

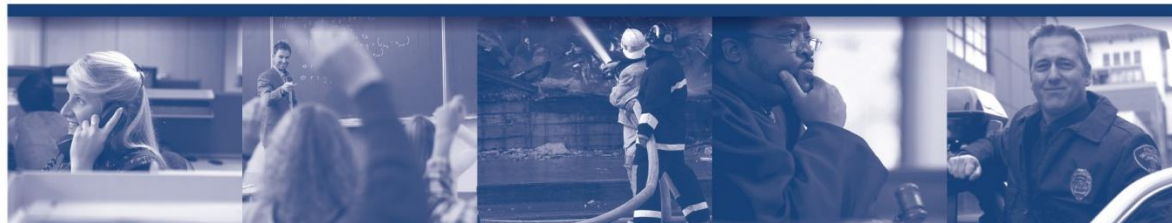


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# Iowa Peace Officers' Retirement System Review of Economic Assumptions

**Presented By: Pat Beckham**  
**March 23, 2020**





# Today's Discussion

- Background on Assumptions
  - Importance and implications of selected assumptions
  - Types of assumptions: economic and demographic
  
- Review of demographic assumptions will be done after July 1, 2021 valuation is completed (regular five year cycle)
  
- Today – discuss economic assumptions
  - Analysis and Findings
  - Recommendations
  - Board action, if appropriate



# Importance of Assumptions

- Valuations are a best estimate of the current value of all future benefit payments
- Payments are dependent on a number of contingent events that are unknown
- Actuaries use assumptions to help answer questions as to the amount, commencement, and duration of benefit payments in the future
- Different assumptions create different valuation results – sometimes significantly so. Assumptions used are a critical part of the actuarial process.



# Purpose of Experience Study

- Provides basis for developing recommended assumptions to be used in the actuarial valuation
  - Performed on periodic basis, generally every five years
  - Last POR study for economic assumptions was in 2016
  
- Actuarial Standards of Practice Numbers 27 (ASOP 27) provides guidance to actuary on the best practices for analysis
  - Each assumption should be the “best estimate”
  - Credentialed actuaries must follow ASOPs
  
- Actuary’s role is to make recommendations to Board for each assumption
  - Board’s role, as fiduciaries, is to adopt all, none or some of the actuary’s recommendations

# Selection of Assumptions



## What Are They?

### Economic

- Price Inflation
- Investment Return
- Wage Inflation
- COLA/Escalator
- Interest Crediting Rate on Contributions
- Covered Payroll Growth

### Demographic

- Retirement
- Promotional/Step Pay Increases
- Disability
- Termination
- Mortality

## Who Selects Them?

### Economic

- Board
- Actuary
- Other Advisors

### Demographic

- Board Approves
- Mostly Actuary since data driven

# Actuarial Assumptions



- Choice of assumptions impacts the funded ratio, unfunded actuarial liability, and the employer actuarial contribution rate
- Assumptions do not affect the actual benefit payments paid from the trust – the true cost of the System
- Different assumptions create different cost patterns over time. We generally shoot for middle ground, trying not to be overly conservative or aggressive
- Valuation process is self-correcting as it captures actual experience to date every year

# Actuarial Standards of Practice (ASOP)



- Issued by the Actuarial Standards Board
- *ASOP 27: Selection of Economic Assumptions for Measuring Pension Obligations*
- Provides guidance to actuaries in the selection of assumptions used in valuing pension benefits
  - Not prescriptive
  - More about the process and data to consider
- Credentialed actuaries, like POR's consulting actuary, must follow ASOPs

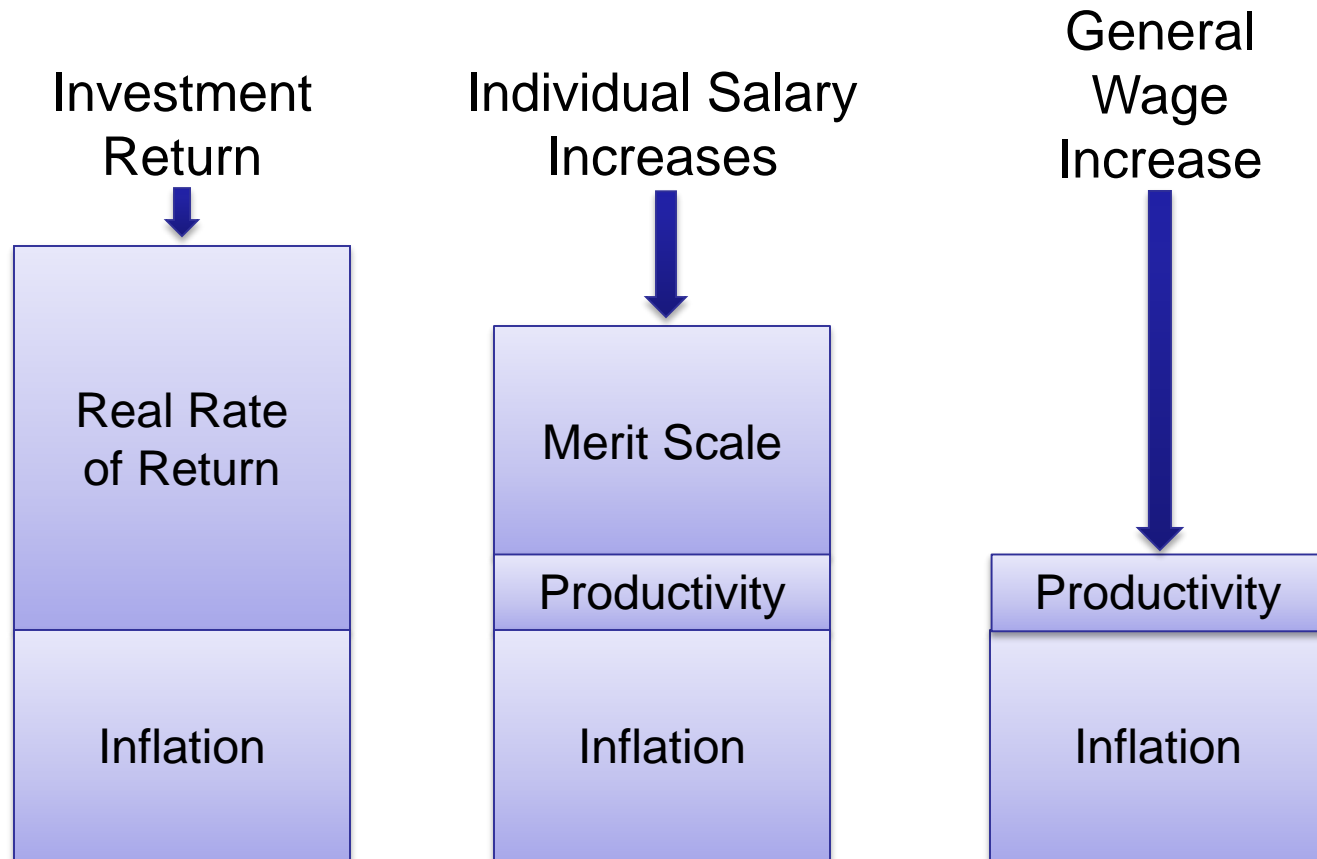
# Review of Actuarial Standard of Practice Number 27



- Recommendation for each economic assumption is for a “reasonable assumption”
  - Appropriate for purpose of measurement
  - Reflects actuary’s professional judgment
  - Takes into account historical and current economic data that is relevant
  - Reflects actuary’s estimate of future experience, observation of estimates inherent in market data, or combination
  - No significant bias (not significantly optimistic or pessimistic)
  - Permissible to include some conservatism for adverse deviation



# Economic Assumptions Building Block Method



Note: inflation assumption and productivity must be consistent in all assumptions.



# Inflation Assumption

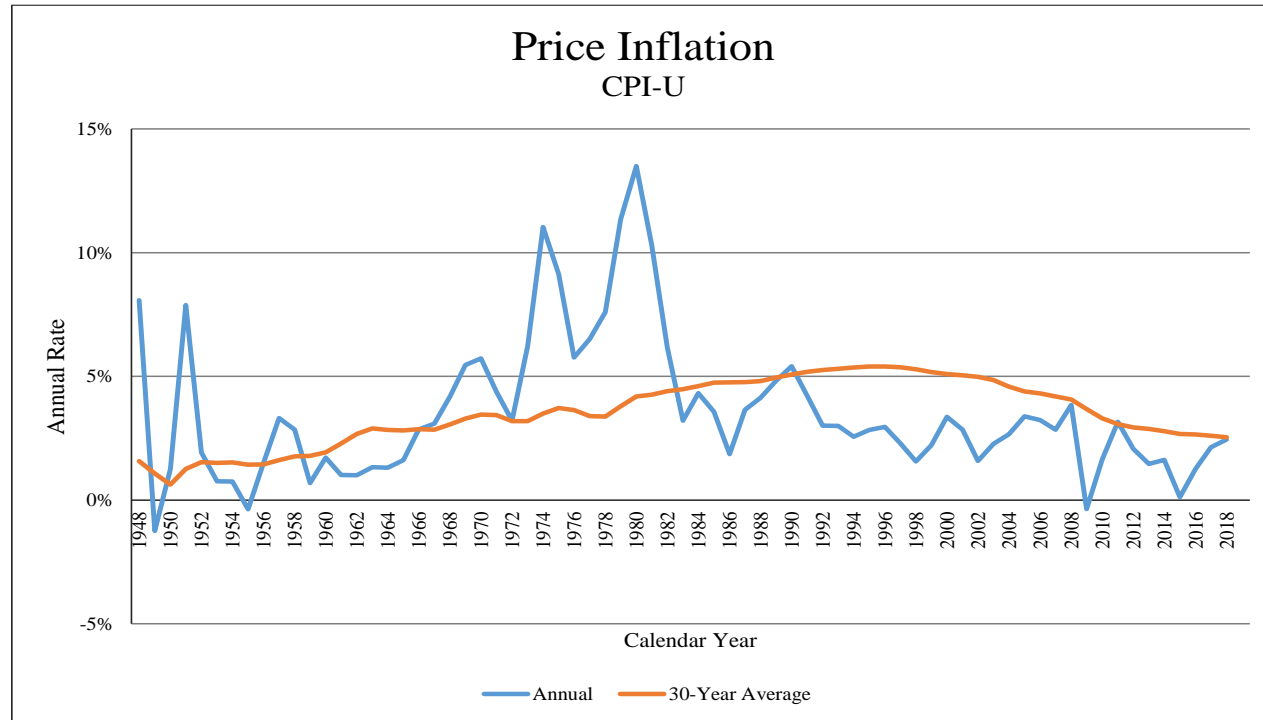
- Price inflation represents annual increase in cost of living, measured by the Consumer Price Index (CPI)
- Current assumption is 2.75% (reduced from 3.00% in last study)
- Indirectly impacts the valuation as a component of other economic assumptions
  - Investment return
  - General wage increase/individual salary increase
  - Post-retirement benefit escalator
  - Payroll growth for amortization of unfunded actuarial liability

# Inflation Assumption



- Considerations for setting the assumption
  - Historical inflation
  - Market expectations
  - Social Security and other professionals' expectations
  - Peer group/other public plans

# Historical Inflation (measured from 12/31/19)



Period	Inflation		Period	Inflation
93 Years	2.91%		30 Years	2.44%
60 Years	3.69%		20 Years	2.16%
50 Years	3.96%		10 Years	1.77%
40 Years	3.20%			

# Future Inflation Expectations



## ➤ Current market expectations

- Federal Reserve targeting 2% inflation
- Financial markets: “breakeven rate of inflation” is difference between yields on fixed coupon Treasury bonds and inflation-protected Treasuries (TIPS)

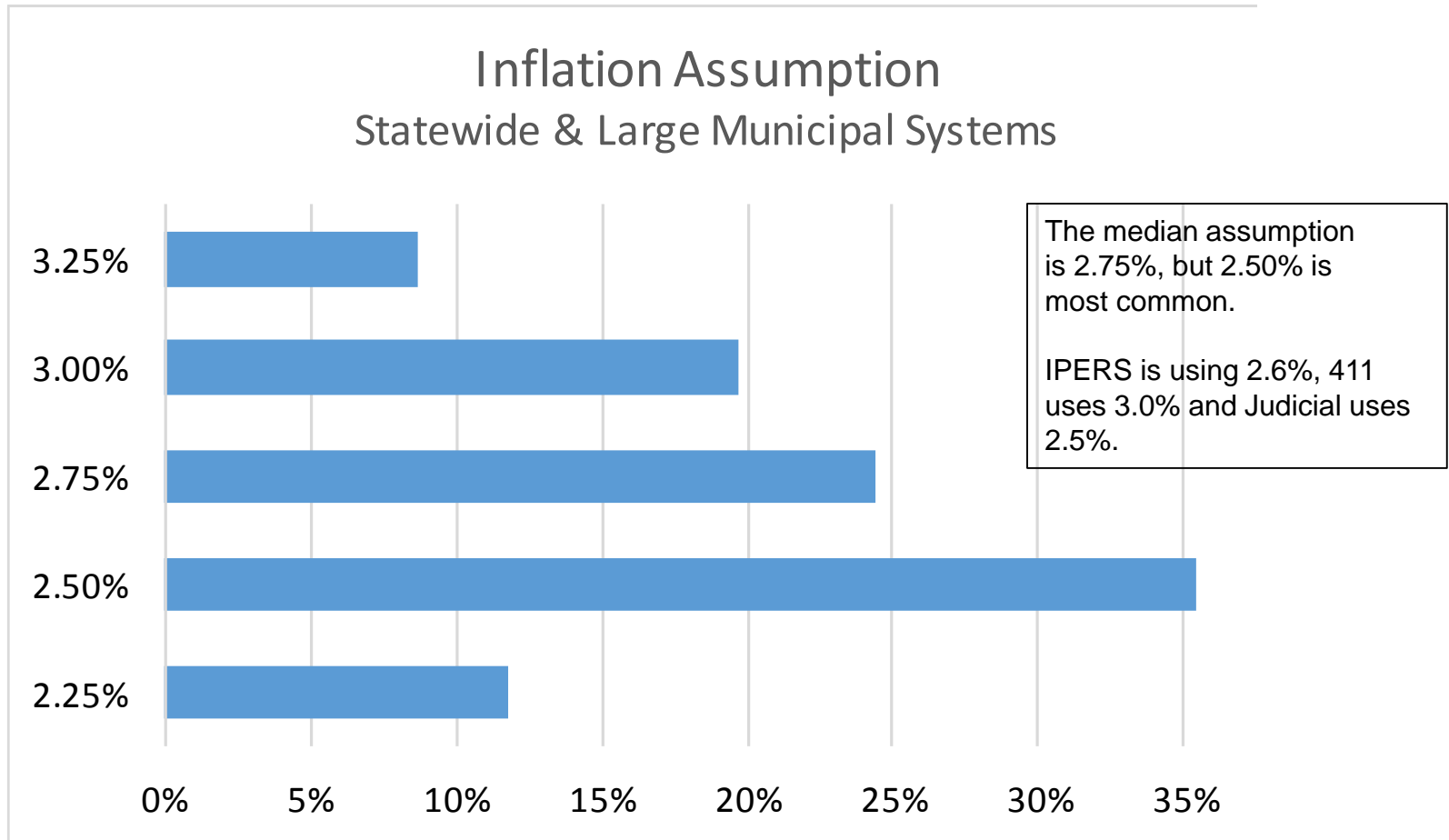
30 Year Maturity Bonds	Expected Inflation
December 31, 2017	1.97%
June 30, 2018	2.12%
December 31, 2018	1.91%
June 30, 2019	1.78%
December 31, 2019	1.78%

# Future Inflation Expectations



- Capital market assumptions developed by investment professionals
  - NEPC
    - Short term: 2.3% and Long term: 2.5%
  - Horizon Survey (32 investment consultants including 12 with short and long term assumptions)
    - Short term median: 2.22% and Long term median: 2.29%
  
- Survey of Professional Forecasters: 2.20% over next ten years
  
- Social Security projections (75 years)
  - Best estimate: 2.60%
  - Range: 2.00% to 3.20%

# Inflation Assumptions (Peer Comparison)



# Summary of Future Inflation Expectations



Source	Expected Inflation
NEPC (30 years)	2.50%
2019 Horizon Survey (20 years)	2.29%
Bond market at 12/31/19 (30 years)	1.78%
2019 Social Security report (75 years)	2.60%
Survey of Professional Forecasters (10 years)	2.20%
Peer Group Comparison (median)	2.75%

- Historical inflation has been lower than 2.75% over last 30 years
- Most expectations of inflation are lower than current assumption
- Data supports lowering the inflation assumption
- We recommend moving to 2.50%





# Investment Return Assumption

- Investment Return is composed of price inflation assumption and real return assumption
  
- Current assumption
  - Price inflation: 2.75%
  - Real rate of return: 4.75%
  - Total return: 7.50%
  
- We have made a recommendation on price inflation so this discussion will focus on real rate of return

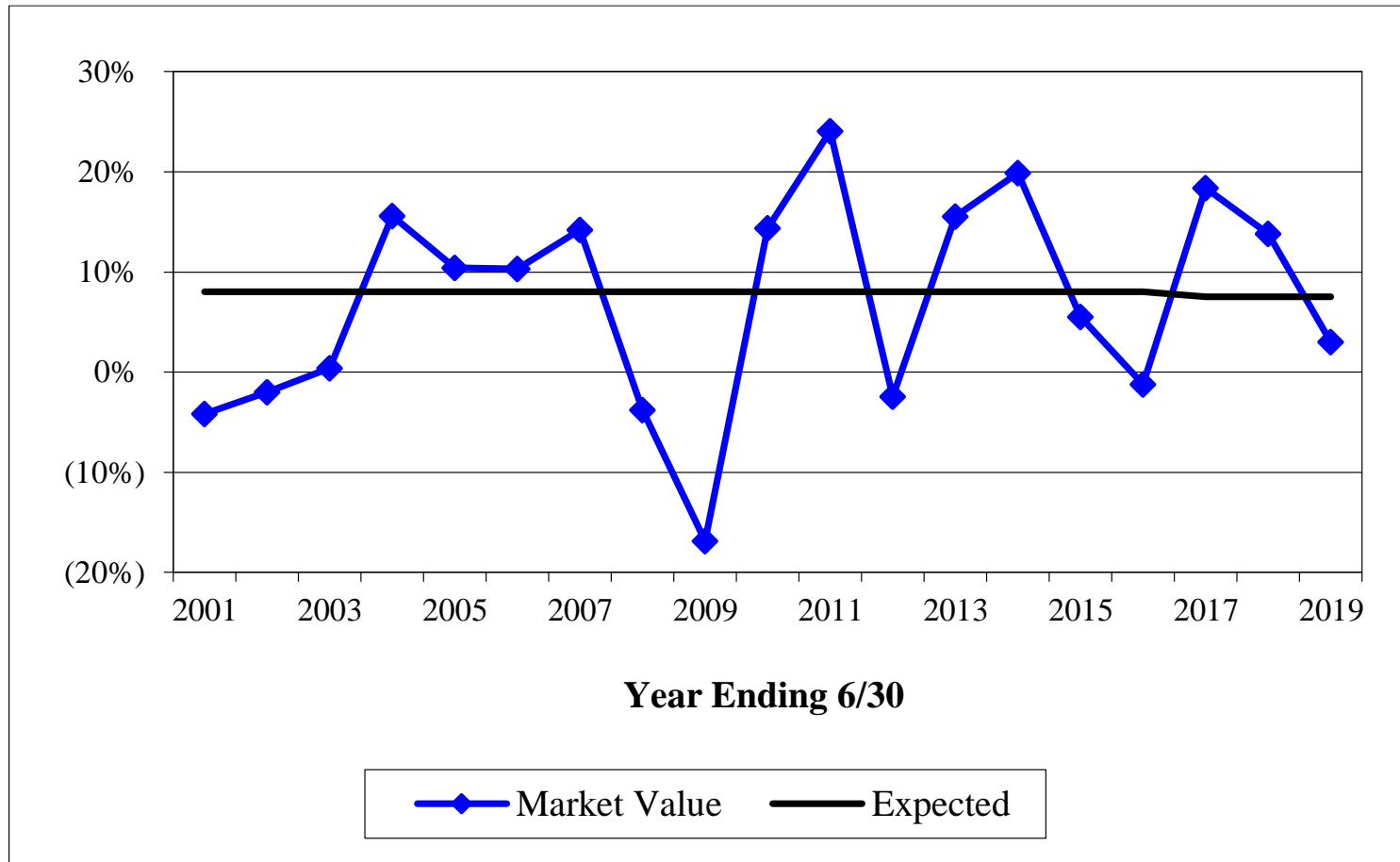


# Investment Return Assumption

- Analysis included:
  - Historical information (limited value)
  - Forward-looking modeling of returns
    - Using NEPC's assumptions
    - Using Horizon Survey of Capital Market Assumptions (2019 Edition)
  - Peer system comparison (NASRA Public Fund Survey)

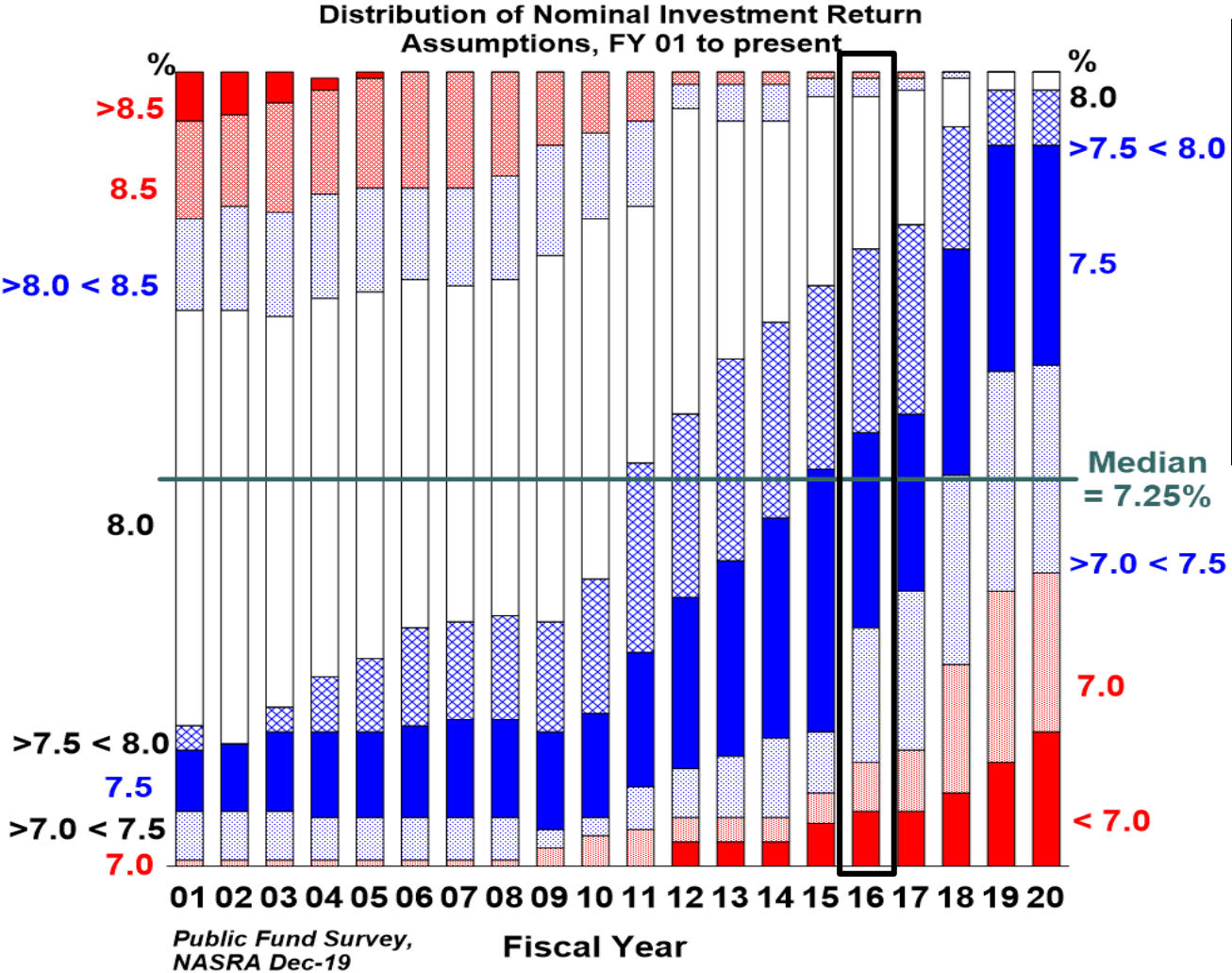


# POR Historical Returns



Rate of return over this 17 year period was 6.58%, but the past is not necessarily a good indicator of future returns.

# Peer Group Return Assumptions

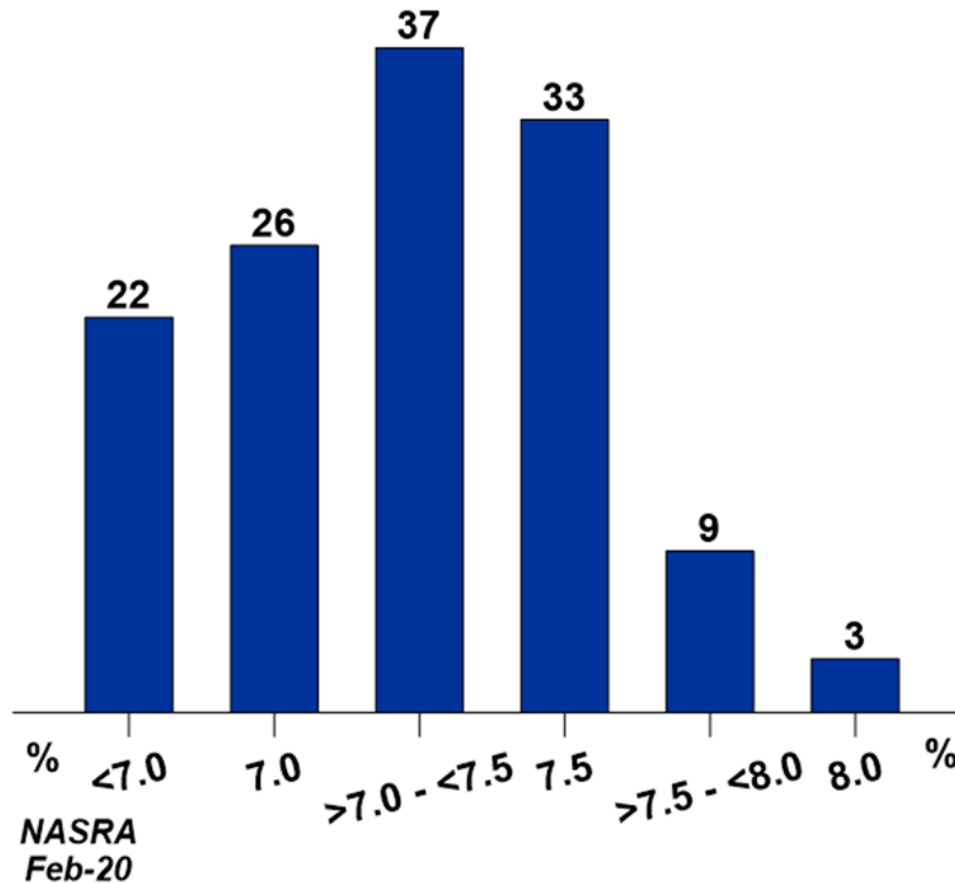


Note: when the last economic assumption review was performed in 2016, the median return assumption was 7.50%.

# Peer Group Return Assumptions

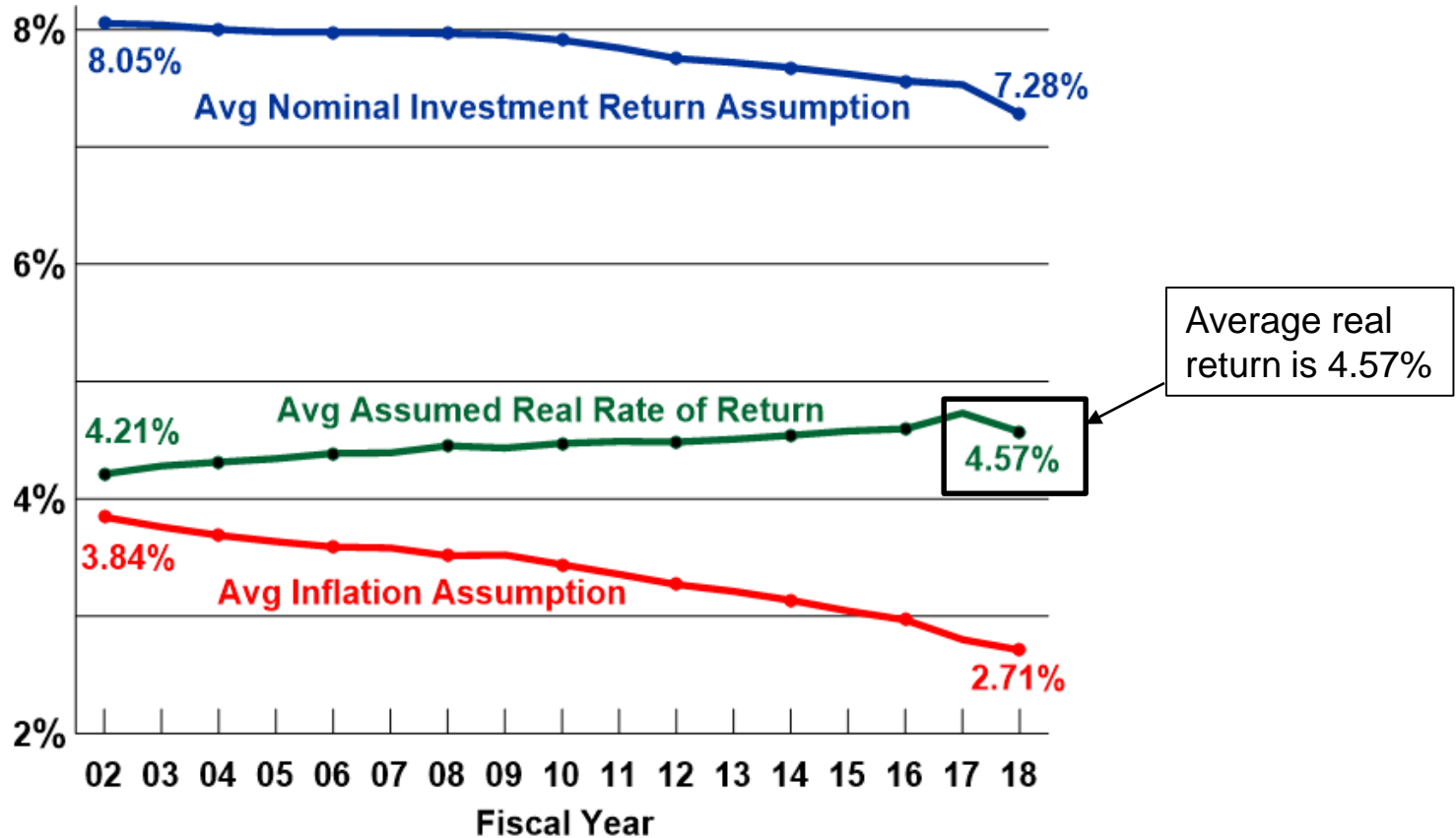


Distribution of  
Latest Investment  
Return Assumptions



85 of 130 Plans in the Survey (65%) use an investment return assumption below 7.5% and the number continues to increase.

# Trend to Lower Return Assumptions



Note: Public Plan database reflects median returns which reflect different investment mixes among the various funds.



# Investment Return Assumption

- Target asset allocation has greatest impact on investment return assumption
  - Has not changed since 2016 experience study

Asset Class	Percent
Fixed income	25.00%
Large cap	25.00%
Small/mid cap	15.00%
International equities	18.75%
Emerging equities	6.25%
Real estate	<u>10.00%</u>
Total	100.00%

# Comparison of NEPC 2015 and 2019 Assumptions



## NEPC's 30-Year Capital Market Assumptions

Asset Class	2015	2019	Difference
Large Cap	8.83%	7.91%	(0.92%)
Small Cap	9.64%	8.89%	(0.75%)
International Equities	9.89%	8.78%	(1.11%)
Emerging Equities	12.50%	12.42%	(0.08%)
Fixed Income	3.95%	3.59%	(0.36%)
Real Estate	7.50%	6.71%	(0.79%)

Note: return expectations are much lower for most asset classes.



# Projections Using NEPC's Assumptions



- Rely on investment professionals to set capital market assumptions
- Expected returns (median)

	Nominal Returns		Real Returns	
	<u>Arithmetic</u>	<u>Geometric</u>	<u>Arithmetic</u>	<u>Geometric</u>
10 Years	6.11%	5.39%	3.81%	3.09%
30 Years	7.36%	6.65%	4.86%	4.15%

- Geometric returns reflect the impact of volatility in the investment returns and, therefore, are a more appropriate basis for setting the investment return assumption



# Expected Real Return

	Real Return 10 Year	Real Return 30 Year	Blended 25-Year Real Return
NEPC	3.09%	4.15%	3.72%
Horizon Survey	4.07%	4.95%	4.60%
Difference: NEPC vs Horizon	(1.02%)	(0.80%)	(0.88%)

This data indicates a reduction to the current real rate of return assumption of 4.75% is needed.



# Investment Return Assumption

- Shift downward in investment return assumption has continued to occur over the past four years
- Our recommendation to lower inflation assumption has an impact since inflation is a component of the investment return assumption
- NEPC's expected return in the short term (10 years) is more than 1.00% lower than long term (30 years)
- Data supports a decrease in the investment return assumption

# Investment Return Recommendation



- Recommend lowering the investment return assumption

	Current	Option 1	Option 2
Inflation	2.75%	2.50%	2.50%
Real rate of return	<u>4.75%</u>	<u>4.50%</u>	<u>4.25%</u>
Investment return	7.50%	7.00%	6.75%

- A lower return of 6.75% should provide some margin for adverse deviation which might be prudent, depending on Board's perspective



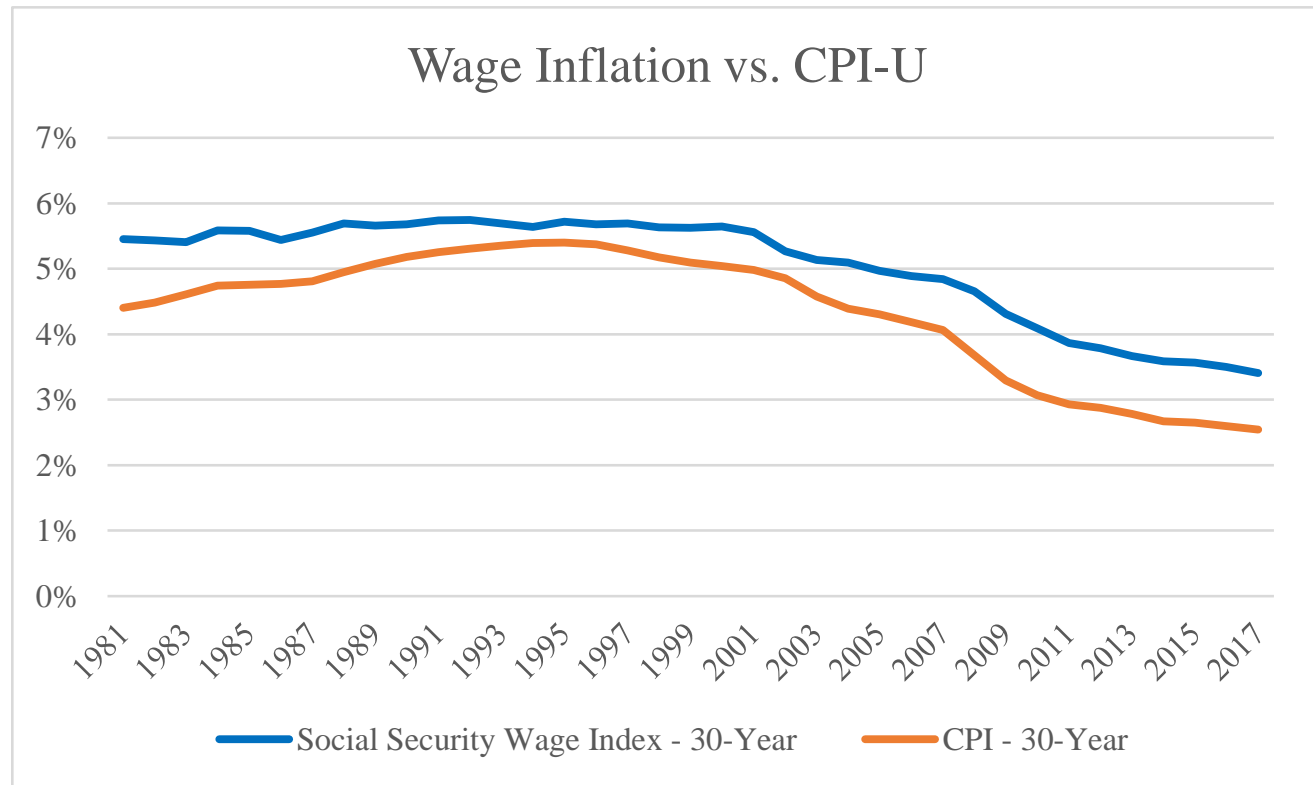
# General Wage Increase

- Used to develop the individual salary increase assumption which is sum of:
  - General wage increase assumption
  - Merit salary increase (demographic assumption)
  
- Current assumption is 3.50% (2.75% price inflation + 0.75% real wage growth)
  
- General wage increase assumption anticipates how wages, in general, will grow over time
  
- Historically, wages in the general economy have grown more than price inflation (see next slide)

# Rolling 30-Year Wage Inflation Compared to Price Inflation



Over long periods of time, wages have increased more than price inflation.



Note: Data for wage inflation is based on national average wage index as published by the Social Security Administration

# General Wage Increase for POR Members



- Compared actual pay plans for POR members from FY 2017 to FY 2020
  - Effective annual increase was between 2.5% and 3.2%
  - Actual price inflation over same period was 1.8%
  - Difference is 0.7% to 1.4% indicating real wage growth around 1.0%
  
- Recommend the current assumption of 3.50% be retained, but the component pieces will change.
  - Price inflation of 2.50% plus real wage growth of 1.00%
  - This assumption is also used in valuing the post-retirement benefit escalator



# UAL Payment Increase Rate

- Payments on the unfunded actuarial liability (UAL) are assumed to increase each year in the future
  - Need an assumption to develop the amortization schedule to pay the UAL off over time
  - Informational, does not impact actual contributions
  
- A lower payroll growth assumption is more conservative
  - Results in larger amortization payments in early years
  - Example: 0% payroll growth = level dollar payments
  
- Current assumption is 3.00% (0.25% higher than price inflation assumption)





# Actual POR Payroll Growth

- Following table summarizes POR's historical payroll growth and active population change:

<b>Year Ended June 30</b>	<b>Active Count</b>	<b>Covered Payroll (\$ Millions)</b>	<b>Average Annual Salary (\$)</b>
2000	651	\$30,599,524	\$47,004
2005	580	33,336,856	57,477
2010	643	41,954,599	65,248
2015	589	45,128,506	76,619
2019	551	46,955,334	85,218



# Payroll Growth Assumption

- Actual POR covered payroll increased an average of 2.28% per year over the period 2000-2019
  - Over this same period, the size of the active membership declined 15%
  - Increase in average salary, which mitigates the impact of the decline in active members, was 3.18% over this period
  - Size of active membership in the future has an impact of setting this assumption
  
- Recommend lowering the payroll growth assumption from 3.00% to 2.75%, retaining the current assumption of price inflation plus 0.25%

# Recommended Set of Economic Assumptions



Assumption	Current	Recommended
Price inflation	2.75%	2.50%
Productivity	0.75%	1.00%
Wage inflation*	3.50%	3.50%
Payroll growth**	3.00%	2.75%
Investment return	7.50%	7.00% or 6.75%

\* Used in developing the individual salary increase assumption

\*\*Used to calculate the schedule of UAAL amortization payments



# Cost Impact\*

## Change in Economic Assumptions

	2019 Valuation	Proposed With 7.00%	Proposed With 6.75%
Actuarial Liability	\$684,752,489	\$729,766,344	\$754,066,895
Actuarial Assets	\$530,900,116	\$530,900,116	\$530,900,116
Unfunded Actuarial Liability	\$153,852,373	\$198,866,228	\$223,166,779
Increase in UAL		\$45,013,855	\$69,314,406
Funded Ratio	77.5%	72.7%	70.4%

\* Estimated using the July 1, 2019 actuarial valuation. Actual impact on July 1, 2020 valuation will be somewhat different.

# Cost Impact\*

## Change in Economic Assumptions



	2019 Valuation	Proposed With 7.00%	Proposed With 6.75%
Normal cost	26.53%	30.32%	32.44%
Admin expenses	0.55%	0.55%	0.55%
UAAL payment	<u>25.61%</u>	<u>32.20%</u>	<u>35.33%</u>
Total contribution rate	52.69%	63.07%	68.32%
Current contributions (with \$5 million supplemental)	<u>(59.05%)</u>	<u>(59.05%)</u>	<u>(59.05%)</u>
(Margin)/Shortfall	(6.36%)	4.02%	9.27%
(Margin)/Shortfall - Dollars	(\$3.0M)	\$1.9M	\$4.4M

\* Estimated using the July 1, 2019 actuarial valuation. Actual impact on July 1, 2020 valuation will be somewhat different.