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Oklahoma State Pension Commission

Public Fund Landscape

November 29, 2017

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- 1. Asset Allocation Trends**
- 2. Funding Levels**
- 3. Actuarial Assumed Investment Rates of Return**
- 4. Investment Manager Fees**
- 5. Active vs. Passive Allocations**

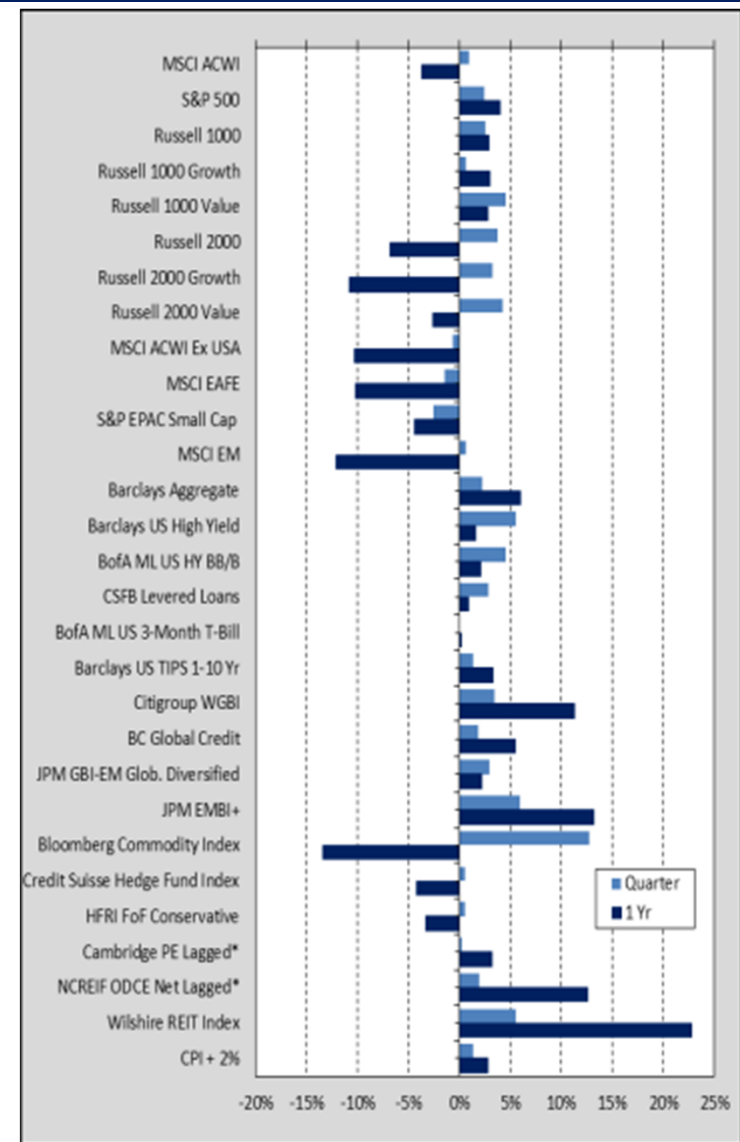
The presentation uses data from three main sources:

1. **NCPERS 2016 Study – An annual survey done using 159 responses from state and local pension funds across the country using data as of June 30, 2016.**
2. **Milliman 2017 Public Pension Funding Study – Milliman does a study of the country’s 100 largest public funds in the U.S. based on data as of June 30, 2016. Oklahoma PERS and Oklahoma TRS were among the group studied.**
3. **CEM 2016 Investment Benchmarking Study – CEM gathers data from 286 pension funds (166 U.S. funds, 74 Canadian funds, 37 European funds, and 7 funds from Asia). Of the U.S. funds 98 are corporate funds, 58 are public funds, and 10 are other.**
4. **Greenwich Associates - 205 U.S. public funds interviewed, including 121 funds with over \$1 billion in plan assets. It’s based on interviews conducted primarily through in-person interviews, and supplemented by telephone interviews and online surveys, between July and October of 2016.**

We’ll look at the analysis done by each organization and compare the data to that of the OK Pension Commission.

Market Environment – Q2 2016 Overview

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
World Equity Benchmarks						
MSCI ACWI	World	1.0%	-3.7%	6.0%	5.4%	4.3%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Equity Benchmarks						
S&P 500	Large Core	2.5%	4.0%	11.7%	12.1%	7.4%
Russell 1000	Large Core	2.5%	2.9%	11.5%	11.9%	7.5%
Russell 1000 Growth	Large Growth	0.6%	3.0%	13.1%	12.3%	8.8%
Russell 1000 Value	Large Value	4.6%	2.9%	9.9%	11.4%	6.1%
Russell 2000	Small Core	3.8%	-6.7%	7.1%	8.4%	6.2%
Russell 2000 Growth	Small Growth	3.2%	-10.8%	7.7%	8.5%	7.1%
Russell 2000 Value	Small Value	4.3%	-2.6%	6.4%	8.1%	5.2%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
International Equity Benchmarks						
MSCI ACWI Ex USA	World ex-US	-0.6%	-10.2%	1.2%	0.1%	1.9%
MSCI EAFE	Int'l Developed	-1.5%	-10.2%	2.1%	1.7%	1.6%
S&P EPAC Small Cap	Small Cap Int'l	-2.6%	-4.4%	7.6%	5.0%	4.3%
MSCI EM	Emerging Equity	0.7%	-12.1%	-1.6%	-3.8%	3.5%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Domestic Fixed Income Benchmarks						
Barclays Aggregate	Core Bonds	2.2%	6.0%	4.1%	3.8%	5.1%
Barclays US High Yield	High Yield	5.5%	1.6%	4.2%	5.8%	7.6%
BofA ML US HY BB/B	High Yield	4.6%	2.1%	4.6%	5.9%	7.0%
CSFB Levered Loans	Bank Loans	2.9%	0.9%	3.0%	4.0%	4.2%
BofA ML US 3-Month T-Bill	Cash	0.1%	0.2%	0.1%	0.1%	1.0%
Barclays US TIPS 1-10 Yr	Inflation	1.3%	3.3%	1.6%	1.6%	4.0%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Global Fixed Income Benchmarks						
Citigroup WGBI	World Gov. Bonds	3.4%	11.3%	2.6%	1.2%	4.2%
BC Global Credit	Global Bonds	1.9%	5.5%	3.2%	3.1%	4.7%
JPM GBI-EM Glob. Diversified	Em. Mkt. Bonds (Local)	3.0%	2.2%	-3.5%	-2.2%	5.7%
JPM EMBI+	Em. Mkt. Bonds	6.0%	13.2%	7.1%	6.4%	8.0%
		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Alternative Benchmarks						
Bloomberg Commodity Index	Commodity	12.7%	-13.4%	-10.6%	-10.8%	-5.6%
Credit Suisse Hedge Fund Index	Hedge Fund	0.6%	-4.2%	2.5%	2.9%	4.2%
HFRI FoF Conservative	Fund of Funds	0.5%	-3.3%	1.9%	1.9%	1.4%
Cambridge PE Lagged*	Private Equity	0.3%	3.2%	10.9%	11.4%	10.8%
NCREIF ODCE Net Lagged*	Real Estate	2.0%	12.6%	12.6%	12.2%	5.4%
Wilshire REIT Index	REIT	5.6%	22.8%	13.6%	12.5%	7.0%
CPI + 2%	Inflation/Real Assets	1.3%	2.8%	3.0%	3.3%	3.8%



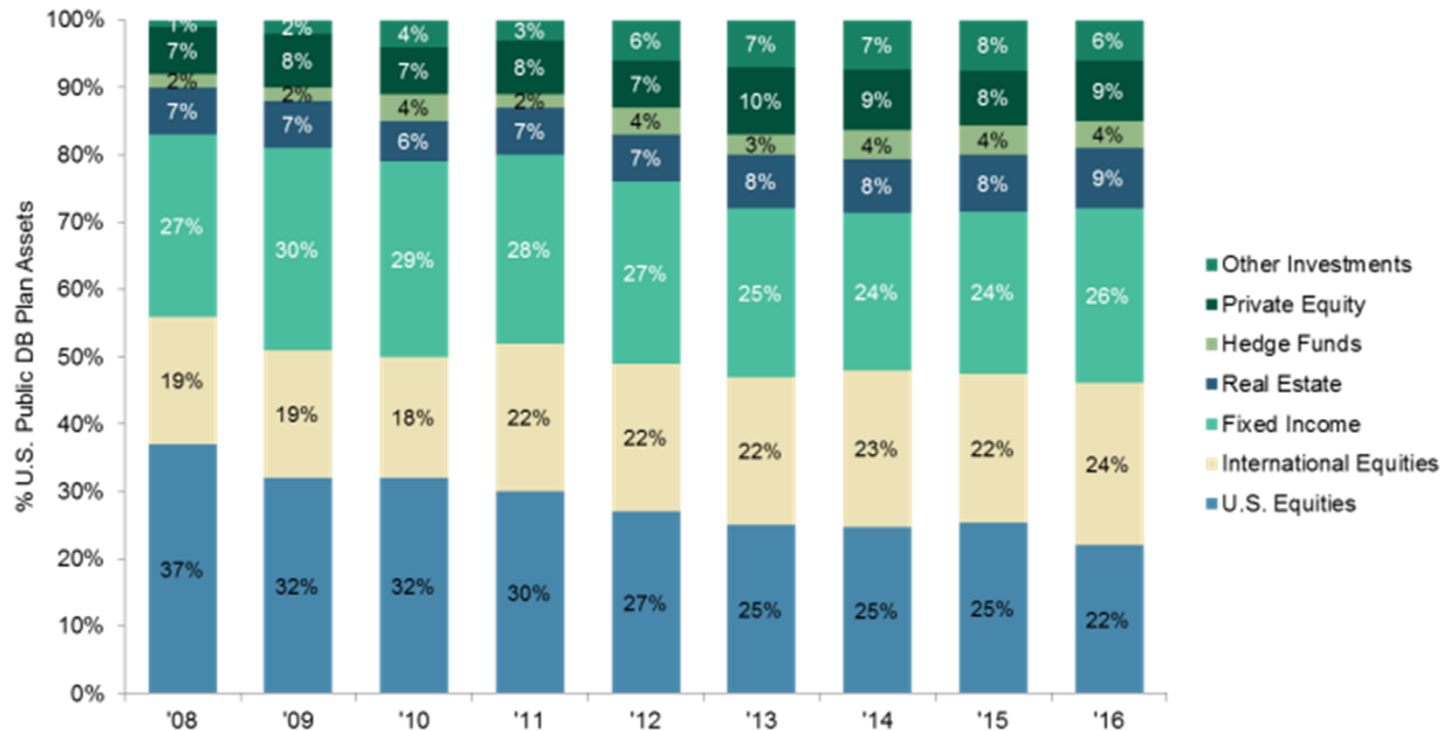
* As of 3/31/2016

- The one year median gross return for Public Funds was 0.8% in our InvestorForce universe.

Asset Allocation Trends

Greenwich 2016 Study

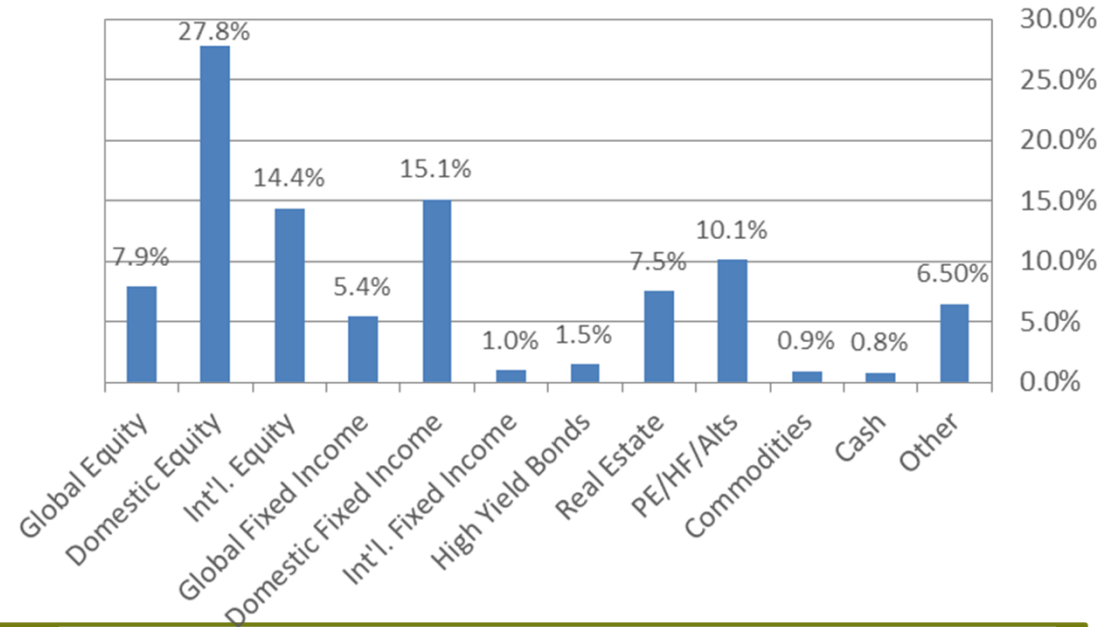
- The Greenwich study shows how public funds have diversified into alternative asset classes, especially over the last four years.
- Again, one thing to note with the Greenwich study is that the respondents can differ from year to year. So results can be misleading when comparing year over year.
- But looking at the allocation of U.S. Equities versus International Equities, we can see that for 2016, the allocation to International Equities was actually higher than U.S. Equities.
- Also worth noting is that public equities were at their lowest total allocation (46%) since 2008.



Asset Allocation Trends – Cont'd.

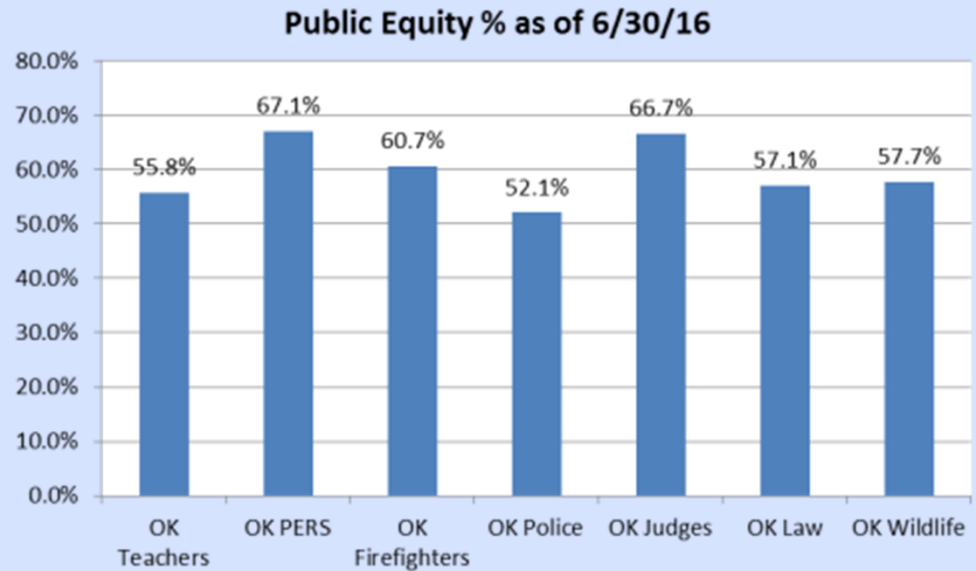
NCPERS 2016 Study

- Average target asset allocations to the respective asset classes are shown as of June 30, 2016.
- Overall equity allocations dropped about 3% from the 2015 averages to about 50%.
- The "Private Equity/Hedge Fund/Alternatives" asset class also saw a 3% drop from last year's study.



OK Pension Commission Comparison

- Comparing this to just the underlying funds' public equity allocations, we can see the funds are all higher than the average public equity allocation for the NCPERS Study.

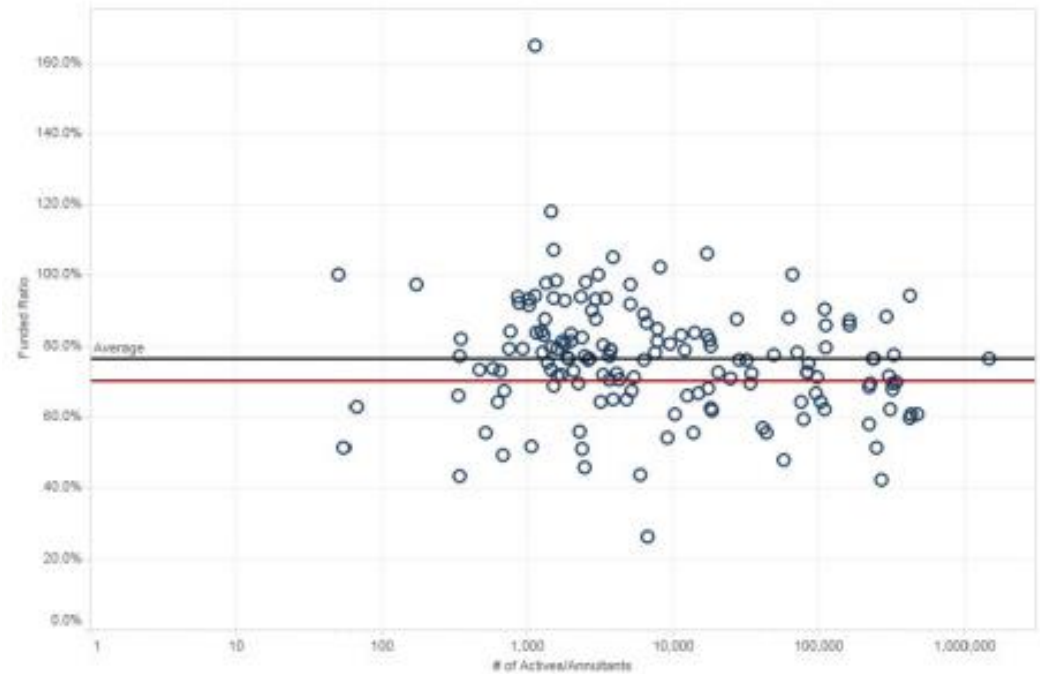


Funding Levels

NCPERS 2016 Study

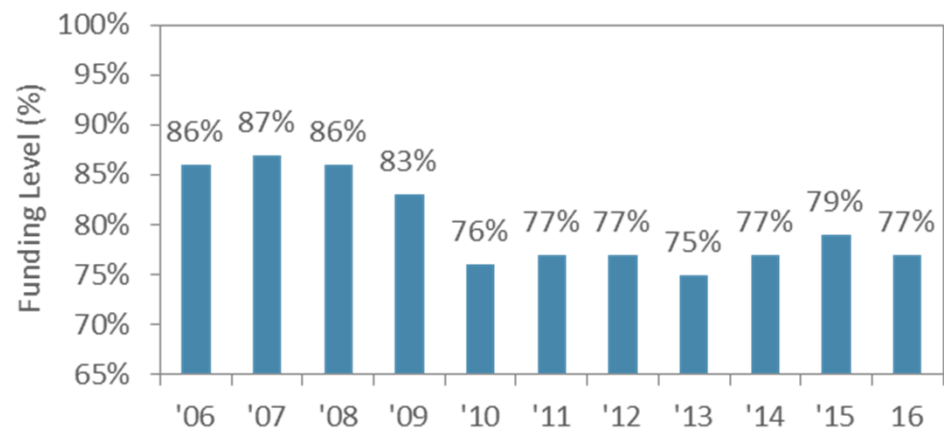
- The average funded ratio on an actuarial basis was 76.2%. The black line denotes the 76.2% average and the red line denotes the 70% funded ratio that Fitch Ratings considers to be adequate.

2016 Funded Level Distribution



Greenwich 2016 Study

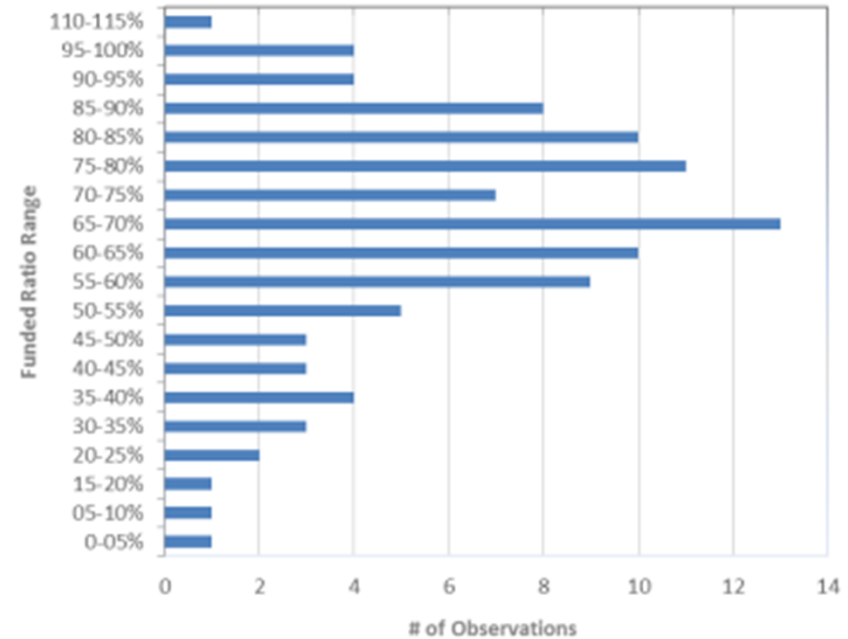
- Of the 167 Public Funds surveyed, the average funded ratio was 77% as of June 30, 2016.



Funding Levels – Cont'd.

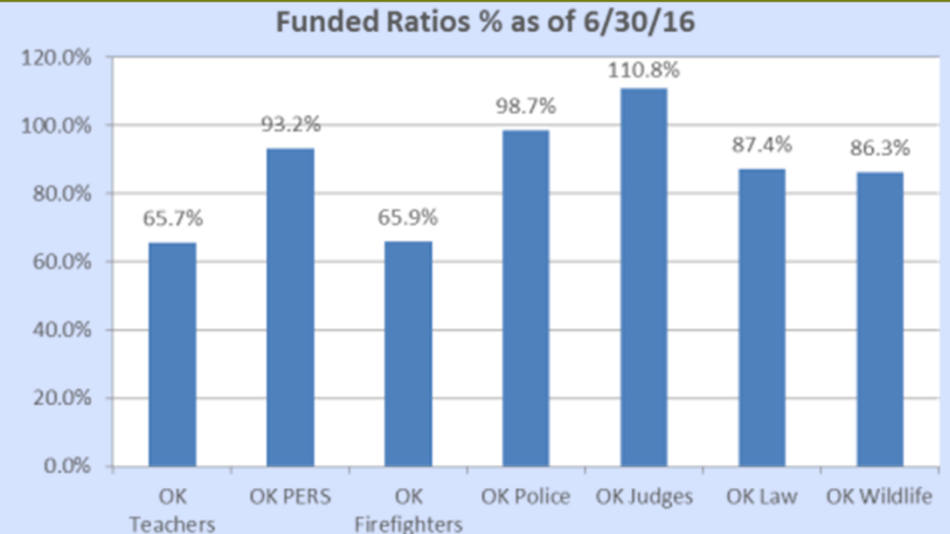
Milliman 2016 Study

- Of the 100 largest public funds in the country, 45 had funded ratios on an actuarial basis above 70% as of June 30, 2016.
- The aggregate funded ratio was 67.7% versus 73.3% when the study was done as of June 30, 2015.



OK Pension Commission Comparison

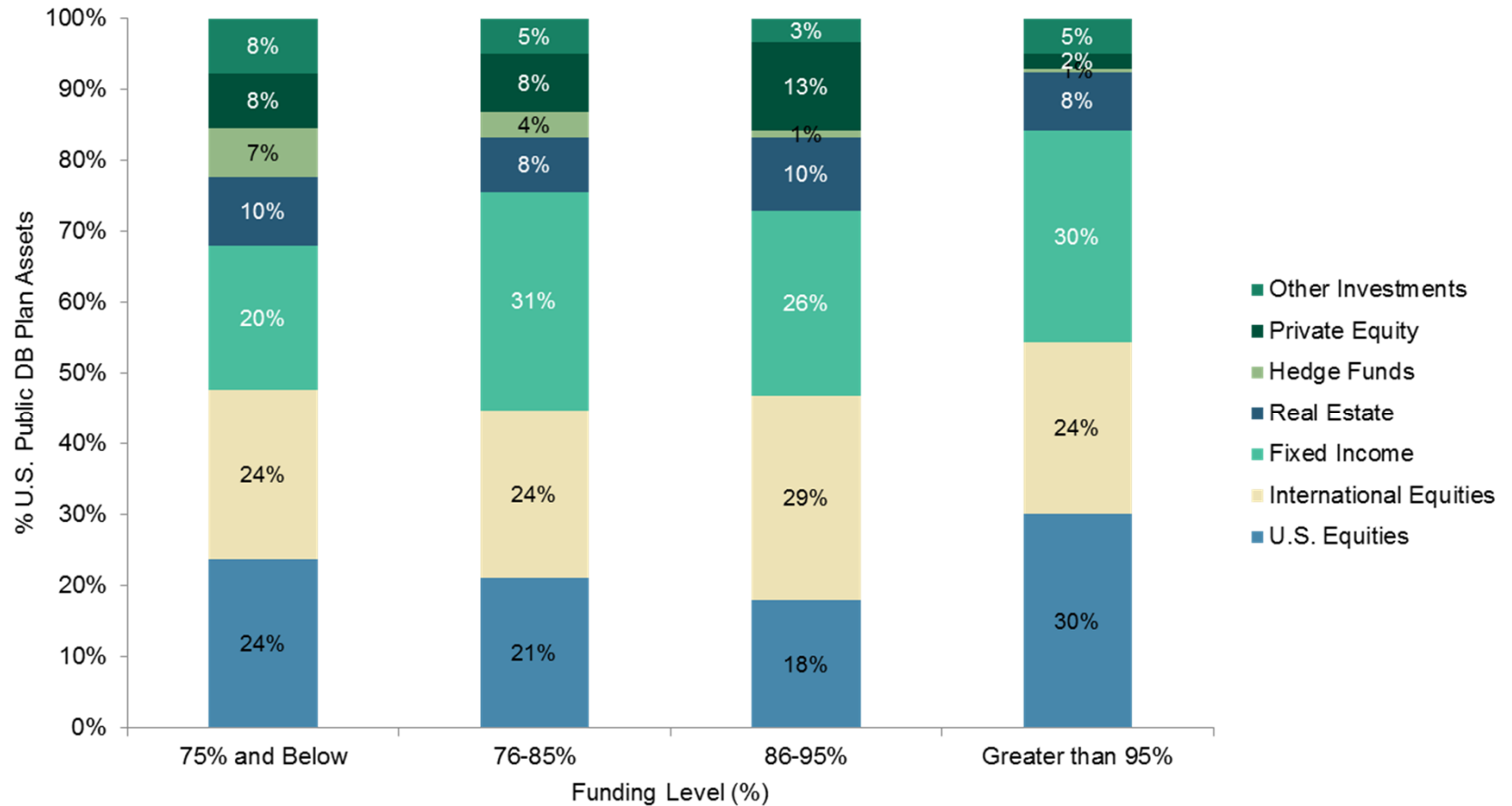
- Comparing this to the underlying funds' funded ratios, the Commission has a higher average amongst its seven funds, 86.9%, with five of the seven funds being higher than 85%.



Funding Levels – Cont'd.

Greenwich 2016 Study

- Greenwich took their funding levels a step further to see what the asset allocations were at various funded ratios.
- Below we can see that the funds with higher equity allocations and less in alternatives, generally speaking, had higher funded ratios as of June 30, 2016.

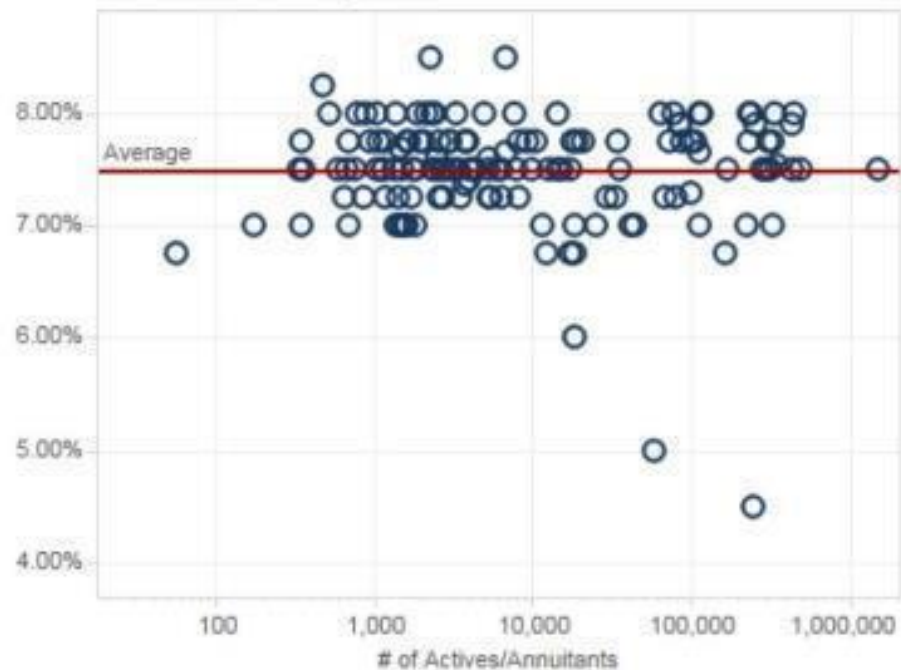


Actuarial Investment Assumptions

NCPERS 2016 Study

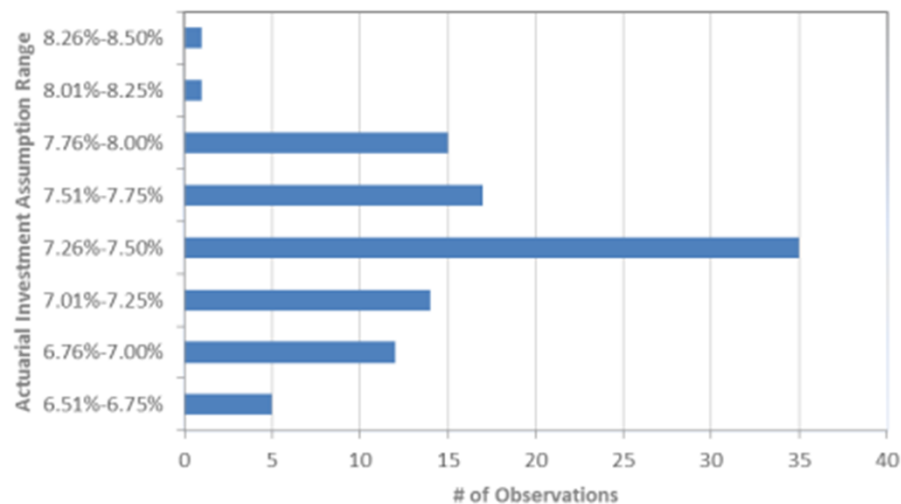
- The average investment assumption for responding funds is 7.50% , the same aggregated average as 2015. However, almost a quarter of funds who also responded in 2015 reduced their investment assumption. Among those who made a change from 2015 to 2016, their investment assumption was lowered by 0.26 percent.

Investment Assumption



Milliman 2016 Study

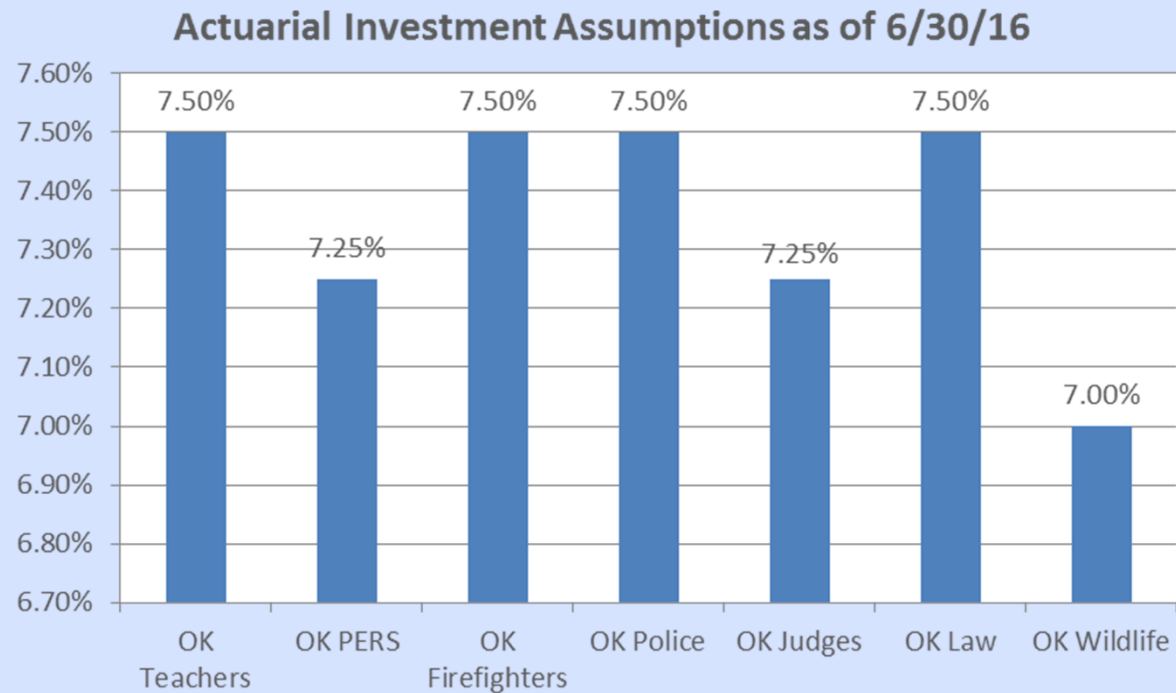
- Of the 100 largest Public Funds in the country, two-thirds are now between 7.00%-7.75%.
- The median investment assumption is 7.50% for this study, with a spread from 6.50%-8.50%.
- One-third of the Funds have dropped their investment assumption since last year's study.



Actuarial Investment Assumptions – Cont'd.

OK Pension Commission Comparison

- Comparing this to the underlying funds' actuarial investment assumptions, four of the seven funds are at the two averages / medians of 7.5% found in the studies with the other three falling in the lower end of the range.



Fees and Expenses

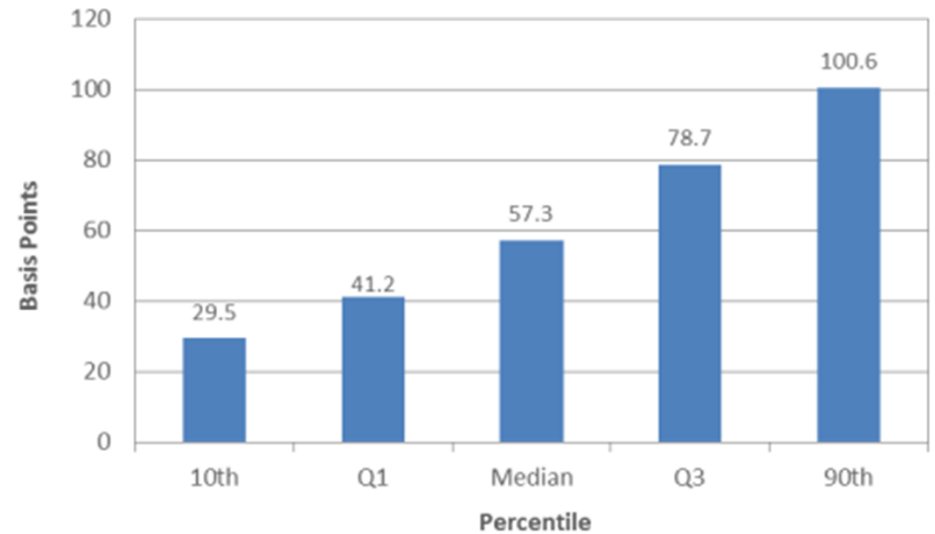
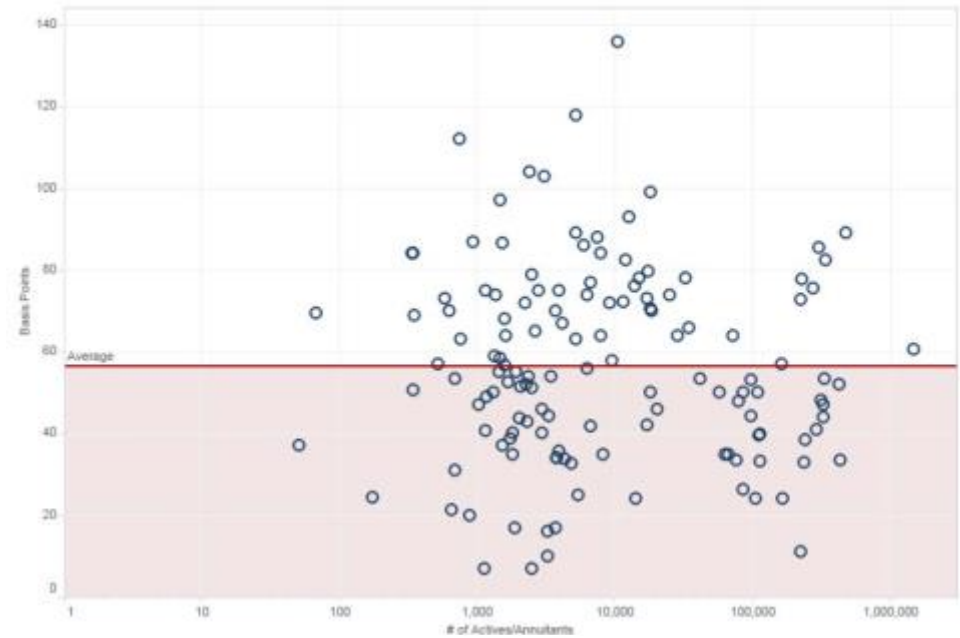
NCPERS 2016 Study

- The overall average of Fund expenses for respondents to the NCPERS Study was 56 basis points. Which breaks down into 42 basis points for investment related fees and 14 basis points for administrative related fees. This is a decrease from 60 bps in the 2015 study.

CEM 2016 Study

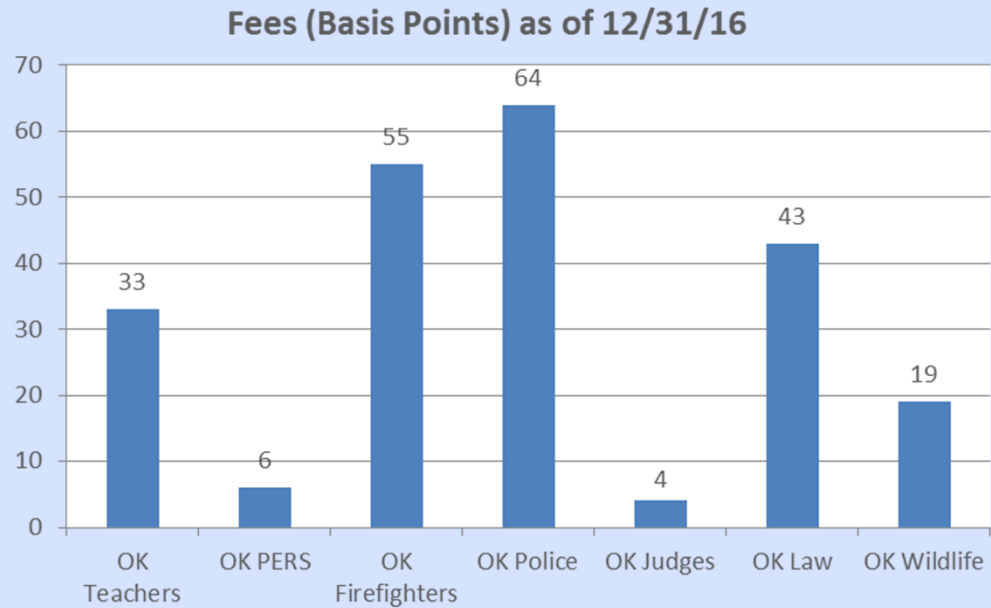
- Defines total investment costs as asset management costs and oversight, custodial and consulting costs. It excludes transaction costs private asset performance fees, actuarial costs and benefit administration.
- The study confirms the NCPERS study with fees averaging around 57 basis points.

2016 Total Plan Expense by Fund Size

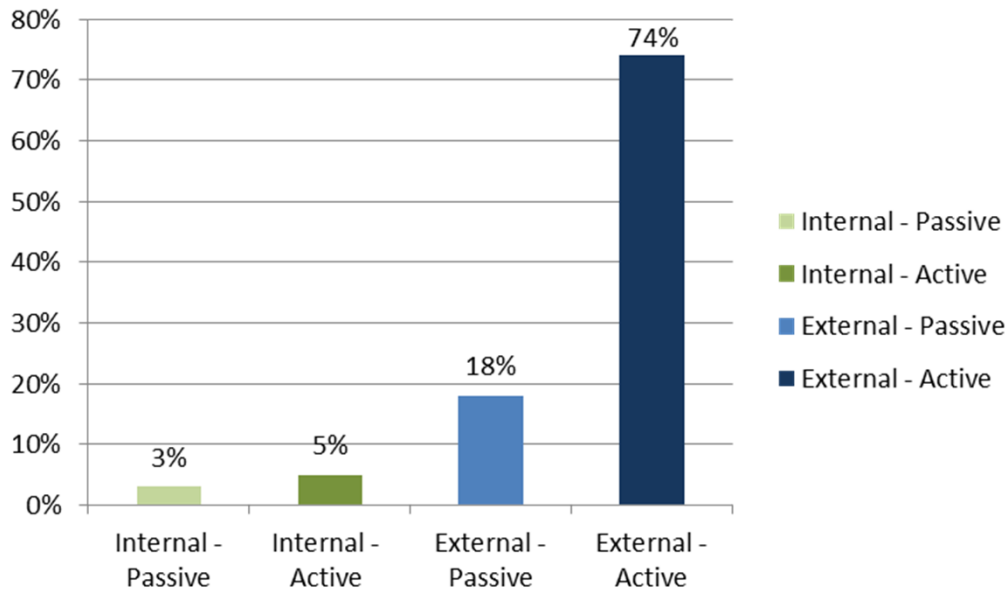


OK Pension Commission Comparison

- Comparing this to the underlying funds' fees done as of 12/31/16, we can see that six of the seven plans are below the average/median of 56 and 57 basis points found in the other two studies.

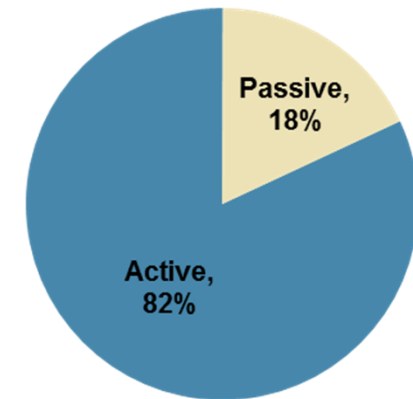


CEM 2016 Study – Implementation Style by U.S. Pension Funds*

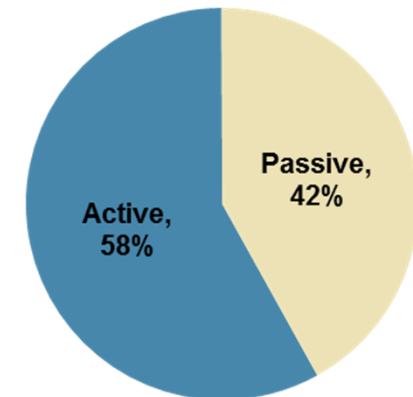


Greenwich 2016 Study – Implementation Style by U.S. Pension Funds

Overall Portfolio Active Allocation*



U.S. Equities Active Allocation

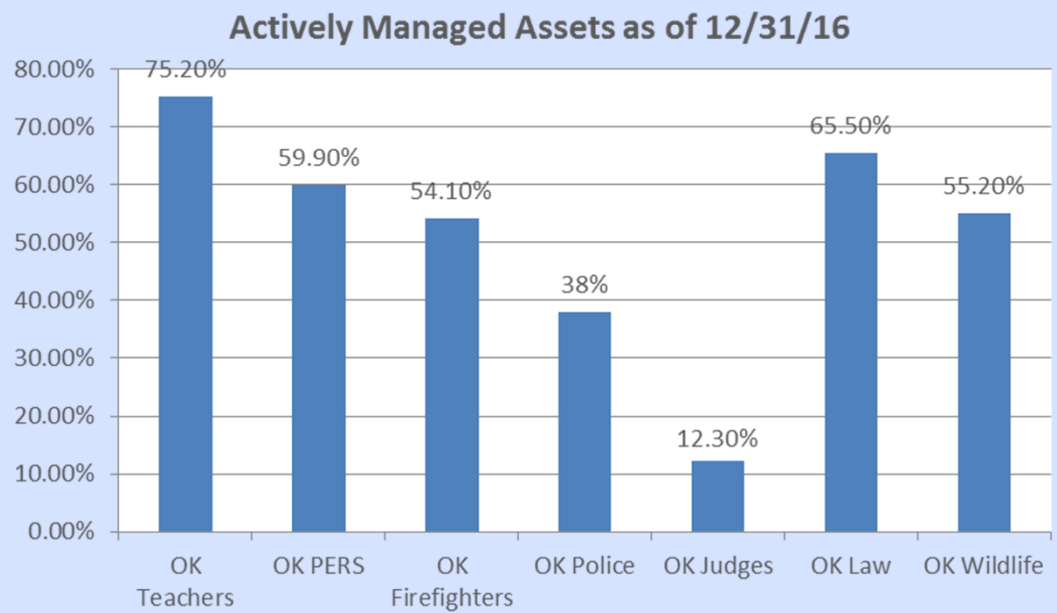


- **98% of active U.S. equity funds trailed the benchmark over the past 10 years according to Greenwich Associates.**

*Includes U.S. equities, international equities, and fixed income products.

OK Pension Commission Comparison

- Comparing this to the underlying funds' active management allocations done as of 12/31/16, we can see that six of the seven plans are below the averages of 74 % and 82% found in the other two studies.



*Includes U.S. equities, international equities, and fixed income products.

Appendix



OK Pension Commission – Performance as of 6/30/16 Gross of Fees

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Oklahoma State Pension Commission	27,864,681,702	100.0	2.5	14	3.5	32	-1.0	81	7.2	23	7.6	11	6.4	11
S&P 500			2.5	14	3.8	22	4.0	3	11.7	1	12.1	1	7.4	1
Barclays Aggregate			2.2	27	5.3	2	6.0	1	4.1	96	3.8	98	5.1	78
60% S&P 500 / 40% BC Agg			2.4	17	4.5	7	5.0	1	8.7	1	8.9	1	6.8	5
MSCI EAFE			-1.5	99	-4.4	99	-10.2	99	2.1	99	1.7	99	1.6	99
Teachers	13,777,576,641	49.4	3.1	6	4.1	17	-2.2	94	7.4	14	8.3	2	7.1	3
TEACHERS Allocation Index			3.3	3	4.0	18	-0.5	75	7.4	18	7.6	10	6.4	13
TEACHERS Policy Index			3.3	5	4.7	6	0.6	57	6.5	49	7.1	24	6.0	34
PERS	8,418,977,966	30.2	1.7	62	3.3	45	0.3	63	6.9	32	7.0	28	6.2	19
PERS Allocation Index			2.0	32	3.7	24	1.1	43	6.8	35	6.5	45	6.0	27
PERS Policy Index			2.0	38	3.6	27	0.8	52	6.7	39	6.6	40	5.9	38
Firefighters	2,231,409,221	8.0	1.8	58	2.7	72	1.1	43	8.0	4	7.7	9	6.0	34
FIREFIGHTERS Allocation Index			2.0	34	2.9	63	0.8	52	7.3	19	7.5	13	5.9	36
FIREFIGHTERS Policy Index			2.0	32	3.4	38	2.9	7	8.4	2	8.4	2	6.5	10
Police	2,195,219,601	7.9	2.1	30	2.5	77	-0.3	73	6.1	61	6.3	60	5.5	62
POLICE Allocation Index			1.6	76	2.0	86	-1.2	84	5.3	82	5.8	75	5.3	71
POLICE Policy Index			2.0	36	3.4	39	-0.5	75	5.4	81	6.2	60	5.3	75
Law	849,359,249	3.0	1.8	58	1.5	93	-2.0	93	6.0	66	6.3	56	5.3	71
LAW Allocation Index			1.9	51	3.4	36	1.5	32	6.8	34	6.8	30	5.8	39
LAW Policy Index			2.0	35	2.9	65	1.3	35	7.1	26	7.2	21	6.0	34
Judges	293,094,909	1.1	2.0	34	3.6	30	0.6	57	6.8	37	6.7	36	6.0	30
JUDGES Allocation Index			1.9	40	3.5	35	0.5	58	6.6	44	6.5	44	5.7	45
JUDGES Policy Index			2.0	38	3.6	27	0.8	52	6.7	39	6.6	39	5.7	47
Wildlife	99,044,115	0.4	1.5	80	2.6	74	0.9	49	6.6	44	6.5	44	5.2	77
WILDLIFE Allocation Index			2.2	28	4.0	19	2.1	18	6.8	35	6.7	38	5.8	40
WILDLIFE Policy Index			2.2	28	3.8	22	3.8	4	7.7	11	7.8	8	6.5	10
InvestorForce Public DB Gross Median			1.9		3.2		0.8		6.4		6.4		5.6	