



Kentucky Retirement Systems

Interim Joint Committee on Appropriations and
Revenue

Actuarial Assumptions

David Eager, Executive Director
July 9, 2019

Recent KRS Board Actions

- GRS conducted an experience study for the five-year period ending June 30, 2018
- KRS Board adopted the actuarial assumptions recommended by GRS as a result of that investigation
- These assumptions will be used to perform the 2019 actuarial valuation
 - Determines the contribution for fiscal years 2020/2021 and 2021/2022 for KERS and SPRS
 - Determines the contribution for fiscal year 2020/2021 for CERS

Importance of Experience Study

- Assumptions are not static; they should occasionally change to reflect
 - New information
 - Mortality improvement
 - Changing patterns of retirements, terminations, etc.
 - Changing knowledge
 - Changes in best practices
- Recent experience provides strong guidance for some assumptions (for example, mortality) and weak guidance for others (for example, the investment return rate)

Principle Assumptions Reviewed

- Economic
 - Price inflation
 - Investment return
 - Individual salary increase
 - Payroll growth
- Demographic
 - Mortality
 - Non-Disabled Retirees
 - Pre-Retirement,
 - Disability Retirees,
 - Turnover
 - Disability incidence
 - Participation in the Retiree health insurance plan
 - Other

Highlight of Changes in Assumptions



Mortality

- Members will live 2+ years longer than previously assumed
- Effective 07/01/2020

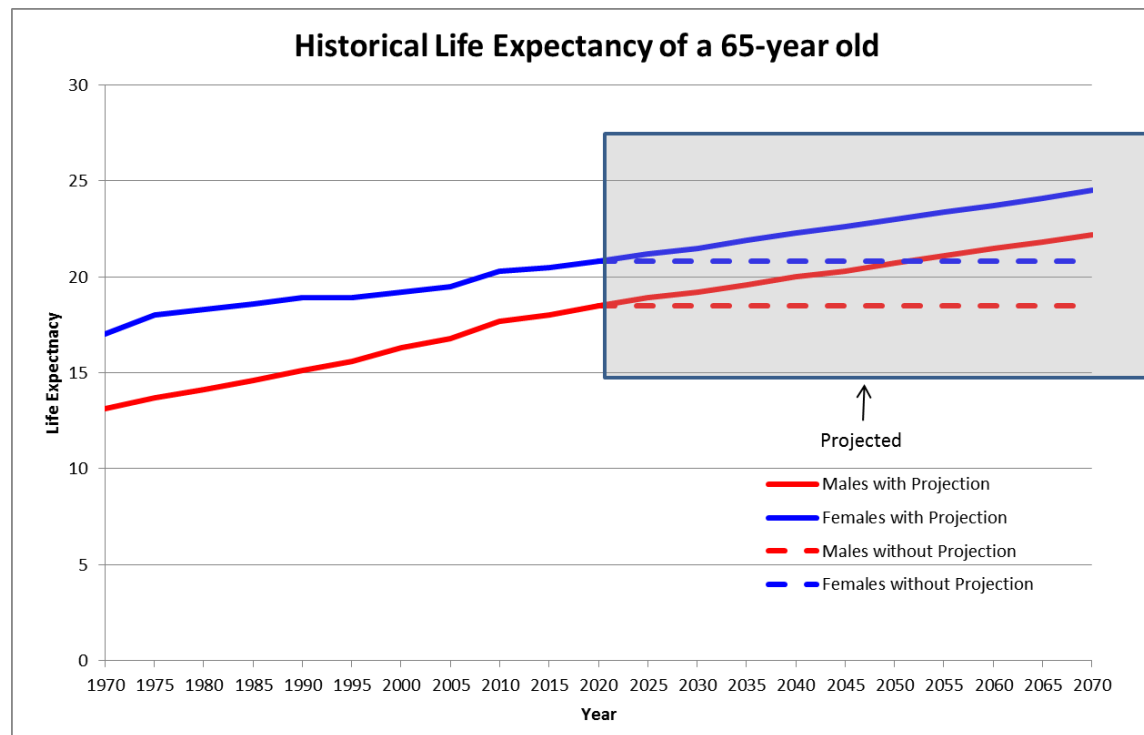
Turnover

- Mixed
 - KERS Non-Haz higher
 - CERS Non-Haz lower
 - Effective 07/01/2020

Investment Earnings

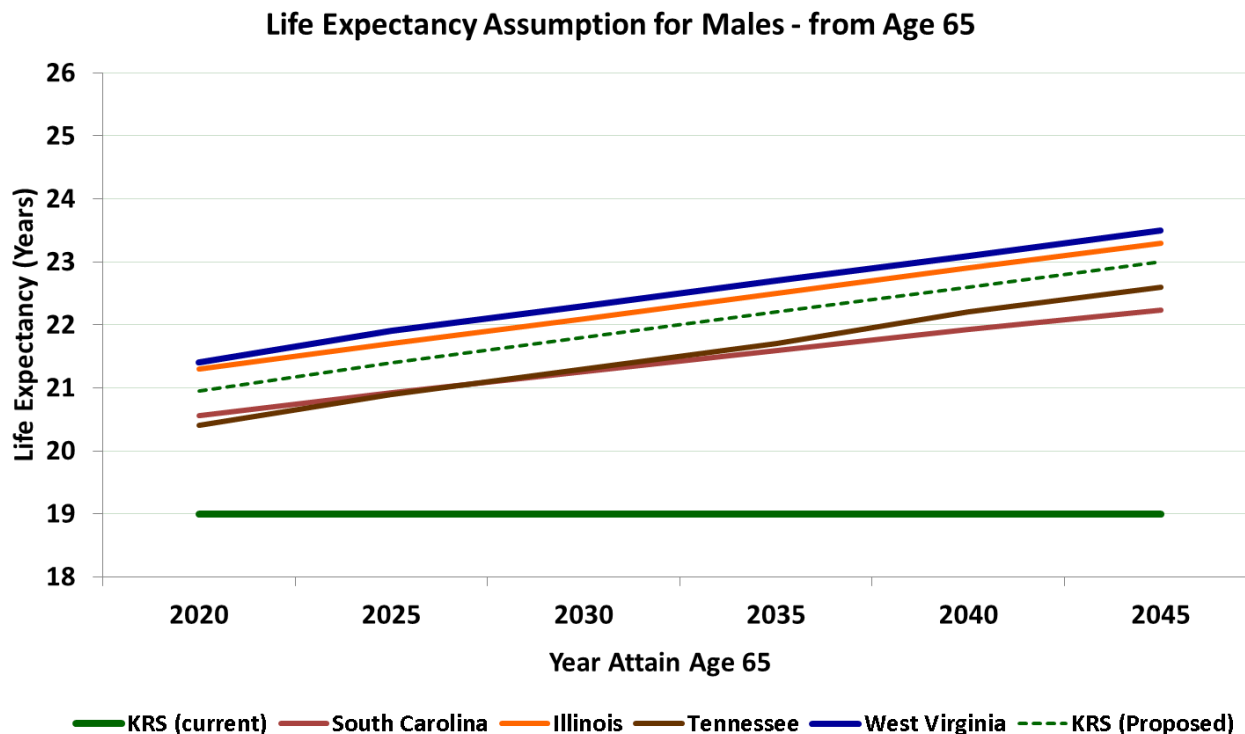
- Are 1.25% to 1.50% lower than previously assumed
- Effective 07/01/2018

Historical and Projected Future Improvement National Data



Source: historical data from social security reports.

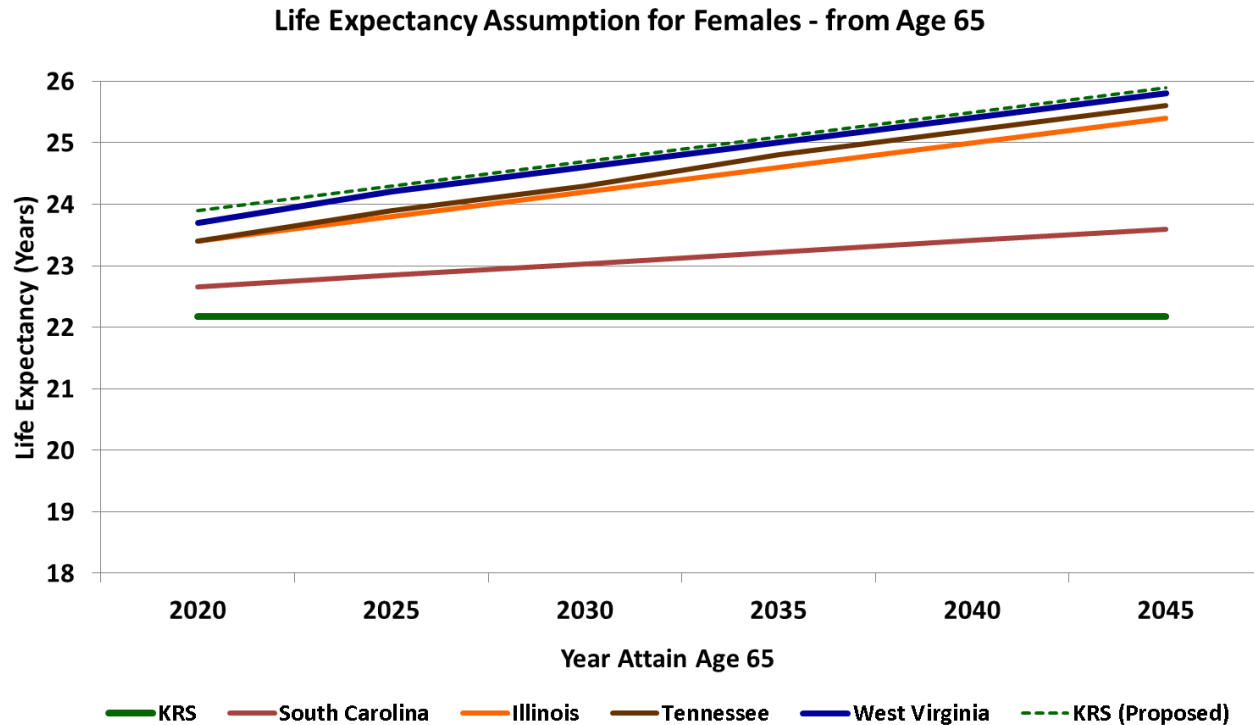
Life Expectancy Assumption Peer Comparison



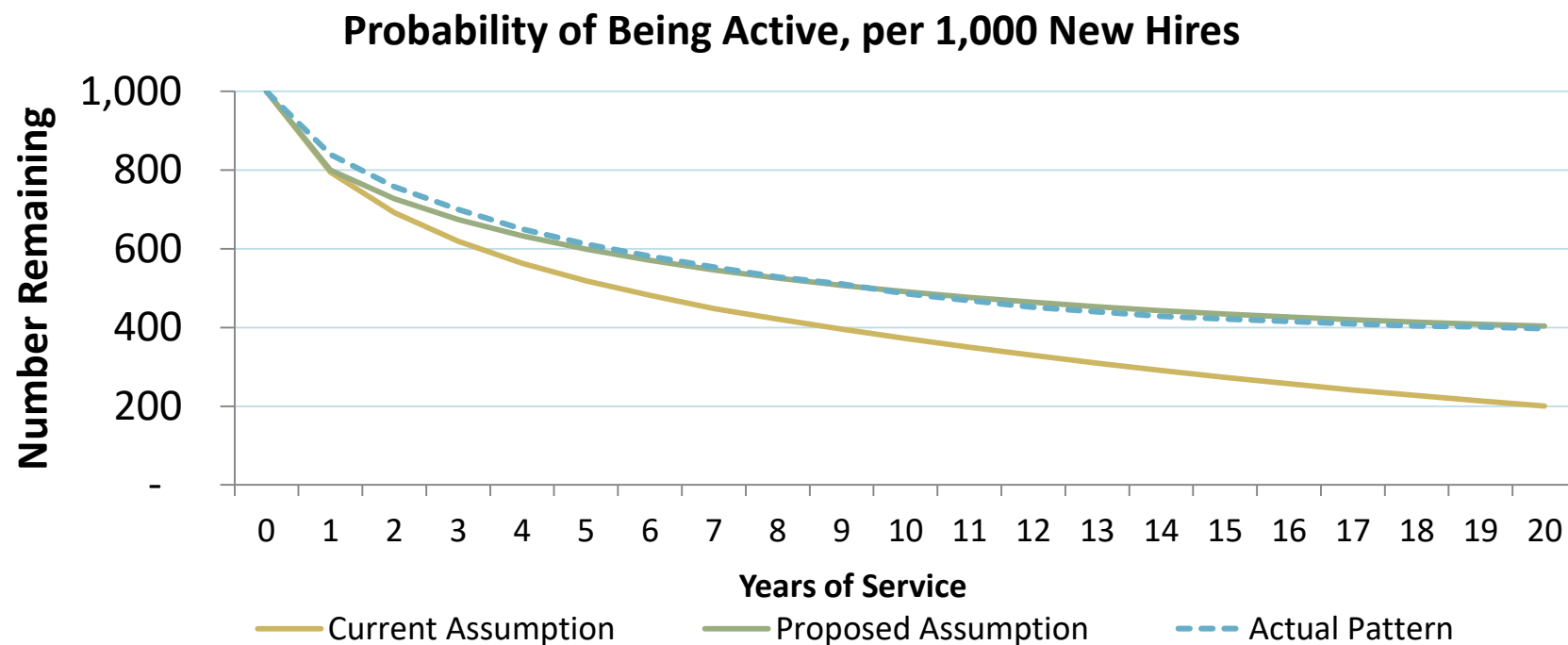
Life Expectancy will be projected to improve into the future using the ultimate rates of the latest MP projection scales issued by the SOA.

GRS Comment: Recommended assumptions more in line with industry best practices.

Life Expectancy Assumption Peer Comparison



Termination Probabilities: CERS Haz



Fiscal Impact of Recommendations

Employer Contribution Requirement

	Contribution Rate (% of Covered Payroll)			Contribution Requirement (\$ in Millions)		
	Current	Recommended	Increase	Current	Recommended	Increase
KERS Non-Haz	85.2%	89.2%	4.0%	\$1,254	\$1,313	\$59
KERS Haz	34.4%	37.2%	2.8%	54	59	4
CERS Non-Haz ¹	27.3%	30.8%	3.5%	673	760	86
CERS Haz ¹	46.5%	57.6%	11.1%	248	307	59
SPRS	140.0%	153.0%	13.0%	68	75	6

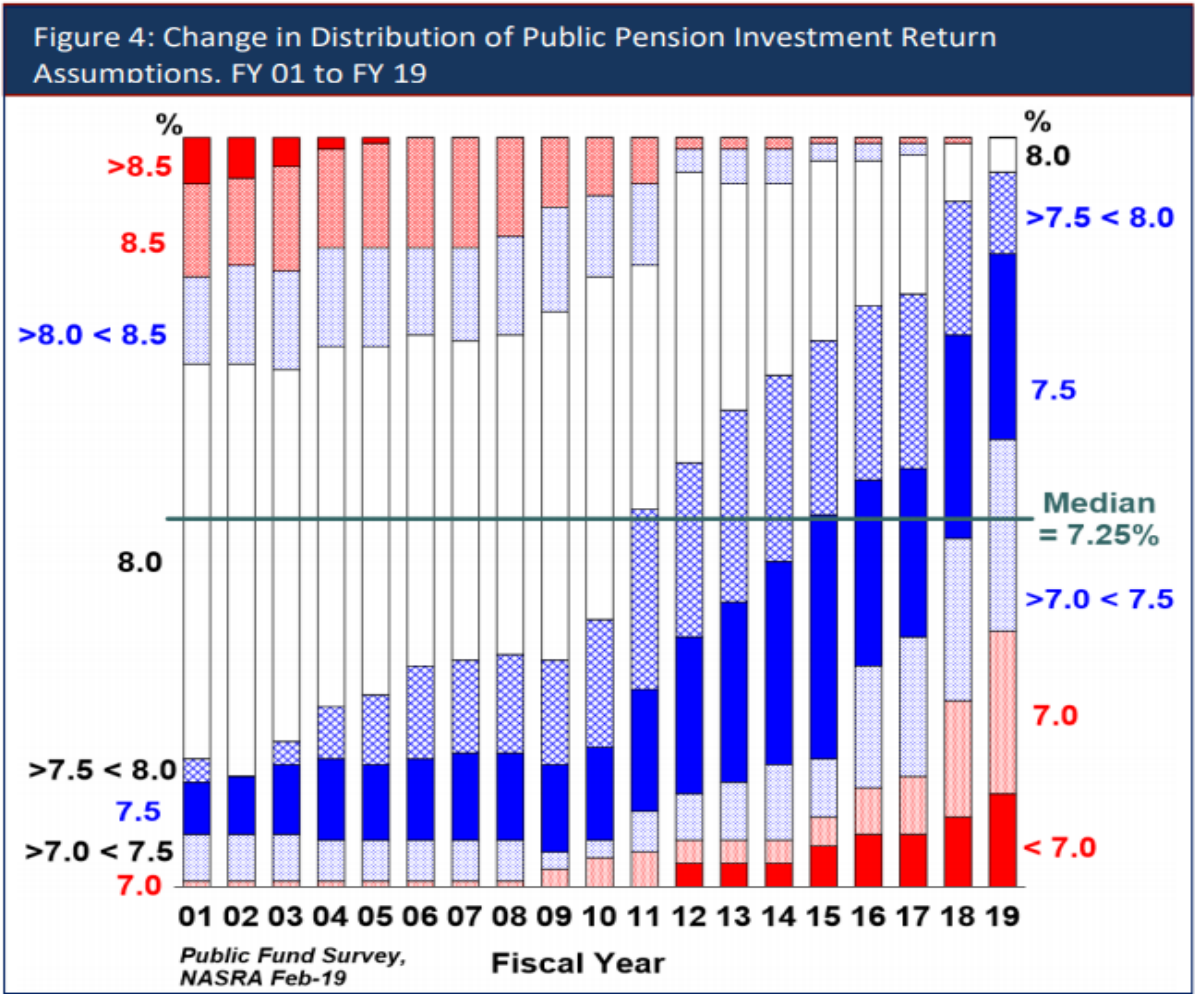
¹ Without regard to 12% phase-in of contribution rates.

Impact of Recommendations

System	Pension		Insurance	
	Before Change	After Change	Before Change	After Change
KERS Non-Hazardous				
UAL	\$ 13,655,954	\$ 14,321,191	\$ 1,548,384	\$ 1,658,097
Funded Ratio	12.9%	12.4%	36.4%	34.9%
Employer Rate	74.5%	78.0%	10.7%	11.2%
KERS Hazardous				
UAL	\$ 512,661	\$ 559,986	\$ (117,960)	\$ (102,741)
Funded Ratio	55.5%	53.3%	130.0%	125.1%
Employer Rate	34.4%	37.2%	0.0%	0.0%
CERS Non-Hazardous				
UAL	\$ 6,241,280	\$ 6,902,382	\$ 721,194	\$ 882,018
Funded Ratio	52.7%	50.2%	76.7%	72.9%
Employer Rate	22.5%	25.4%	4.8%	5.4%
CERS Hazardous				
UAL	\$ 2,470,827	\$ 2,702,563	\$ 427,722	\$ 458,277
Funded Ratio	48.4%	46.2%	74.6%	73.3%
Employer Rate	37.0%	45.9%	9.5%	11.7%
SPRS				
UAL	\$ 721,269	\$ 761,380	\$ 74,553	\$ 79,973
Funded Ratio	27.1%	26.1%	71.6%	70.1%
Employer Rate	120.5%	131.7%	19.5%	21.3%

Note: Contribution rates shown for CERS are without regard to the phase-in provision.

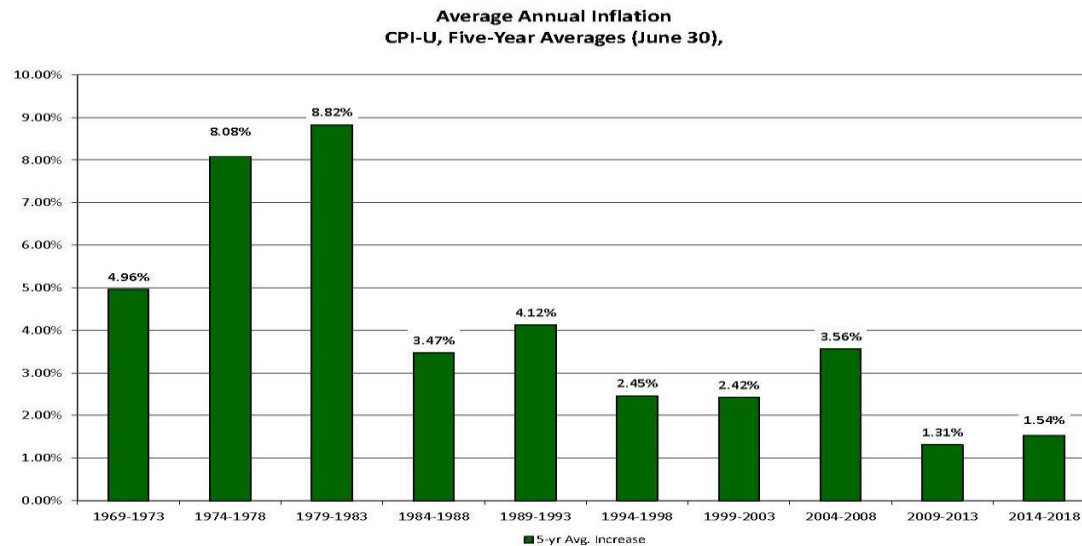
Investment Return Assumption: National Trends



GRS Comment:
“The median
return
assumption
decreased from
7.46% to 7.25%
from NASRA’s
Survey in 2018 to
2019.”

Actual Change in CPI-U

The chart below shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:



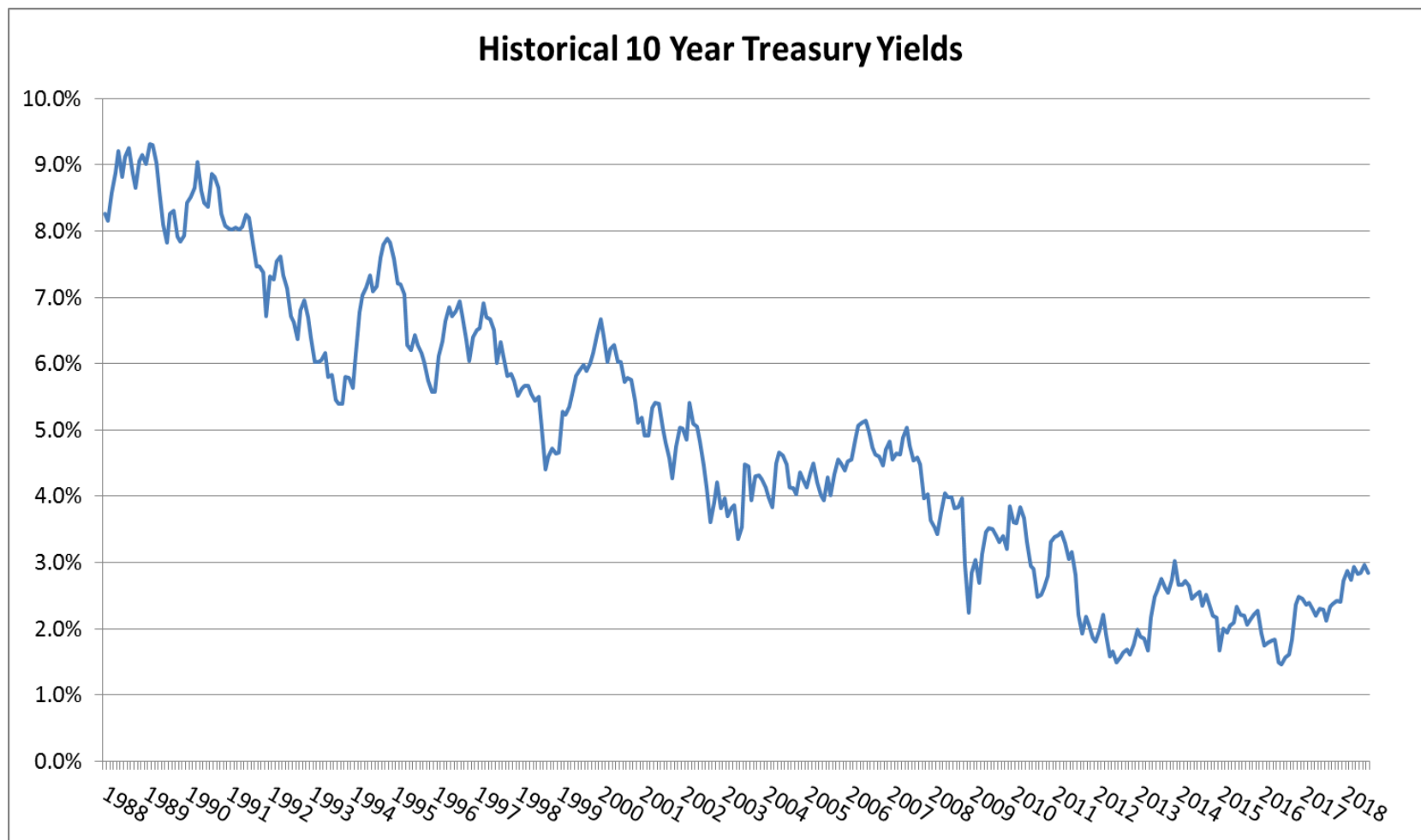
The following table shows the average inflation over various periods, ending June 30, 2018:

Periods Ending June 30, 2018	Average Annual Increase in CPI-U
Last five (5) years	1.54%
Last ten (10) years	1.42%
Last fifteen (15) years	2.13%
Last twenty (20) years	2.20%
Last twenty-five (25) years	2.25%
Last thirty (30) years	2.56%
Since 1913 (first available year)	3.12%

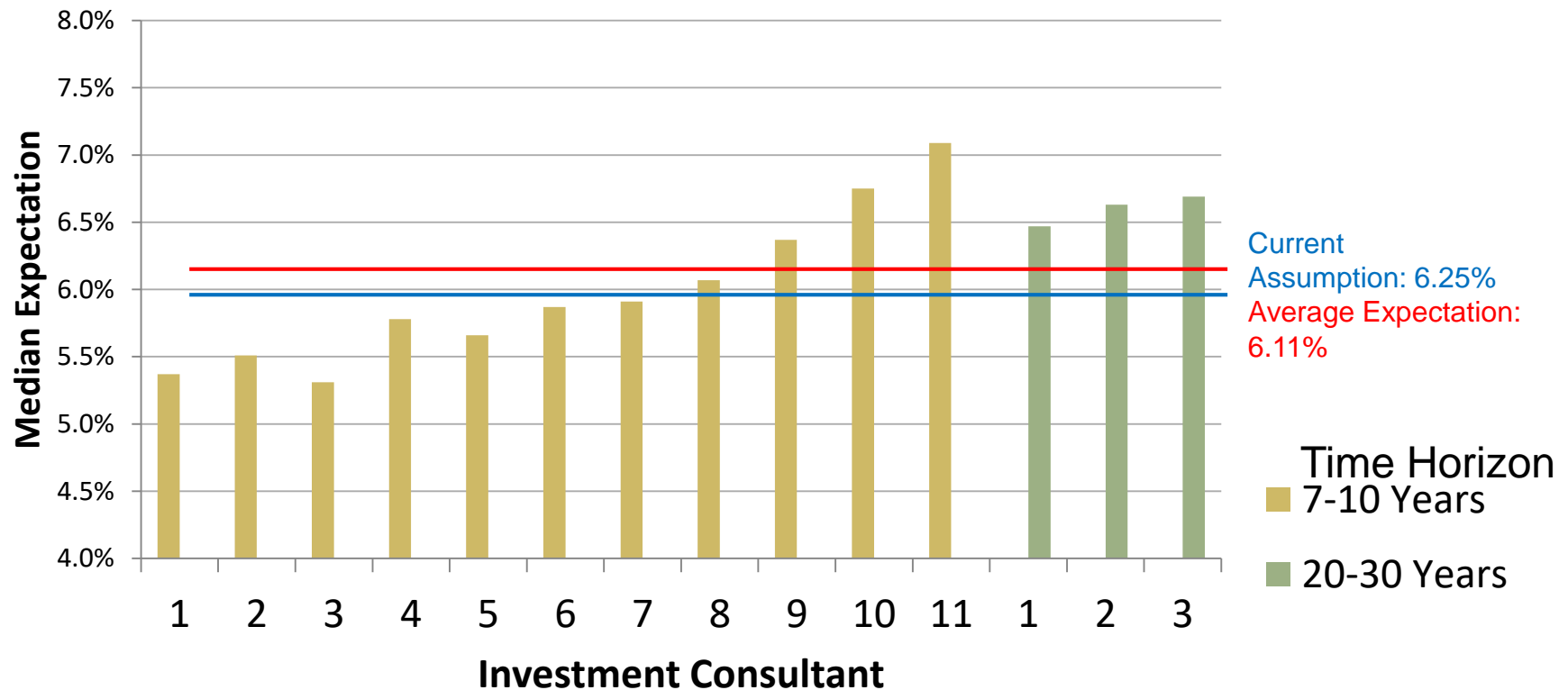
Source: Bureau of Labor Statistics, CPI-W, all items, not seasonally adjusted

As you can see, inflation has been relatively low over the last thirty years.

Historical Economic Conditions – Declining Interest Rate Environment



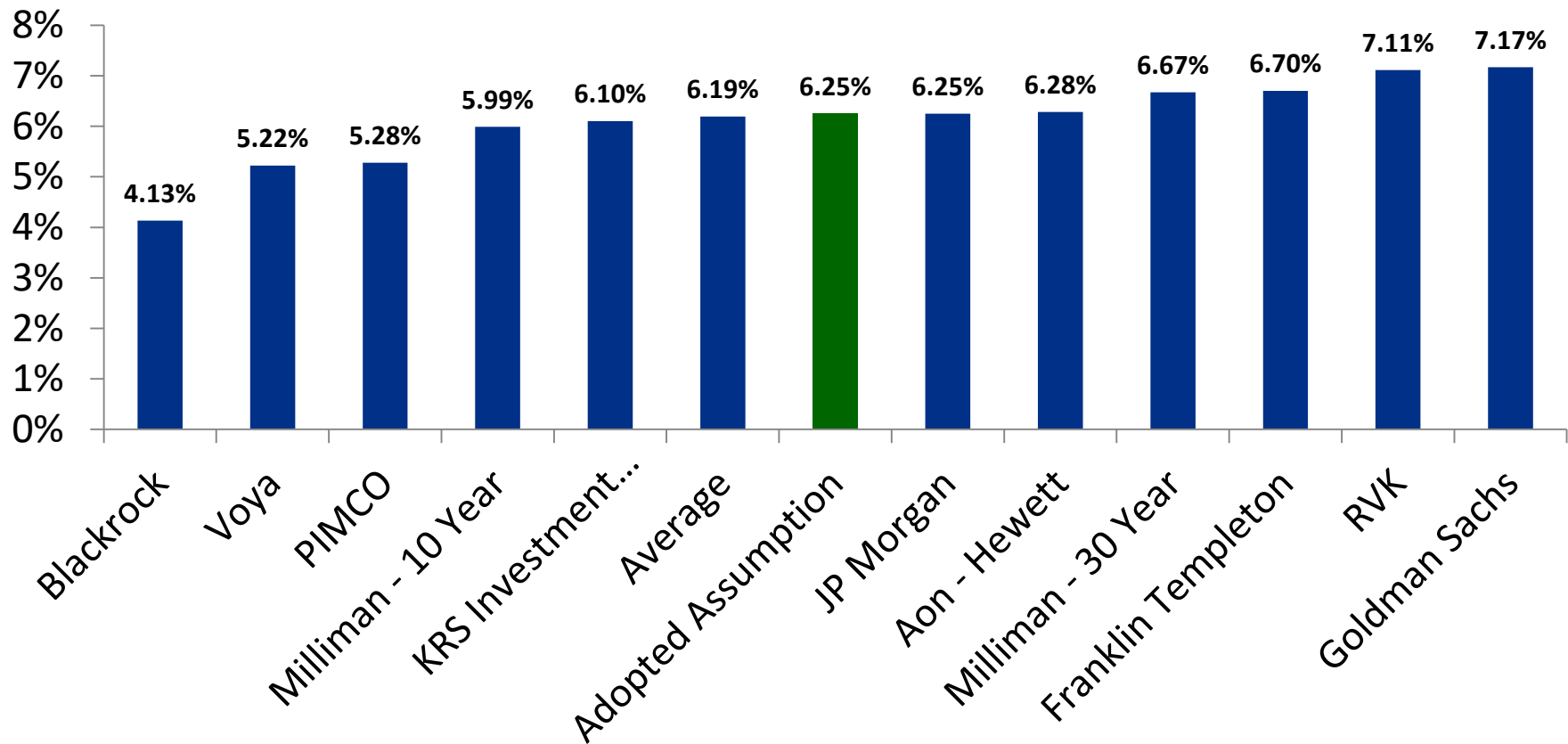
GRS Survey: Distribution of Forward-Looking Returns Expectations: CERS, KERS Haz, and Insurance Plans



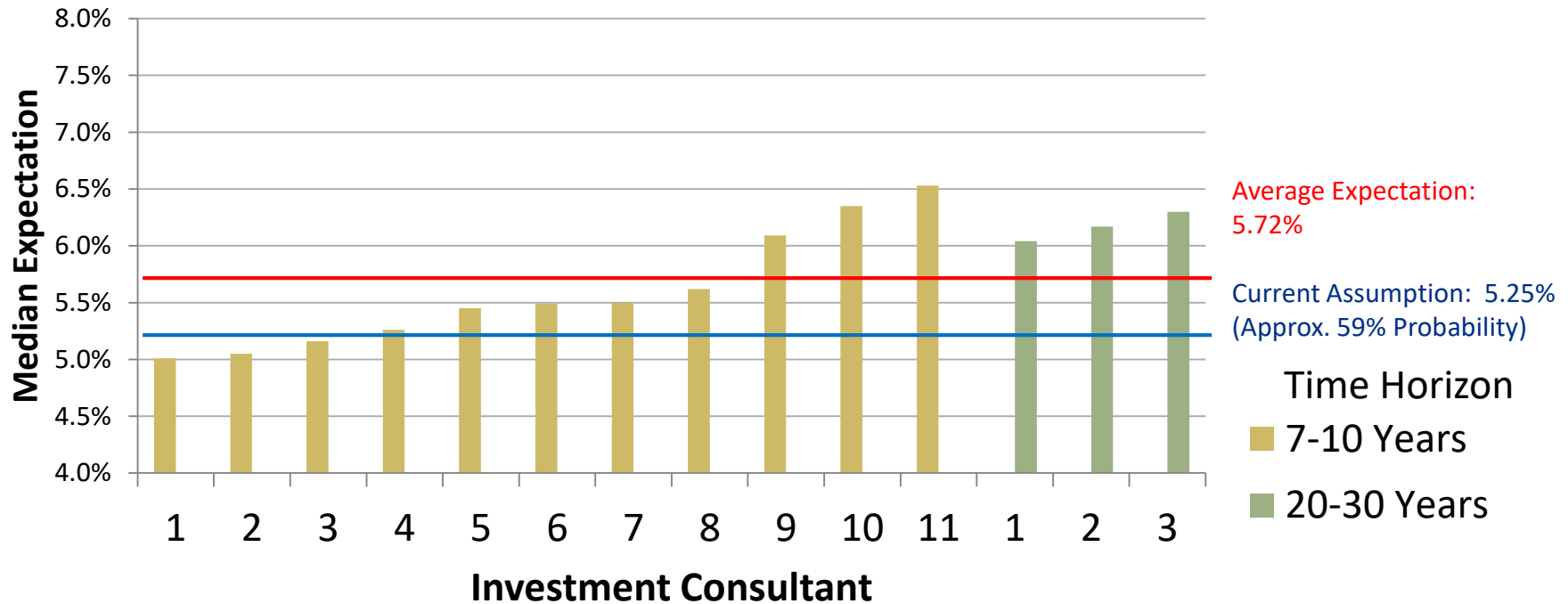
Investment consultants (alphabetical order): Aon (2), BNY Mellon, Callan, JP Morgan, NEPC (2), Mercer (2), RV Kuhns, Summit, and Wilshire.

Data from 2017 Assumption Review (KRS Haz, CERS Non-Haz and Haz)

Return Expectations



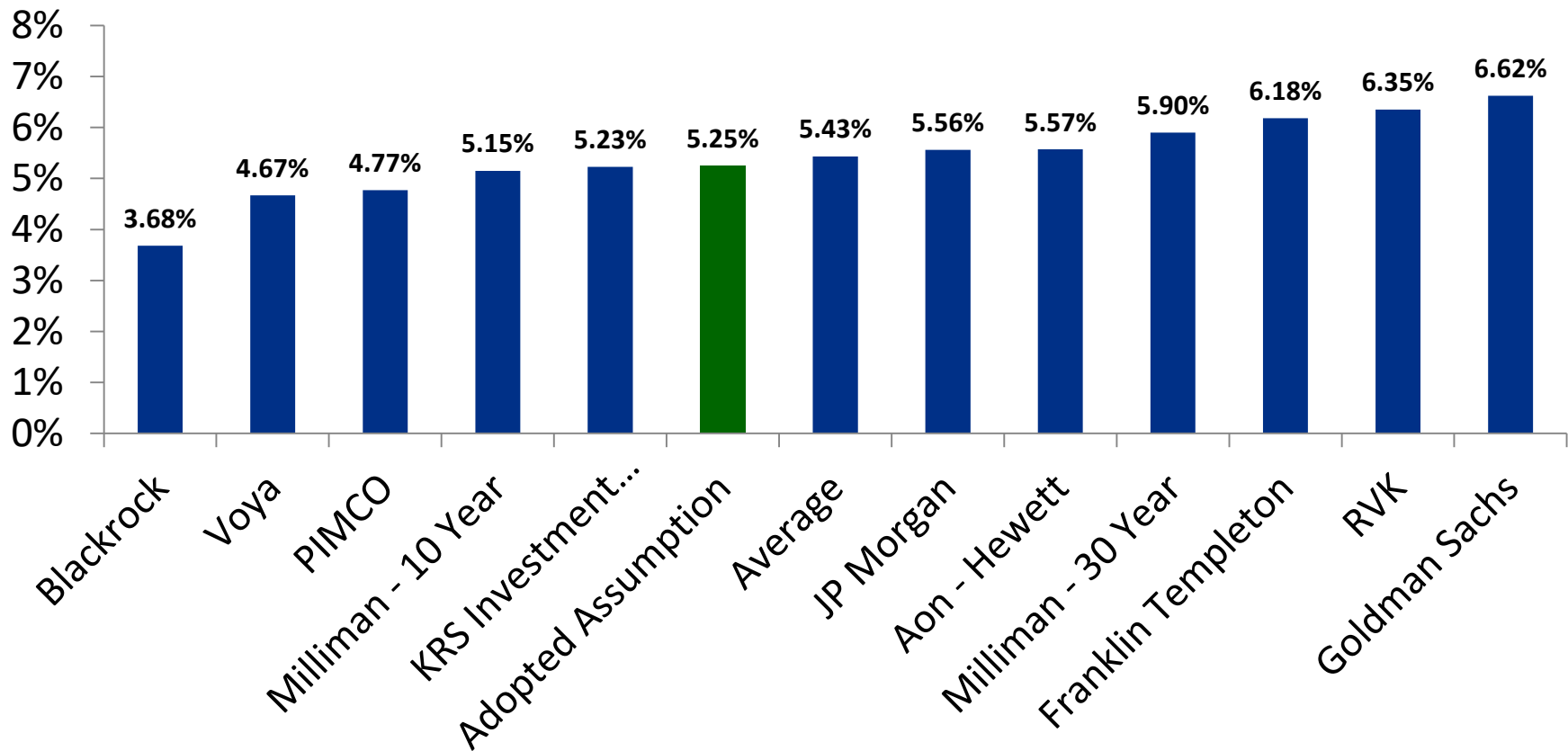
GRS Survey: Distribution of Forward-Looking Returns Expectations: KERS Non-Haz and SPRS



Investment consultants (alphabetical order): Aon (2), BNY Mellon, Callan, JP Morgan, NEPC (2), Mercer (2), RV Kuhns, Summit, and Wilshire.

Data from 2017 Assumption Review (KRS Non-Haz & State Police)

Return Expectations



Forecast of Longer-Term Investment Returns

Select Investment Managers*



	U.S. Stocks	U.S. Banks	Time Periods
Average Annual Returns	3.1%	3.8%	7-15 years

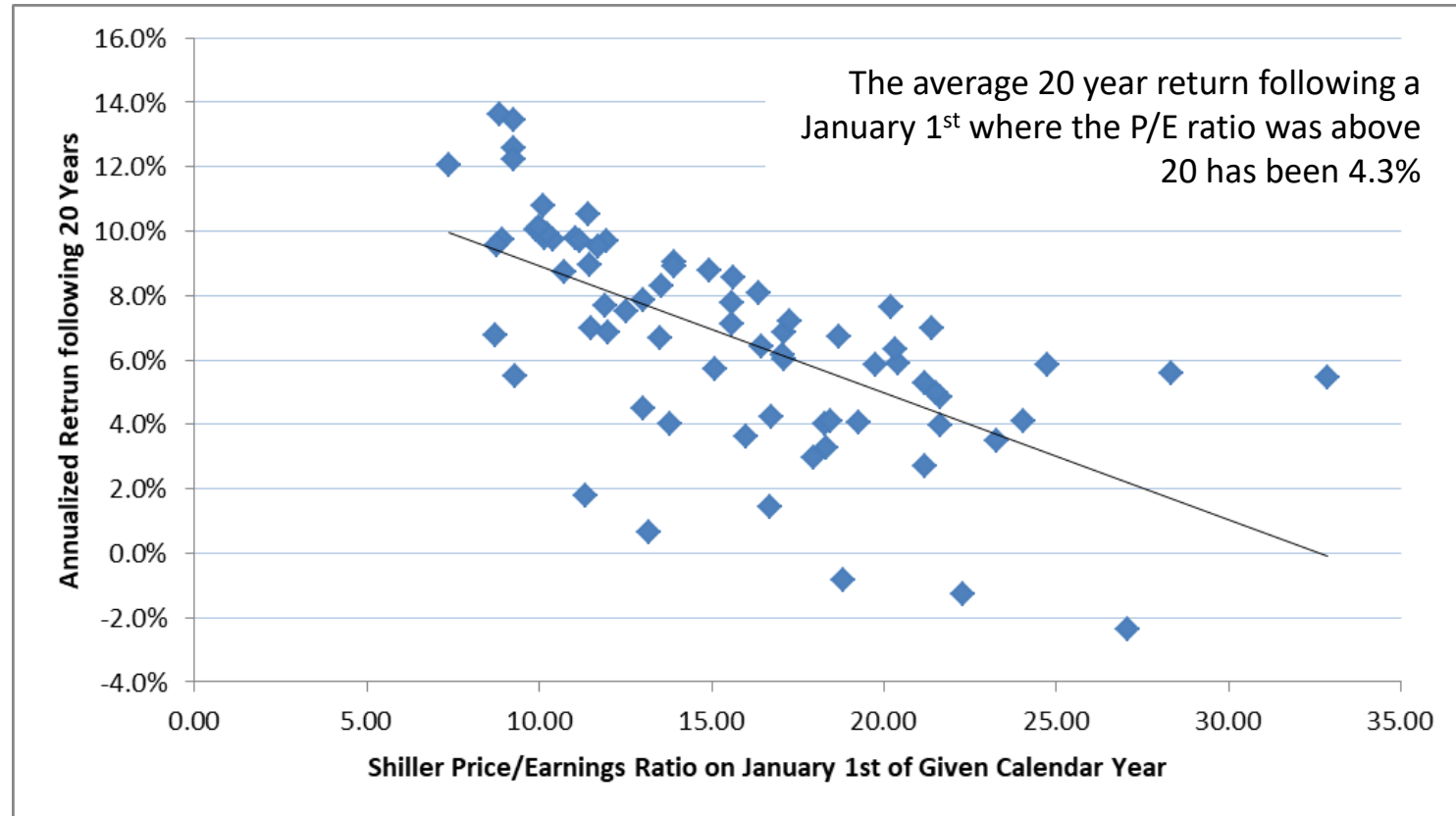
“I always ask myself, what could go wrong?”

“When forced to chose, I would not trade even one night’s sleep for the chance of extra profits”

Warren Buffet

* Blackrock
John Bogel- Founder of Vanguard
GMO
J.P. Morgan Asset Management
Morningstar Asset Management
Vanguard

Historical Economic Conditions - Impact of Starting Point on Equity Returns



Returns on the nominal returns of the S&P 500 Index
Periods beginning January 1, 1926

Trend of Declining Expectations in Future Investment Returns

History of Forward-Looking Return Expectations by Asset Class

