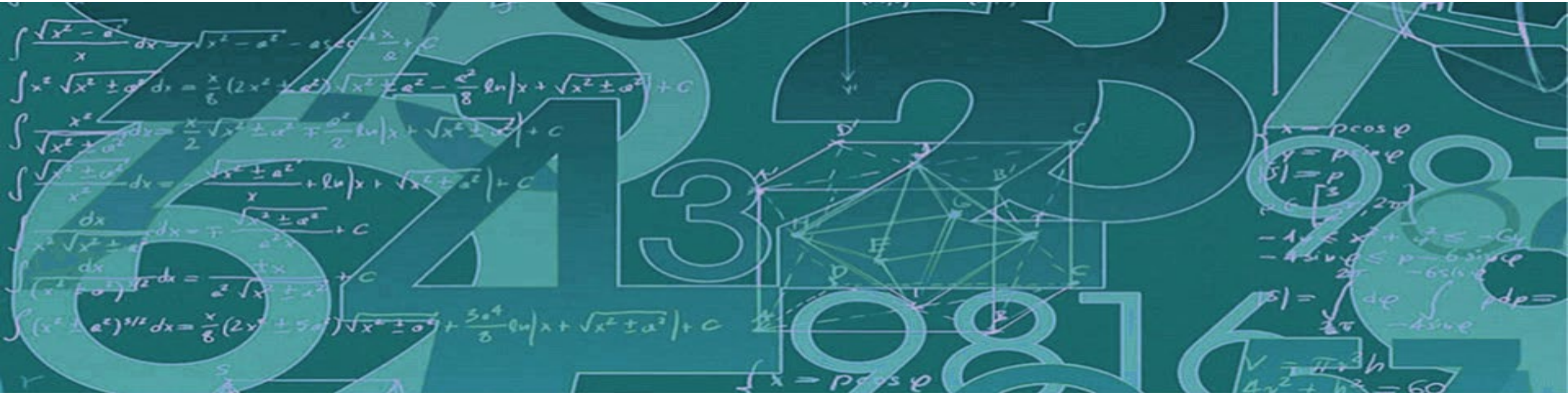


State Actuary's Recommendation on Long-Term Economic Assumptions

Presentation to: LEOFF Plan 2 Retirement Board

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Today's Presentation

- Background
 - What is the *Economic Experience Study*?
 - What does OSA consider when conducting this study?
- *2023 Economic Experience Study* Highlights
 - Key takeaways & state actuary's recommendations
 - No recommended change to the assumptions
 - Full report available on OSA's [website](#)
 - Appendix contains additional reference material

Economic Experience Study

Inflation



**Inform Future Regional COLA Expectations
Component for Other Assumptions**

General Salary Growth



**Project Wages to Determine Future Benefits
and Calculate Contribution Rates**

Investment Return



**Assumed Annual Return on Assets
Determine Present Value of Benefits and
Salaries**

Key Considerations

Purpose of Assumptions



Actuarial Funding Contribution Rates

Measurement Period



**About 20 years for Open Plans
About 8 years for Closed Plans**

Relevant Data



Forecasts for Future Vs. Historical Data

Actuarial Standards of Practice



Provides Guidance when Selecting or Recommending Assumptions

Professional Judgment

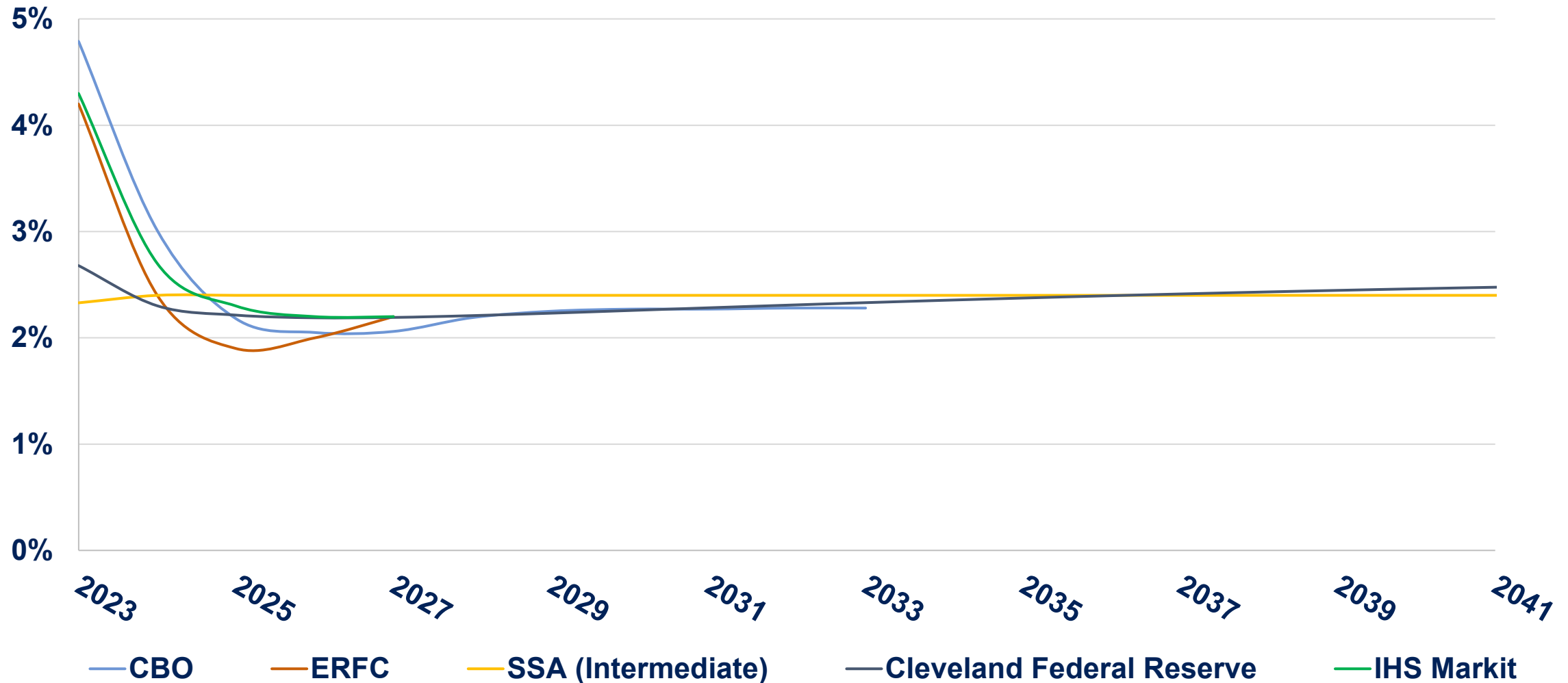


Based on Education and Experience

Inflation

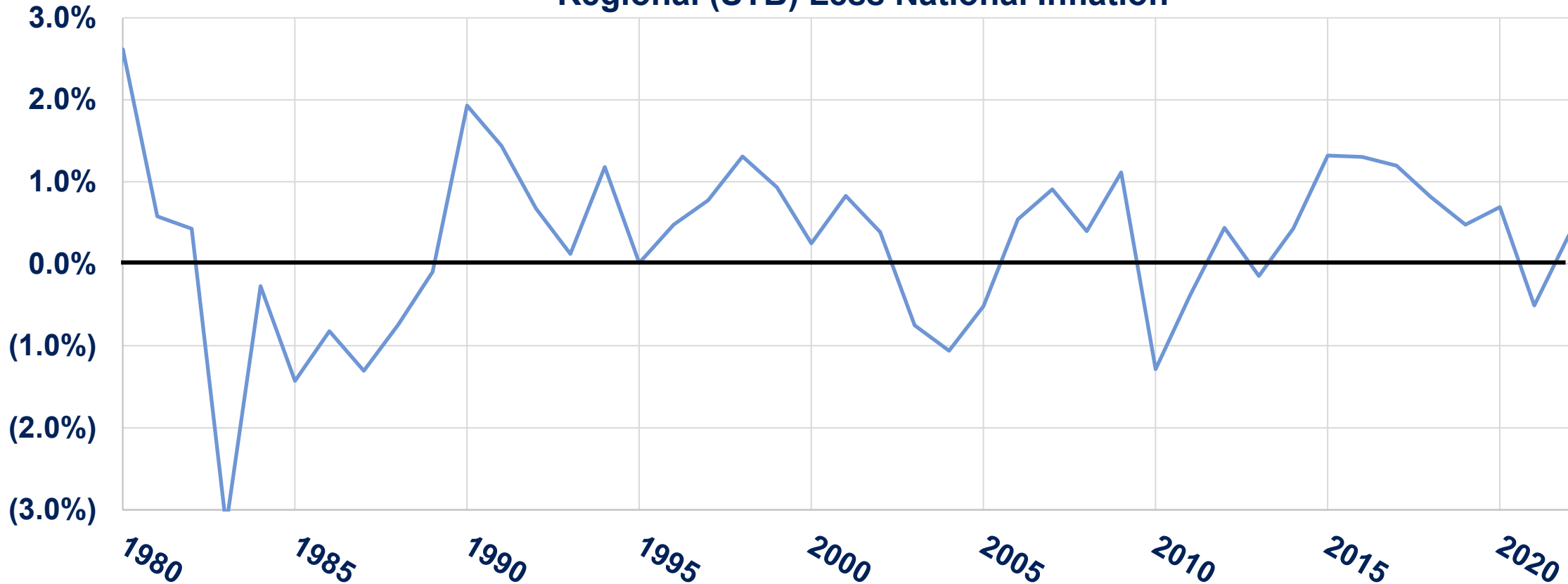
National Inflation Forecasts Are Elevated in the Short-Term but Closer to 2.3-2.5% in the Long-Term

National Inflation Forecasts



We Continue to Expect Regional Inflation to Outpace National Inflation

Regional (STB) Less National Inflation



■ Over the past 10, 15, 20, and 25 years, we observed annual average inflation differentials of 0.60%, 0.41%, 0.26%, and 0.36%, respectively

Inflation Considerations and Recommendation

- We expect national inflation to be 2.3-2.5% in the long-term
- We expect regional inflation to outpace national by 0.2-0.5%
- Federal Reserve remains committed to bringing down inflation
- Recently, we've experienced a decline in inflation
 - June 2023 national inflation was roughly 3%
- **Recommendation = 2.75% for all plans**
 - Matches current assumption
 - We did not observe significant differences in the inflation forecasts over open vs. closed plan durations

General Salary Growth

OSA Models Total Salary Growth with Economic and Demographic Assumptions

- Economic assumption = “General Salary Growth”
 - General Salary Growth equals Inflation plus Real Wage Growth
 - Constant assumption across all DRS plans
- Demographic assumption = “Service-Based Salary Growth”
 - Merit, longevity, and “step” salary increases
 - Varies by retirement system and service level
- Together, these assumptions model total expected salary growth
 - Economic assumption will be the focus of today’s presentation

We've Observed a Longer-Term Downward Trend in General Salary Growth with High Levels of Annual Volatility

Estimated General Salary Growth for Employees of DRS Open Plans

Last 10 years (2012-2021)	3.23%
Last 20 years (2002-2021)	3.41%
Last 30 years (1992-2021)	3.43%

- Can be influenced by economic or business cycles and more localized forces such as employee recruitment and retention, budgetary priorities, and collective bargaining agreements

National Forecasts Suggest Minimal Changes in Real Wage Growth Component

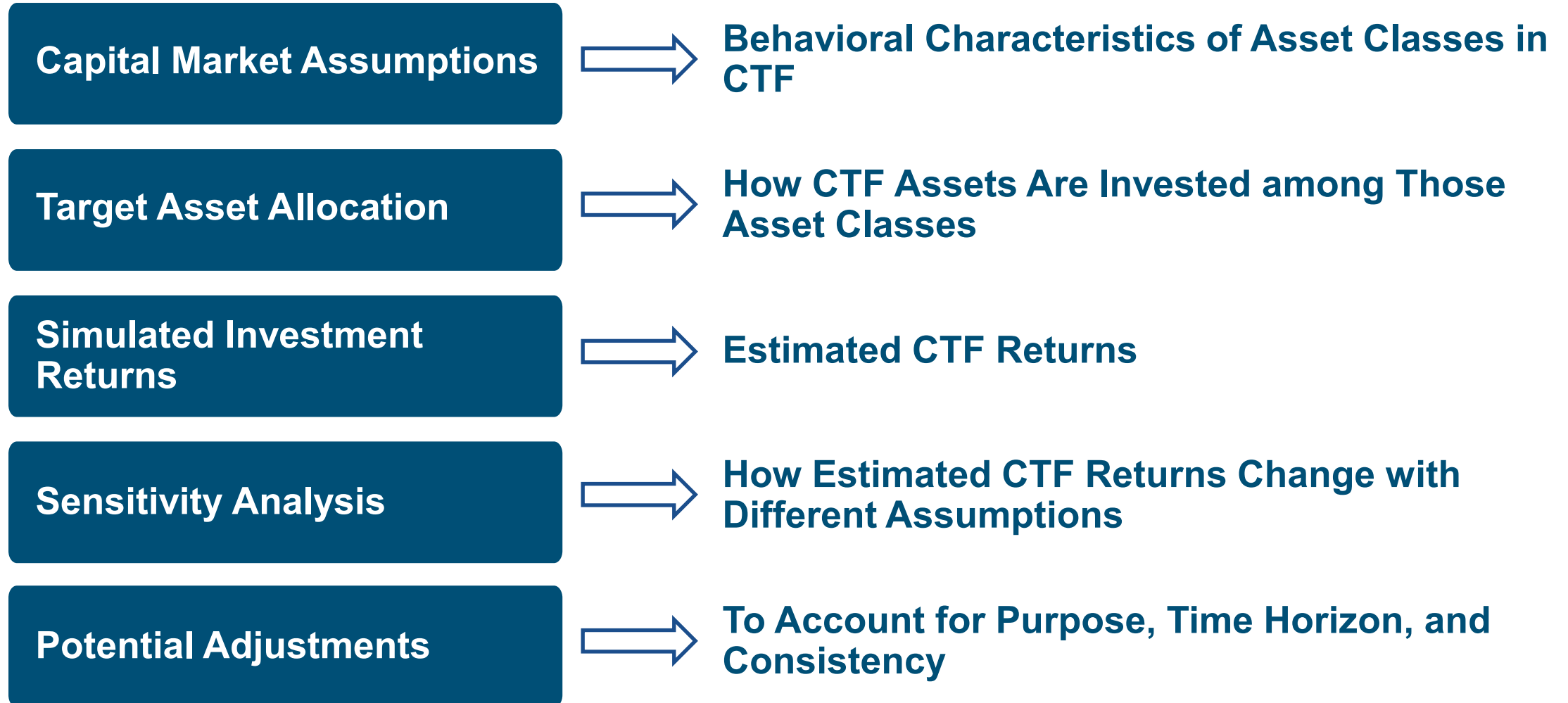
- General Salary Growth equals Inflation plus Real Wage Growth
 - Inflation was already covered
- We look at Real Wage Growth forecasts on a national level
 - Regional forecasts are not readily available
- We look at the change in forecasts rather than the values themselves
 - Forecasts rely on a broader definition of wages and can include benefits
 - Forecasts may include both economic and demographic sources
- Real Wage Growth forecasts have remained steady over the past 2-4 years

General Salary Growth Considerations and Recommendation

- We've observed a longer-term downward trend in General Salary Growth but forecasts for Real Wage Growth remain similar to two years ago
- Represents average annual salary growth over the measurement period
 - As we have done in the past, if we become aware of actual salary growth well above/below our long-term expectations, we can update our assumptions in a future actuarial valuation (e.g., known salary increases in a given year)
- **Recommendation = 3.25% for all plans**
 - Matches current assumption

Investment Return

Key Considerations When Selecting a Return Assumption



Capital Market Assumptions (CMAs)

- According to WSIB, CMAs are the cornerstone in the development of a strategic asset allocation strategy
- Represent the projected behavioral characteristics of asset classes
 - Risk (volatility)
 - Reward (return)
 - Relationship (correlation)
- WSIB CMAs developed for a 15-year time horizon

WSIB's CMAs Changed since Our Last Study

WSIB Capital Market Assumptions						
Asset Class	Expected 1-Year Return*			Standard Deviation		
	2023	2021	Difference	2023	2021	Difference
Global Equity	8.1%	8.1%	0.0%	19.0%	19.0%	0.0%
Tangible Assets	7.0%	6.9%	0.1%	12.0%	12.0%	0.0%
Fixed Income	4.6%	3.7%	0.9%	6.0%	6.0%	0.0%
Private Equity	11.1%	11.1%	0.0%	25.0%	25.0%	0.0%
Real Estate	7.3%	7.6%	(0.3%)	13.0%	13.0%	0.0%
Cash	2.5%	1.7%	0.8%	2.0%	1.5%	0.5%

*Reflects arithmetic returns. Geometric returns are lower but have the same difference between 2023 and 2021.

- One-year expected returns for Fixed Income and Cash are nearly 1% higher, but all other asset classes display modest to no change since our last study
- Except for Cash, no changes to expected standard deviation (or volatility)

WSIB's CTF Target Asset Allocation Changed Since Our Last Study

WSIB CTF Target Asset Allocation			
	2023 EES	2021 EES*	Difference
Global Equity	30%	32%	(2%)
Tangible Assets	8%	7%	1%
Fixed Income	19%	20%	(1%)
Private Equity	25%	23%	2%
Real Estate	18%	18%	0%
Cash	0%	0%	0%
Total	100%	100%	

**Report published prior to WSIB's October 2021 target asset allocation update.*

- Private Equity and Tangible Assets saw a small allocation increase; Global Equity and Fixed Income saw a small corresponding decrease since our last study
- A future change in the CTF asset allocation could lead to a different recommended return assumption in the future

WSIB's Simulated Returns for the CTF Increased Since Our Last Study

15-Year Simulated Annual Investment Returns*			
	2023	2021	Difference
70th Percentile	8.94%	8.81%	0.13%
60th Percentile	7.92%	7.83%	0.09%
Median Return	7.02%	6.89%	0.13%
40th Percentile	6.11%	5.94%	0.17%
30th Percentile	5.15%	4.98%	0.17%

**Displayed simulations rely on a downside log-stable distribution, which uses actual historical returns to inform the future distribution (and volatility) of more pessimistic return scenarios.*

- Simulations rely on CMAs and Target Asset Allocation
- Simulated returns are modestly higher than reported in our last study
 - 15-year median return increased by 13 basis points and is now close to 7.00%
 - Simulated median returns were 7.03% and 7.01% over a 10- and 25-year horizon, respectively

Simulated Returns Vary with Use of Different CMAs

OSA Estimated Median Return Sensitivity				
	Change in Private Equity Expected Return		Change in Global Equity Expected Return	
Base	-1%	+1%	-1%	+1%
7.0%	6.8%	7.3%	6.7%	7.3%

- OSA modeled how median CTF returns would change with a 1% decrease or increase in the expected 1-year return of Private Equities and Global Equities
 - These two asset classes comprise 55% of the asset allocation of the CTF and have the greatest return volatility

We Considered Adjustments to WSIB's Simulations

- Potential adjustments take into account investment factors such as
 - Inflation
 - Reversion of returns to their long-term mean values
 - Assumed premium of private equity over global equity returns
- Potential adjustments also take into account differences in how OSA and WSIB apply these assumptions
 - **Purpose** – Plan funding (OSA) vs. strategic asset allocation (WSIB)
 - **Time Horizon** – 8 to 20 years (OSA) vs. 15 years (WSIB)

Investment Return Considerations and Recommendation

- We view WSIB's simulated returns as reasonable and found our inflation assumptions to be consistent
 - We focused on the simulated median return for purposes of recommending a return assumption
- We considered adjustments to these simulations based on how OSA applies the Investment Return assumption
 - The adjustments we considered generally offset each other or were unnecessary
- **Recommendation = 7.00% for all plans**
 - Matches current assumption
 - We did not observe significant differences in simulated investment returns over open vs. closed plan durations

Summary of Long-Term Economic Assumptions

Assumption	Current	Recommended
Inflation	2.75%	2.75%
General Salary Growth	3.25%	3.25%
Investment Return	7.00%	7.00%

- 2023 recommendations reflect no change from 2021 recommendations or from currently prescribed assumptions
- We developed these assumptions as a consistent set of economic assumptions and recommend reviewing them as a set of assumptions

Questions?



Questions? Please Contact: The Office of the State Actuary

leg.wa.gov/OSA; state.actuary@leg.wa.gov

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Thank You



Appendix

- Other states' Economic Assumptions
- Historical Economic Assumptions for Washington State Pension Systems



Other States' Economic Assumptions

Economic Assumptions for Select Public Plans Outside Washington				
Plan Name	Inflation*	General Salary Growth	Investment Return	Date of Valuation
Washington 2023 EES Recommendations	2.75%	3.25%	7.00%	
Washington Currently Prescribed Assumptions	2.75%	3.25%	7.00%	
Alaska PERS & Teachers	2.50%	2.75%	7.25%	6/30/2022
California PERS	2.30%	2.80%	6.80%	6/30/2021
California Teachers	2.75%	3.50%	7.00%	6/30/2021
Colorado PERA	2.30%	3.00%	7.25%	12/31/2021
Florida Retirement System	2.40%	3.25%	6.70%	7/1/2022
Idaho PERS	2.30%	3.05%	6.30%	6/30/2022
Iowa PERS	2.60%	3.25%	7.00%	6/30/2022
Missouri State Employees	2.25%	2.75%	6.95%	6/30/2021
Ohio PERS	2.35%	2.75%	6.90%	12/31/2021
Oregon PERS	2.40%	3.40%	6.90%	12/31/2021
Wisconsin Retirement System	2.40%	3.00%	5.40%	12/31/2021
Selected Public Plans Outside WA – Average	2.41%	3.05%	6.77%	
Selected Public Plans Outside WA – Minimum	2.25%	2.75%	5.40%	
Selected Public Plans Outside WA – Maximum	2.75%	3.50%	7.25%	

Note: Data gathered from the National Association of State Retirement Administrators (NASRA) as of April 2023. This data reflects the assumptions prescribed by each plan, which may not match the actuary's recommended assumption. There may also be a timing lag between the date of valuation and when the assumptions were actually last studied.

**Selected public plans outside Washington primarily use a national inflation assumption rather than a regional assumption. We expect inflation in the Seattle-Tacoma-Bellevue region to be higher than the national average.*

Historical Economic Assumptions for Washington State Pension Systems

Historical Economic Assumptions for Washington State Pension Systems				
Valuation Years	Inflation	General Salary Growth	Investment Return	Membership Growth for Plan 1 Funding
1989 - 1994	5.00%	5.50%	7.50%	0.75% TRS 1.25% PERS
1995 - 1997	4.25%	5.00%	7.50%	0.90% TRS 1.25% PERS
1998 - 1999	3.50%	4.00%	7.50%	0.90% TRS 1.25% PERS
2000 - 2008	3.50%	4.50%	8.00%	0.90% TRS 1.25% PERS
2009 - 2010	3.50%	4.50% LEOFF 2 4.00% Other Plans	8.00%	0.90% TRS 1.25% PERS
2011 - 2012	3.00%	3.75%	7.5% LEOFF 2 7.9% Other Plans	0.80% TRS 0.95% PERS
2013 - 2014	3.00%	3.75%	7.5% LEOFF 2 7.8% Other Plans	0.80% TRS 0.95% PERS
2015	3.00%	3.75%	7.5% LEOFF 2 7.7% Other Plans	0.80% TRS 0.95% PERS
2016	3.00%	3.75%	7.5% LEOFF 2 7.7% Other Plans	1.25% TRS 0.95% PERS
2017 - 2020	2.75%	3.50%	7.4% LEOFF 2 7.5% Other Plans	1.25% TRS 0.95% PERS
2021 - 2022	2.75%	3.25%	7.00%	1.00% TRS/PERS

Note: Values represent prescribed assumptions, which may not necessarily match OSA's recommended assumptions.