Amortization Policy Discussion

Finance & Administration Committee
September 19, 2017

CalPERS | Actuarial Office

Agenda

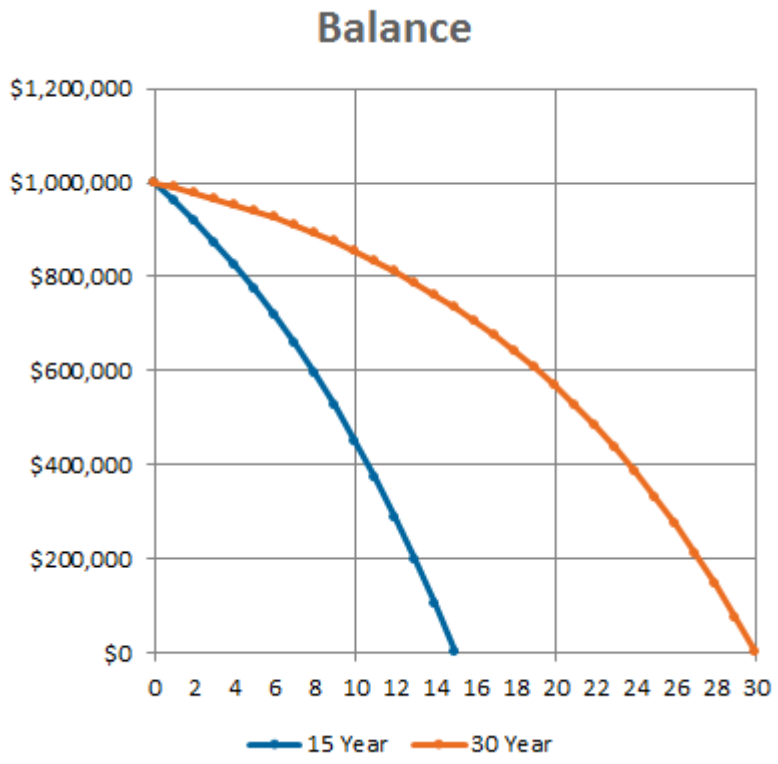
- Background
- Amortization Drivers
  - Payment Escalation Rate
  - Amortization Period
  - Direct Rate Smoothing (Ramps)
- Current Policy
- Why Consider Changes?
- Next Steps

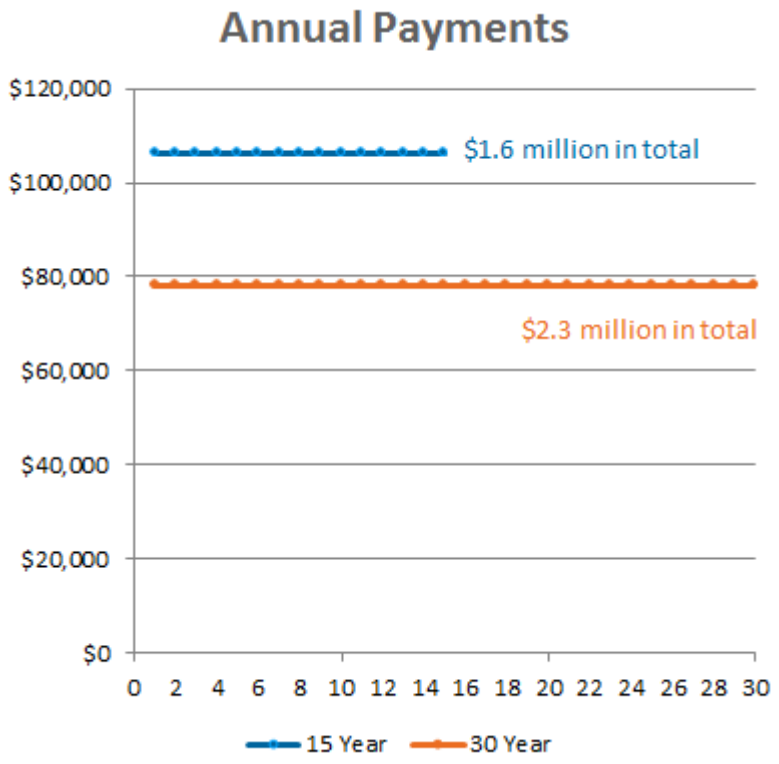
Background

What is Amortization?

- Pay down of debt in a systematic way over a scheduled period of years
- Example: Mortgage
  - Period (15 year, 30 year)
  - Interest Rate (fixed, variable)
  - Level payments

Amortization Example - $1,000,000 Mortgage Interest Rate: 7%





Why does a Retirement System need an Amortization Policy?

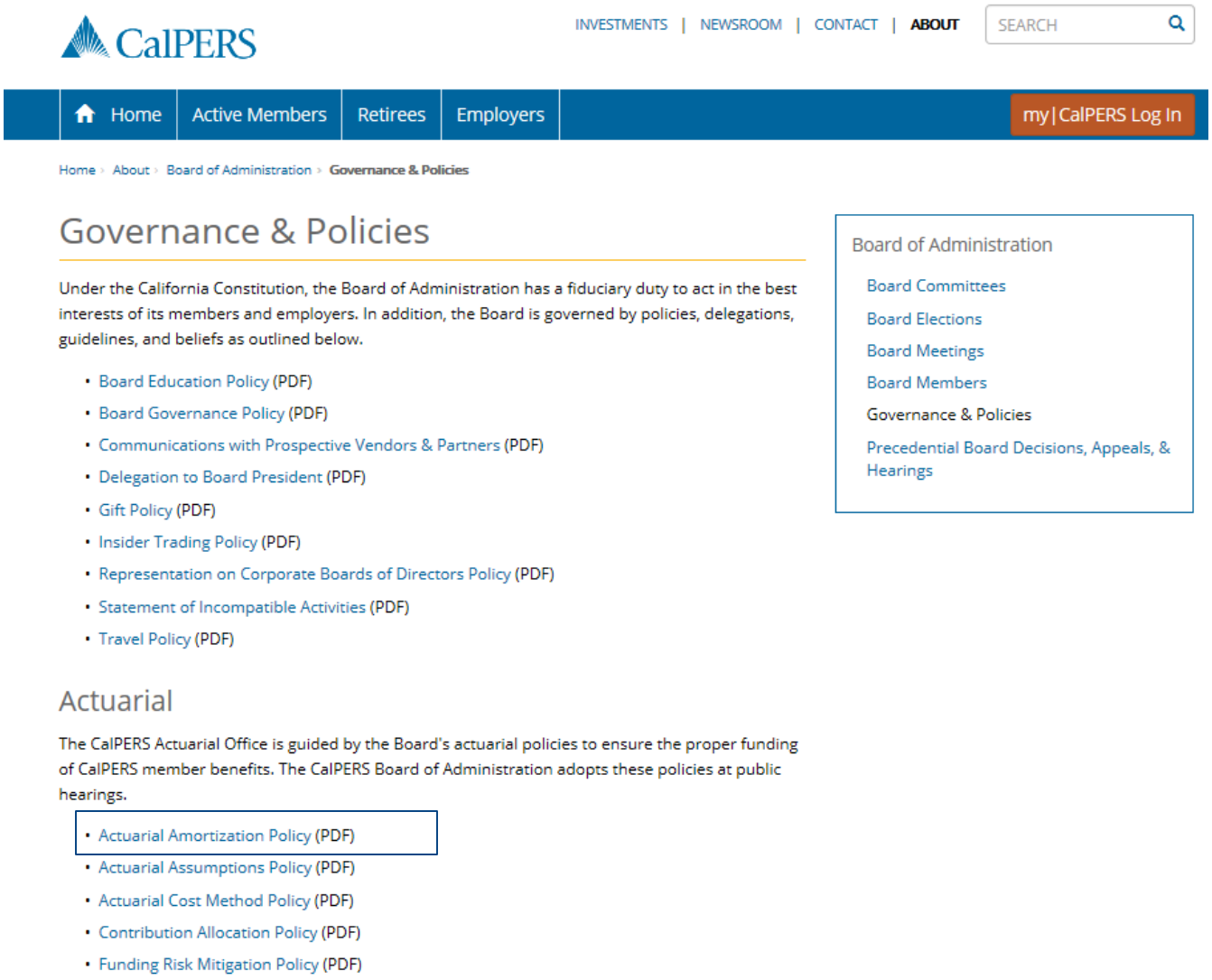
- Ideally no need for an Amortization Policy
- Pension plans would always be 100% funded
- Annual Contribution = Normal Cost only
- Normal Cost contributions plus investment earnings would be sufficient to pay all benefits

Need for an Amortization Policy

- Reality - Pension plans are not 100% funded due to
  - Investment performance
  - Actual demographic experience
  - Actual economic outcomes
  - Changes in actuarial assumptions
  - Plan amendments, benefits modified/improved

Need for an Amortization Policy

- An Amortization Policy is needed
  - To systematically steer plans back to the 100% funded ratio target
  - Achieve this full funding goal in an way which promotes
    - Rate stability
    - Intergenerational equity
    - Benefit security



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Governance & Policies

Under the California Constitution, the Board of Administration has a fiduciary duty to act in the best interests of its members and employers. In addition, the Board is governed by policies, delegations, guidelines, and beliefs as outlined below.

- Board Education Policy (PDF)
- Board Governance Policy (PDF)
- Communications with Prospective Vendors & Partners (PDF)
- Delegation to Board President (PDF)
- Gift Policy (PDF)
- Insider Trading Policy (PDF)
- Representation on Corporate Boards of Directors Policy (PDF)
- Statement of Incompatible Activities (PDF)
- Travel Policy (PDF)

Actuarial

The CalPERS Actuarial Office is guided by the Board's actuarial policies to ensure the proper funding of CalPERS member benefits. The CalPERS Board of Administration adopts these policies at public hearings.

- Actuarial Amortization Policy (PDF)
- Actuarial Assumptions Policy (PDF)
- Actuarial Cost Method Policy (PDF)
- Contribution Allocation Policy (PDF)
- Funding Risk Mitigation Policy (PDF)

Board of Administration

- Board Committees
- Board Elections
- Board Meetings
- Board Members
- Governance & Policies
- Precedential Board Decisions, Appeals, & Hearings

Amortization Policy Must Address

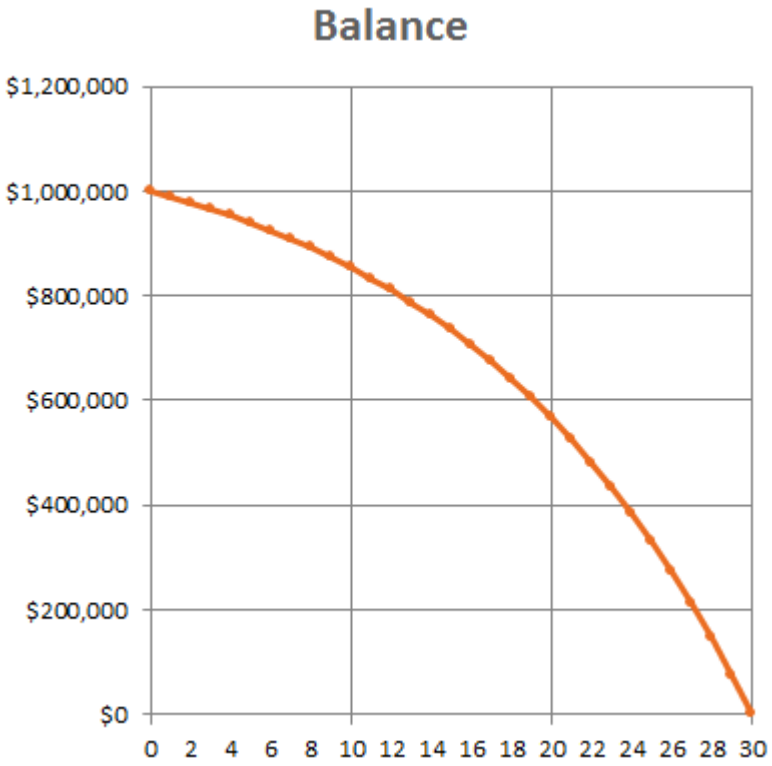
- Payment periods for all types of unfunded liability (gains/losses, assumption changes, plan changes)
- Payment patterns (level dollar, level percent of payroll, other)
- Volatility management (direct rate smoothing, ramps)

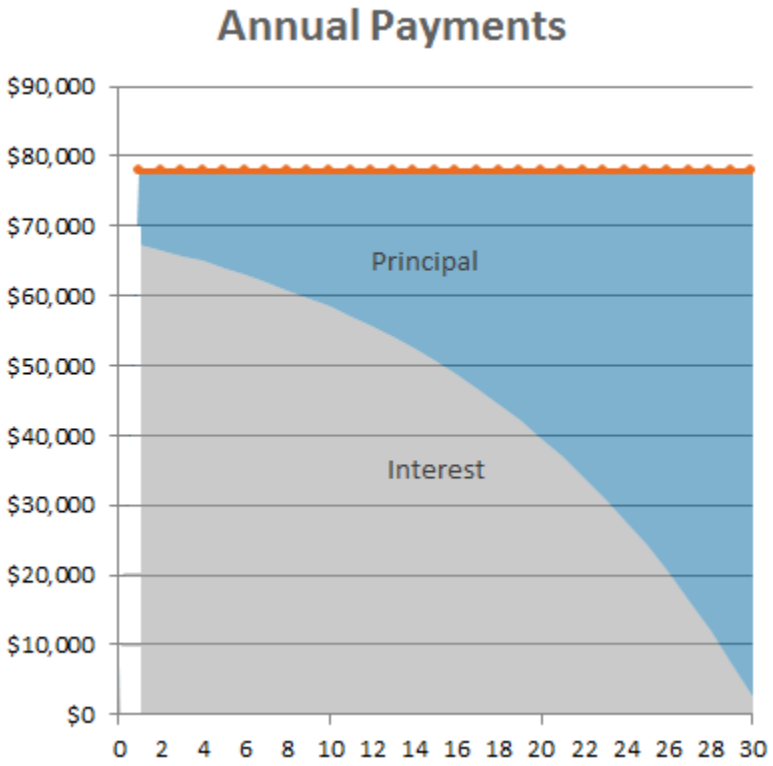
Amortization Drivers

Example: $1 million investment loss

- Classic mortgage approach
- Period: 30 years
- Level dollar amortization
- Interest rate = Discount rate

Example: $1 million investment loss



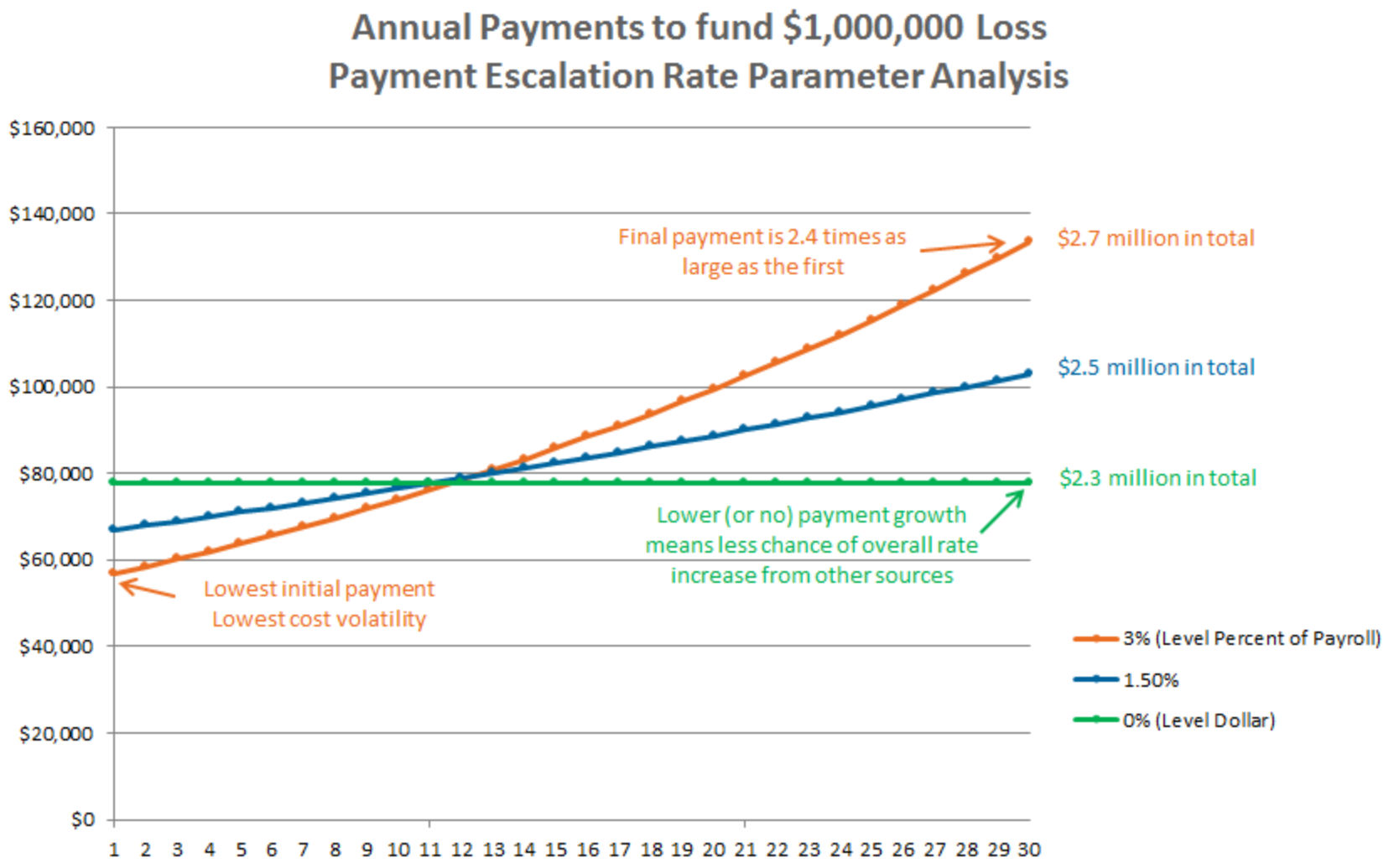


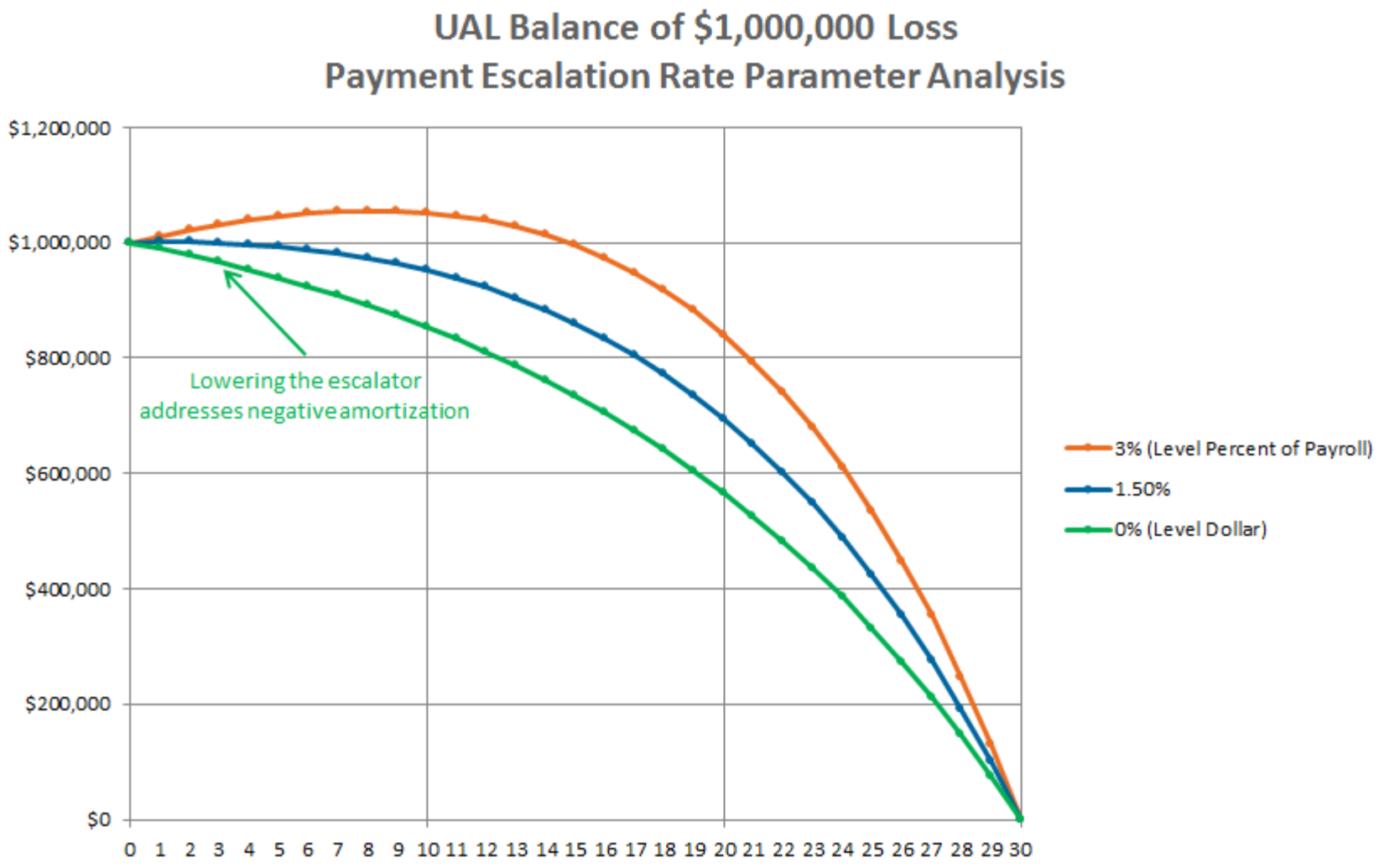
Is a Classic Mortgage Approach Appropriate for Pension Funding?

- Annual fixed dollar payments
  - Good for budgeting as a dollar amount
  - Payments expected to decline as a percent of payroll
- A widely accepted practice is to amortize as a “level percent of payroll”, which means the payments start low and increase each year by the payroll growth assumption

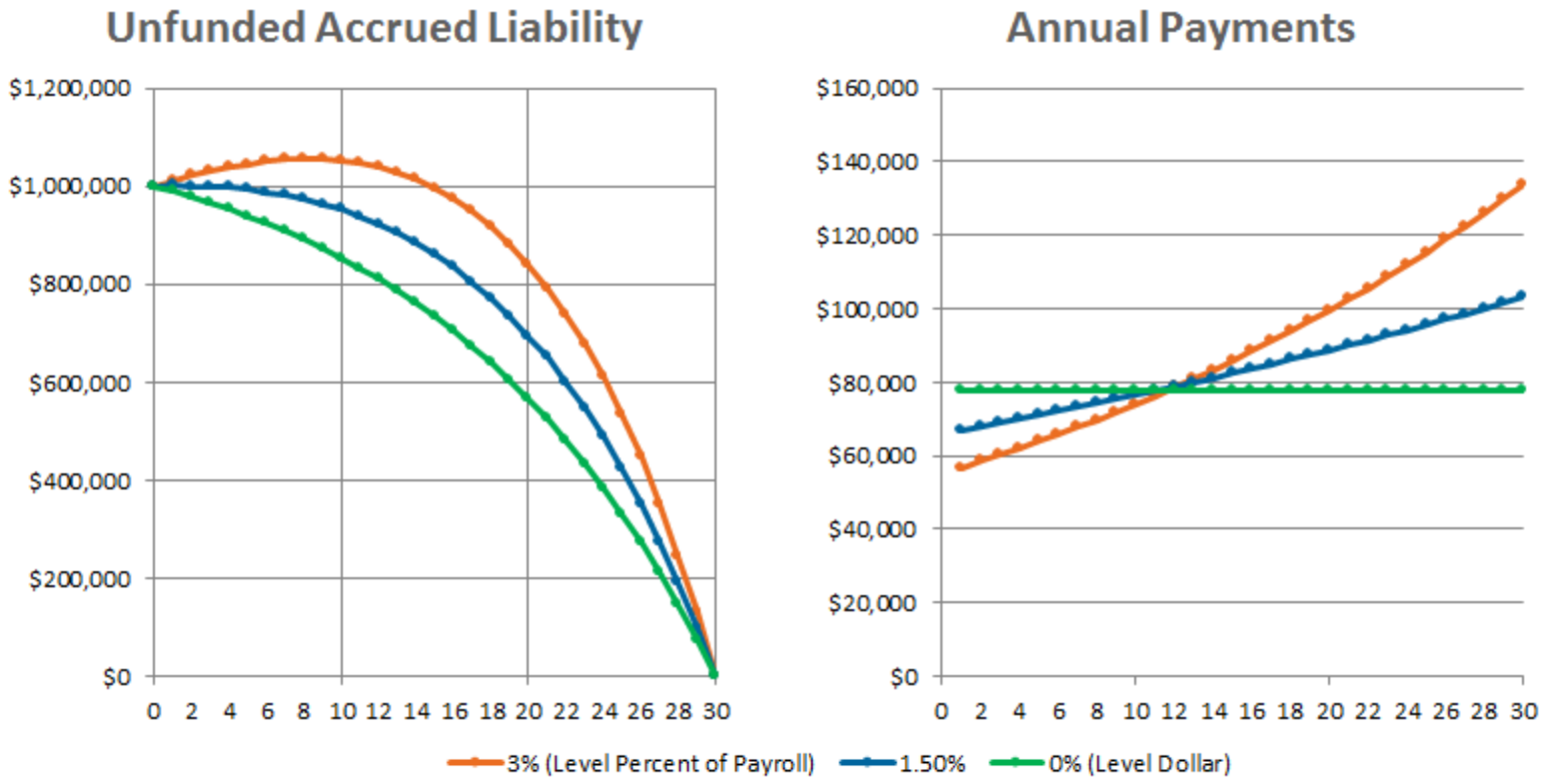
Payment Escalation Rate Analysis
Example: $1 million investment loss

- Scenarios
  - 3% (level percent of payroll)
  - 1.5%
  - 0% (level dollar)
- Period: 30 years
- Interest rate = Discount rate (7%)


Annual Payments to fund $1,000,000 Loss
Payment Escalation Rate Parameter Analysis
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Final payment is 2.4 times as large as the first
$2.7 million in total
$2.5 million in total
$2.3 million in total
Lower (or no) payment growth means less chance of overall rate increase from other sources
Lowest initial payment
Lowest cost volatility
3% (Level Percent of Payroll)
1.50%
0% (Level Dollar)


UAL Balance of $1,000,000 Loss
Payment Escalation Rate Parameter Analysis
$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Lowering the escalator
addresses negative amortization
3% (Level Percent of Payroll)
1.50%
0% (Level Dollar)

Payment Escalation Rate Analysis
Example: $1 million investment loss

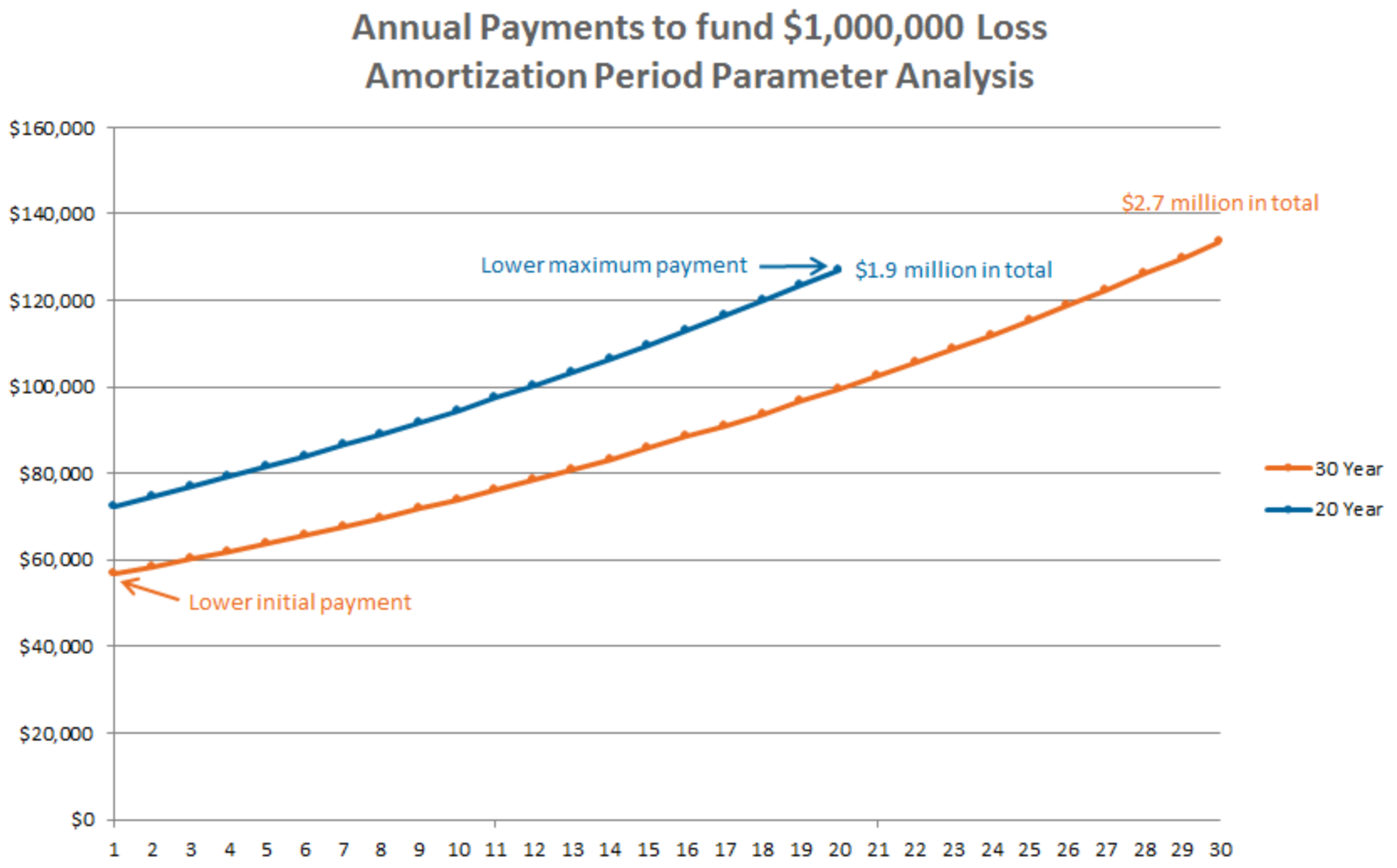


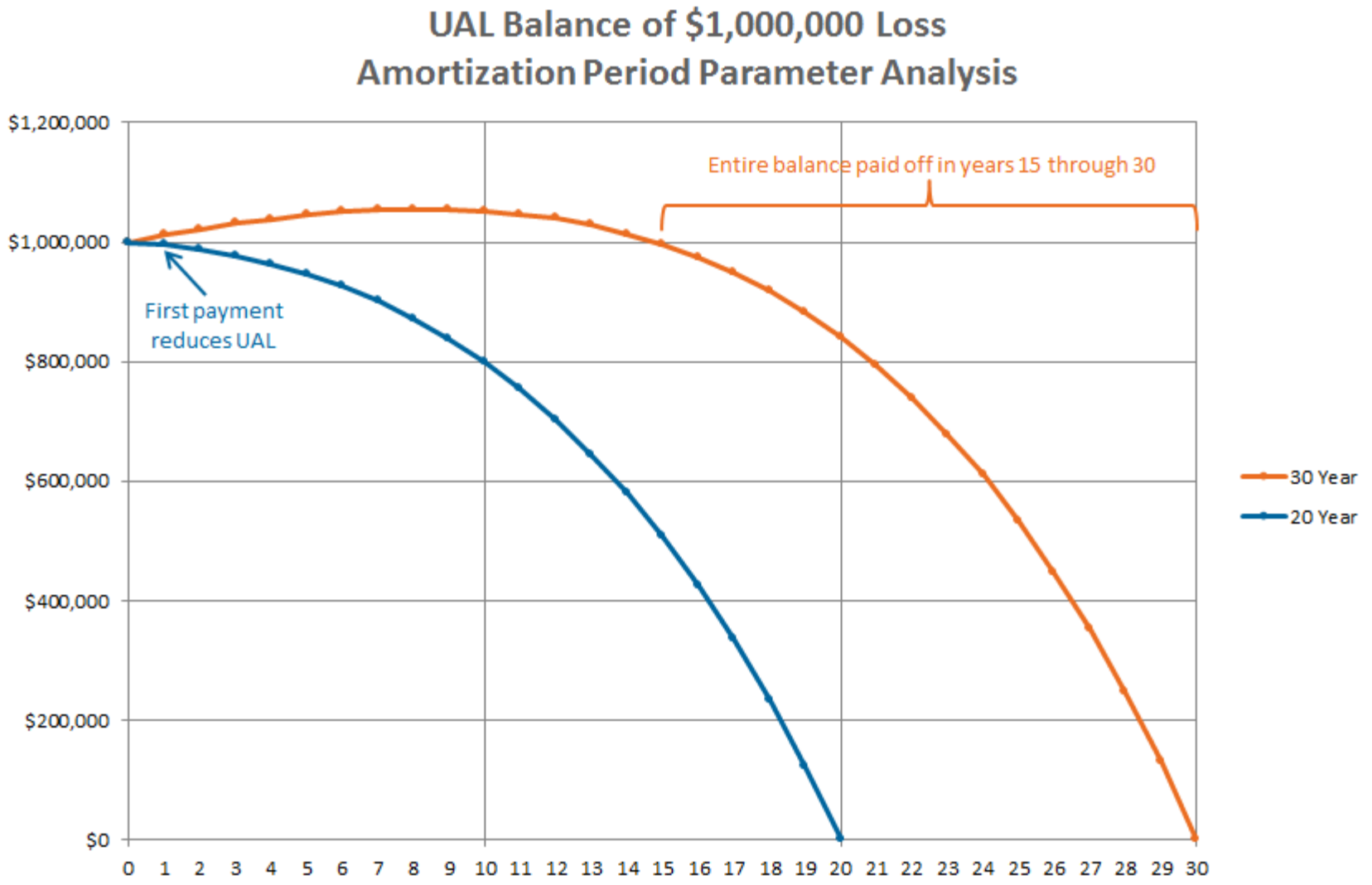
Payment Escalation Rate Analysis

Consequences of a $1,000,000 Loss (30 Year amortization period)				
Escalation Rate	Initial Payment	Maximum Payment	Total Payments	Comments
3%	$57,000	$134,000	$2.7 million	Lowest initial payment Highest negative amortization
1.5%	$67,000	$103,000	$2.5 million	Middle of the road
0%	$78,000	$78,000	$2.3 million	No negative amortization

Amortization Period Analysis
Example: $1 million investment loss

- Scenarios
  - 30 year amortization period
  - 20 year amortization period
- Annual increasing payments
  - Rate of increase is long term payroll growth assumption (3%)
- Interest rate = Discount rate (7%)


Annual Payments to fund $1,000,000 Loss
Amortization Period Parameter Analysis
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
$2.7 million in total
Lower maximum payment
$1.9 million in total
Lower initial payment
30 Year
20 Year


UAL Balance of $1,000,000 Loss
Amortization Period Parameter Analysis
$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Entire balance paid off in years 15 through 30
First payment reduces UAL
30 Year
20 Year

Amortization Period Analysis

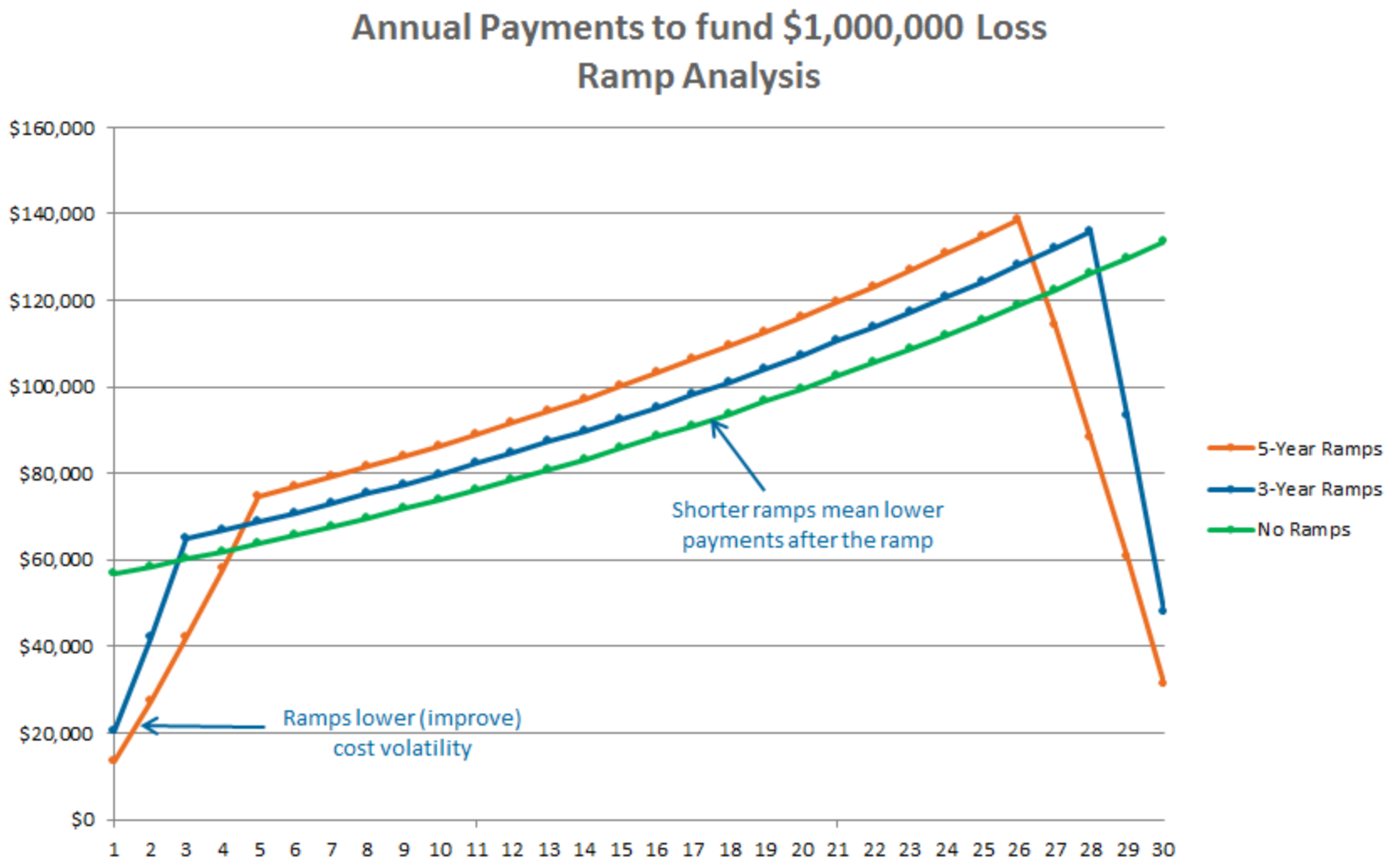
Consequences of a $1,000,000 Loss (3% Payment Escalation Rate)						
Period	Initial Payment	Maximum Payment	Total Payments	Inter-generational Equity	Cost Volatility	Long-term Cost
30 Years	$57,000	$134,000	$2.7 million	Worse	Better	Worse
20 Years	$73,000	$127,000	$1.9 million	Better	Worse	Better

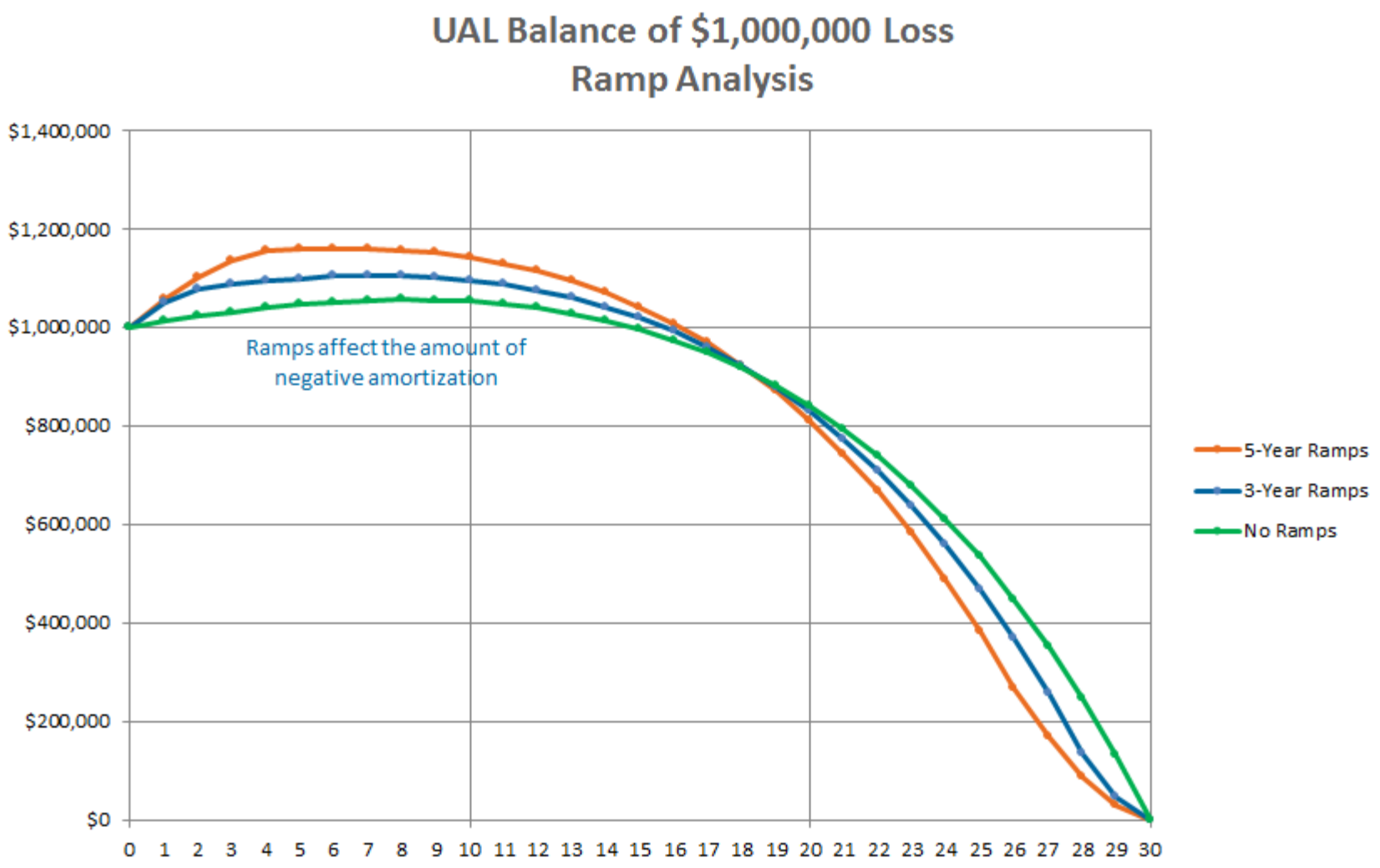
Volatility of Investment Performance

- Most volatile source of gains and losses
- Need to dampen impact on contribution rates by either
  1. Developing Actuarial Value of Assets by smoothing fluctuations in the Market Value of Assets, or
  2. Smoothing contribution rates directly through the amortization policy
- CalPERS uses Option 2
  - Direct rate smoothing

Direct Rate Smoothing (Ramp) Analysis Example: $1 million investment loss

- Scenarios
  - 5-year ramp up and down
  - 3-year ramp up and down
  - No ramps
- Escalation rate of 3%
- Period: 30 years
- Interest rate = Discount rate (7%)


Annual Payments to fund $1,000,000 Loss
Ramp Analysis
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Shorter ramps mean lower payments after the ramp
Ramps lower (improve) cost volatility
5-Year Ramps
3-Year Ramps
No Ramps


UAL Balance of $1,000,000 Loss
Ramp Analysis
$1,400,000
$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Ramps affect the amount of
negative amortization
5-Year Ramps
3-Year Ramps
No Ramps

Amortization Payment Ramp Analysis

Consequences of a $1,000,000 Loss				
Ramp	Initial Payment	Year 5 Payment	Maximum Payment	Comments
5 Years	$13,000	$75,000	$139,000	Lowest initial payment
3 Years	$20,000	$70,000	$136,000	Middle of the road
No Ramp	$57,000	$64,000	$134,000	Lowest payment in years 5 through 26

Current Policy

Actuarial Amortization Policy Goals

- Benefit Security
  - Current assets plus future contributions will be sufficient to pay all benefits
- Intergenerational Equity
  - Benefits paid for during years of active service
- Contribution Stability
  - Contribution rates remain stable from year to year

Goals may conflict
with each other

Current Actuarial Amortization Policy

Driver	Source				
	(Gain)/Loss		Assumption/ Method Change	Benefit Change	Golden Handshake
	Investment	Non-investment			
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate - Active Plans - Inactive Plans	 Payroll (3%) 0%	 3% 0%	 3% 0%	 3% 0%	 3% 0%
Ramp Up	5	5	5	0	0
Ramp Down	5	5	5	0	0

Current Actuarial Amortization Policy

Reason for Base	Date Established	Amortization Period	Balance 6/30/16	Expected Payment 2016-17	Balance 6/30/17	Expected Payment 2017-18	Balance 6/30/18	Scheduled Payment for 2018-19
FRESH START	06/30/06	20	$(3,311,095)	$(235,714)	$(3,311,037)	$(242,786)	$(3,303,646)	$(246,956)
BENEFIT CHANGE	06/30/07	10	$10,181,451	$1,100,913	$9,791,546	$1,133,941	$9,338,661	$1,158,611
BENEFIT CHANGE	06/30/09	12	$206,116	$19,859	$200,739	$20,455	$194,347	$20,881
ASSUMPTION CHANGE	06/30/09	13	$3,969,431	$363,876	$3,885,121	$374,792	$3,783,282	$382,406
SPECIAL (GAIN)/LOSS	06/30/09	23	$3,323,633	$219,674	$3,341,121	$226,264	$3,353,069	$229,870
SPECIAL (GAIN)/LOSS	06/30/10	24	$1,969,169	$127,364	$1,982,418	$131,184	$1,992,686	$133,223
ASSUMPTION CHANGE	06/30/11	15	$3,372,180	$283,301	$3,327,316	$291,800	$3,270,337	$297,456
SPECIAL (GAIN)/LOSS	06/30/11	25	$(459,988)	$(29,153)	$(463,703)	$(30,028)	$(466,786)	$(30,483)
PAYMENT (GAIN)/LOSS	06/30/12	26	$216,749	$13,478	$218,768	$13,882	$220,517	$14,087
(GAIN)/LOSS	06/30/12	26	$27,322,920	$1,698,945	$27,577,506	$1,749,913	$27,798,054	$1,775,756
(GAIN)/LOSS	06/30/13	27	$15,502,390	$423,575	$16,206,775	$654,423	$16,723,899	$885,706
ASSUMPTION CHANGE	06/30/14	18	$13,477,593	$256,717	$14,205,550	$528,837	$14,705,219	$808,039
(GAIN)/LOSS	06/30/14	28	$(12,188,347)	$(171,430)	$(12,909,599)	$(353,145)	$(13,495,746)	$(537,353)
(GAIN)/LOSS	06/30/15	29	$5,884,876	$(37,121)	$6,357,351	$89,520	$6,733,443	$181,480
ASSUMPTION CHANGE	06/30/16	20	$3,665,476	$(158,207)	$4,099,742	$(162,953)	$4,570,953	$86,157
(GAIN)/LOSS	06/30/16	30	$8,647,172	$54,262	$9,228,674	$0	$9,909,289	$137,348
TOTAL			**$81,779,726**	**$3,930,339**	**$83,738,289**	**$4,426,099**	**$85,327,578**	**$5,296,228**

2016 UAL

Projected 2018 UAL

Required UAL Contribution

- If the current minimum payment is less than interest on the UAL, the UAL will be projected to grow
- The payments change due to the ramp and 3% escalator

Why Consider Changes?

Question to consider?

- How well is the current policy working?
- What upgrades can be made to the policy to…
  - Improve benefit security and system sustainability
  - Increase intergenerational equity
  - Manage and control contribution volatility
  - Enhance consistency with industry guidance and best practices

Policy Minimum Requirements

- Conform with applicable state law (if any)
- Meet applicable Actuarial Standards of Practice

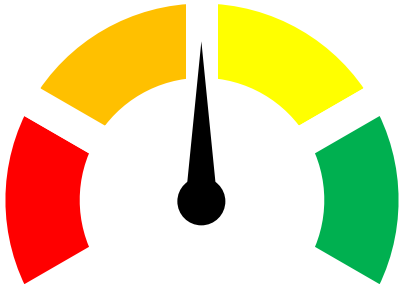
Guidance / Best Practices

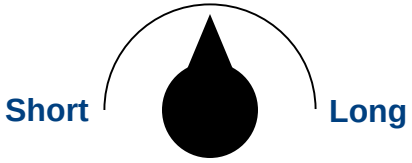
- California Actuarial Advisory Panel (CAAP)
  - Mitigate negative amortization
  - Promote accountability and transparency
    - Recognize sources of gains/losses explicitly
  - Recommended periods
    - Gains/losses: 15-20 years
    - Assumption changes: no longer than 25 years
    - Benefit changes
      - Active: lesser of expected future service or 15 years
      - Retired: lesser of expected lifetime or 10 years

Next Steps

Next Steps

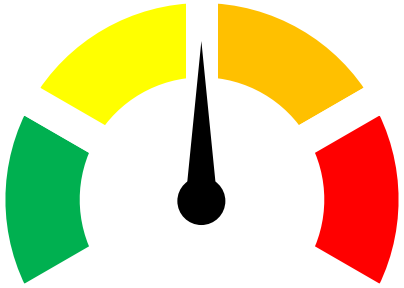
Intergenerational Equity

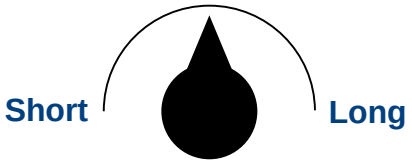




Amortization Period

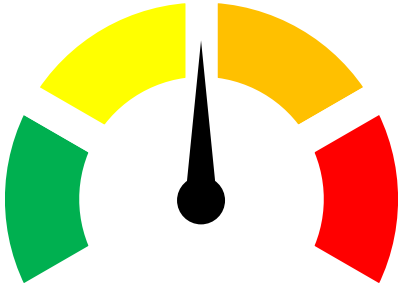
Year to Year Cost Volatility

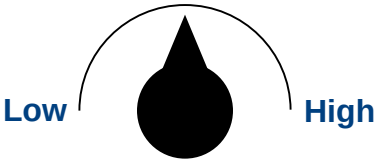




Ramp Period

Long Term Cost





Payment Escalator

Next Steps

- Stakeholder outreach
- Modeling alternatives/ALM style analysis
- Additional Board input
- Propose recommendation at November FAC meeting

Questions & Comments

Appendix

Guidance / Best Practices

- Conference of Consulting Actuaries (CCA) Recommendations
  - Layered fixed periods by source
  - Level percent of pay
  - Recommended periods
    - Gains/losses – 15 to 20 years
    - Assumption changes – 15 to 25 years
    - Benefit changes – remaining future service or 15 if lower

Guidance / Best Practices

- Government Finance Officers Association (GFOA) Recommendations
  - Layered fixed periods by source
  - Level percent of pay or level dollar
  - Never to exceed 25 years, but ideally fall in the 15-20 year range
  - No longer than 10 years for gains/losses for closed plans

Guidance / Best Practices

- SOA Blue Ribbon Panel Recommendations
  - Amortization of unrecognized amounts should be limited to a period of 15 to 20 years