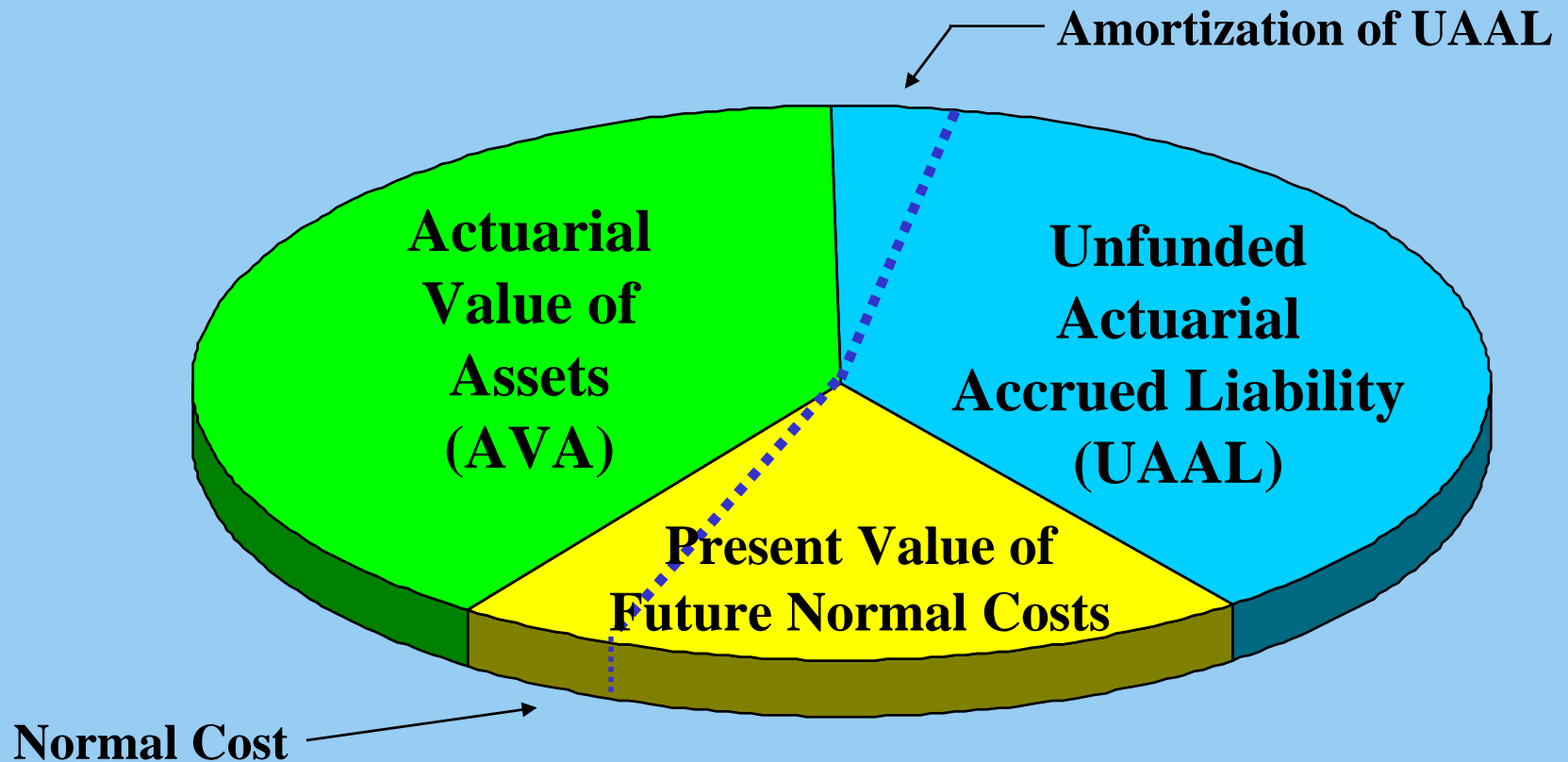
Session 56A

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Current Contribution



Managing Contribution Volatility

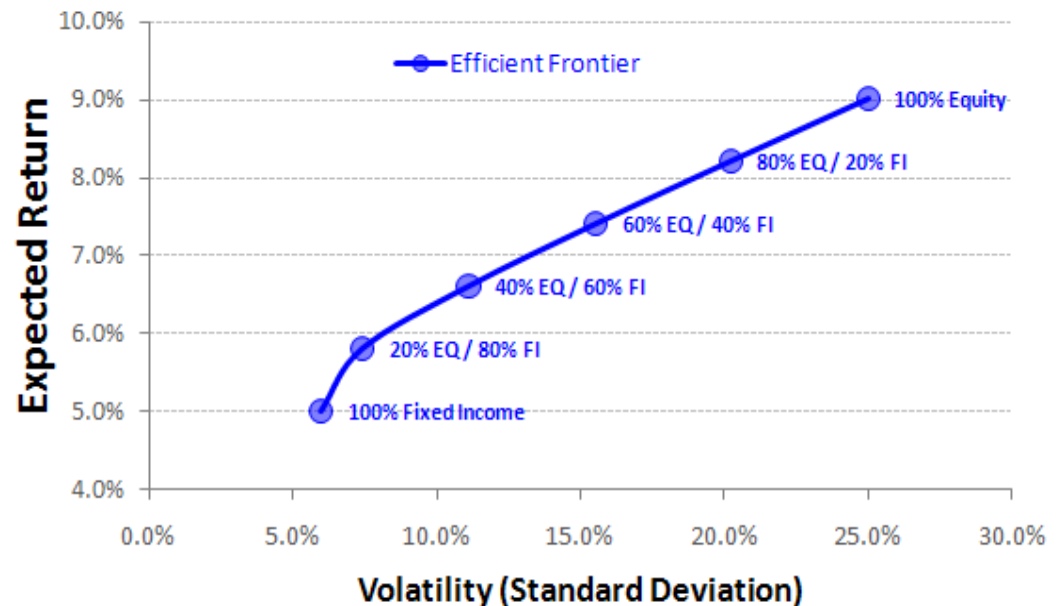
- Asset allocation – volatility at the source
- Asset smoothing
 - Specific to investment return volatility
- UAAL amortization – assets and liabilities
 - More than just asset volatility control
- Direct contribution rate smoothing
 - Contribution collar – limits increases
 - Contribution rate phase-in – delays full impact

Asset Allocation: Risk and Reward

- “Reward” is long term expected return
- “Risk” is volatility of returns, measured by “standard deviation” (s.d.)
 - For “normal” distribution of returns:
 - 2/3 of returns will be within one standard deviation
 - 95% will be within two standard deviations
- More conservative asset allocation lowers volatility but at cost of lower expected return

Risk / Reward Tradeoff for Various “Efficient Portfolios”

	Equity	Fixed Income		
Mean	9.00%	5.00%		
Stdev	25.00%	6.00%		
Correl		0.15		
Portfolio	Equity	Fixed Income	ArithMean	Standard Deviation
1	0%	100%	5.0%	6.0%
2	20%	80%	5.8%	7.4%
3	40%	60%	6.6%	11.1%
4	60%	40%	7.4%	15.5%
5	80%	20%	8.2%	20.2%
6	100%	0%	9.0%	25.0%

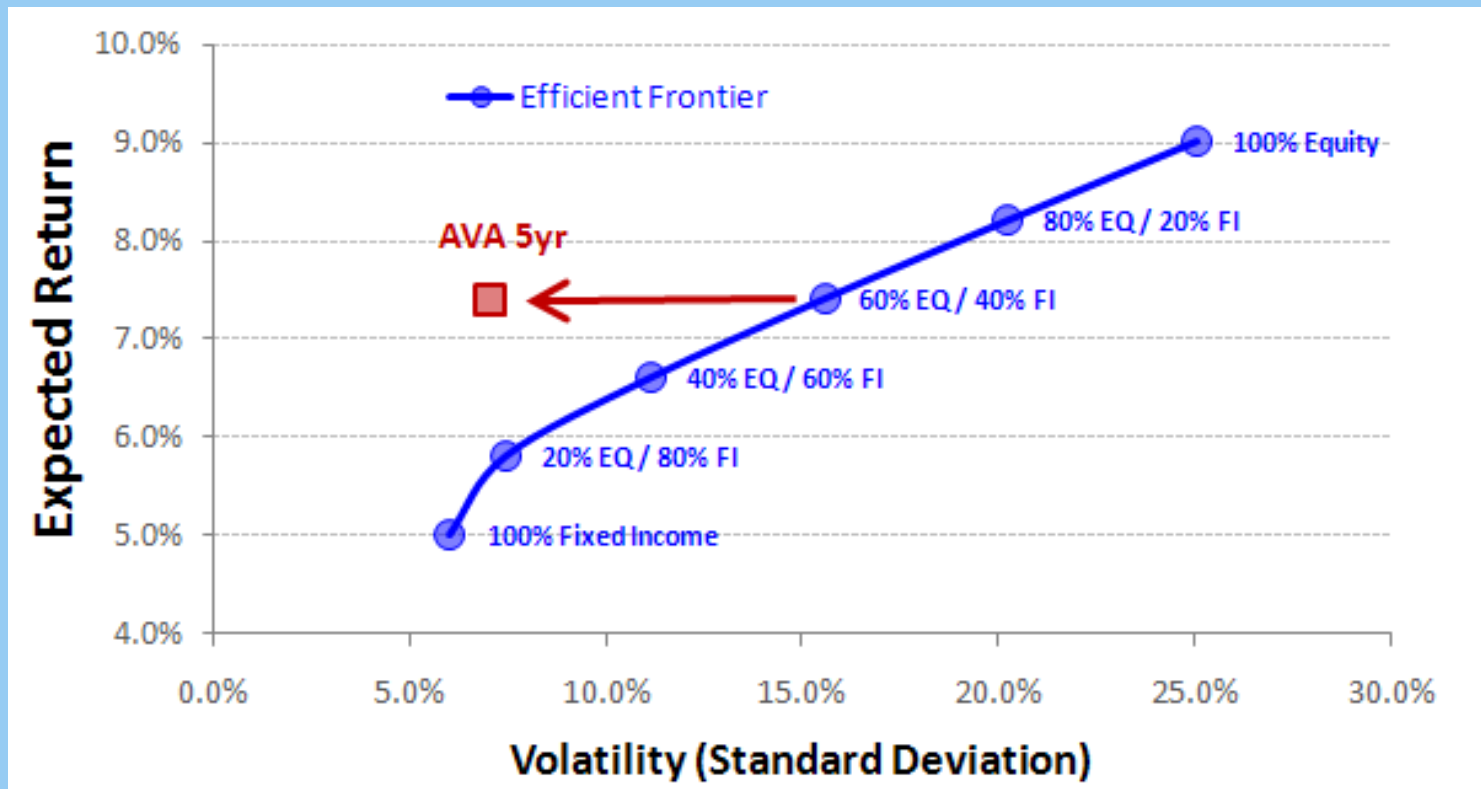


- For these market assumptions (NOT used for “System”): Typical 60% Equity / 40% Fixed Income portfolio has an expected return of 7.4% with 15.5% annual volatility

Actuarial Value of Assets

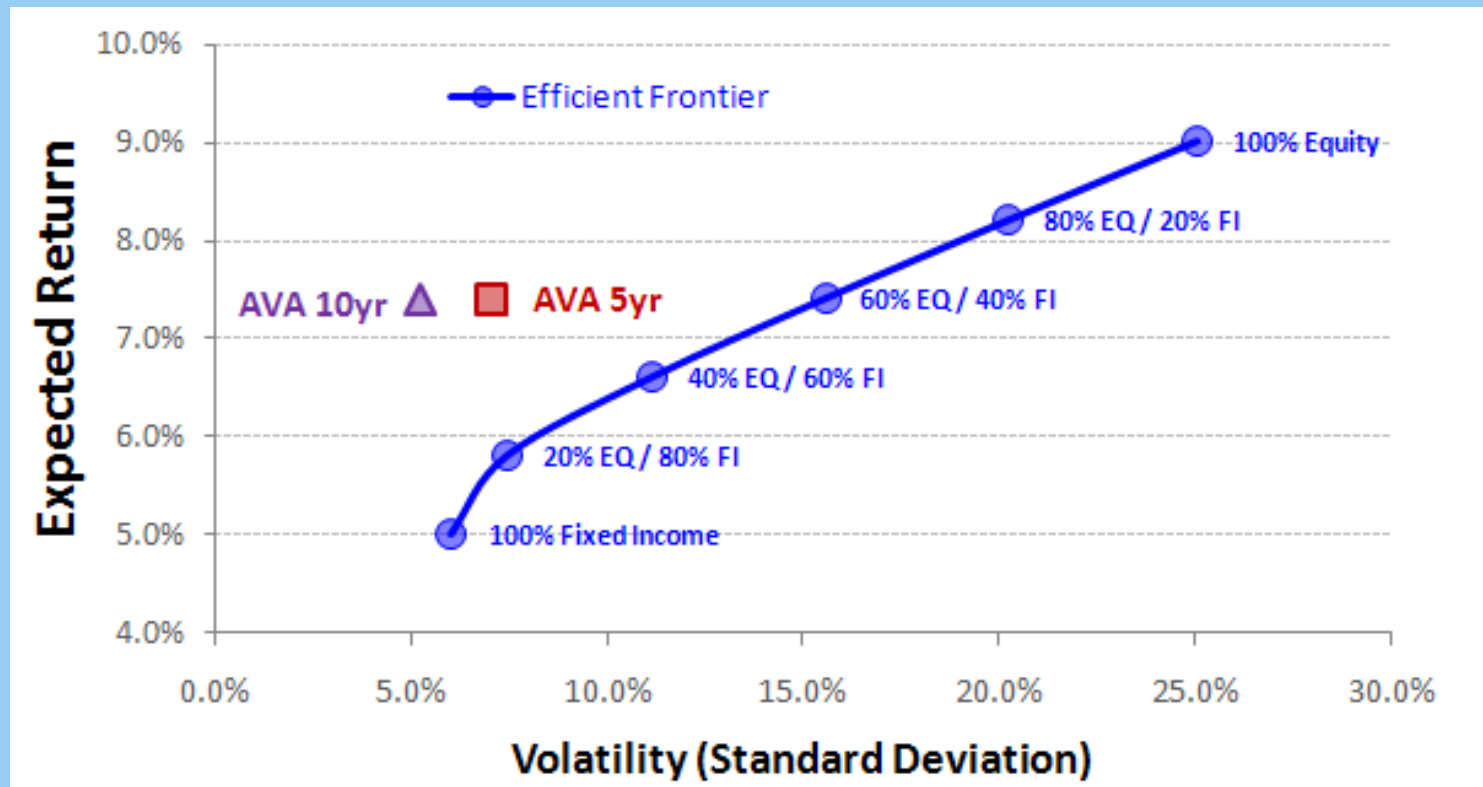
- Discussion uses common family of Actuarial Value of Assets (AVA) methods
 - Each year, take the difference between:
 - Actual return on Market Value of Assets (MVA)
 - Assumed return on MVA (here set at 8.00%)
 - Difference is spread over (typically) five years
- Intent is to reduce volatility without reducing long term expected return

Actuarial Value of Assets: 5 yr. Smoothing



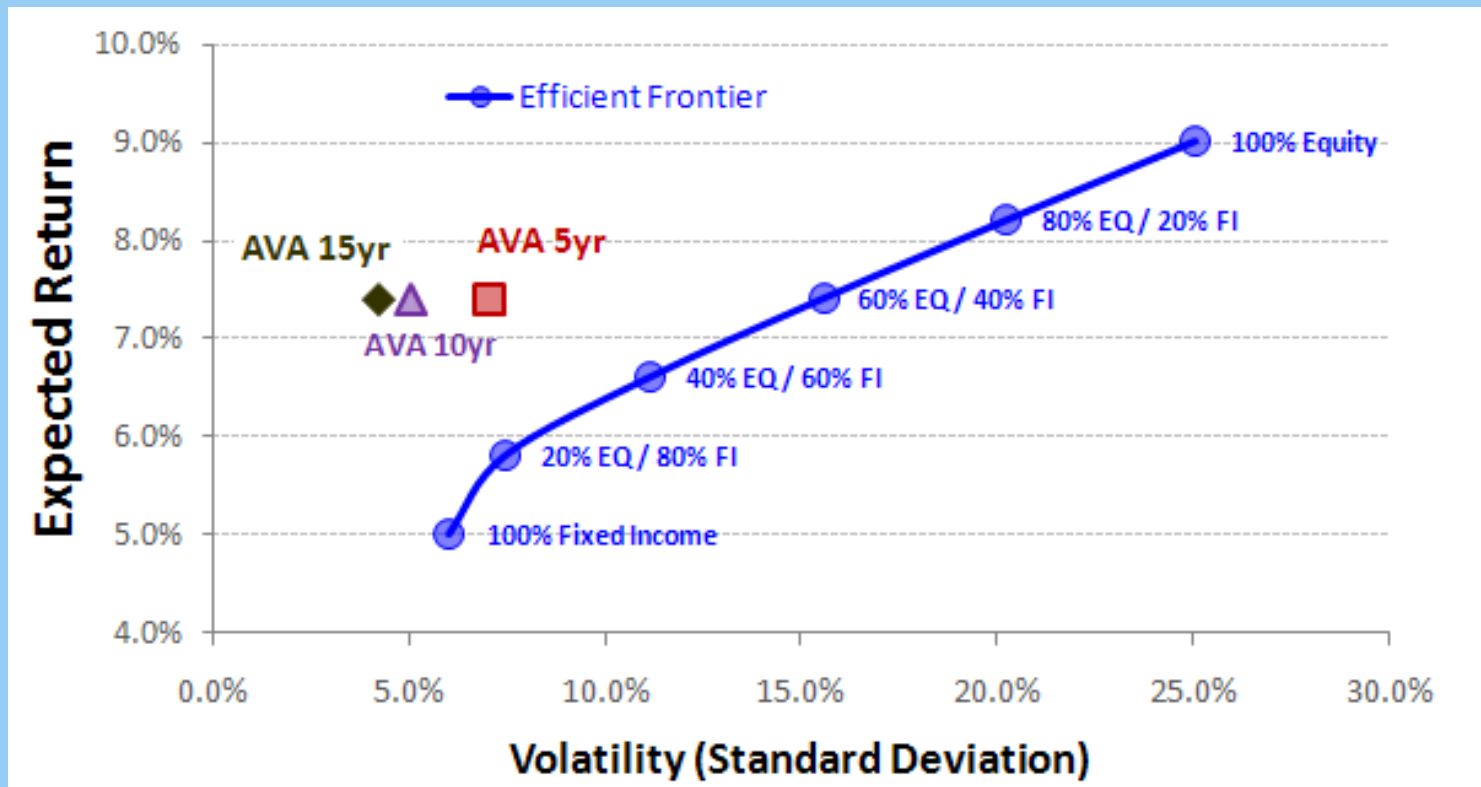
- The 60/40 allocation with a 5yr AVA has about the same volatility as a 20% Equity portfolio

Actuarial Value of Assets: 10 yr. Smoothing



- The 60/40 allocation with a 10yr AVA has less volatility than a 100% Fixed Income portfolio

Actuarial Value of Assets: 15 yr. Smoothing



- The 60/40 allocation with a 15 yr AVA has only marginally lower volatility than 10 yr AVA

Effect on Investment Earnings Assumption

- Earnings assumption depends on:
 - Inflation and expense assumptions
 - Expected real returns by asset class
 - Asset allocation
- **Policy pitfalls:**
 - Setting allocation to “chase” assumed return
 - Using smoothing to justify more asset volatility

Managing future asset volatility

- Possible reasons for longer smoothing period
 - Longer business/economic cycles
 - Greater actual market volatility (assets)
 - Greater sensitivity to contribution rate volatility
 - Greater asset volatility relative to payroll
 - Higher funded percentages
 - More mature plan
 - Larger benefit levels
- Not much theory on selecting MVA corridor

Managing past volatility (market downturn)

- Asset smoothing manages transition from lower to higher cost level
- Two policy components, two time frames
 - Asset smoothing period – determines how long to reach higher level
 - MVA corridor – determines how costs go from lower to higher level
 - Straight line or sharp, immediate increase
- See contribution rate graphs for cost patterns

“System” Actuarial Value of Assets

6/30/2007 Valuation (\$000s, Combined)

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-07	\$1,054,377	80%	\$843,502
Jun-06	\$366,479	60%	\$219,887
Jun-05	\$132,848	40%	\$53,139
Jun-04	\$710,821	20%	<u>\$142,164</u>
Net total GAINS not yet recognized			\$1,258,692
Market Value of Assets (MVA)			\$11,071,619
MINUS GAINS not yet recognized			<u>(\$1,258,692)</u>
Actuarial Value of Assets (AVA)			\$9,812,927
AVA/MVA Ratio			88.6%

System Actuarial Value of Assets

6/30/2008 Valuation (\$000s, Combined)

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-08	(\$1,549,293)	80%	(\$1,239,435)
Jun-07	\$1,054,377	60%	\$632,626
Jun-06	\$366,479	40%	\$146,592
Jun-05	\$132,848	20%	<u>\$26,570</u>
Net total LOSSES not yet recognized			(\$433,647)
Market Value of Assets (MVA)			\$10,372,194
PLUS LOSSES not yet recognized			<u>\$433,647</u>
Actuarial Value of Assets (AVA)			\$10,805,841
AVA/MVA Ratio			104.2%

System Actuarial Value of Assets

6/30/2009 Valuation (\$000s, Combined) - ESTIMATED*

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-09	(\$3,998,794)	80%	(\$3,199,035)
Jun-08	(\$1,549,293)	60%	(\$929,576)
Jun-07	\$1,054,377	40%	\$421,751
Jun-06	\$366,479	20%	<u>\$73,296</u>
Net total LOSSES not yet recognized			(\$3,633,564)
Market Value of Assets (MVA)			\$7,151,115
PLUS LOSSES not yet recognized			<u>\$3,633,564</u>
Actuarial Value of Assets (AVA) before corridor			\$10,784,679
Actuarial Value of Assets AFTER corridor			\$8,581,338
AVA/MVA Ratio (before corridor)			150.8%

* 2008/2009 estimated Market Value return = -30%

System Actuarial Value of Assets

6/30/2009 Valuation (\$000s, Combined) - REVISED*

Year-end	Return above (below) assumed	Percent not yet recognized	Amount not yet recognized
Jun-09	(\$2,904,387)	80%	(\$2,323,510)
Jun-08	(\$1,549,293)	60%	(\$929,576)
Jun-07	\$1,054,377	40%	\$421,751
Jun-06	\$366,479	20%	<u>\$73,296</u>
Net total LOSSES not yet recognized			(\$2,758,039)
Market Value of Assets (MVA)			\$8,245,522
PLUS LOSSES not yet recognized			<u>\$2,758,039</u>
Actuarial Value of Assets (AVA) before corridor			\$11,003,561
Actuarial Value of Assets AFTER corridor			\$9,894,626
AVA/MVA Ratio (before corridor)			133.4%

* 2008/2009 estimated Market Value return = -20%

Asset Smoothing and “MVA Corridor”

- Many plans (incl. System) limit how far the AVA can get from the MVA by limiting the AVA ratio
- System’s 20% “MVA corridor” means the AVA must be between 120% and 80% of MVA
 - Maximum deferred gain or loss is 20% of MVA
 - Hitting the corridor effectively stops smoothing
- MVA corridor will have major impact starting in 2009
 - For System, 6/30/2009 AVA is 151% or 133% of MVA
 - Immediate cost increase w/ MVA corridor: 12.2% or 6.8%
 - Immediate cost increase w/o MVA corridor: 3.1% or 2.2%

Actuarial Standards of Practice #44

- ASOP 44 focuses on two key features
 - How close does AVA stay to MVA
 - Ratio of AVA to MVA (“AVA Ratio”)
 - How long before AVA returns to MVA
 - Smoothing period
- ASOP 44 also provides some structure
 - If “likely” to be “reasonable”, both are required
 - If “sufficiently close” or “sufficiently short” then only one or the other is required

“Likely” to be in a “reasonable range”

Smooth Asset Value / Market Value Ratios (in 20th forecast year*)						Smooth Asset Value / Market Value Ratios (in 20th forecast year*)					
Range	Years of Asset Smoothing					Likelihood	Years of Asset Smoothing				
	3	5	7	10	15		3	5	7	10	15
90%-110%	72%	52%	43%	36%	29%	98%	77-123%	63-137%	51-149%	36-164%	17-183%
80%-120%	96%	85%	75%	65%	55%	95%	81-119%	71-129%	63-137%	53-147%	41-159%
70%-130%	99.5%	96%	91%	83%	75%	90%	85-115%	77-123%	71-129%	64-136%	55-145%
60%-140%	99.9%	99%	96%	93%	87%	80%	88-112%	82-118%	77-123%	72-128%	66-134%
50%-150%	100.0%	100%	98%	96%	92%	70%	90-110%	85-115%	82-118%	78-122%	73-127%
						60%	92-108%	88-112%	85-115%	82-118%	78-122%
						50%	94-106%	90-110%	88-112%	85-115%	82-118%

Likelihood that outcomes are within the range.

10,000 Monte Carlo Simulations

Range which matches the likelihood.



MVA Corridor with 5-year Smoothing

- Under ASOP 44, 5 years is “sufficiently short”
 - Widespread use, industry opinions
 - Assumes employer ability to pay
- Other reasons to retain narrow MVA corridor
 - Accelerates contribution increases
 - Market timing – more contributions in down market
 - Cash flow – avoid selling assets to pay benefits
 - Solvency – if contributions ever stop, increased plan assets could secure more benefits (extreme case)

MVA Corridor with 5-year Smoothing

- Under ASOP 44, 5 years is “sufficiently short”
- If intent is a more gradual contribution transition, recommend widening MVA corridor
 - Considerations beyond just ASOP compliance
 - Maintains policy of some control on AVA vs MVA
 - Important if also considering longer smoothing
 - Use 5-year smoothing AVA ratio as a guide
 - For System, consider 130% or 140% (but was 150!)
 - Fully aware of current and future implications

Longer Smoothing and MVA Corridor

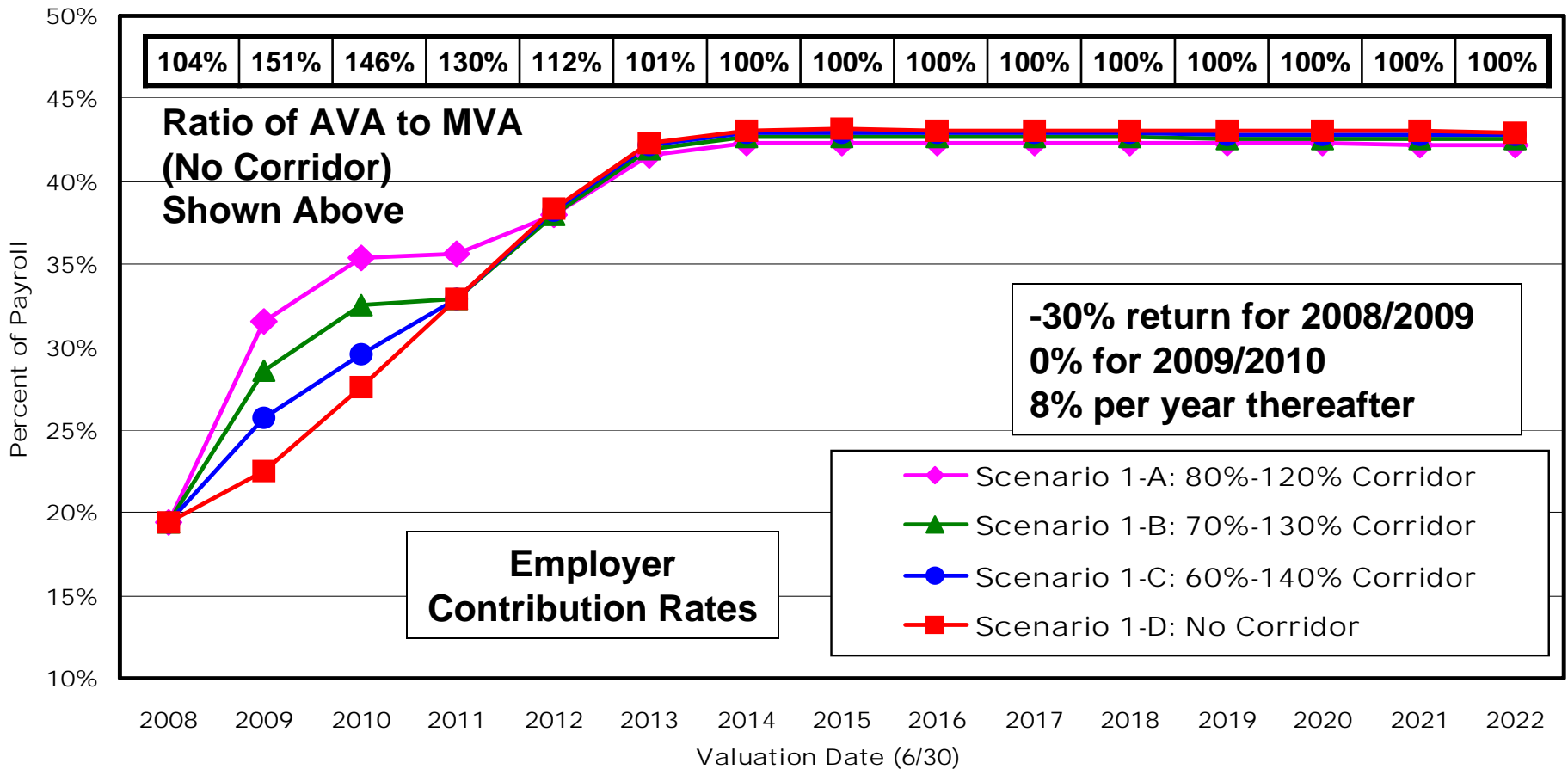
- Longer smoothing means larger AVA ratios
- Longer period increases need for MVA corridor
 - Not so clearly defined as for 5-year smoothing
 - Consider 5-year smoothing AVA ratio as a guide
 - For System this is now 133%
 - For much longer periods (10 - 15 years) eventually reduce to 120%-130%
 - “Funnel corridor” returns to narrower corridor after absorbing extraordinary market downturn

Asset Smoothing and UAAL amortization

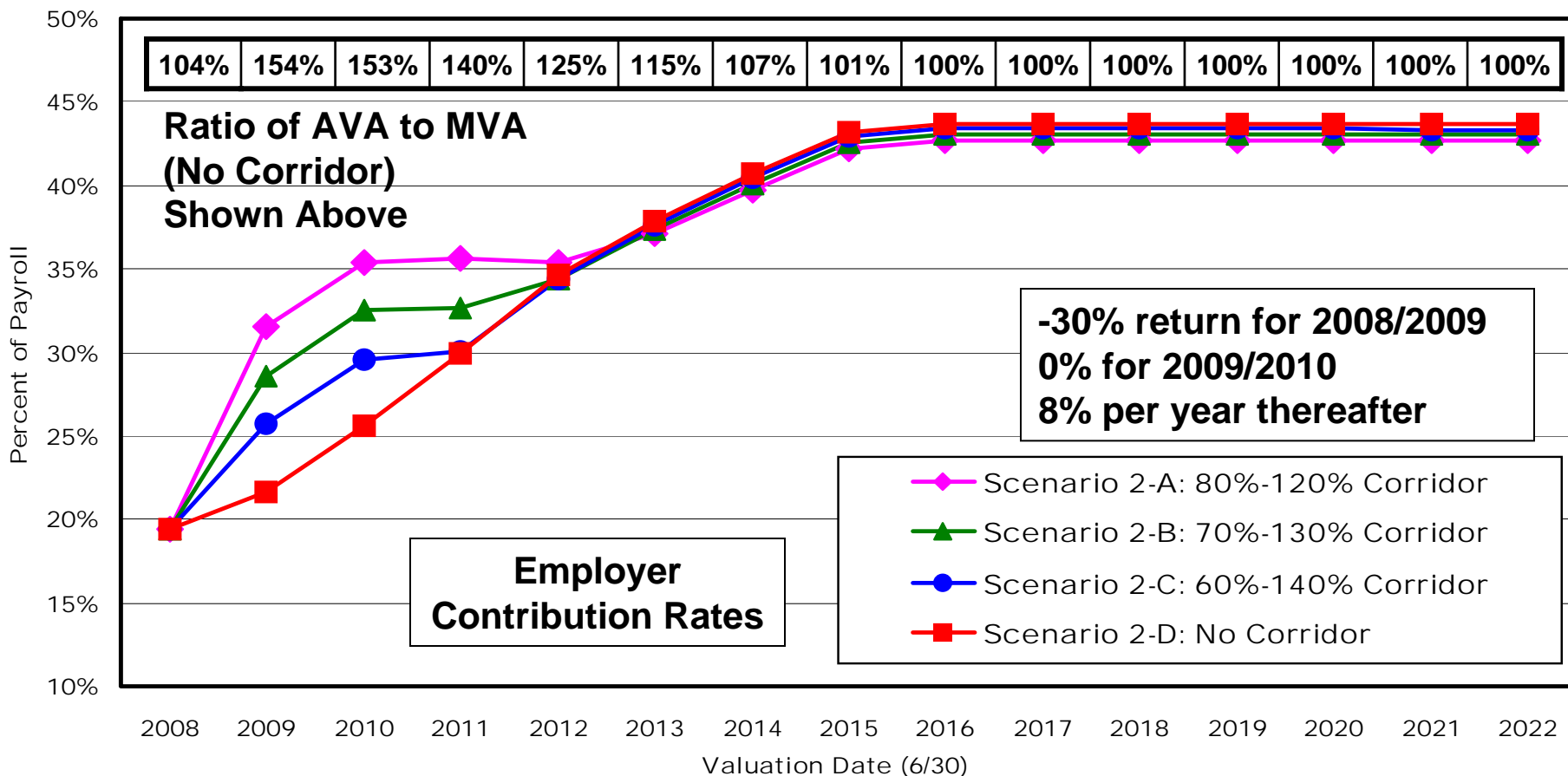
- Three policy components, three segments of future costs (after market downturn)
 - Asset smoothing corridor – immediate rate impact
 - Asset smoothing period – determines slope and period to reach new contribution “plateau”
 - UAAL amortization period – determines height and length of new contribution plateau
- UAAL policy is a separate but related issue
 - Impact is mainly at end of smoothing period

**Asset Smoothing Projections
with negative 30% return for
2008/2009,
0% for 2009/2010**

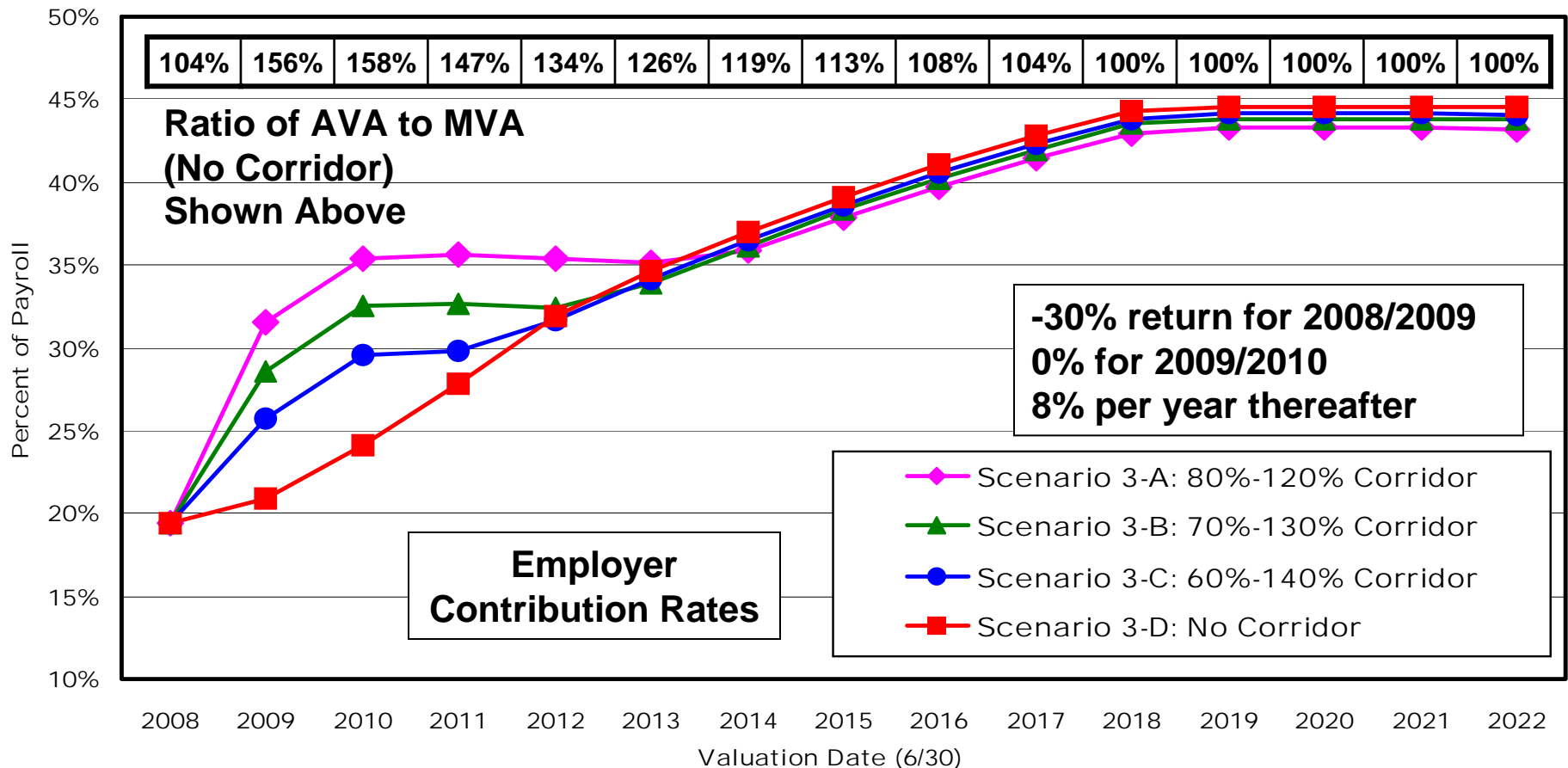
5 Year Smoothing Period – Various Corridors



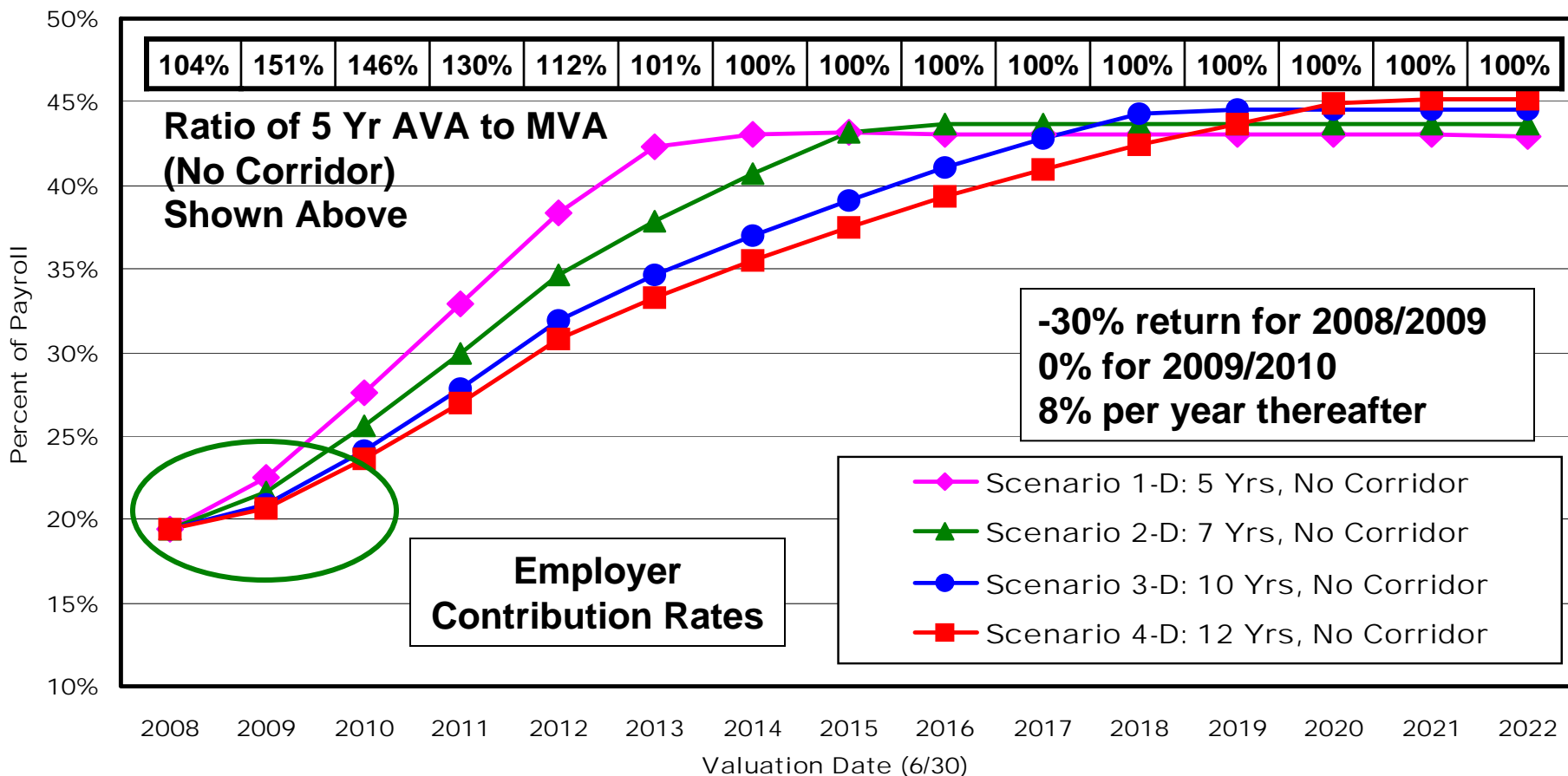
7 Year Smoothing Period - Various Corridors



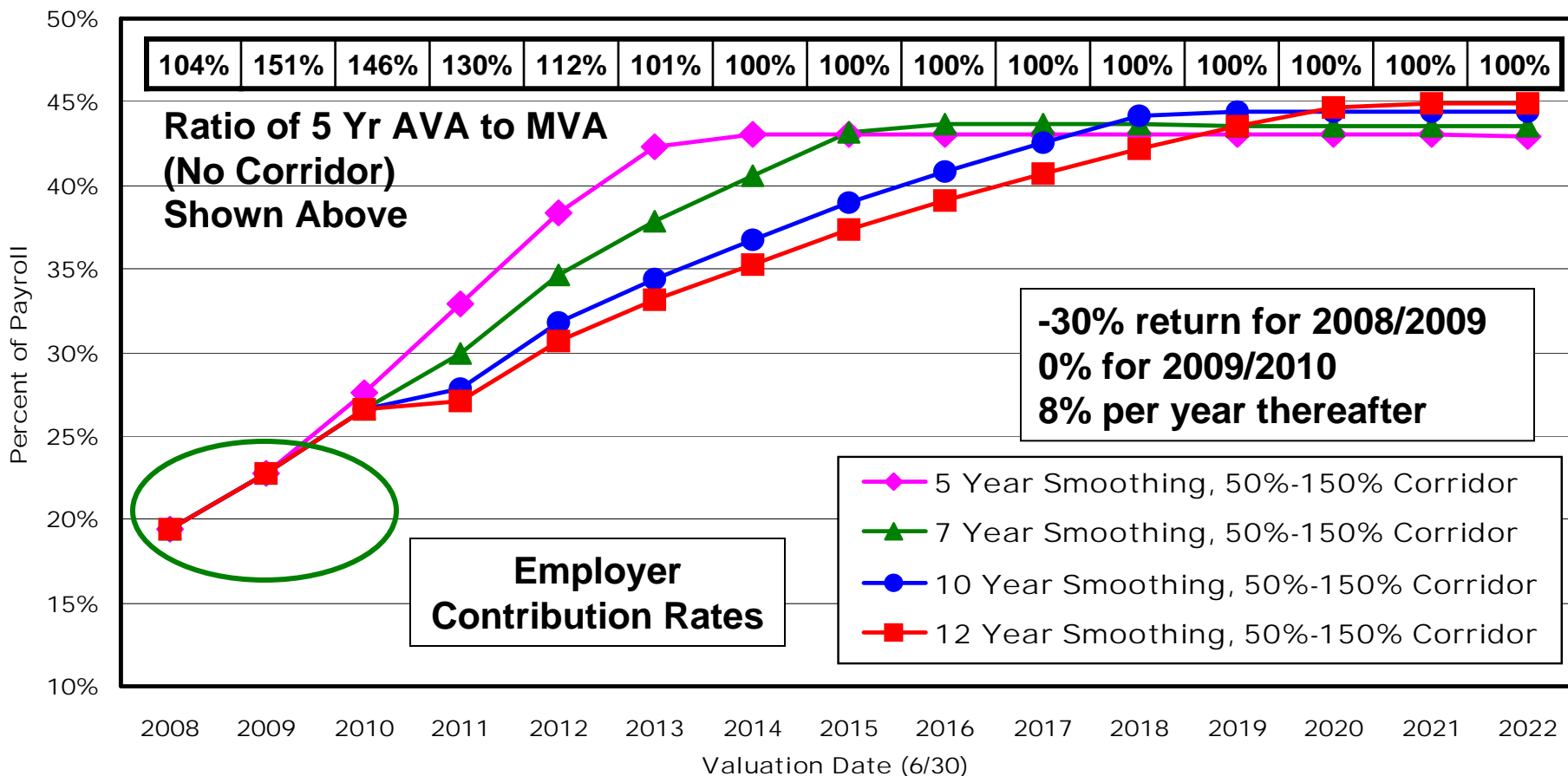
10 Year Smoothing Period - Various Corridors



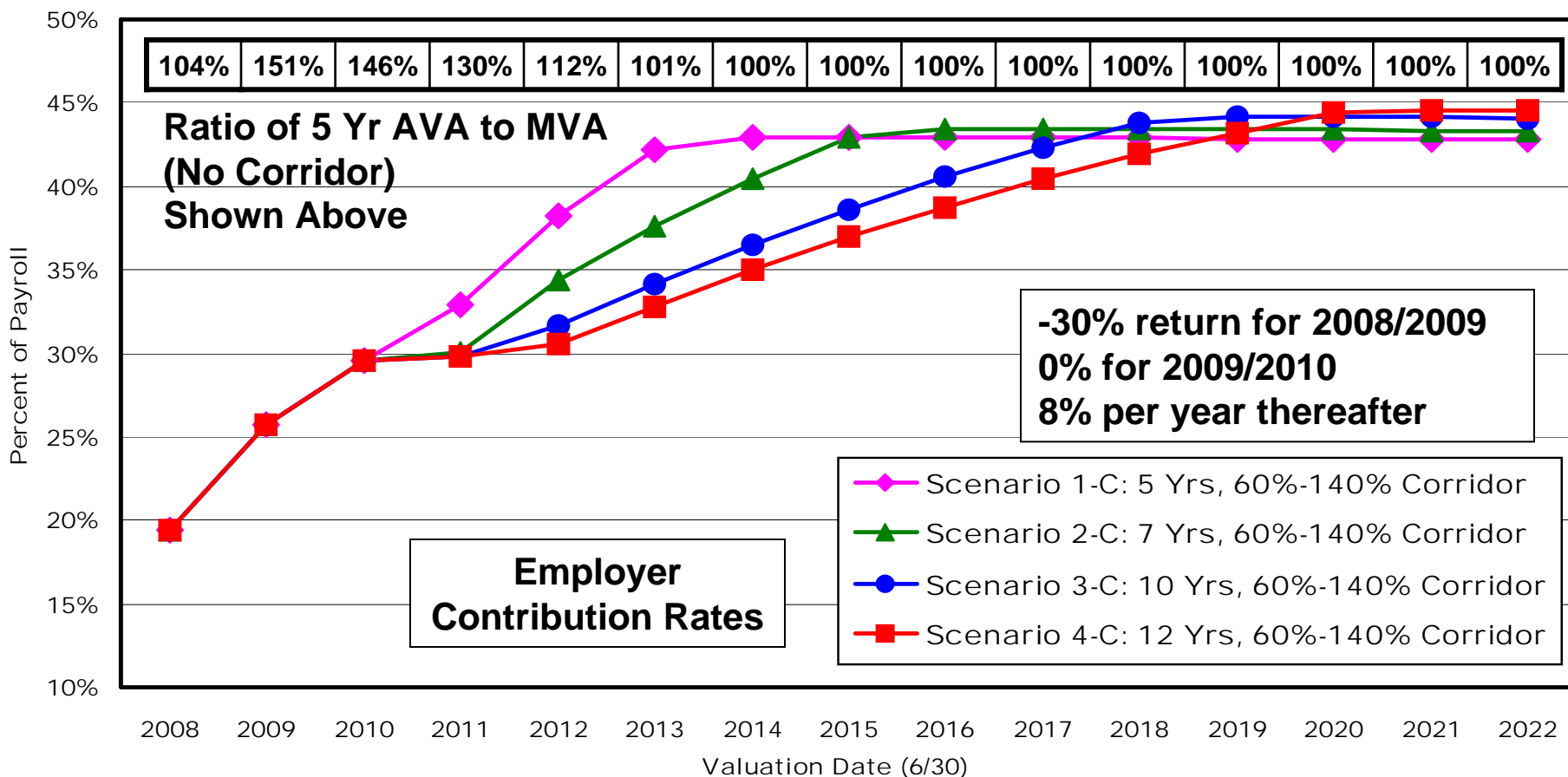
Various Smoothing Periods – No Corridor



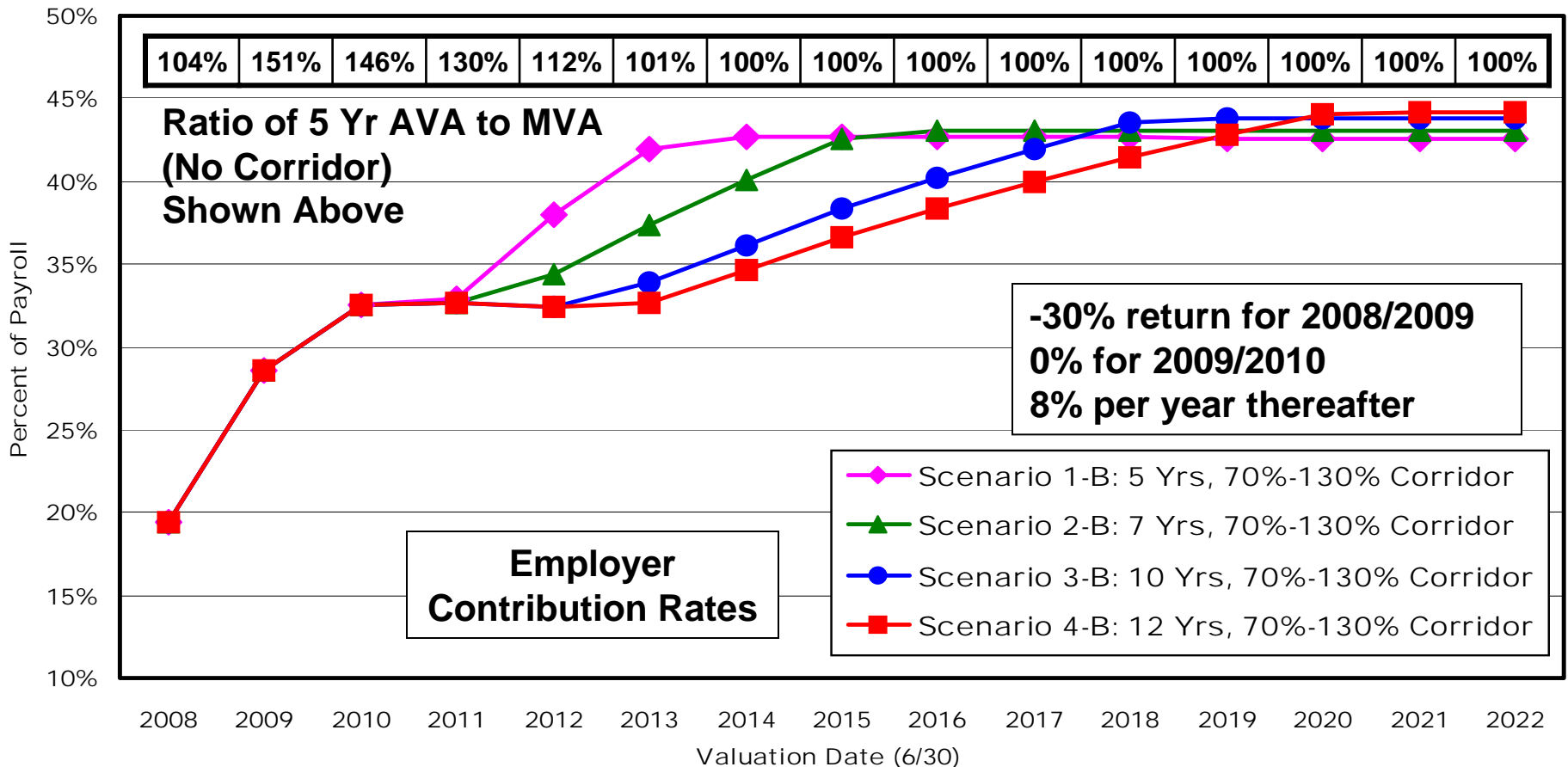
Various Smoothing Periods – 150% Corridor



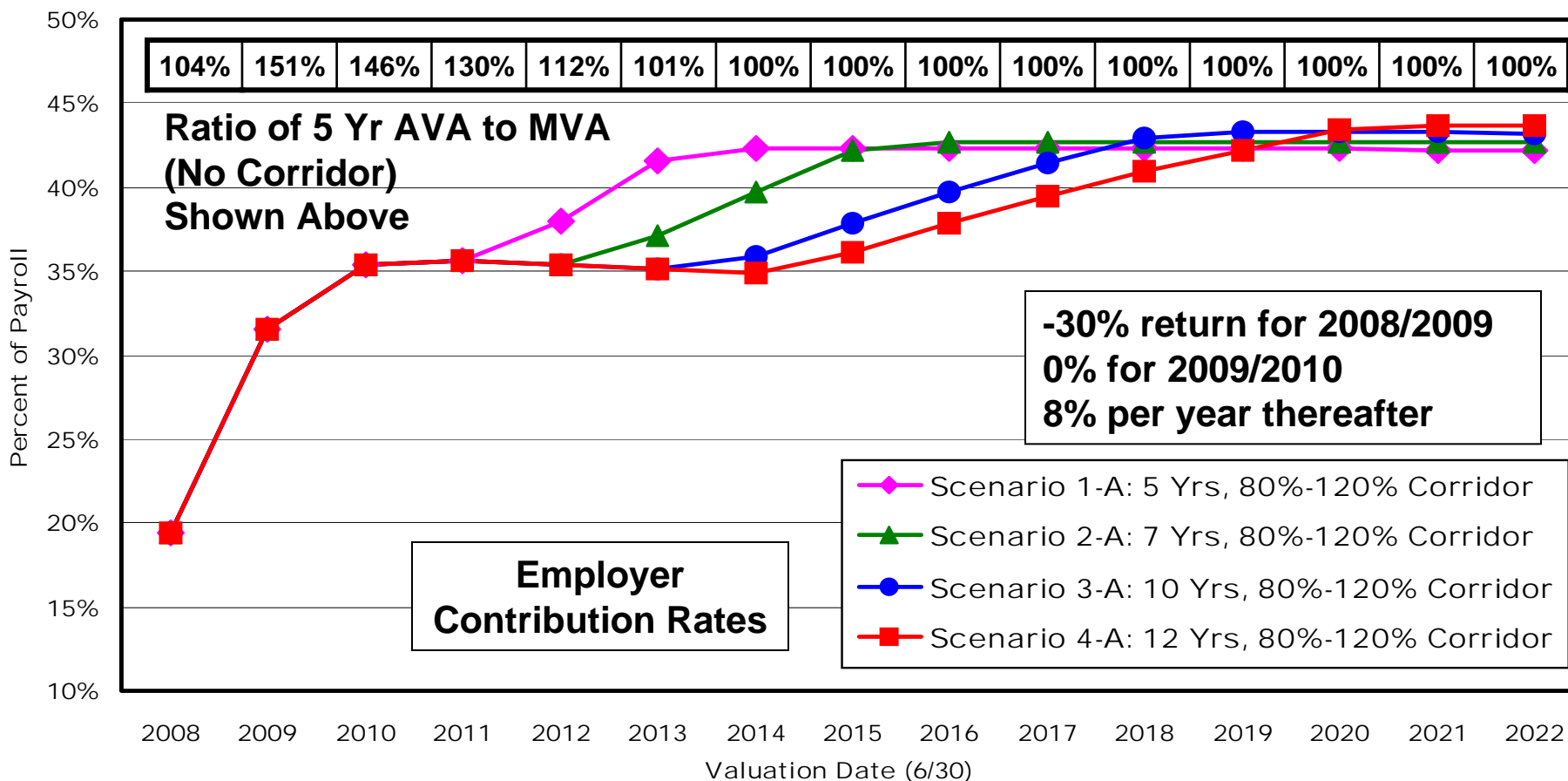
Various Smoothing Periods – 140% Corridor



Various Smoothing Periods – 130% Corridor



Various Smoothing Periods – 120% Corridor





QUESTIONS