Contest Winners | Innovative Public Pension Funding Strategies

Webinar | April 5, 2022

CCA CONFERENCE OF CONSULTING ACTUARIES

NATIONAL INSTITUTE ON Retirement Security
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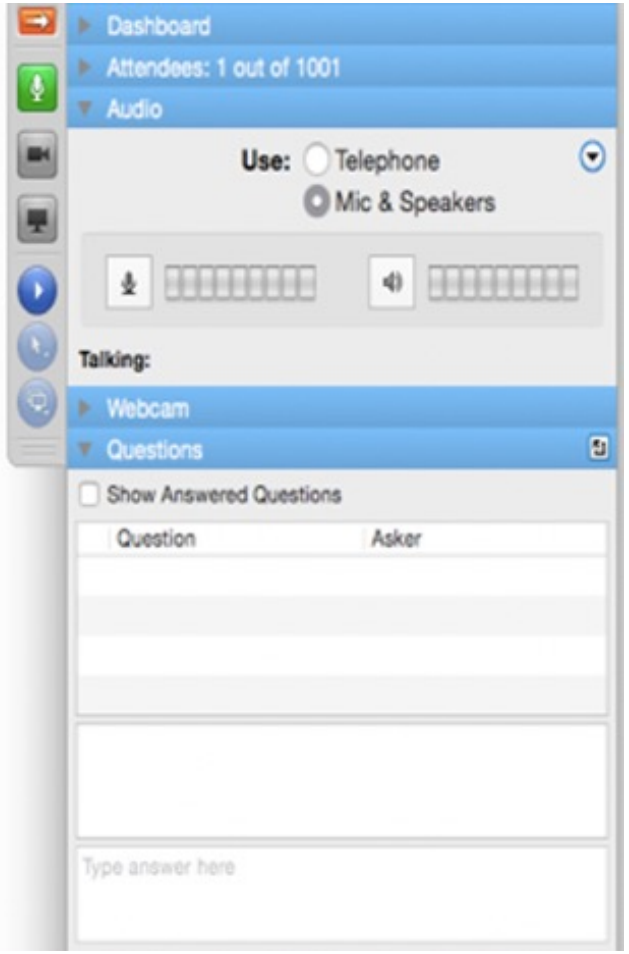
Agenda

1. Logistics and Introductions
2. Contest Overview
3. Winning Submission Presentations
4. Questions

Logistics

- Attendees in listen only mode.
- Question are welcome. Submit using “Question” function on control panel.
- Audio/technical issues during webinar: call GoToWebinar at 1-800-263-6316.
- Webinar replay and slides will be posted at nirsonline.org/events.



Today's Speakers

MODERATORS

Dan Doonan, NIRS Executive Director

Ellen Kleinstuber, FCA, MAAA, FSA, EA, FSEA, Chief Actuary, Bolton, and President, Conference of Consulting Actuaries

PRESENTERS

Robert (Andy) Blough, FSA, EA, MAAA, FCA, Chief Actuary, INPRS

Michelle Boyles, FSA, EA, MAAA, Consulting Actuary, Milliman

David Draine, Senior Officer, Pew Charitable Trusts

Aaron Shapiro, FSA, EA, MAAA, Consulting Actuary, Milliman

Seth Stock, Senior Actuarial Analyst, INPRS

INNOVATIVE PUBLIC PENSION FUNDING STRATEGIES

Contest Overview

- Competition aimed at encouraging and sharing innovative thinking around the funding of state and local pension plans.
- Focus on innovative ideas on funding policies that can reduce cost volatility, promote intergenerational equity, and assure plans remain on a strong fiscal path over time.
- Entrants provided a hypothetical pension scenario and asked to design a funding policy that will address the goals above over the long-term.

INNOVATIVE PUBLIC PENSION FUNDING STRATEGIES

Contest Overview

- Innovative ideas on funding policies were to be consistent with the CCA white paper, Actuarial Funding Policies and Practices for Public Pension Plans.

  https://www.ccactuaries.org/docs/default-source/papers/cca-ppc_actuarial-funding-policies-and-practices-for-public-pension-plans.pdf?sfvrsn=6397cc76_6

- Contestants could not achieve the objectives above by proposing to change plan benefits, the structure of benefits, or the cost-sharing arrangement.

Prestigious Panel of Judges

- Patricia Bishop – Director, Virginia Retirement System
- Brent Banister – Chief Actuary, Cavanaugh MacDonald
- Jim Holland – Chief Research Actuary, Cheiron
- Judy Kermans – President and CEO, GRS
- Ellen Kleinstuber – Principal and Chief Actuary, Bolton and President, CCA
- Deborah Simonds – Board Chair, Teachers Retirement System of GA
- Jay Stoffel – Executive Director, TRA of Minnesota
- Todd Tauzer – National Public Sector Retirement Practice Leader, Segal
- Daniel Wade – Principal and Consulting Actuary, Milliman
- Aaron Weindling – former Senior Director and North American Modeling Analytics Leader, WTW

Award Evaluation Criteria

- Effectiveness in meeting contest criteria
  - Fully funding benefits effectively and prudently over a reasonable period of time, taking into consideration intergenerational equity and tail risk
  - Affordability, especially in the long-term
  - Managing volatility of cost over the long-term, including handling changes in expectations
- Feasibility – meeting plans where they're at "in real life"
- Level of innovation
- Stakeholder risk – readability, understandability, unintended consequences (e.g., political risk)
- Managing surplus and positive experience prudently
- Scalability/adaptability to other plans, including dynamic and risk-sharing plan designs

Three Winning Submissions Announced at the NIRS Annual Retirement Policy Conference

The Cost of Stability: A Case Study

Robert (Andy) Blough – Chief Actuary

Seth Stock – Senior Actuarial Analyst

Indiana Public Retirement System

Risk-Based Funding Policy

Bill Winningham – Consulting Actuary

Michelle Boyles – Consulting Actuary

Aaron Shapiro – Consulting Actuary

David Kent – Consulting Actuary

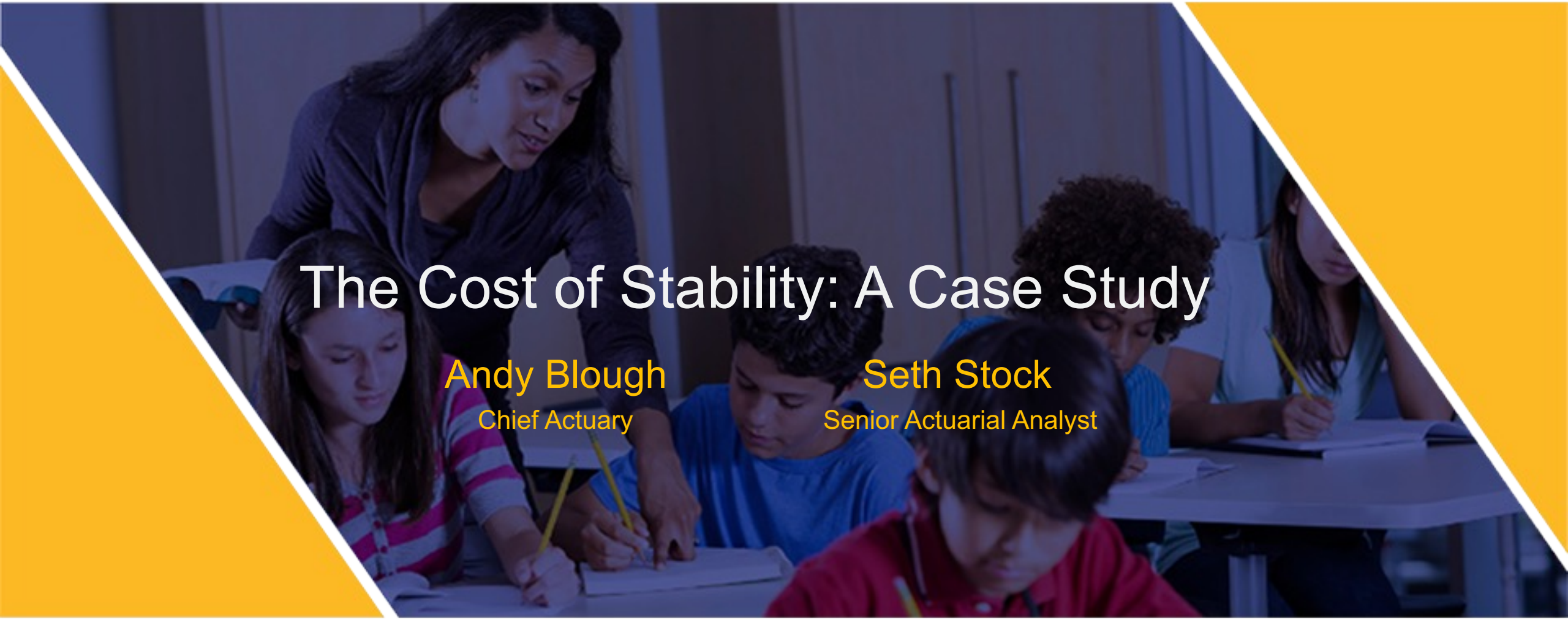
Milliman

Reserve Fund Stabilized Contribution Policy

David Draine – Senior Officer

The Pew Charitable Trusts

INPRS
INDIANA PUBLIC RETIREMENT SYSTEM



The Cost of Stability: A Case Study

Andy Blough
Chief Actuary

Seth Stock
Senior Actuarial Analyst

The Cost of Stability: A Case Study

- The funding policy described in our submitted paper is a simplified version of the policy currently used in the Indiana Public Retirement System (INPRS)
- Policy was originally adopted in 2014, although some elements predate that adoption
- Originally based on California Actuarial Advisory Panel paper, but many of those recommendations are mirrored in the CCA's *Actuarial Funding Policies and Practices for Public Pension Plans*

Cost Method and Asset Smoothing Method

- INPRS uses Entry Age Normal Cost Method, same as the hypothetical plan
- INPRS uses an asset smoothing method to even out market fluctuations
  - Asset gains and losses are smoothed over five years
  - 20% corridor around the market value of assets

Amortization Policy

- Gains and losses, assumption and method changes, and plan provision changes are all amortized over time
- The gains and losses from all sources are amortized as follows:

Funded Status < 100%	Funded Status > 100%
20-year amortization period	30-year amortization period
Layered	Single Layer
Closed	Open
Level dollar	Level dollar

  - If the plan transitions from below 100% funded to above 100% funded or vice versa, the prior amortization layers are cleared, and the amortization restarts according to the above rules

INPRS

Contribution Policy

- Contributions are set as a percent of payroll
- The Actuarially Determined Contribution (ADC) is equal to the normal cost rate of the plan plus any unfunded or surplus amortization
- The final employer contribution rate remains at the greater of the most recent ADC or the prior year's rate until the plan reaches 105% funded
- Once the plan reaches 105% funded, the contribution rate will decrease 25% of the difference between the prior year's contribution rate and the current year's ADC

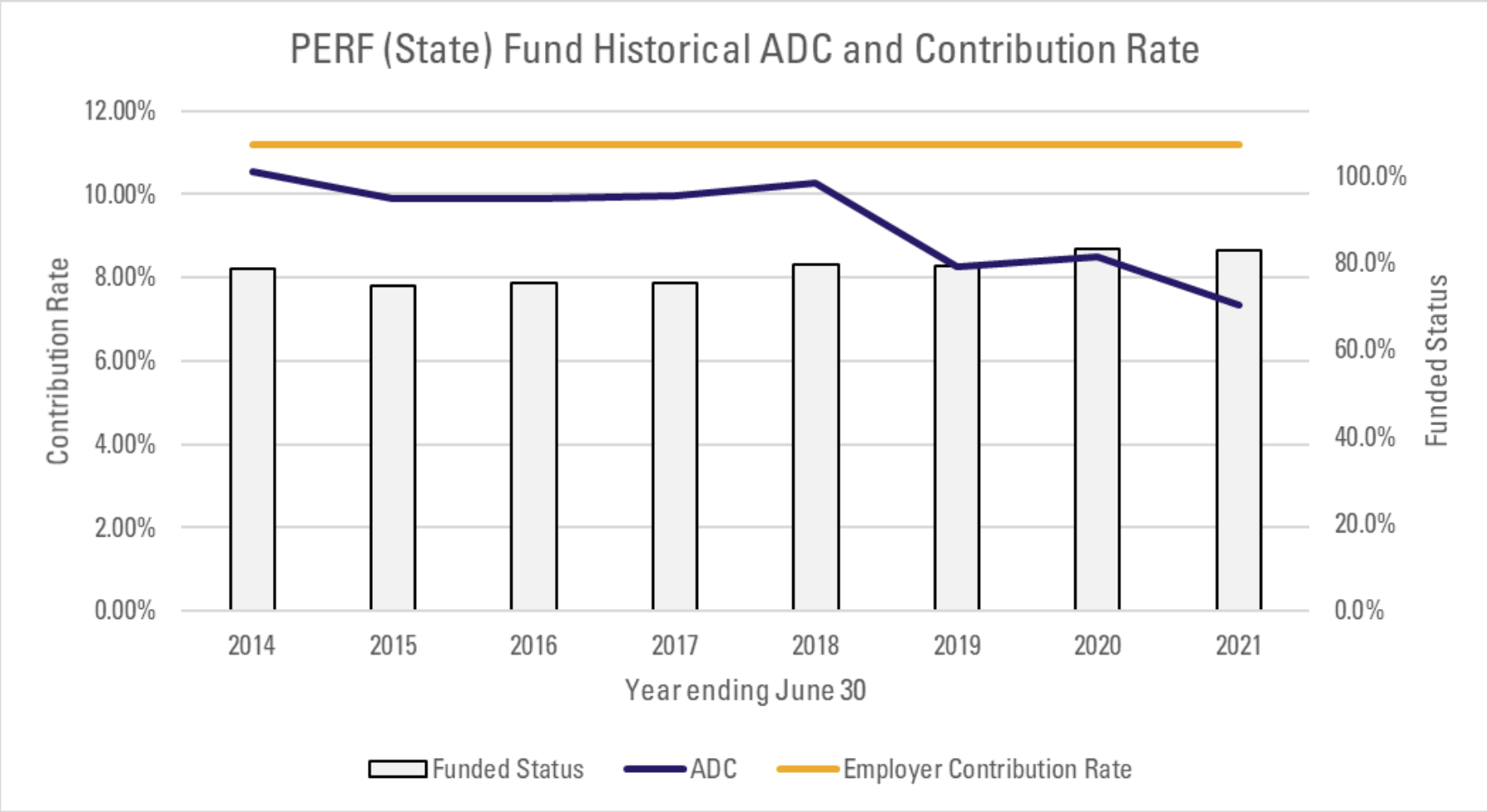
Transition or Other Issues

- Policy model may not be appropriate for poorly funded plans or very weak sponsors
- Policy is designed for open plans. If a plan is closed it may require a shorter amortization period.
- Recommend retaining any level-dollar amortization bases, but removing any percent of pay amortization bases
- There may be a delay between valuation results and contribution rates go into effect

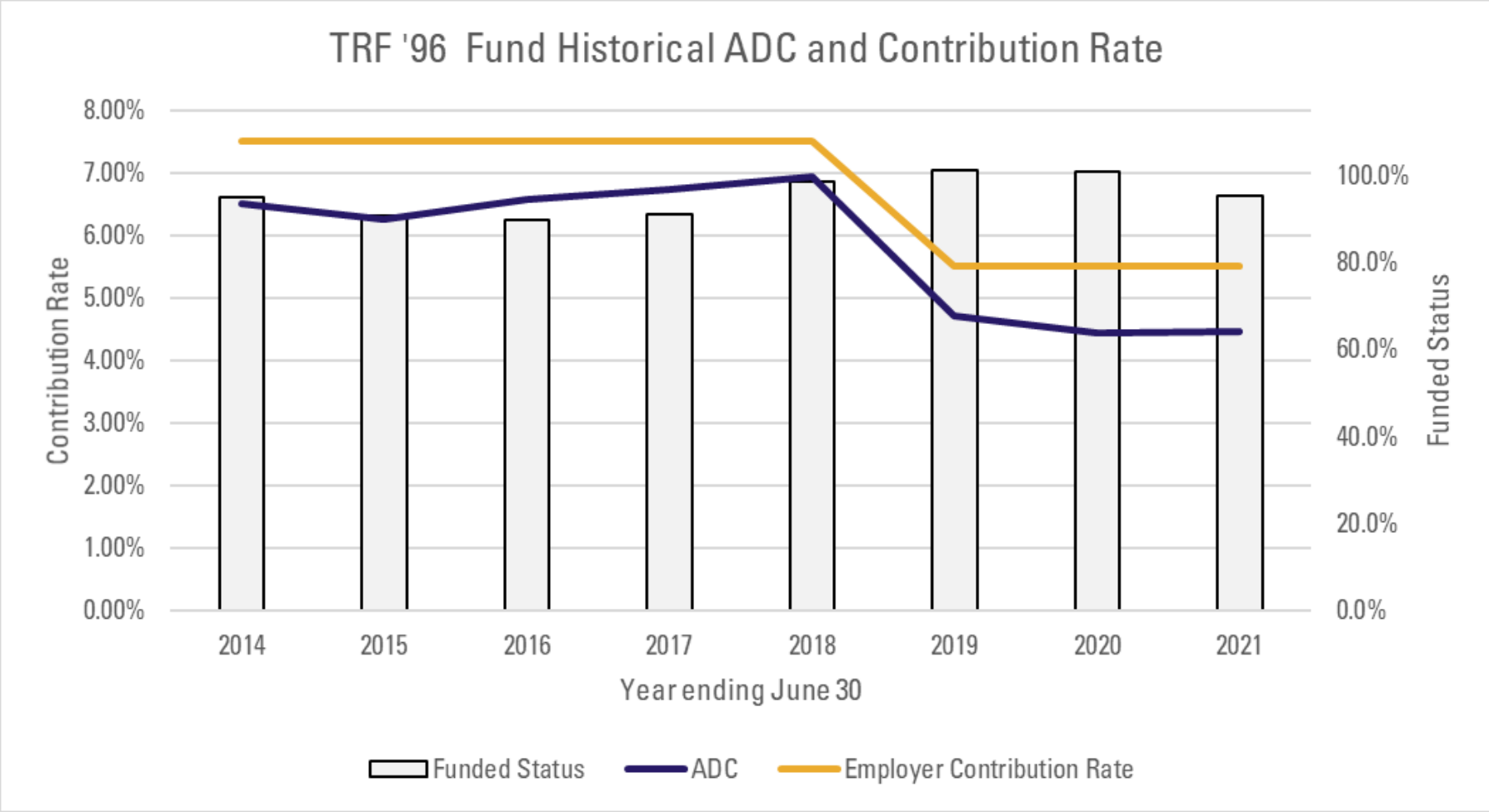
Performance of this policy?

- Submitted policy is close enough to INPRS's existing policy that we will look at INPRS's experience with the policy as a proxy
- What is different?
  - Some items specific to Indiana law and plan history
  - When over 105% funded, employer contributions currently blend 25% of the way to the normal cost, not 25% of the way to the ADC
  - A provision where contributions are forced to equal the normal cost if over 120% funded

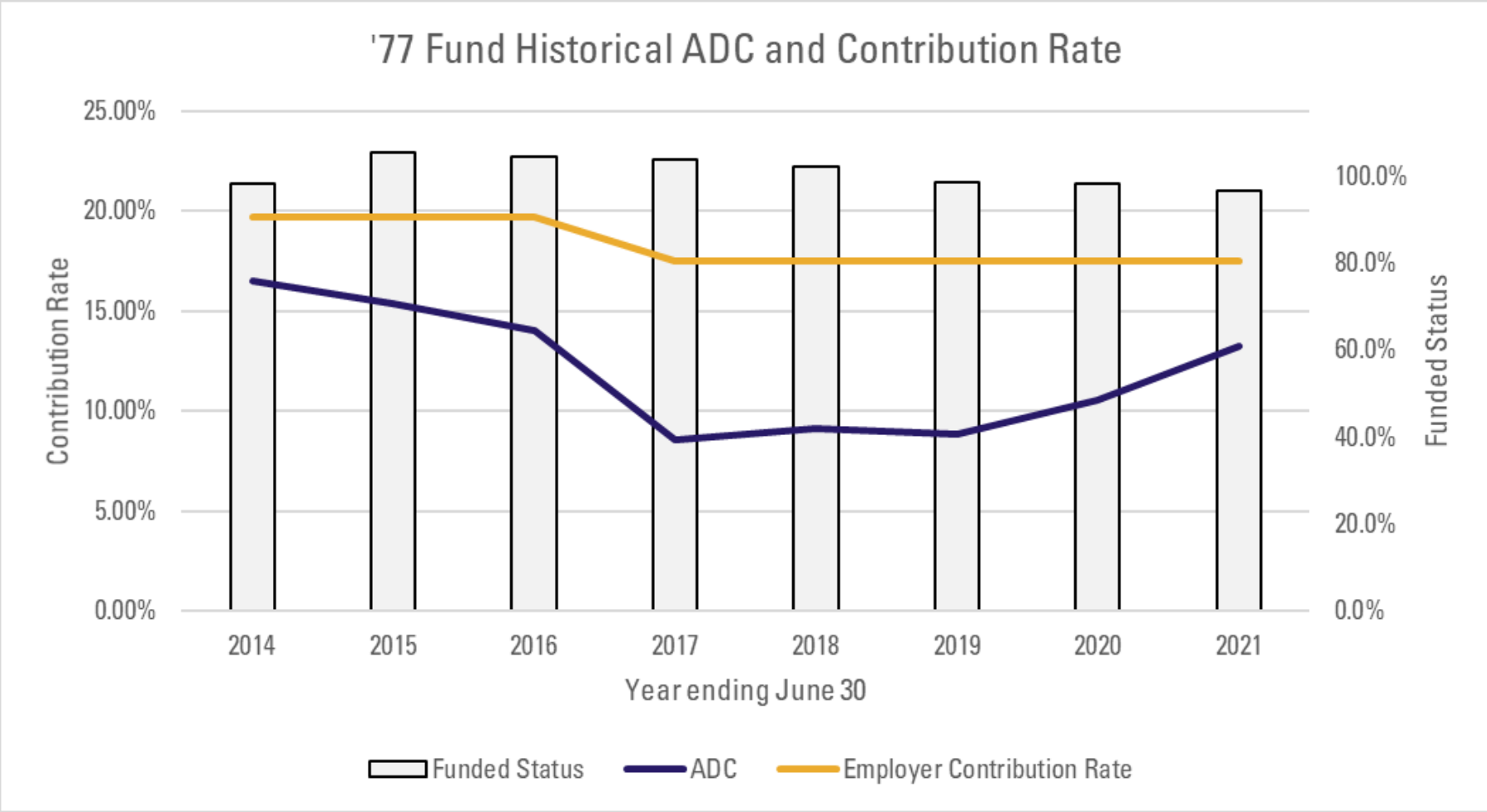
Contribution and ADC History



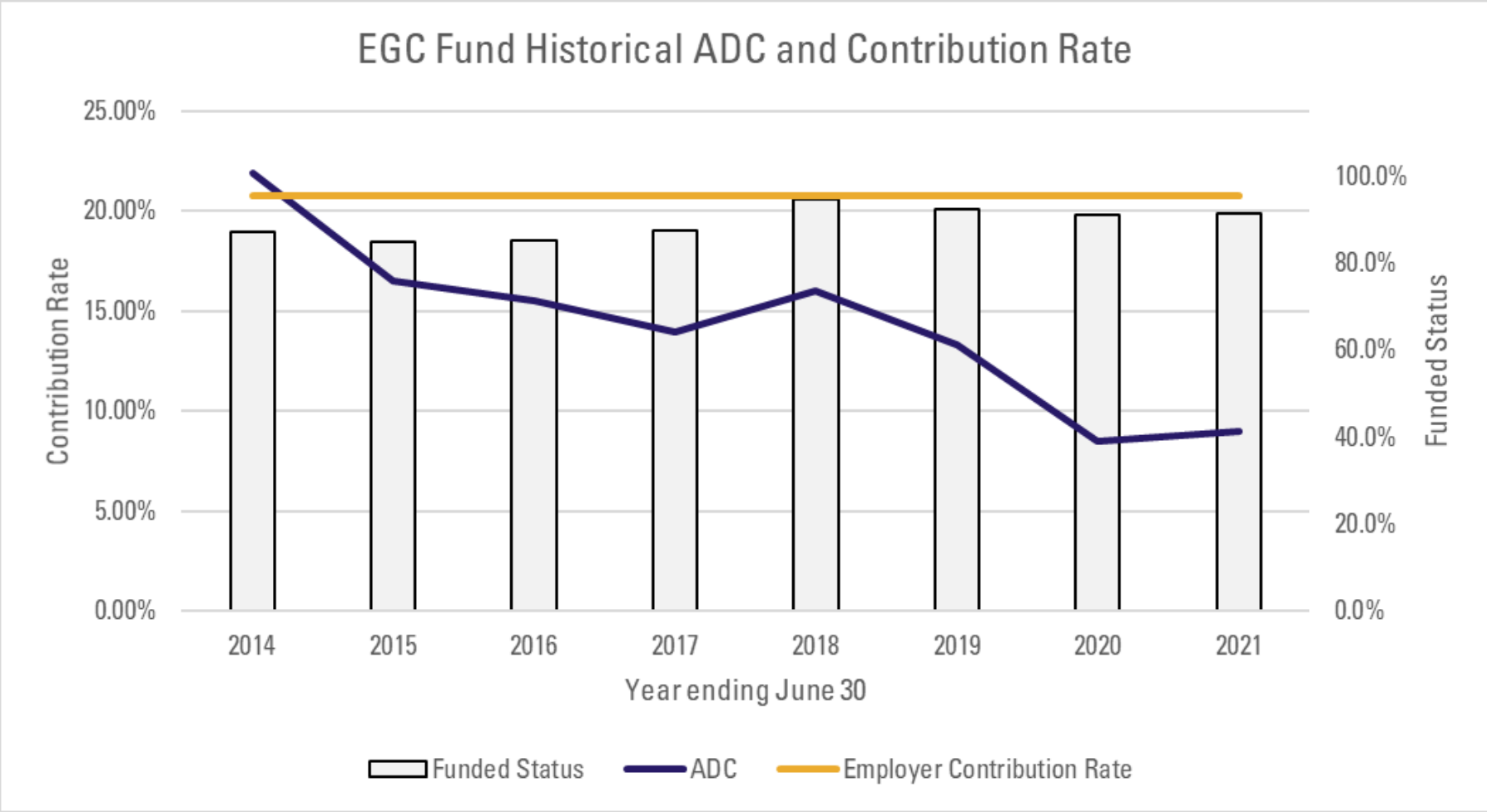
Contribution and ADC History



Contribution and ADC History



Contribution and ADC History



Pros of this Policy

- Benefit security, by contributing at least the ADC
- Contribution levels above the ADC and funding above 100% leave a buffer for adverse experience and generate stability
- Accelerated funding when contributing above the ADC
- Because all amortizations are level-dollar, there is no concern for negative amortization
- Transparency
  - Publicly posted
  - Regularly discussed at public meetings

INPRS

Cons of this Policy

- Some stakeholders may view the stabilization mechanism as overcharging employers
- Benefit improvements can appear to have no cost if they increase the ADC but not enough to increase the employer contribution rate
- Results in a funded percentage over 100%, which can lead to pressure for benefit improvements or contribution reductions
- More rapid funding puts additional funding burden on the current generation of members and taxpayers

About the Authors

Andy Blough, FSA, EA, MAAA, FCA, is the Chief Actuary of the Indiana Public Retirement System (INPRS). At INPRS, Andy routinely provides subject matter expertise on retirement actuarial matters to system staff, members of the INPRS Board of Trustees, state legislators, and others in the Indiana government. Andy also serves as the Vice Chair of the American Academy of Actuaries' Public Pensions Committee and is a member of the Society of Actuaries' Retirement Plans Experience Committee. Before joining INPRS, Andy was a consulting actuary with Buck focusing on single-employer private-sector pension plans. Andy has a B.A. in Mathematics and Economics from Ball State University.

Seth Stock is a Senior Actuarial Analyst at the Indiana Public Retirement System (INPRS). Before joining INPRS Seth was an actuarial analyst at Mercer, focusing on single-employer OPEB plans. Seth has a B.S. in Mathematical Economics and an M.S. in Actuarial Science from Ball State University, as well as an MBA from the University of Indianapolis

Risk-Based Funding Policy

NIRS/CCA 2022 Innovative Public Pension Funding Strategies Submission

Michelle L. Boyles, FSA, EA, MAAA

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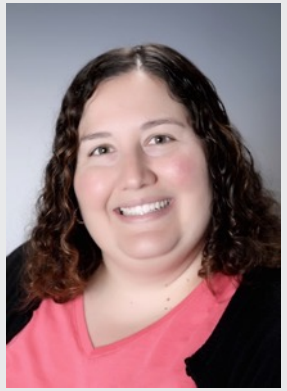
The Team



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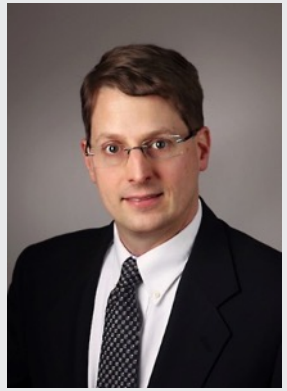

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Risk-Based Funding Policy

Overview

Cost Method	Asset Method	Amortization Method	Risk Adjustment	Contribution Surplus Account (CSA)
▪ Entry age normal, level percent of pay (level dollar if not pay-related)	▪ Market Value of Assets ▪ Asset smoothing, max 5 years with a 20% corridor ▪ If smoothing applied, reduces the maximum amortization period	▪ Layered ▪ Level percent of pay (level dollar if not pay-related **or** accruals frozen) ▪ Max 15 years of deferrals, reduced for asset smoothing	▪ Risk matrix yields a risk load factor of at least 100% ▪ Funding Policy Liability (FPL) = Accrued Liability x Risk Load Factor ▪ ADC = Normal Cost + Layered Amortization of unfunded FPL	▪ Contributions greater than ADC can be allocated to the CSA ▪ CSA adjusted by actual investment return annually ▪ Apply towards future benefit improvements or reduce ADC

Risk Matrix

Investment Risk

DESCRIPTION OF RISK	ANALYSIS		RISK FACTOR
Portfolio Volatility	Measured by the standard deviation of the expected return:		
		Risk Factor	Standard deviation = 12
	< 4	-3	
	4-6	-2	
	6-8	-1	
	8-10	0	
	10-12	1	1
	12-14	2	
	> 14	3	
Portfolio Liquidity	Measured by portion of the portfolio in illiquid or difficult to sell assets:		
		Risk Factor	Illiquid assets < 10%
	< 10%	0	
	10-20%	1	
	20-30%	2	0
	> 30%	3	
Well-defined investment policy	Robust investment policy	0	Robust Policy 0
	Missing key elements	1+	

Risk Matrix

Plan Design Risk

- Most flexibility in this component
- Significant opportunities for risk adjustment

DESCRIPTION OF RISK	ANALYSIS		RISK FACTOR
Benefit Accrual	Assess benefit risk:		
		Risk Factor	3-year Final Average Formula
	Frozen accruals	-1	
	Career average	-1	
	Final average (4 years or more)	0	
	Final average (less than 4 years)	1	1
	Overtime, vacation, sick payout included	2	
Optional Forms	Assess potential for adverse selection or "run on the bank":		
		Risk Factor	Traditional Annuities only
	Traditional annuities, actuarial equivalent forms	0	
	Subsidized optional forms (like free J&S)	1	
	Level Income Option	1	0
	Lump sums (other than return of contributions)	2	
Early Retirement	Actuarial equivalence	0	1
	Subsidized factors/unreduced early	1+	
Disability	none or requires Social Security disability	0	0
	Plan determines eligibility or highly subsidized benefit	1+	
COLA	Sum the following, based on design:	*Risk Factor*	
	none	0	
	fixed rate < 2%	1	Fixed COLA of 1.5%
	fixed rate > 2%	2	
	linked to CPI	3	
	Annual minimum rate	1	1
	Annual maximum rate	-0.5	
	Lifetime maximum increase	-0.5	
	Delayed start	-0.5	
DROP	If the plan offers DROP, add 1+ based on design		
Other	Determined by the actuary		

Risk Matrix

Plan Sponsor Risk and Total Risk Factor

DESCRIPTION OF RISK	ANALYSIS		RISK FACTOR
10-year average % ADC contributed	95%+	0	0
	< 95%	1+	
Fiduciary risk	Follows good fiduciary practice	0	0
	Missing key elements (such as annual valuations, completing an experience study every five years, using a reasonable investment return assumption)	1+	
		Total Risk Factor	**4**

- Sum all risk components (1 + 3 + 0) = 4
- Identify the Risk Load Factor based on the Total Risk Factor = 10%
- Funding Policy Liability = 110% x Accrued Liability

Total Risk Factor	Risk Load Factor
< 1	0%
1 - 2	5%
3 - 4	**10%**
5	15%
6	20%
7	25%
8	30%
9	35%
10+	40%

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Reserve Fund Stabilized Contribution Policy: A Model Public Pension Funding Policy

David Draine, Senior Officer
Strengthening Public Sector Retirement Systems

Key Steps for Improving Funding Policy

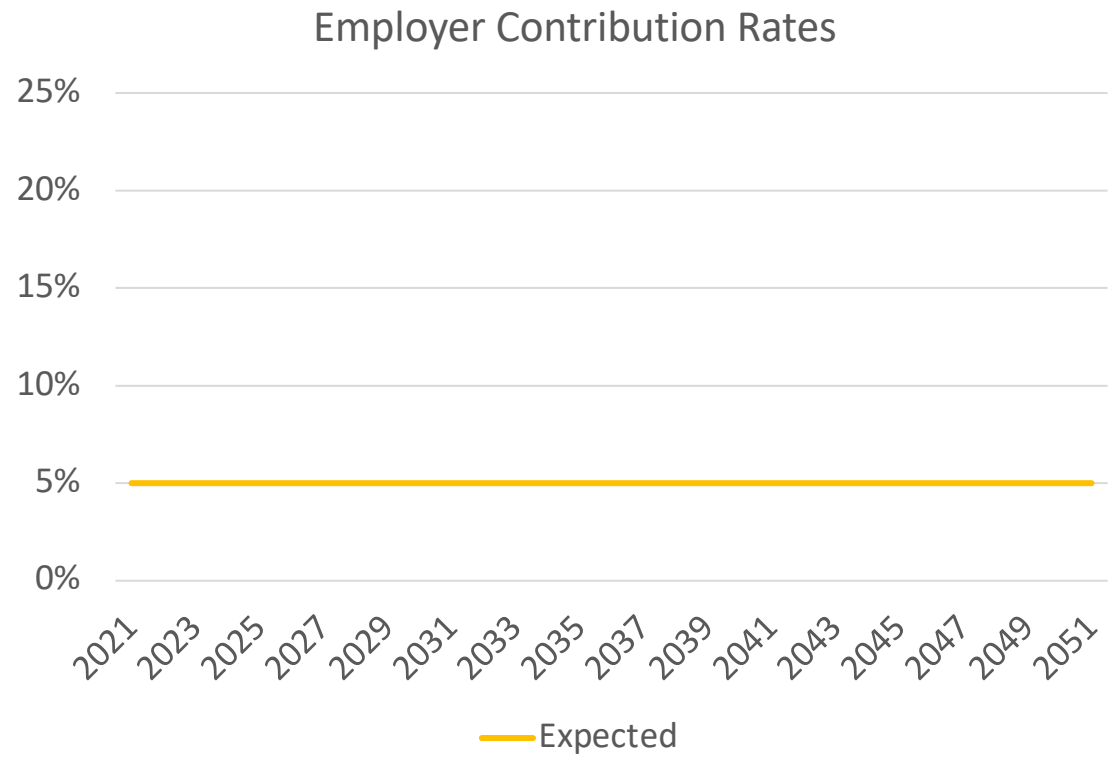
- Ask the right questions
- Learn from states
- Model volatility

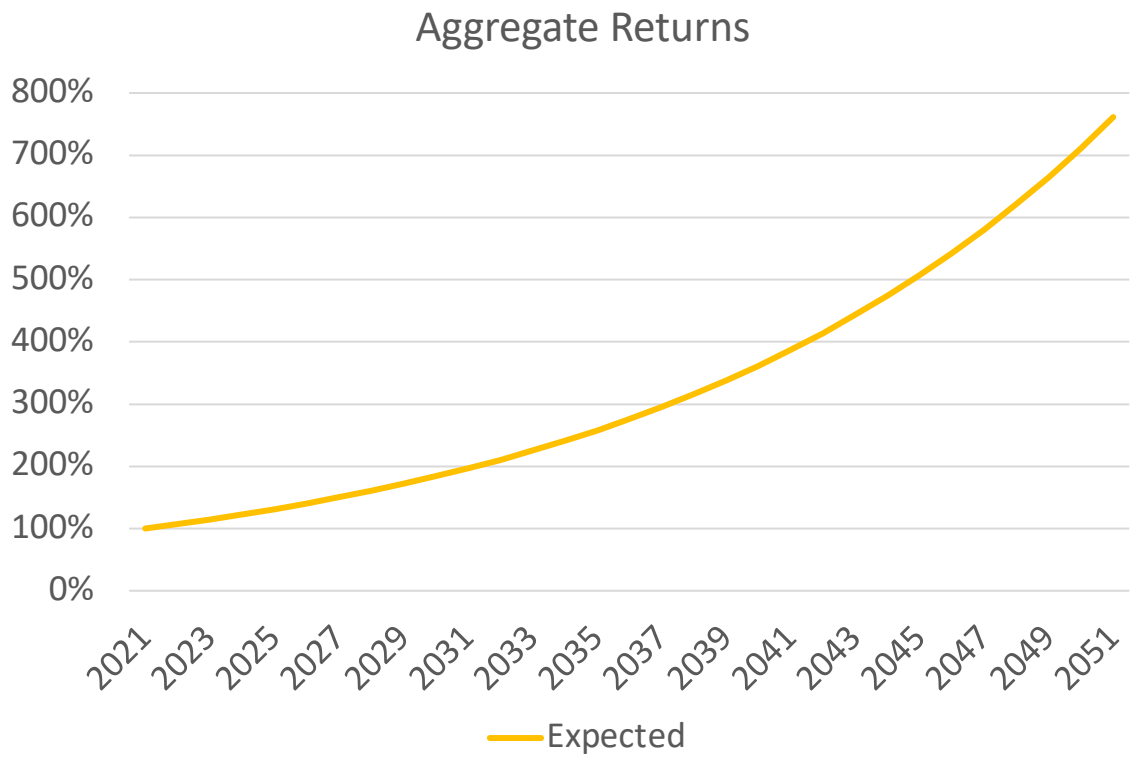
Finding a better funding policy

- Standard actuarial funding practices have led to volatile contribution levels following recessions and market corrections.
- States and local governments that fall short of minimum actuarial standards have been in even worse shape.
- Volatile contributions make budget planning difficult and crowd out important public investments.
- The challenge—identify funding approaches that reduce cost volatility and preserve intergenerational equity **without** sacrificing solvency and plan funding.

Current practice can handle the expected

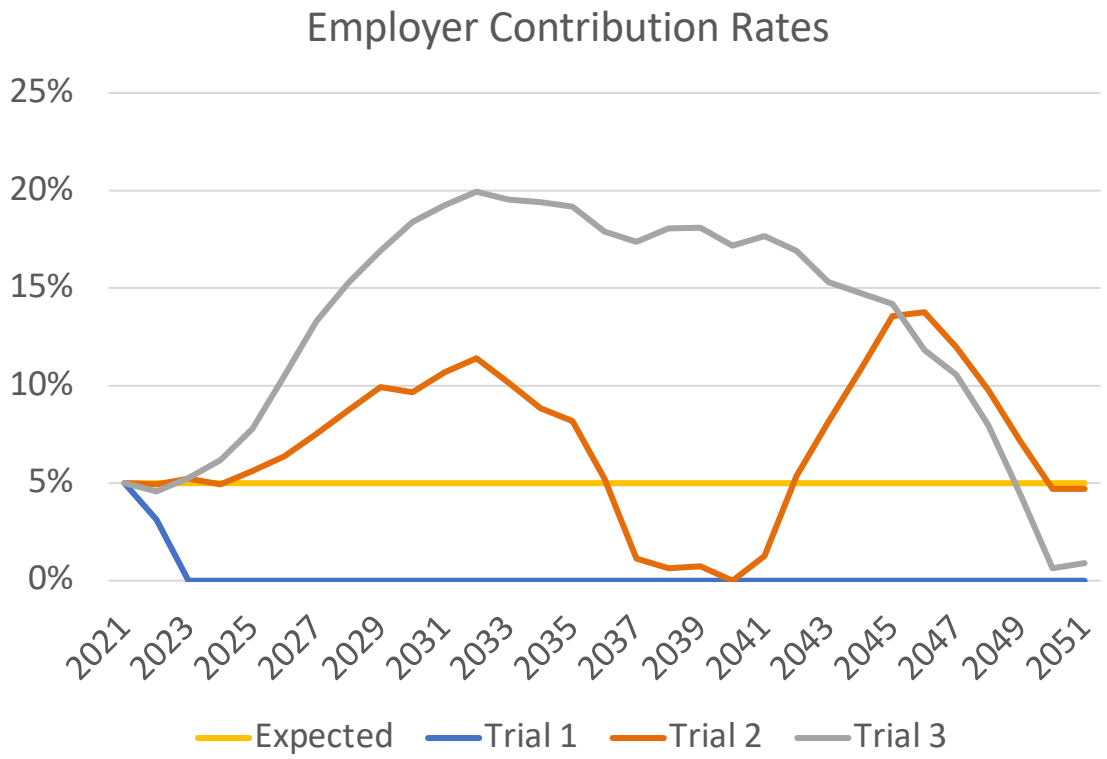
If everything meets expectations, typical plan funding will allow for stable employer costs.

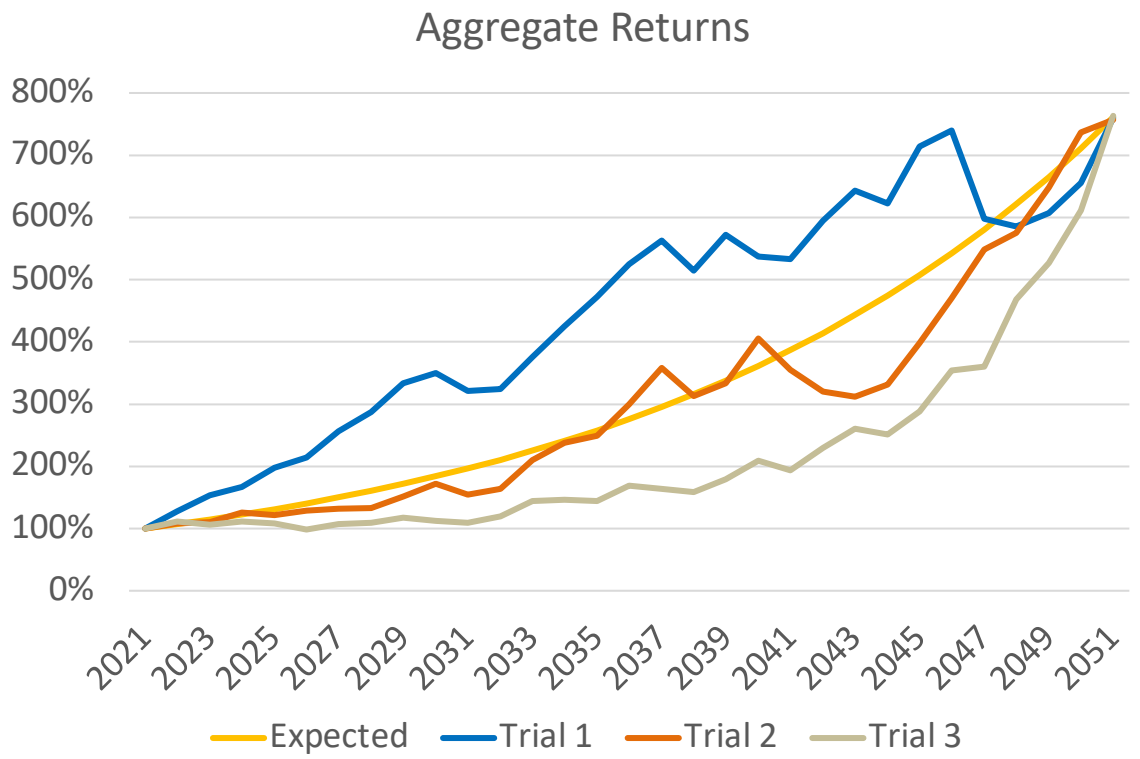




But not the unexpected

Standard actuarial funding practices can lead to unpredictable costs given the volatility of public pension plan investments.



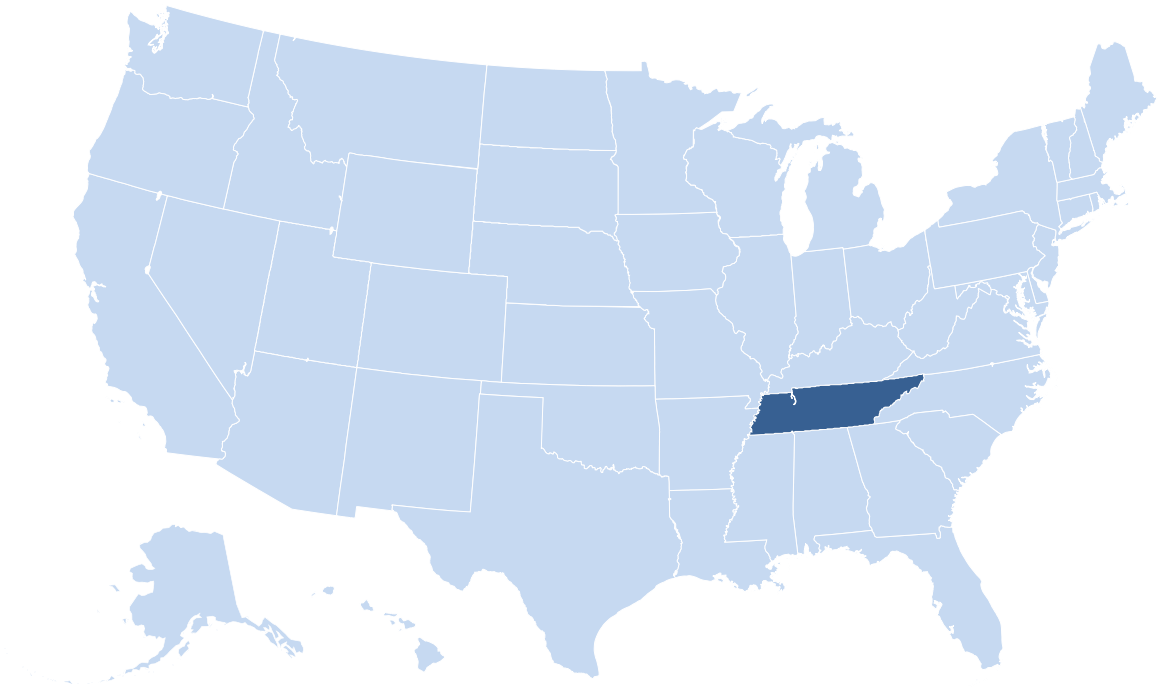


Using a reserve fund to stabilize funding

- The proposed funding policy builds on current actuarial best practices on funding by adding a reserve fund to stabilize employer contributions.
- When the plan is fully funded, the plan sponsor will contribute more than the employer normal cost, with the excess going into a reserve fund.
- When there is a downturn or actuarial shock, some or all of the increase in needed contributions will come from the reserve fund rather than from the plan sponsor.
- At no time does the plan receive less than the actuarial contribution rate from the plan sponsor and the reserve fund, preserving funding levels.
- The key tradeoff—higher employer contribution rates if everything goes as expected in exchange for greater predictability in the case of a downturn.

Tennessee's pension reserve fund

Following the Great Recession, Tennessee adopted a hybrid plan design for new hires. This plan would ensure predictable costs through the combination of a reserve fund, variable benefits, and by providing a portion of benefits through a DC account.



How the TN reserve fund works:

- Every participating employer will contribute 4% of payroll for the hybrid DB.
- The normal cost is projected to be below that—the excess goes to the reserve.
- If the actuarial contribution for the hybrid exceeds 4%, the reserve is used to pay for the difference.
- If the reserve is depleted, the variable benefit provisions apply.

Questions in designing a reserve fund?

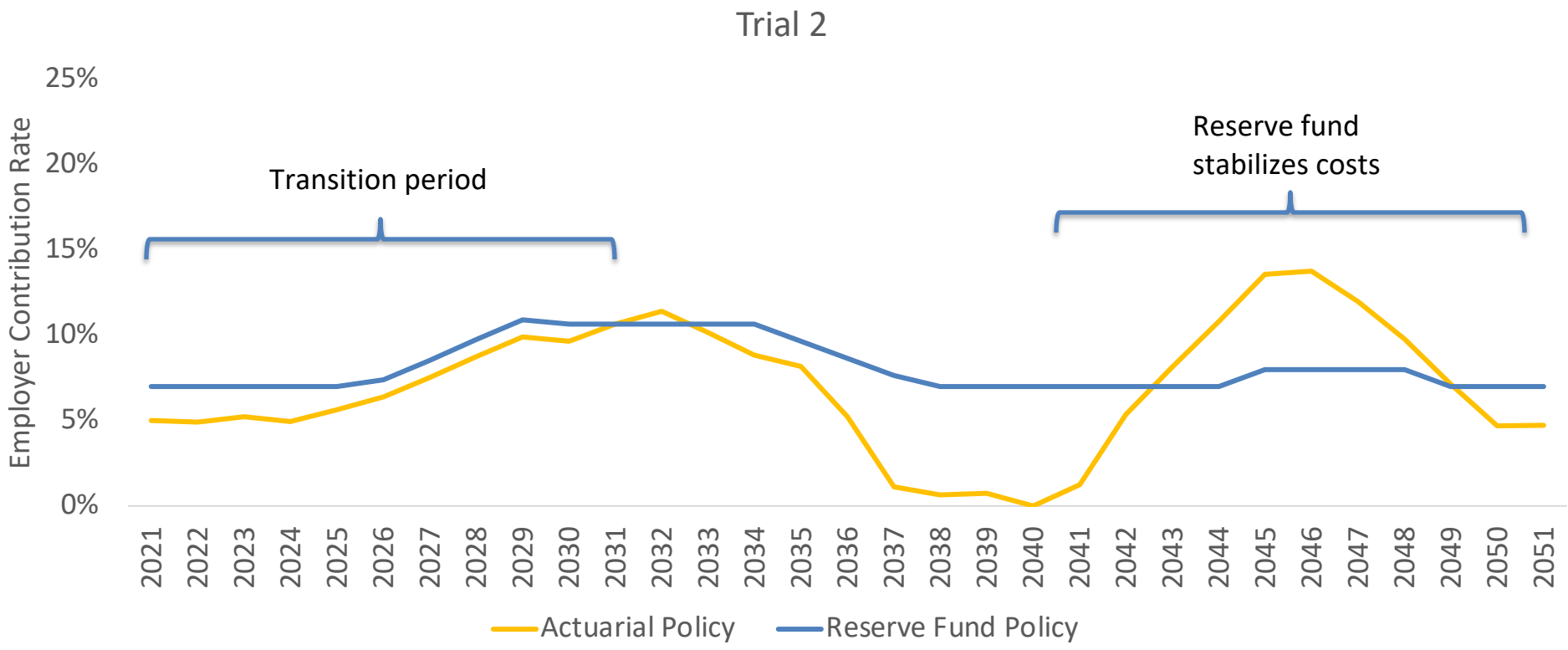
- How do you build up the reserve?
- How do you invest the reserve?
- When is the reserve fund sufficient to allow for predictable costs?
- How should the plan manage surpluses?
- Modeling volatility through stochastic analysis, which simulates the variability and uncertainty of investment markets, allows policymakers to find answers to these questions that fit the situation in their state or city.

Reserve Fund Stabilized Contribution Policy

- The plan will never receive less than the actuarial contribution and the employer will never pay less than the normal cost plus a buffer rate.
  - The buffer rate was set at 2% of payroll so the employer minimum contribution is 7% of payroll.
- To build up the reserve, the funding policy will have an initial transition period during which the employer will contribute the higher of the minimum contribution or the actuarial contribution plus 1% of payroll.
  - The transition period is set at 10 years.
- After the transition period, the goal is for the employer contribution rate to stay stable.
- If the actuarial rate rises above the current employer rate, the reserve fund will make up the full difference if the fund balance is sufficient, or a portion of the difference.
- If the current employer rate sufficiently exceeds the actuarial rate, it will decrease by 1%.

How it works

State pension plan balance sheets are dependent on investment market performance.



Results

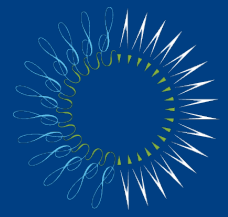
Applying stochastic analysis with 1,000 trials shows how a reserve fund policy can offer greater stability without dampening funded levels.

	Actuarial Contribution Policy Results					
	Returns	Average ERC	Share, contribution rate above 15%	Share, max annual increase above 4%	Share, no contribution increase after 10 years	Share, min funding below 60%
All trials	7.0%	6.3%	46%	17%	28%	32%
Median	6.9%	5.3%	38%	28%	18%	22%
25th percentile	5.5%	9.2%	82%	26%	0%	38%
10th percentile	4.2%	12.8%	100%	22%	0%	98%
75th percentile	8.4%	2.6%	16%	8%	50%	6%
	Reserve Fund Policy Results					
	Returns	Average ERC	Share, contribution rate above 15%	Share, max annual increase above 4%	Share, no contribution increase after 10 years	Share, min funding below 60%
All trials	7.0%	9.6%	36%	10%	64%	28%
Median	6.9%	8.5%	22%	6%	66%	16%
25th percentile	5.5%	10.5%	46%	10%	42%	28%
10th percentile	4.2%	13.2%	88%	26%	8%	82%
75th percentile	8.4%	7.7%	16%	2%	94%	6%

Percentile results show 50 trials clustered at the median, 25th percentile, 10th percentile, and 75th percentile

Key Takeaways

- Asking the right questions, learning from states, and analyzing volatility can help plans, plan sponsors, and stakeholders arrive at better funding policies.
- Using a reserve fund can stabilize contributions in the face of volatile investments or other shocks without sacrificing plan funding.
- The Reserve Fund Stabilized Contribution Policy offers an example of how to build on current actuarial best practices.



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Highlights of Other Contest Entries

- Two entries illustrated the effectiveness of the CCA Whitepaper model funding policies
- The CCA whitepaper outlines a Level Cost Allocation Model (LCAM) as the basis for sound funding policy
  - Entry Age cost method with a level percentage of pay normal cost
  - Smoothing of asset gains/losses based on total market return, average over not less than three years, with a corridor
  - Layered, fixed amortization period by source (level percent of pay)
    - Generally, 10 – 25 years for most sources
    - 5 years max for early retirement incentives
    - 30 years for surplus
    - Combine layers or restart to manage tail volatility

Highlights of Other Contest Entries

- One submission reviewed of the actual experience of a dozen county plans using the LCAM
  - 5-year asset smoothing, some with no corridor, others with less than maximum
  - 20-year layered (closed) amortization for gains/losses and assumption changes, 30-year rolling (open) amortization for surplus in excess of 20% of AAL
- Systems maintained or improved funded status over a 10-year period after assumptions changes to reflect lower expected returns and longer life expectancies
  - Our modeling shows that over a 30-year period the baseline funding policy achieves near 100% funding for the model pension plan

Highlights of Other Contest Entries

- Another submission added a twist to the basic LCAM
  - Base contribution rate (percentage of pay), plus
  - Supplemental contribution when ADEC exceeds the base contribution (fixed dollar)
- Core contribution was always more than the ADEC
  - High degree of stability
  - Expensive
- Achieves in excess of 100% funding over 30 years
- Concern about length of combined amortization + asset smoothing period

Highlights of Other Contest Entries

- Demographic-based funding strategy
  - Controls financial risk resulting from growth of the size of the plan that outpaces growth in revenues
  - Integrates funding and investment policy
    - Retirees – immunize liability and amortize any remaining shortfall over 10 years max
    - Actives – use traditional funding and investment policies; assets are the excess over the retiree liability valued using a discount rate based on asset allocation

Highlights of Other Contest Entries

- Final entry focuses on management of future cash flows with three main strategies employed
  1. Subtract contributions from benefit payments + expenses – assets fund net liabilities (similar to GASB Asset Exhaustion Test (AET))
  2. Calculate ROA based on the AET and not asset allocation
     - This determines what ROA will fully fund net liabilities
  3. Use a Beta portfolio of bonds to cash flow match net liabilities chronologically for the next 10 years
     - Provides liquidity to fund benefits and expenses
     - Allows Alpha, return-seeking portfolio to grow unencumbered, with dividend and income reinvestment

Questions?

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