



**RETIREMENT BOARD CALENDAR SHEET
Retirement Board Meeting of January 13, 2020**

To: Retirement Board

Through: Jay Huish 
Executive Director

From: Janet Brazelton
Actuarial Services Coordinator

Date: January 13, 2020

Agenda Item:

2020 Review of Economic Assumptions: Discount Rate (continued discussion)

Background:

The Retirement Board reviews the long-term economic assumptions annually in accordance with its Monitoring and Reporting Policy. Cheiron presented the 2020 Economic Assumptions Review at the Board's December 9, 2020 meeting. At that meeting, the Board adopted new demographic assumptions and also adopted new price and wage inflation assumptions. The selection of the discount rate was continued.

Assumption	7/1/2019	Proposed 7/1/2020	Adopted 7/1/2020
Discount Rate	7.40%	7.30% to 7.40%	Under Discussion
Price Inflation	2.75%	2.50%	2.50%
Wage Inflation	3.50%	3.25%	3.25%

Recommendation/Action:

Adopt a discount rate of 7.40% or a lower discount rate for the July 1, 2020 actuarial funding valuation.

Attachments: Cheiron's presentation of Economic and Demographic Assumptions dated December 9, 2020

San Francisco Employees' Retirement System



Economic and Demographic Assumptions

December 9, 2020

Bill Hallmark, ASA, EA, FCA, MAAA

Anne Harper, FSA, EA, MAAA

Agenda



Background

Economic Assumptions

- Price Inflation
- Wage Inflation
- Amortization Payment Growth Rate
- Discount Rate

Demographic Assumptions

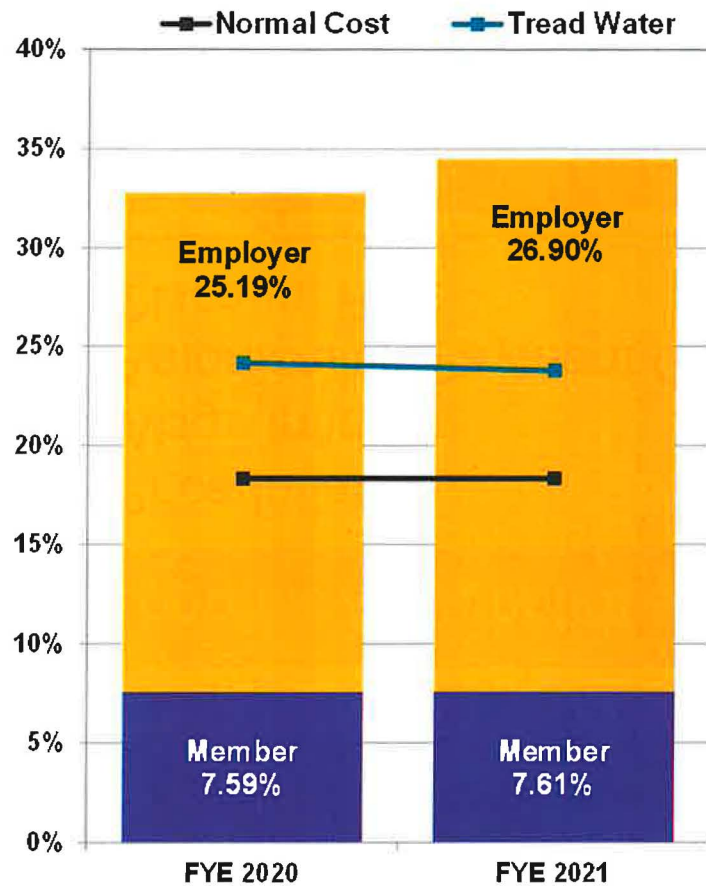
- Review Experience Study Results

Board Decisions

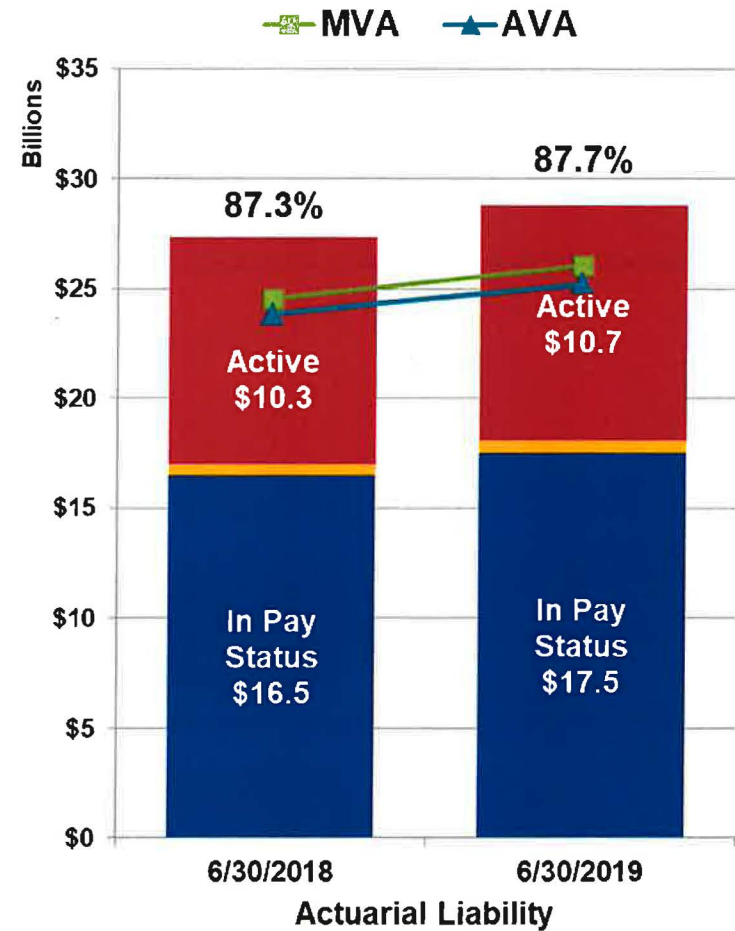
Background – 2019 Valuation Results



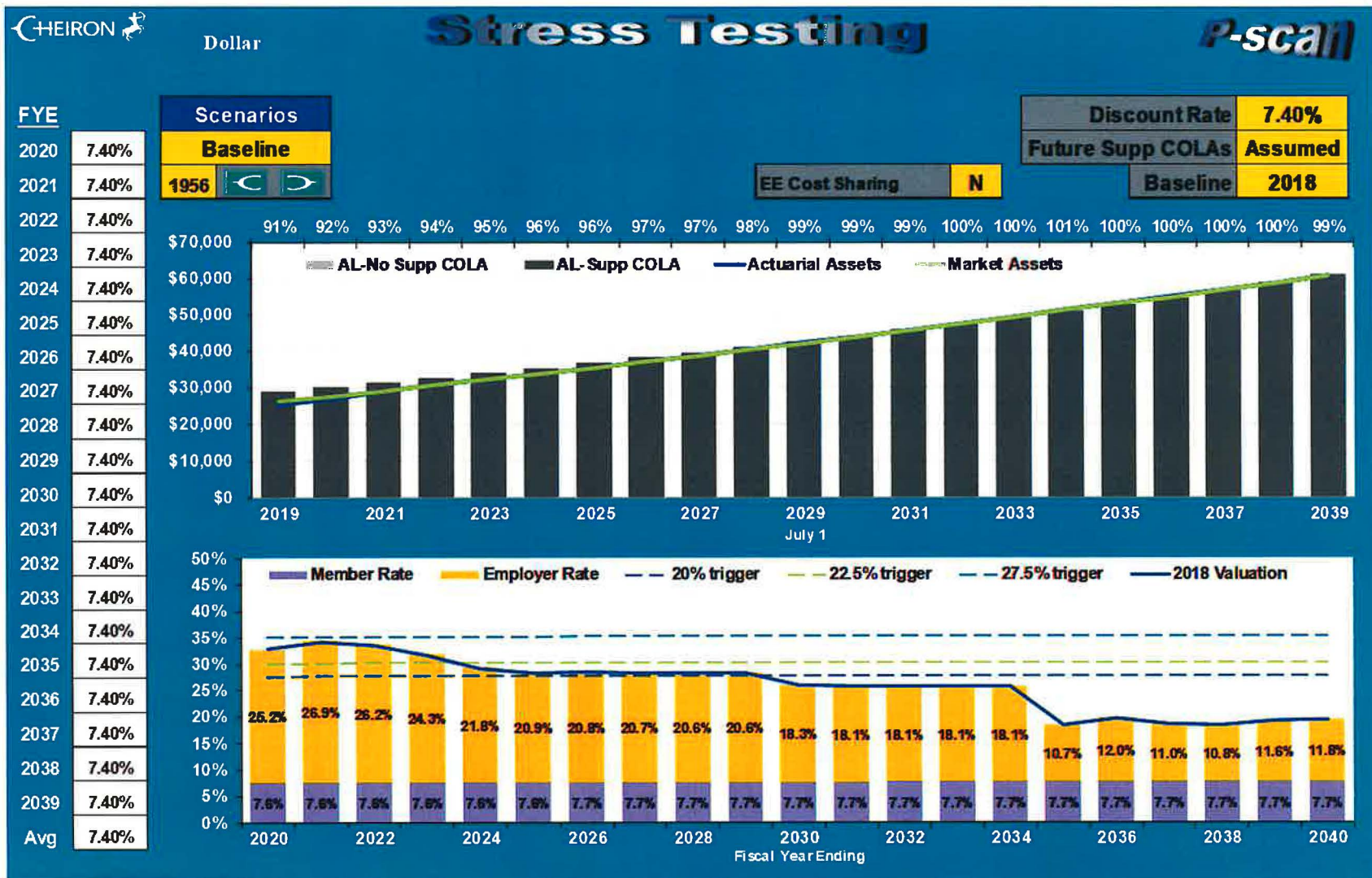
**Contribution Rates
(Before Cost-Sharing)**



AVA Funded Status



Background – 2019 Projections



December 9, 2020

Background



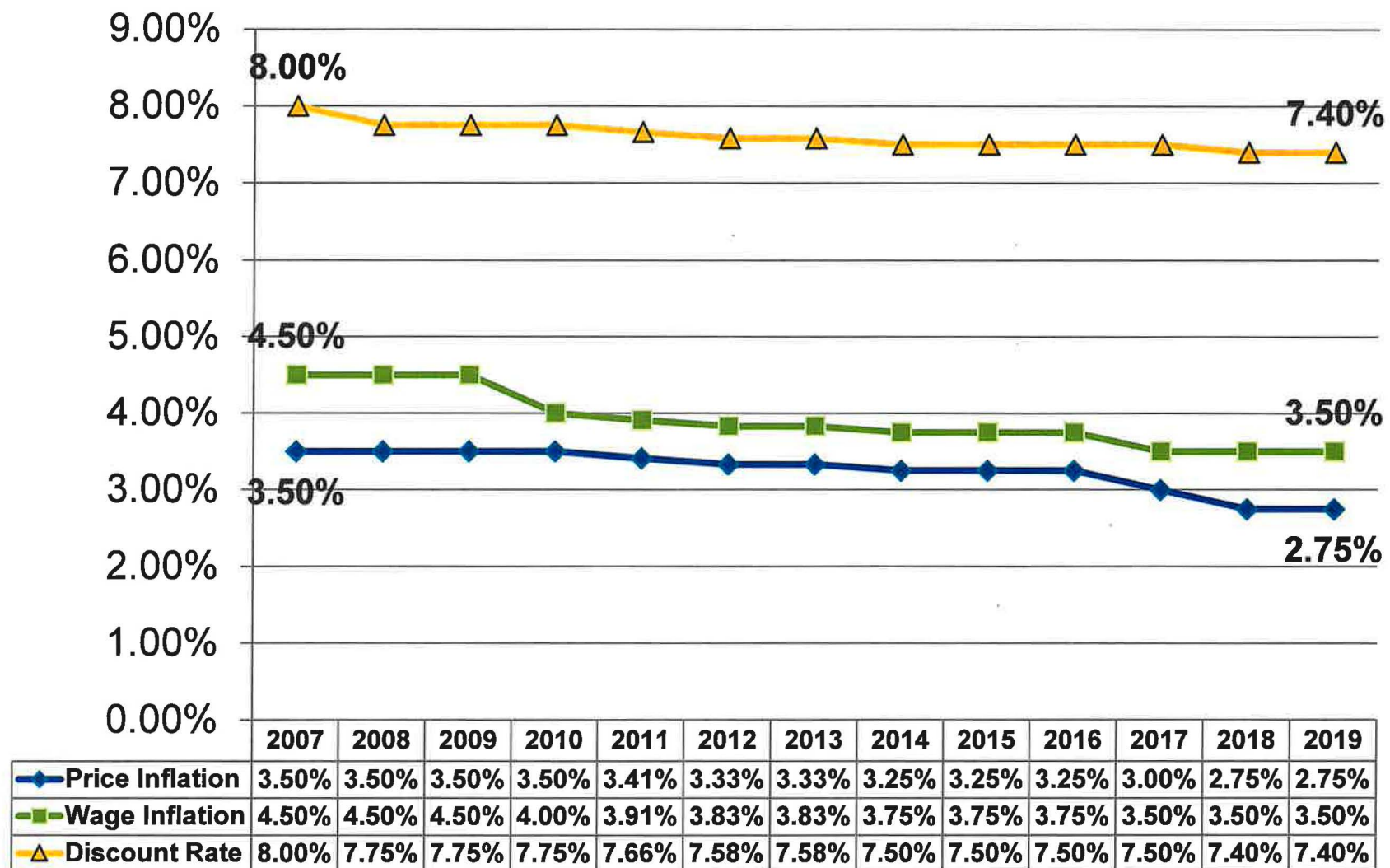
- Economic assumptions are reviewed every year
- Demographic experience study performed every five years
 - Presented at August Board meeting
 - Recommended changes had minimal impact
- The assumptions adopted based on this review will be used in the 2020 actuarial valuation to develop contribution rates for FYE 2022
- The primary purpose of this analysis is to evaluate if the current economic assumptions adequately reflect the short and long-term expectations for SFERS

Economic Assumptions Studied



- **Price Inflation** – used directly to project cost-of-living adjustments for pensioners (capped at 2% for most) and indirectly as an underlying component of other economic assumptions
- **Wage Inflation** – across the board wage growth used to project benefits
- **Amortization Payment Growth Rate** – annual increase in payments on the Unfunded Actuarial Liability
- **Discount Rate** – used both to project long-term asset growth and to discount future benefit cash flows in measuring the liability and determining contribution rates for the System

Historical Economic Assumptions



Summary of Recommendations



- Reduce price inflation from 2.75% to 2.50%
- Reduce ultimate wage inflation from 3.50% to 3.25%
 - Recognize actual bargained increases over next few years
- Set amortization payment growth assumption equal to ultimate wage inflation of 3.25%
- Consider alternative discount rates
 - 7.4%
 - 7.3%
- Adopt demographic assumptions presented in August



Economic Assumptions

- Price Inflation

Price Inflation – Overview

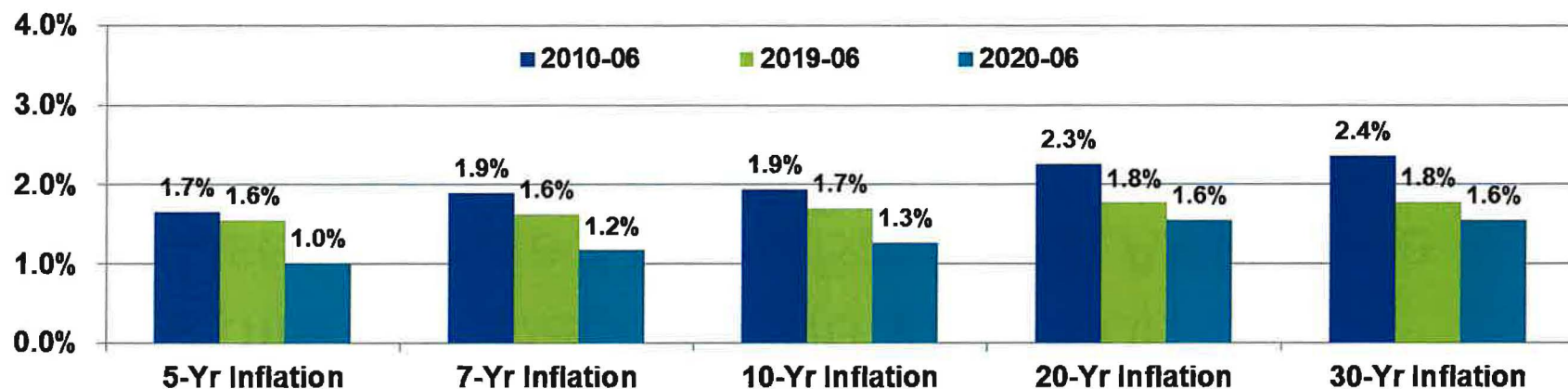


- Price inflation is the foundation for all economic assumptions
 - $\text{Wage inflation} = \text{Price inflation} + \text{Real wage growth}$
 - $\text{Expected return} = \text{Price inflation} + \text{Real return}$
- Current price inflation assumption = 2.75%
- No direct impact on the valuation
 - Used to project future Basic COLAs that are based on CPI-U (San Francisco) and capped at 2.0%
 - As long as price inflation assumption is above 2.0%, it has no direct impact on the valuation results

Break Even Inflation



Break-Even Inflation

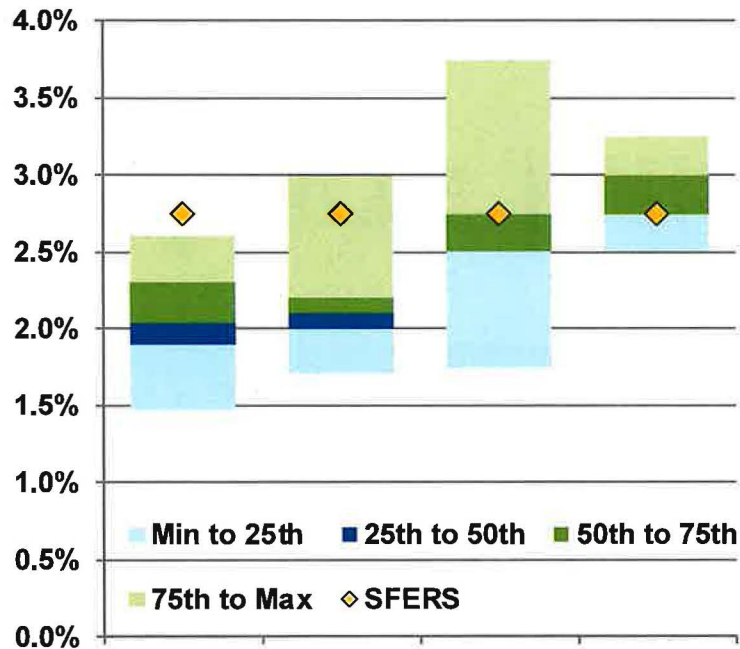


- Break-even inflation represents a consensus expectation of future inflation by investors
 - Calculated as yield on Treasury securities minus yield on Treasury Inflation Protection Securities (TIPS) of the same maturity
 - June 2020 expectations range from 1.0% to 1.6%

Price Inflation Forecasts



Survey of CPI Assumptions



	Q3 2020 Economic Forecasters	2020 Horizon Survey	2019 Public Plan Database	2019 California Survey
Minimum	1.46%	1.70%	1.75%	2.50%
25th	1.90%	2.00%	2.50%	2.75%
50th	2.03%	2.10%	2.50%	2.75%
75th	2.30%	2.20%	2.75%	3.00%
Maximum	2.60%	3.00%	3.75%	3.25%

- Economists and investment consultants
 - 75% of economists forecasts are 2.3% or lower
 - 75% of investment consultants forecasts are 2.2% or lower
- Public plan assumptions:
 - National median = 2.50%
 - California median = 2.75%
- NEPC Assumptions
 - 1.7% over 10 years
 - 2.4% over 30 years
- Federal Reserve Policy
 - Unofficial target is 2.0%
- Consider reducing the current assumption from 2.75% to 2.50%



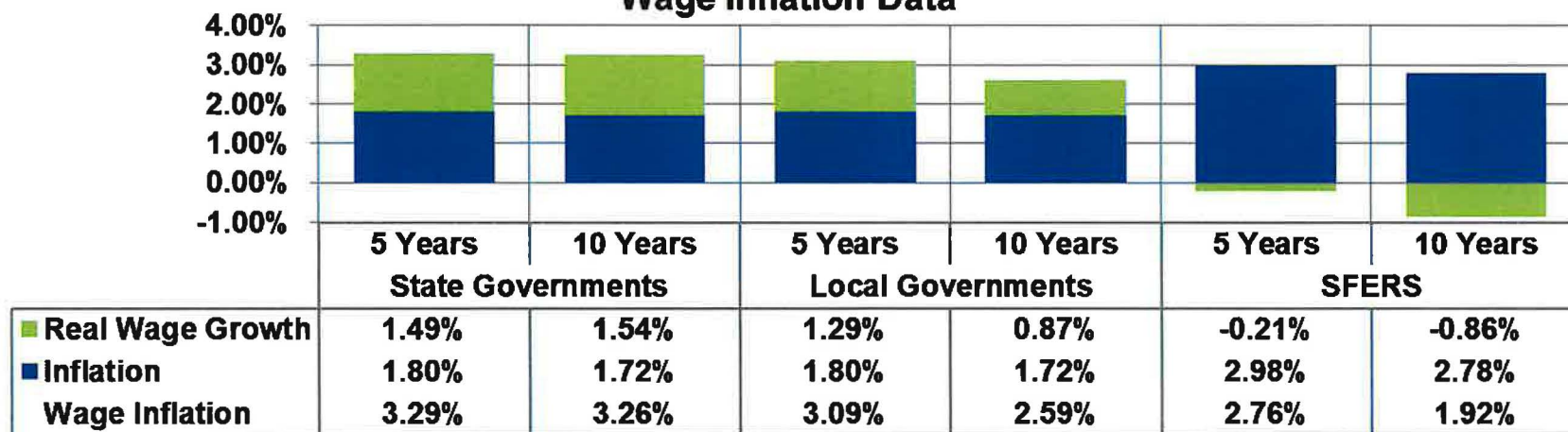
Economic Assumptions

- Wage Inflation

Wage Inflation

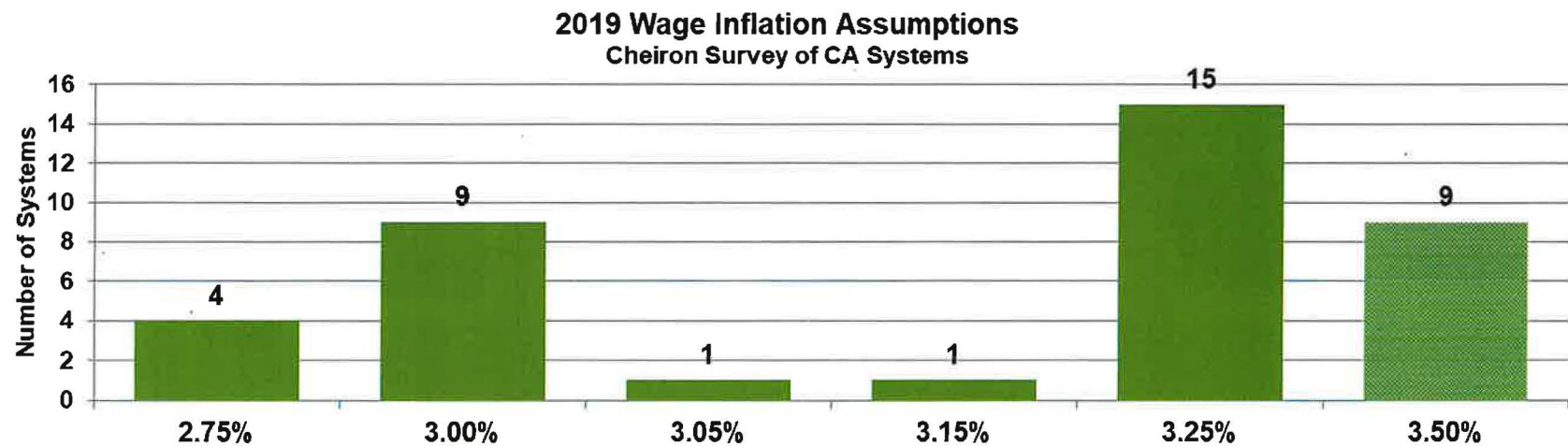
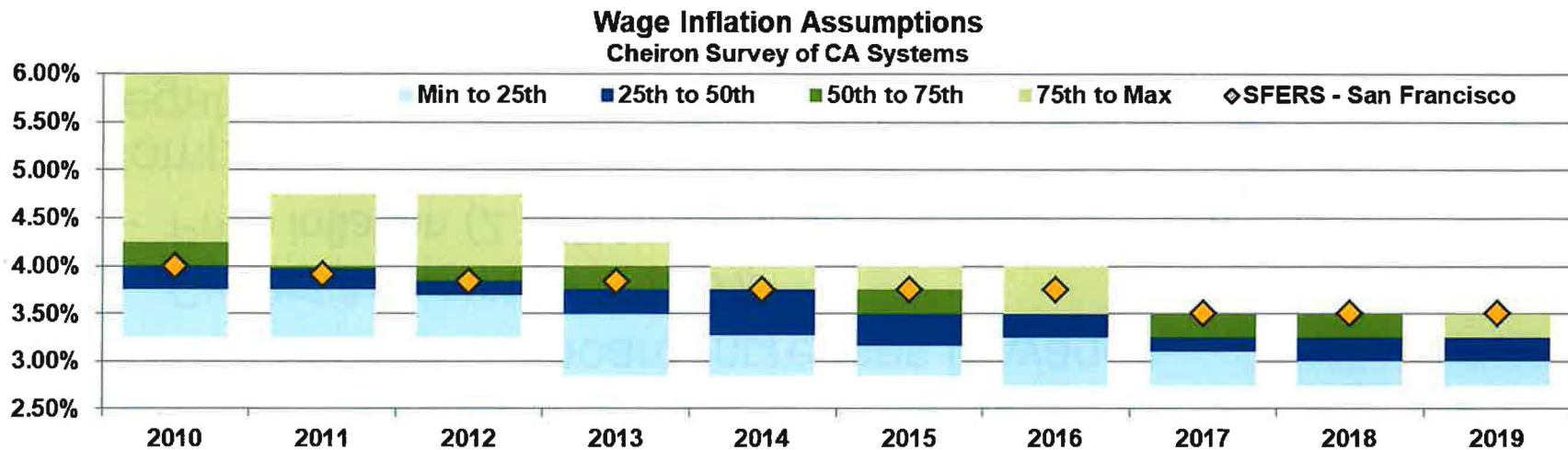


Wage Inflation Data



- Annual across-the-board increases in wages
 - Current Assumption = 3.50%
 - Price inflation (2.75%) + Real wage growth (0.75%)
- Compared to Bay Area inflation, SFERS has experienced negative real wage growth over the last 5 and 10-year periods
 - Bay area inflation has been over 1% higher than national inflation during this period

Wage Inflation – CA Trends



Wage Inflation – MOUs



Bargained Wage Increases as of September 28, 2020

	Miscellaneous	Fire	Police
December 26, 2020	3.0%	0.0%	0.0%
June 30, 2021	0.5%	0.0%	0.0%
July 1, 2021		3.0%	3.0%
June 30, 2022		1.0%	2.0%
July 1, 2022		3.0%	3.0%
June 30, 2023		2.0%	1.0%

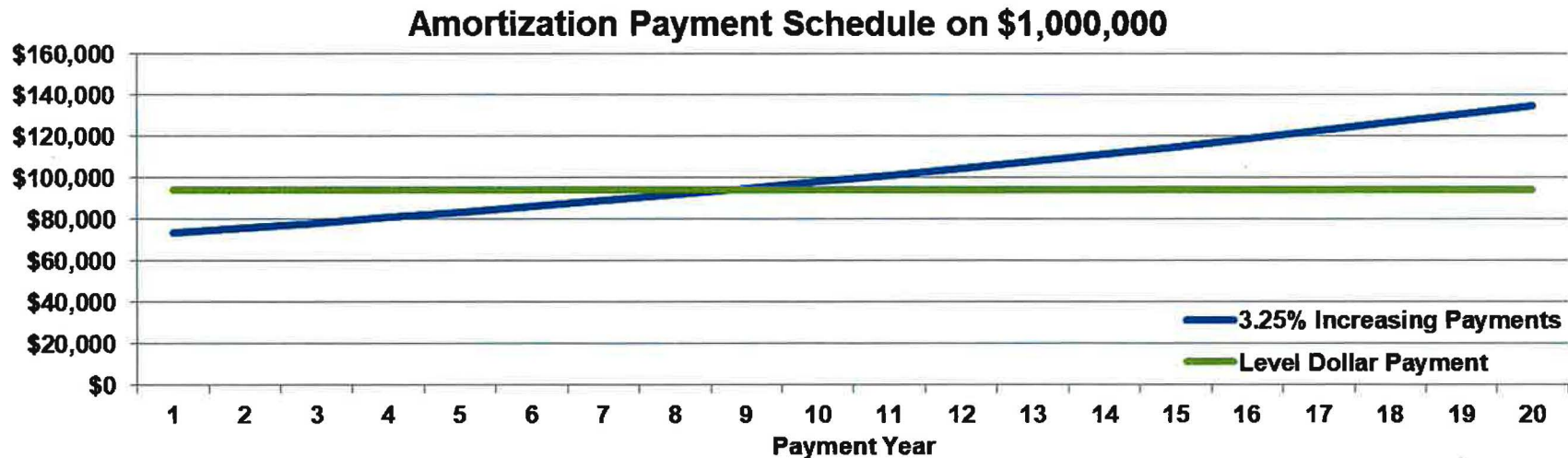
- We propose changing the wage inflation to reflect the actual bargaining agreements for the first few years and reducing the ultimate wage inflation to 3.25%
 - Use ultimate wage inflation for July 1, 2023 to June 30, 2024 of 3.25% instead of 2.0% for Fire and 1.0% for Police since those are deferred wage increases and new agreements could subsequently be added in the future
- Retirement Restoration for members retiring, receive up to 12 months back pay of wage deferrals (shown in red font) for FYE 2021
 - Fire: 3.0% originally due on December 26, 2020
 - Police: 2.0% originally due on December 26, 2020 and 1.0% due on June 30, 2021



Economic Assumptions

- Amortization Payment Growth Rate

Amortization Payment Growth Rate



- Prior valuations = wage inflation
 - Payments are expected to be a level percentage of payroll
- Can range from 0% (level dollar) to wage inflation
- Since wage inflation is not a fixed percentage in the first few years, propose to set amortization payment growth rate equal to ultimate wage inflation = 3.25%



Economic Assumptions

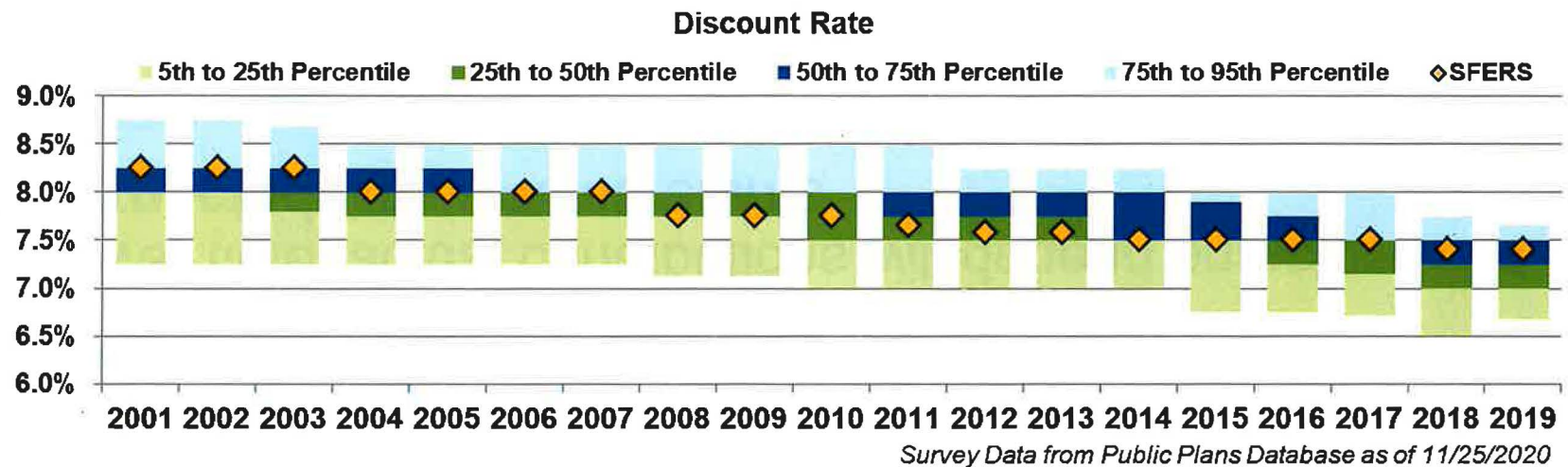
- Discount Rate

Discount Rate – Overview



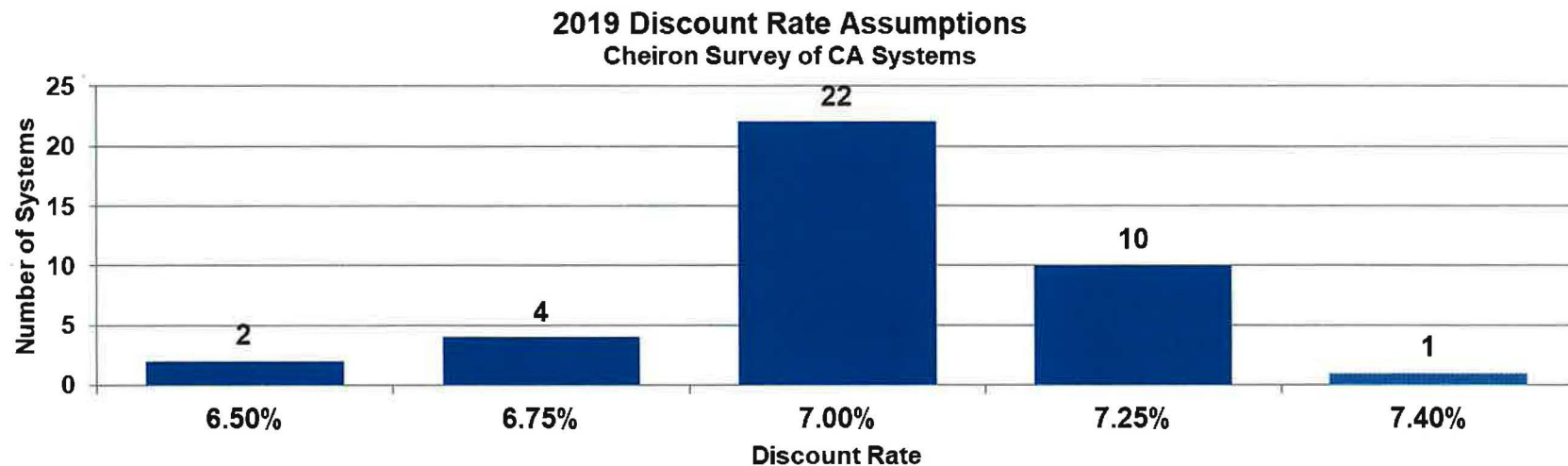
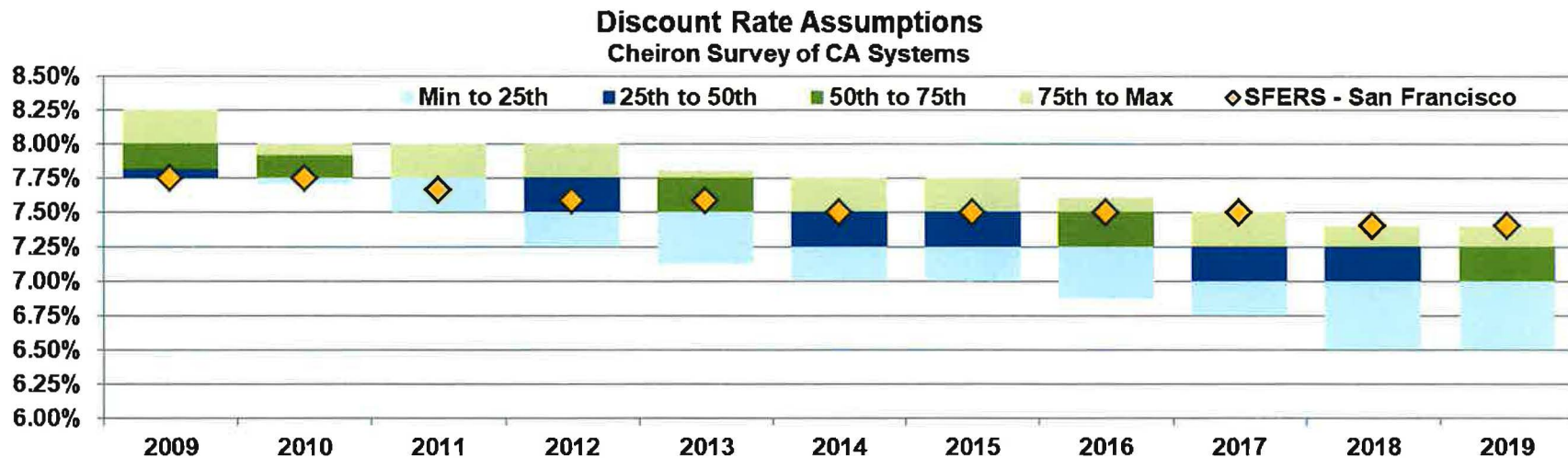
- Most powerful single assumption
 - Higher expected return → Lower expected contributions
 - An aggressive assumption increases the likelihood that future contributions will be higher than expected
 - A conservative assumption increases the likelihood that future contributions will be lower than expected
- For valuations that are used to develop the contributions necessary to fund the benefits over time, the discount rate is based on the expected return on assets
- Over time, actual contributions will depend on actual, **not expected**, investment returns
- Current assumption = 7.40%
 - Spread over price inflation assumption = 4.65%
 - Spread over wage inflation assumption = 3.90%

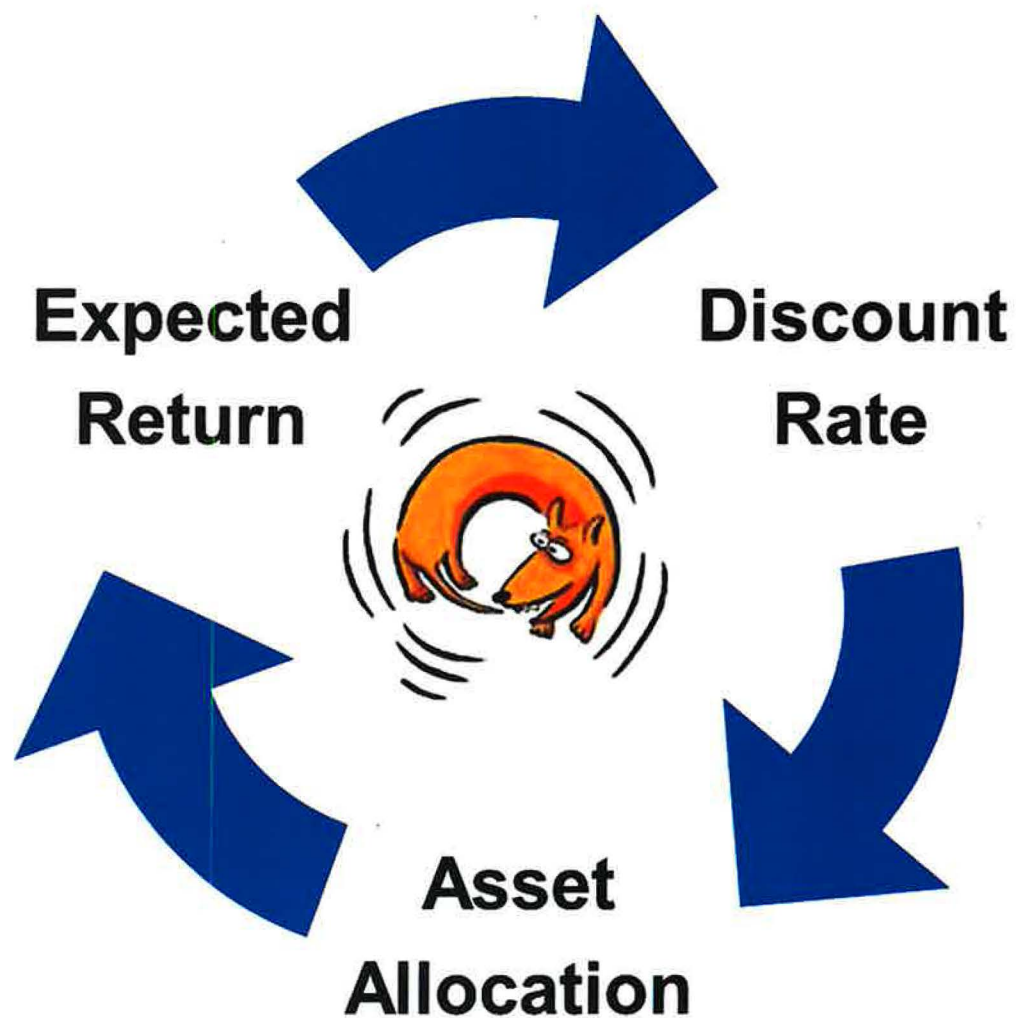
Discount Rate – National Trends



- Public plans nationally continue to lower their discount rates
- From 2004 through 2017, SFERS' discount rate was at or below the median nationally
- In 2018 and 2019, the median discount rate was 7.30%, 10 basis points lower than SFERS assumption

Discount Rate – CA Trends



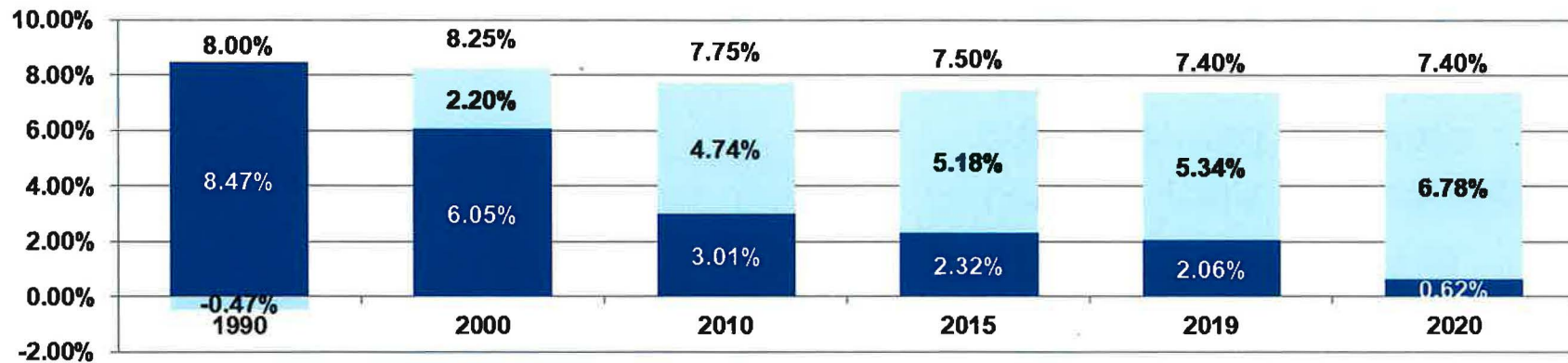


Historical Assumptions and Asset Allocation

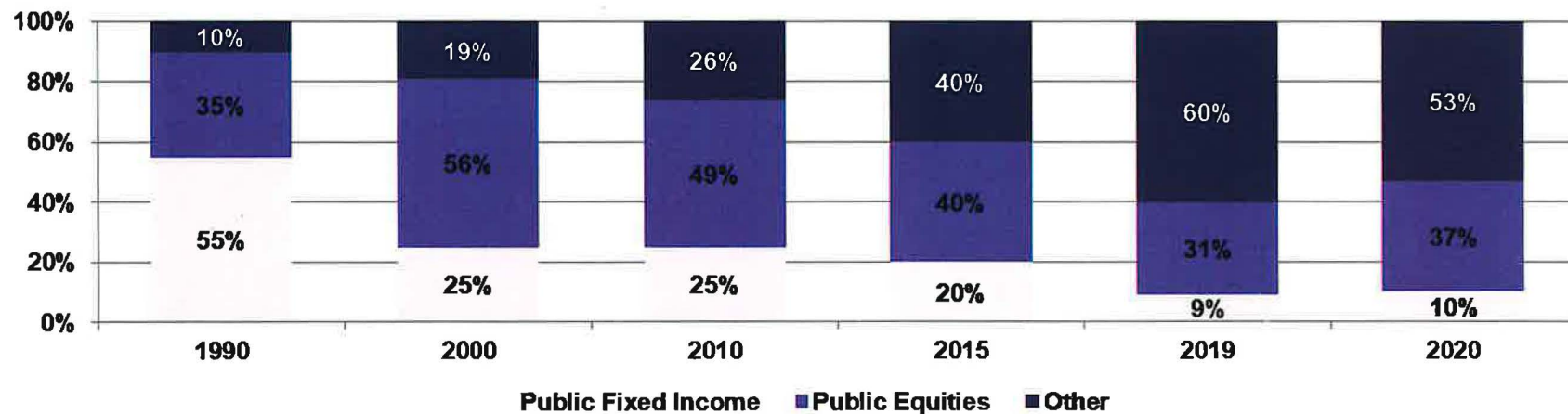


SFERS Valuation Assumptions

■ 10-Yr Treasury Yield ■ Risk Premium



SFERS Asset Allocation



Expected Return on Assets



Expected Distribution of Average Annual Passive Returns

Time Horizon

Percentile 10 Years 30 Years

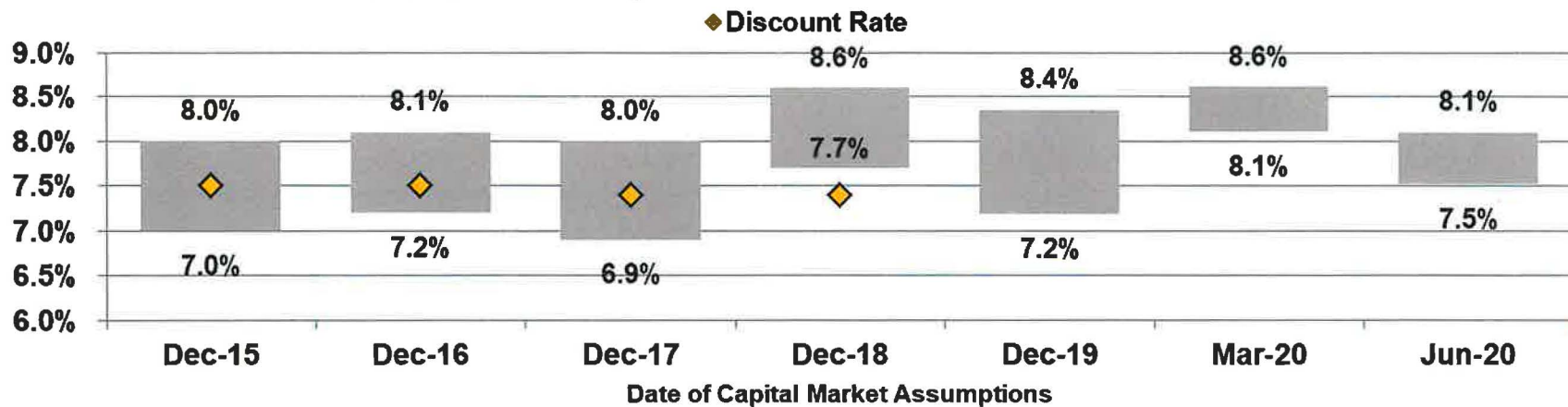
95th	15.6%	12.7%
75th	10.8%	10.0%
60th	8.7%	8.8%
55th	8.1%	8.4%
50th	7.5%	8.1%
45th	6.9%	7.8%
40th	6.3%	7.4%
25th	4.4%	6.3%
5th	0.0%	3.7%

- Based on NEPC's capital market assumptions, we calculated the distribution of expected returns over 10 and 30-year periods
- These assumptions support the current discount rate of 7.4%
 - Greater than 50% chance over the next 10 years
 - 45% chance of return of 6.9% or lower over next 10 years

Capital Market Assumption Volatility



10 to 30-Year NEPC Expected Return on Assets vs. Discount Rate



- Capital market assumptions change as market conditions change
- Discount rate should be adjusted to reflect long-term trends, but shouldn't overreact to short-term fluctuations

Comparison to Other Consultants



Expected Return Comparison		
Consultant	Time Horizon	
	5 - 10 Years	20 - 30 Years
BlackRock	7.1%	7.6%
BNY Mellon	5.6%	
Callan	7.4%	
JP Morgan	6.1%	
Meketa	6.6%	7.5%
Northern Trust	5.8%	
Verus	7.1%	7.1%
Average	6.5%	7.4%
NEPC	7.5%	8.1%
Ave. w/ NEPC	6.6%	7.6%

- Asset classes aren't always a perfect match
- Used NEPC's assumptions when no reasonable match available
- Most significant differences in assumptions appear to be with Private Equity
 - Other consultants don't publish private equity assumptions in the four sub classes NEPC uses
 - May result in different weighting of sub classes

Discount Rate Conclusions



- Current discount rate of 7.4%
 - Remains reasonable
 - Higher than national median and highest in California
- Future outlook is “extraordinarily uncertain”
 - Pandemic
 - Budget constraints
 - Market returns
- Consider alternatives
 - 7.4%
 - 7.3%



Demographic Assumptions

Demographic Assumption Changes



Assumption	Primary Proposed Demographic Assumption Changes	Estimated Change in Contribution Rate
Merit Salary Increases	<ul style="list-style-type: none"> Increased Miscellaneous merit scale Decreased safety merit scale 	0.07%
Old Safety COLAs	<ul style="list-style-type: none"> Decrease assumption for all Charters 	-0.24%
Retirement	<ul style="list-style-type: none"> Extended Miscellaneous rates to age 75 	-0.25%
Mortality	<ul style="list-style-type: none"> Updated base tables to Pub-2010 (General and Safety) Updated projection scale to MP-2019 	0.42%
Termination / Refund	<ul style="list-style-type: none"> Reduced termination rates for Misc. members with over 10 years of service and for Fire members; Increase rates for Police members with less than 10 years of service Reduced refund rates 	0.11%
Family Composition	<ul style="list-style-type: none"> Reduced age difference for female spouses from 4 to 3 Reduced male safety marriage assumption from 85% to 80% 	-0.13%
Disability	<ul style="list-style-type: none"> Generally, slight reductions in disability rates More significant reductions for Fire 	-0.07%
Total		-0.09%

December 9, 2020



Board Decisions

- **Economic Assumptions**
 - Price Inflation
 - Wage Inflation
 - Amortization Payment Growth Rate
 - Discount Rate
- **Demographic Assumptions**

Estimated Impacts of Potential Changes



Employer Rate (before cost-sharing)

FYE 2021 Employer Rate (2019 valuation)	26.9%
Expected FYE 2022 Employer Rate (All assumptions met, including 7.4% return and 50% Supplemental COLA)	26.2%
Estimated Impacts of Changes	
Actual contributions, benefit payments and earnings through June 30, 2020	0.0%
Proposed demographic assumption changes	-0.1%
Proposed price inflation, wage inflation, and amortization payment increase assumptions	-0.7%
Estimated FYE 2022 Employer Rate at 7.4% discount rate	25.4%
Alternative reduction in discount rate to 7.3%	+1.0%
Estimated FYE 2022 Employer Rate at 7.3% discount rate	26.4%

Estimates are based on 2019 valuation results and do not include the impact of demographic experience since July 1, 2019

Summary of Recommendations



- Demographic assumptions
 - Adopt proposed changes presented in August
- Price Inflation
 - Reduce price inflation from 2.75% to 2.50%
- Wage Inflation
 - Reduce ultimate wage inflation from 3.50% to 3.25%
 - Recognize actual bargained increases over next few years
- Amortization Payment Growth Rate
 - Set amortization payment growth rate equal to ultimate wage inflation of 3.25%
- Discount Rate
 - Current assumption of 7.4% is still reasonable
 - Consider reducing discount rate to 7.3%

Certification



- The purpose of this presentation is to review the economic assumptions to be used in the July 1, 2020 valuation for the City and County of San Francisco Employees' Retirement System.
- In preparing our presentation, we relied on information (some oral and some written) supplied by the Retirement System.
- Cheiron utilizes ProVal actuarial valuation software leased from Winklevoss Technologies (WinTech) to calculate liabilities and project benefit payments. We have relied on WinTech as the developer of ProVal. We have a basic understanding of ProVal and have used ProVal in accordance with its original intended purpose. We have not identified any material inconsistencies in assumptions or output of ProVal that would affect this valuation.
- Expected returns for the portfolio are calculated using internal software. We relied on Cheiron colleagues to develop this software. We have a basic understanding of the software and have reviewed the output for any material inconsistencies.
- This presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.
- This presentation was prepared exclusively for the City and County of San Francisco Employees' Retirement System for the purpose described herein. This presentation is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

William R. Hallmark, ASA, EA, FCA, MAAA
Consulting Actuary

Anne D. Harper, FSA, EA, MAAA
Principal Consulting Actuary

December 9, 2020



Classic Values, Innovative Advice



Classic Values, Innovative Advice.

Cheiron (pronounced kī·ron), the immortal centaur from Greek mythology, broke away from the pack and was educated by the gods. Cheiron became a mentor to classical Greek heroes, then sacrificed his immortality and was awarded in eternity as the constellation Sagittarius.



Classic Values, Innovative Advice

December 9, 2020

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