



## **Appendix A: Kentucky Benefit Structures**

		KERS Non-Hazardous			KERS Hazardous		
		Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008- 12/31/2013)	Tier 3 (post 1/1/2014)	Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008- 12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit Multiplier</b>	1.97% (or 2.0% for btwn 1/1998-1/1999) (8/1/2004-9/1/2008) ≥ 4 YOS: 2.00%	≤ 10 YOS: 1.10% 11-20 YOS: 1.30% 20-26 YOS: 1.50% 26-30 YOS: 1.75% ≥ 30 YOS: 2.00%	No benefit factor Annuity calculated by member's account balance reflecting 4% employer contribution and minimum 4% interest	2.49%	≤ 10 YOS: 1.30% 11-20 YOS: 1.50% 20-25 YOS: 2.25% ≥ 25 YOS: 2.50%	No benefit factor Annuity calculated by member's account balance reflecting 7.5% employer contribution and minimum 4% interest
	<b>Maximum Benefit</b>	No cap	No cap	No cap	No cap	No cap	No cap
	<b>Vesting Period</b>	5 YRS	5 YRS	5 YRS	5 YRS	5 YRS	5 YRS
	<b>Employee Contribution</b>	5.00%	6.00% (1.00% allocated to health benefits)	6.00% (1.00% allocated to health benefits)	8.00%	9.00% (1.00% allocated to health benefits)	9.00% (1.00% allocated to health benefits)
	<b>Final Average Salary Period</b>	Highest 5 YRS	Last 5 YRS preceding retirement	n/a	Highest 3 YRS	Highest 3 YRS	n/a
	<b>Retirement Eligibility</b>	Any age w/ 27 YOS Age 65 w/ 4 YOS*	Age + YOS ≥ 87 (Min Age 57) or Age 65 w/ 5 YOS		Any age w/ 20 YOS Age 55 w/ 5 YOS*	Any age w/ 25 YOS*	Age 60 w 5 YOS
	<b>COLA</b>	COLA needs to be authorized by legislature			COLA needs to be authorized by legislature		
Assumptions:	<b>Investment Return</b>	6.75%	6.75%	6.75%	7.50%*	7.50%*	7.50%*
	<b>GASB Discount Rate</b>	6.75%	6.75%	6.75%	7.50%*	7.50%*	7.50%*
	<b>Inflation</b>	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	15.97%	15.97%	15.97%	59.73%	59.73%	59.73%
	<b>Unfunded Actuarial Liability</b>	\$11,112,411,929	\$11,112,411,929	\$11,112,411,929	\$377,218,942	\$377,218,942	\$377,218,942

Note:  
KERS Non-Haz Tier1: Money Purchase for age 65 with less than 4 YOS based on contributions and interest  
KERS Haz Tier1: Money Purchase for age 55 with less than 5 YOS based on contributions and interest  
KERS Haz Tier2: Money Purchase calculations

		CERS Non-Hazardous			CERS Hazardous		
		Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008- 12/31/2013)	Tier 3 (post 1/1/2014)	Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008- 12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit Multiplier</b>	Prior to 8/1/2004 ≥ 4 YOS: 2.20% (8/1/2004-9/1/2008) ≥ 4 YOS: 2.00%	≤ 10 YOS: 1.10% 10-20 YOS: 1.30% 20-26 YOS: 1.55% 26-30 YOS: 1.75% ≥ 30+ YOS: 2.00%	No benefit factor Annuity calculated by member's account balance reflecting 4% employer contribution and minimum 4% interest	≥ 5 YOS: 2.50%	≤ 10 YOS: 1.30% 10-20 YOS: 1.50% 20-25 YOS: 2.25% ≥ 25+ YOS: 2.50%	No benefit factor Annuity calculated by member's account balance reflecting 7.5% employer contribution and minimum 4% interest
	<b>Maximum Benefit</b>	No cap	No cap	No cap	No cap	No cap	No cap
	<b>Vesting Period</b>	5 YRS	5 YRS	5 YRS	5 YRS	5 YRS	5 YRS
	<b>Employee Contribution</b>	5.00%	6.00% (1.00% allocated to health benefits)	6.00% (1.00% allocated to health benefits)	8.00%	9.00% (1.00% allocated to health benefits)	9.00% (1.00% allocated to health benefits)
	<b>Final Average Salary Period</b>	Highest 5 YRS	Last 5 YRS preceding retirement	n/a	Highest 3 YRS	Highest 3 YRS	n/a
	<b>Retirement Eligibility</b>	Age 65 w/ 4 YOS*	Age + YOS ≥ 87 (Min Age 57) or Age 65 w/ 5 YOS		Age 55 w/ 5 YOS*	Age 60 w/ 5 YOS	
	<b>COLA</b>	COLA needs to be authorized by legislature			COLA needs to be authorized by legislature		
Assumptions:	<b>Investment Return</b>	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
	<b>GASB Discount Rate</b>	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
	<b>Inflation</b>	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	59.00%	59.00%	59.00%	57.74%	57.74%	57.74%
	<b>Unfunded Actuarial Liability</b>	\$4,541,084,447	\$4,541,084,447	\$4,541,084,447	\$1,565,337,050	\$1,565,337,050	\$1,565,337,050

Note:  
CERS Non-Haz Tier 1: Less than 4 YOS, the monthly benefit is the actuarial equivalent of 2X the member's contribution w/interest  
CERS Haz Tier 1: Less than 5 YOS, the monthly benefit is the actuarial equivalent of 2X the member's contribution w/interest

State Police				
		Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit Multiplier</b>	≥ 5 YOS:2.50%	≤ 5 YOS (hazardous duty) ≤ 10 YOS:1.30% 11-20 YOS: 1.50% 20-25 YOS: 2.25% ≥ 25 YOS: 2.50%	No benefit formula Annuity calculated by member's account balance reflecting 7.5% employer contribution and minimum 4% interest
	<b>Maximum Benefit</b>	No cap	No cap	No cap
	<b>Vesting Period</b>	5 YRS	5 YRS	5 YRS
	<b>Employee Contribution</b>	8.00%	9.00% (1.00% allocated to health benefits)	9.00% (1.00% allocated to health benefits)
	<b>Final Average Salary Period</b>	Highest 3 YRS	Highest 3 YRS	n/a
	<b>Retirement Eligibility</b>	Any age w/ 20 YOS Age 55 w/ 5 YOS*	Any age w/ 25 YOS Age 60 w/ 5 YOS	
	<b>COLA</b>	COLA needs to be authorized by legislature		
Assumptions:	<b>Investment Return</b>	6.75%	6.75%	6.75%
	<b>GASB Discount Rate</b>	6.75%	6.75%	6.75%
	<b>Inflation</b>	3.50%	3.50%	3.50%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	30.26%	30.26%	30.26%
	<b>Unfunded Actuarial Liability</b>	\$540,592,758	\$540,592,758	\$540,592,758

Note:

KRS State Police: Tier 1 - Money Purchase for age 55 w/ less than 5 YOS Tier 2 & 3 - No Money Purchase calculations

Judicial Retirement Plan**					
		Tier 1 (prior to 7/1/1978)	Tier 2 (7/1/1978-6/30/1980)	Tier 3 (7/1/1980-1/1/2014)	Tier 4 (post 1/1/2014)
Plan Design:	<b>Benefit Multiplier</b>	5.00% uninterrupted YOS (not to exceed 100.00% of FAC)	4.15% uninterrupted YOS (not to exceed 100.00% of FAC)	2.75% uninterrupted YOS (not to exceed 100.00% of FAC)	No benefit factor Annuity calculated by member's account balance reflecting 4% employer contribution and minimum 4% interest
	<b>Maximum Benefit</b>	100.00% of FAC			
	<b>Vesting Period</b>	5 YRS	5 YRS	5 YRS	5 YRS
	<b>Employee Contribution</b>	Prior to 9/1/2008:5.00% (100% of benefit accrued contributions stop)	Prior to 9/1/2008:5.00% (100% of benefit accrued contributions stop)	Prior to 9/1/2008:5.00% Post 9/1/2008:6.00% (100% of benefit accrued contributions stop)	6.00% (1.00% allocated to health benefits)
	<b>Final Average Salary Period</b>	Highest 3 YRS	Highest 3 YRS	Highest 3 YRS	n/a
	<b>Retirement Eligibility</b>	Age 65 w/ 8 YOS*	Age 65 w/ 8 YOS*	Age 65 w/ 8 YOS*	None
	<b>COLA</b>	1.50% annually on July 1 if funding is 100%			Hybrid Cash Balance Plan at 100.00% and authorized by legislature
Assumptions:	<b>Investment Return</b>	7.00%	7.00%	7.00%	7.00%
	<b>GASB Discount Rate</b>	6.41%	6.41%	6.41%	6.41%
	<b>Inflation</b>	3.00%	3.00%	3.00%	3.00%
	<b>Smoothing Period</b>	Market Value	Market Value	Market Value	Market Value
	<b>Amortization Period</b>	≥ 30-YR	≥ 30-YR	≥ 30-YR	≥ 30-YR
	<b>Amortization Method</b>	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability
Financial:	<b>Funded Ratio</b>	72.07%	72.07%	72.07%	72.07%
	<b>Unfunded Actuarial Liability</b>	\$114,986,969	\$114,986,969	\$114,986,969	\$114,986,969

\*\* Reporting requirement changed per GABS 67, 2016 UAAL and funded ratio not provided in most recent audit. Information shown as of fiscal year ended 6/30/2015

Note:

KJRP Tier 1 - Tier 3: The age 65 requirement shall be reduced by 1 year for each 5 YOS and 1 year for each year beyond the YOS needed to accrue a benefit of 100%

Legislators' Retirement Plan**					
		Tier 1 (prior to 7/1/1978)	Tier 2 (7/1/1978-6/30/1980)	Tier 3 (7/1/1980-12/31/2013)	Tier 4 (post 1/1/2014)
Plan Design:	<b>Benefit Multiplier</b>	5.00% uninterrupted YOS (not to exceed 100% of FAC) 2.75% all other YOS	4.15% uninterrupted YOS (not to exceed 100% of FAC) 2.75% all of ther YOS	3.5% uninterrupted YOS (not to exceed 100% of FAC) 2.75% all other YOS	No benefit factor Annuity calculated by member's account balance reflecting 4% employer contribution and minimum 4% interest
	<b>Maximum Benefit</b>	100.00% of FAC			
	<b>Vesting Period</b>	5 YRS	5 YRS	5 YRS	5 YRS
	<b>Employee Contribution</b>	Prior to 9/1/2008:5.00% (100% of benefit accrued contributions stop)	Prior to 9/1/2008:5.00% (100% of benefit accrued contributions stop)	Prior to 9/1/2008:5.00% Post 9/1/2008:6.00% (100% of benefit accrued contributions stop)	6.00% (1.00% allocated to health benefits)
	<b>Final Average Salary Period</b>	Highest 3 YRS	Highest 3 YRS	Highest 3 YRS	n/a
	<b>Retirement Eligibility</b>	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	None
	<b>COLA</b>	1.50% annually on July 1 if funding is 100%			
Assumptions:	<b>Investment Return</b>	7.00%	7.00%	7.00%	7.00%
	<b>GASB Discount Rate</b>	6.85%	6.85%	6.85%	6.85%
	<b>Inflation</b>	3.00%	3.00%	3.00%	3.00%
	<b>Smoothing Period</b>	Market Value	Market Value	Market Value	Market Value
	<b>Amortization Period</b>	≥ 30-YR	≥ 30-YR	≥ 30-YR	≥ 30-YR
	<b>Amortization Method</b>	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability
Financial:	<b>Funded Ratio</b>	85.10%	85.10%	85.10%	85.10%
	<b>Unfunded Actuarial Liability</b>	\$15,207,557	\$15,207,557	\$15,207,557	\$15,207,557

\*\* Reporting requirement changed per GABS 67, 2016 UAAL and funded ratio not provided in most recent audit. Information shown as of fiscal year ended 6/30/2015

Note:

KLRP Tier 1 - Tier 3: The age 65 requirement shall be reduced by 1 year for each 5 YOS and 1 year for each year beyond the YOS needed to accrue a benefit of 100%

Teachers' Retirement			
		Tier 1 (prior to 7/1/2008)	Tier 2 (post 7/1/2008)
Plan Design:	<b>Benefit Multiplier</b>	Non-University members service prior to 7/1/1983:2.00% service post 7/1/1983:2.50% post 7/1/2002 ≤ 10 YOS:2.00% ≥ 10 YOS:2.50% retire post 7/1/2004 ≥ 30 YOS:3.00% University members 2.00% for each YOS	Non-University members ≤ 10 YOS:1.70% 10-20 YOS:2.00% 20-26 YOS:2.30% 26-30 YOS:2.50% 30 YOS:3.00% University members ≤ 10 YOS:1.50% 10-20 YOS:1.70% 20-27 YOS:1.85% ≥ 27 YOS 2.00%
	<b>Maximum Benefit</b>	No cap	No cap
	<b>Vesting Period</b>	5 YRS	5 YRS
	<b>Employee Contribution</b>	Non-University members:9.105% University members:7.625%	
	<b>Final Average Salary Period</b>	Age 60 Highest 5 YRS (-5.00% per yr < Age 60 or 27 YOS) Age 55 Highest 3 YRS w/ 27 YOS*	Age 60 Highest 5 YRS (-6.00% per yr < Age 60 or 27 YOS) Age 55 Highest 3 YRS w/ 27 YOS*
	<b>Retirement Eligibility</b>	Any age w/ 27 YOS Age 55 w/ 5 YOS	Any age w/ 27 YOS Age 60 w/ 5 YOS Age 55 w/ 10 YOS
	<b>COLA</b>	1.50% annually additional ad hoc increases authorized by the General Assembly	
Assumptions:	<b>Investment Return</b>	7.50%	7.50%
	<b>GASB Discount Rate</b>	4.20%	4.20%
	<b>Inflation</b>	3.00%	3.00%
	<b>Smoothing Period</b>	5-YR	5-YR
	<b>Amortization Period</b>	28.1-YR	28.1-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	54.60%	54.60%
	<b>Unfunded Actuarial Liability</b>	\$14,531,333,000	\$14,531,333,000

Note:  
KTRS Tier 1 and Tier 2: The minimum annual service allowance for all members is \$440.00 multiplied by credited services

		KERS Non-Hazardous			KERS Hazardous		
		Tier 1 (prior to 7/1/2008)	Tier 2 (7/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)	Tier 1 (prior to 7/1/2008)	Tier 2 (7/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime
	<b>Structure</b>	DC post 2003	DC	DC	DC post 2003	DC	DC
	<b>Coverage</b>	Family	Family	Family	Family	Family	Family
	<b>Employee Contribution</b>	Prior to 2003 employee contributes a % of premium: 20+ YOS:0% 15-19 YOS:25% 10-14 YOS:50% 4-9 YOS:75% ≤4 YOS:100% Post 2003 employer contributes \$12.80/mo per YOS *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$12.99 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$12.99 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Prior to 2003 employee contributes a % of premium: 20+ YOS:0% 15-19 YOS:25% 10-14 YOS:50% 4-9 YOS:75% ≤4 YOS:100% Post 2003 employer contributes \$19.19/mo per YOS *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually
	<b>Retirement Eligibility</b>	Any age w/ 27 YOS Age 65 w/ 4 YOS*	10 YOS	15 YOS	Any age w/ 20 YOS Age 55 w/ 5 YOS*	10 YOS	15 YOS
Assumptions:	<b>Investment Return</b>	7.50%*	7.50%*	7.50%*	7.50%*	7.50%*	7.50%*
	<b>Inflation</b>	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	30.26%	30.26%	30.26%	125.26%	125.26%	125.26%
	<b>Unfunded Actuarial Liability</b>	\$1,761,489,315	\$1,761,489,315	\$1,761,489,315	(\$62,851,075)	(\$62,851,075)	(\$62,851,075)



		CERS Non-Hazardous			CERS Hazardous		
		Tier 1 (prior to 7/1/2008)	Tier 2 (7/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)	Tier 1 (prior to 7/1/2008)	Tier 2 (7/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime
	<b>Structure</b>	DC post 2003	DC	DC	DC post 2003	DC	DC
	<b>Coverage</b>	Family	Family	Family	Family	Family	Family
	<b>Employee Contribution</b>	Prior to 2003 employee contributes a % of premium: 20+ YOS:0% 15-19 YOS:25% 10-14 YOS:50% 4-9 YOS:75% ≤4 YOS:100% Post 2003-2008 employer contributes \$12.80/mo per YOS *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$12.99 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$12.99 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Prior to 2003 employee contributes a % of premium: 20+ YOS:0% 15-19 YOS:25% 10-14 YOS:50% 4-9 YOS:75% ≤4 YOS:100% Post 2003 employer contributes \$19.19/mo per YOS *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually
	<b>Retirement Eligibility</b>	Age 65 w/ 4 YOS*	10 YOS	15 YOS	Age 55 w/ 5 YOS*	10 YOS	15 YOS
Assumptions:	<b>Investment Return</b>	7.50%	7.50%	7.50%	7.50%	7.50%	7.50%
	<b>Inflation</b>	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	69.60%	69.60%	69.60%	72.86%	72.86%	72.86%
	<b>Unfunded Actuarial Liability</b>	\$1,044,364,390	\$1,044,364,390	\$1,044,364,390	\$496,216,115	\$496,216,115	\$496,216,115

State Police				
		Tier 1 (prior to 9/1/2008)	Tier 2 (9/1/2008-12/31/2013)	Tier 3 (post 1/1/2014)
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime	Lifetime
	<b>Structure</b>	DC post 2003	DC	DC
	<b>Coverage</b>	Family	Family	Family
	<b>Employee Contribution</b>	Prior to 7/1/2003 20+ YOS:0% 15-19 YOS:25% 10-14 YOS:50% 4-9 YOS:75% <4 YOS:100%	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually	Active employee contributes 1.00% of salary + retirement system pays \$19.48 per/mo per YOS towards retiree premium *dollar amount is adjusted 1.5% annually
	<b>Retirement Eligibility</b>	Any age w/ 20 YOS Age 55 w/ 5 YOS*	10 YOS	15 YOS
Assumptions:	<b>Investment Return</b>	7.75%	7.75%	7.75%
	<b>Inflation</b>	3.50%	3.50%	3.50%
	<b>Smoothing Period</b>	5-YR	5-YR	5-YR
	<b>Amortization Period</b>	28-YR	28-YR	28-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	67.15%	67.15%	67.15%
	<b>Unfunded Actuarial Liability</b>	\$95,830,947	\$95,830,947	\$95,830,947

Judicial Retirement Plan					
		Tier 1 (prior to 7/1/1978)	Tier 2 (7/1/1978-6/30/1980)	Tier 3 (7/1/1980-1/1/2014)	Tier 4 (post 1/1/2014)
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime	Lifetime	Lifetime
	<b>Structure</b>	DB	DB	DB	DB
	<b>Coverage</b>	Family	Family	Family	Family
	<b>Employee Contribution</b>	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Active employee contributes 1.00% of salary + employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%
	<b>Retirement Eligibility</b>	Age 65 w/ 8 YOS*	Age 65 w/ 8 YOS*	Age 65 w/ 8 YOS*	None
Assumptions:	<b>Investment Return</b>	6.15%	6.15%	6.15%	6.15%
	<b>Inflation</b>	3.00%	3.00%	3.00%	3.00%
	<b>Smoothing Period</b>	Market Value	Market Value	Market Value	Market Value
	<b>Amortization Period</b>	> 30-YR	> 30-YR	> 30-YR	> 30-YR
	<b>Amortization Method</b>	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability
Financial:	<b>Funded Ratio</b>	104.70%	104.70%	104.70%	104.70%
	<b>Unfunded Actuarial Liability</b>	(\$3,041,186)	(\$3,041,186)	(\$3,041,186)	(\$3,041,186)

Legislators' Retirement Plan						
		Tier 1 (prior to 7/1/1978)	Tier 2 (7/1/1978-6/30/1980)	Tier 3 (7/1/1980-12/31/2013)	Tier 4 (post 1/1/2014)	
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime	Lifetime	Lifetime	
	<b>Structure</b>	DB	DB	DB	DB	
	<b>Coverage</b>	Family	Family	Family	Family	
	<b>Employee Contribution</b>	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%	Active employee contributes 1.00% of salary + employee contributes a percentage of premium 20+ YOS:0% 11-19 YOS:50% (-5.00% per additional year above 10 YOS) 10 YOS-10 YOS + 11 mos:50% 4.9 YOS + 11 mos-10 YOS:75%
	<b>Retirement Eligibility</b>	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	Age 65 w/ 5 YOS (or combo w/ other state service = 8 YOS)*	None	
Assumptions:	<b>Investment Return</b>	6.50%	6.50%	6.50%	6.50%	
	<b>Inflation</b>	3.00%	3.00%	3.00%	3.00%	
	<b>Smoothing Period</b>	Market Value	Market Value	Market Value	Market Value	
	<b>Amortization Period</b>	> 30-YR	> 30-YR	> 30-YR	> 30-YR	
	<b>Amortization Method</b>	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	Normal cost plan interest on liability + 1% of liability	
Financial:	<b>Funded Ratio</b>	127.30%	127.30%	127.30%	127.30%	
	<b>Unfunded Actuarial Liability</b>	(\$7,805,086)	(\$7,805,086)	(\$7,805,086)	(\$7,805,086)	

<b>Teachers' Retirement</b>			
		Tier 1 <b>(prior to 7/1/2008)</b>	Tier 2 <b>(post 7/1/2008)</b>
Plan Design:	<b>Benefit</b>	Lifetime	Lifetime
	<b>Structure</b>	DB	DB
	<b>Coverage</b>	Spousal	Spousal
	<b>Employee Contribution</b>	Active employee contribution Non-University members:3.75% University members:2.775% of salary + employee contributes a percentage of premium 0-14.99 YOS: 100% 15-19.99 YOS: 55% 20-24.99 YOS: 35% 25-25.99 YOS: 10% 26-26.99 YOS: 5% 27+ YOS: 0% Spousal coverage at full cost	
	<b>Retirement Eligibility</b>	Any age w/ 27 YOS Age 55 w/ 5 YOS	Any age w/ 27 YOS Age 60 w/ 5 YOS Age 55 w/ 10 YOS
Assumptions:	<b>Investment Return</b>	7.50%	7.50%
	<b>Inflation</b>	3.50%	3.50%
	<b>Smoothing Period</b>	5-YR	5-YR
	<b>Amortization Period</b>	29.3-YR	29.3-YR
	<b>Amortization Method</b>	Level percent of payroll closed	Level percent of payroll closed
Financial:	<b>Funded Ratio</b>	21.90%	21.90%
	<b>Unfunded Actuarial Liability</b>	\$2,839,018,000	\$2,839,018,000



## **Appendix B: Benchmarking Tabular Findings**

Count	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
1	Kentucky (Non-Hazardous)	Y	5.0%	5	N/A	Age 65 with 5 YOS; Age + YOS $\geq$ 87	Employer Contribution is 4.0% Annual interest rate of 4.0% (If the system's geometric average net investment return for the previous five years exceeds 4.0% then the member's account will be credited with 75% of the amount of return over 4.0%) Accumulated Account Balance divided by Actuarial Factor (determined by age at retirement)	No automatic COLA; unless authorized by the General Assembly
1B	Kentucky (Hazardous)	Y	8.0%	5	N/A	Age 60 with 5 YOS; Any age with 25 YOS	Employer Contribution is 7.5% Annual interest rate of 4.0% (If the system's geometric average net investment return for the previous five years exceeds 4.0% then the member's account will be credited with 75% of the amount of return over 4.0%) Accumulated Account Balance divided by Actuarial Factor (determined by age at retirement)	No automatic COLA; unless authorized by the General Assembly
2	California	Y	Contributions range from 5.0% to 10.0% (Approximately 65% of employees contribute 8.0%)	5 YRS	3	Age 52 with 5 YOS	2.5% x AFC x YOS (multiplier decreases by 0.1% per year prior to age 67)	Annual adjustments calculated by determining the lesser of 2.0% compounded from end of the year of retirement; or actual rate of inflation If the calculated rate of increase is less than 1.0%, then no COLA is provided (may be greater than 2.0% after several years of low inflation)
3	Colorado	N	8.0%	5	1/12 of Highest 3 YOS	Age 65; Age 58 with 30 YOS; Any age with 35 YOS	2.5% x AFC x YOS	Lesser of 2.0% or increase in CPI-W
4	Florida [1]	Y	3.0%	8	8	Age 65 with 8 YOS; Any age with 33 YOS	Up to age 65 or up to 33 YOS: 1.60% x AFC x YOS Age 66 or with 34 YOS: 1.63% x AFC x YOS Age 67 or with 35 YOS: 1.65% x AFC x YOS Age 68 or with 36+YOS: 1.68% x AFC x YOS	Retirement service earned on or after 7/1/2011 not subject to a COLA
5	Georgia	Y	1.25% into a DB Plan First 1%: 100% match additional 4% up to 50% match into a 401K plan	DB: 10 DC: 5	2	Age 60 with 10 YOS; Any age 30 YOS	DB: 1.0% x AFC x YOS 401K: Employer contribution of 100% on first 1.0% plus for each additional 1.0% contributed by member the Employer with match 50% up to 4.0% (total additional match up to 2.0%)	N/A
6	Illinois	N	4.0%	10	8	Age 67 with 10 YOS	1.67% x AFC x YOS	Lesser of 50% of increase in CPI or 3.0%

Count	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
7	Indiana [2]	Y	ASA: 3.0% mandatory (3.0% is picked up by employer) Hybrid: 0% for DB side 3% mandatory to an annuity savings acct (paid either by employee, employer, or both) Both options employee may elect to make additional contributions)	ASA: 5 Hybrid:10	ASA: N/A Hybrid:5	ASA: Automatic eligibility for withdrawal once separated from service (certain restrictions may apply if vested in pension)  Hybrid: Age 65 with 10 YOS; 60 with 15 YOS; Age 55 + YOS ≥ 85	ASA: Employer picks up the employee mandatory 3.0% contribution Members direct their investments in a combination of any 8 funds The default investment fund is the target date fund based on a member's estimated retirement date  Hybrid:1.1% x AFC x YOS	ASA: N/A Hybrid: Ad hoc basis
8	Iowa [3]	Y	5.95%	7	5	Age 62 with 20; Age 65 with any; Age + YOS ≥ 88	2.0% x AFC x YOS (1-30) + 1.0% x AFC x YOS (31-35)	No COLA; but Favorable Experience Dividend (FED) can be granted based on status of FED reserve account
9	Massachusetts	N	9% + 2% (on earnings above \$30,000)	10	5	Age 60 with 10 YOS	2.5% (at age 67) x AFC x YOS multiplier decreases by 0.15 for each year member is below age 67	Subject to legislative approval; increase in CPI, up to 3.0%
10	Michigan [4]	Y	Automatically enrolled at hire into a 401(k) with a 5% contribution; Employee may elect to make additional contributions	4	N/A	Withdrawals prior to age 59.5 subject to a 10% penalty	Employer contribution is 4.0% plus match up to 5.0% (First 3.0% match are identified as retirement savings; Next 2.0% are directed to a Personal Healthcare Fund)	N/A
11	Missouri	Y	4.0%	10	3	Age 67 with 10; Age 55 + YOS ≥ 90	1.7% x AFC x YOS	80% of the increase in CPI; 5.0% maximum
12	New York	Y	Based on salary: 3.0%: ≤\$45,000 3.5%: \$45,000-\$55,000 4.5%: \$55,000-\$75,000 5.75%: \$75,000-\$100,000 6.0%: ≥\$100,000	10	5	Age 63 with 20 YOS	1.75% x AFC x YOS (1-20) + 2.0% x AFC x YOS (21+)	50% of increase in CPI; 1.0% minimum; 3.0% maximum; Adjustment is limited to first \$18,000 of annuity
13	North Carolina	Y	6.0%	5	4	Age 60 with 25 YOS; Age 65 with 5 YOS; Any age with 30 YOS	1.82% x AFC x YOS	Subject to legislative approval
14	Ohio [5]	N	10.0%	5	5	Age 67 with 5 YOS; Age 55 with 32 YOS	2.2% x AFC x YOS (1-35) + 2.5% x AFC YOS (36+)	Increase in CPI; 3.0%
15	Pennsylvania [6]	Y	6.25% (Plus a shared risk contribution not to exceed an additional 2%)	10	3	Age 65 with 3 YOS; Age + YOS ≥ 92 (min 35 YOS)	2.0% x AFC x YOS x 1.0%	No automatic COLA; General Assembly or Governor can grant a COLA
16	South Carolina	Y	8.66%	8	5	Age 65 with 8 YOS; Age + YOS ≥ 90	1.82% x AFC x YOS	1.0%; \$500 maximum



Count	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
17	Tennessee	Y	5.0% into a DB Plan 2.0% into a DC Plan (Automatic enrollment to DC Plan with opt-out feature)	5	5	Age 65 with 5 YOS; Age + YOS $\geq$ 90	DB: 1.0% x AFC x YOS DC: Employer contribution is 5.0% into a 401K	Increase in CPI is: 0.5% - 1.0%: 1.0% 1.0%+: equal to increase in CPI, not to exceed 3.0%
18	Texas [6]	Y	9.5%	10	3	Age 65 with 10; Age + YOS $\geq$ 80 (min of 10 YOS)	2.3% x AFC x YOS	Any COLAs must be approved by State Legislature
19	Virginia	Y	4% into a DB Plan 1% into a DC Plan	DB: 5 DC: 4	5	Age 67 with 5 YOS; Age + YOS $\geq$ 90	DB: 1.0 x AFC x YOS DC: Employer contribution is 1.0% plus 100% match on the first 1.0%; 83% on 1.5%; 75% on 2.0%; 70% on 2.5%; 66% on 3.0%; 64% on 3.5%; and 62.5% on 4.0%	First 2.0% increase in CPI-U + 50% of any additional increase; 3.0% maximum
20	West Virginia	Y	4.5%	5	5	Age 62 with 10 YOS; Age 55 $\geq$ 80 YOS	2.0% x AFC x YOS	None
21	Wisconsin	Y	6.6%	5	3	Age 65; Age 57 with 30 YOS	1.6% x AFC x YOS	Ad hoc basis: annual annuity increases and decreases dependent on trust fund investment performance and current and future projected funding needs

Count	State	Social Security	Employee Contribution	Percentage of Local and State Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
1	Kentucky	N - Non-University members Y - University members	Non-University members: 9.105% University members: 7.625%	State: 100%	5	5 YRS; Age 55 with 27 YOS: 3 YRS	Any age with 27 YOS; Age 60 with 5 YOS; or Age 55 with 10 YOS	Non-University members ≤ 10 YOS: 1.70% 10-20 YOS: 2.00% 20-26 YOS: 2.30% 26-30 YOS: 2.50% 30 YOS: 3.00% University members ≤ 10 YOS: 1.50% 10-20 YOS: 1.70% 20-27 YOS: 1.85% ≥ 27 YOS: 2.00%	1.5% annually, additional ad hoc increases must be authorized by the General Assembly
2	California [1]	N	2.0% at age 60: 10.25% 2.0% at age 62: 9.205%*	State: 38.7% Local: 58.8%	5	< 25 YOS: 3 YRS ≥ 25 YOS: 1 YR	2.0% at age 60: Age 50 with 30 YOS; 2.0% at age 62: Age 55 with 5 YOS	2.0% at age 60 2.0% at age 62	2.0%
3	Colorado [2]	N	8.0%	State: 0% Local: 100%	5	1/12 of Highest 3 YOS	Any age with 35 YOS; Age 58 + YOS ≥ 88; Age 65 with 5 YOS; or Age 65 with less than 5 YOS but 60 payroll postings	Greater of 2.5% x AFC x YOS (up to 40 years) or the money purchase benefit, which is actuarially determined based on the value of the member's account on the date of retirement	Lesser of increase in CPI-W or 2.0%
4	Florida	Y	3.0%	Local: 100%	8	8	Age 65 with 8 YOS; Age after 65 that member becomes vested; or Any age with 30 YOS	Up to age 65 or up to 33 YOS: 1.60% x AFC x YOS Age 66 or with 34 YOS: 1.63% x AFC x YOS Age 67 or with 35 YOS: 1.65% x AFC x YOS Age 68 or with 36+YOS: 1.68% x AFC x YOS	Retirement service earned on or after 7/1/2011 not subject to a COLA
5	Georgia [3]	Y	6.0%	State: 0% Local: 100%	10	2	Any age with 30 YOS or Age 60 with 10 YOS	2.0% x AFC x YOS (up to 40 years)	Granted on an ad hoc basis If current average CPI is greater or equal to CPI at time of retirement: 1.5% If current average CPI is than the CPI at time of retirement: no COLA
6	Illinois [4]	N	9.0%	State: 96.4% Local: 3.6%	5	8	Age 67 with 10 YOS	2.2% x AFC x YOS	Lesser of 50% of CPI or 3.0%
7	Indiana [5]	Y	ASA: 3.0% mandatory (3.0% is picked up by employer) Hybrid: 0% for DB side 3% mandatory to an annuity savings acct (paid either by employee, employer, or both) Both options employee may elect to make additional contributions)	State: 0.40% Local: 99.6%	ASA: 5 Hybrid:10	ASA: N/A Hybrid:5	ASA: Automatic eligibility for withdrawal once separated from service (certain restrictions may apply if vested in pension) Hybrid: Age 65 with 10 YOS; 60 with 15 YOS; Age 55 + YOS ≥ 85	ASA: Employer picks up the employee mandatory 3.0% contribution Members direct their investments in a combination of any 8 funds The default investment fund is the target date fund based on a member's estimated retirement date Hybrid:1.1% x AFC x YOS	ASA: N/A Hybrid: Ad hoc basis

Count	State	Social Security	Employee Contribution	Percentage of Local and State Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
8	Iowa [6]	Y	5.95%	State: 0% Local: 100%	7	Highest 3 YRS as of 7/1/2012, or Highest 5 YRS over entire career	Age 65; Age 62 with 20 YOS; or Age + YOS ≥ 88	2.0% x YOS up to 30 years + additional 1% per YOS 31-35	No COLA; but Favorable Experience Dividend (FED) can be granted based on status of FED reserve account
9	Massachusetts [7]	N	11.0%	State: 100% Local: 0%	10	5	Age 60 with 10 YOS; Retirement Plus: Age 60 with 30 YOS (20 with MTRS)	Ranges from 1.45% to 2.5% based on age and YOS	Subject to legislative approval; increase in CPI, up to 3.0%
10	Michigan [8]	Y	Varies by earnings: \$0 - \$5,000: 3.0% \$5,000.01 - \$15,000: 3.6% \$15,000.01 and up: 6.4%	State: 0% Local: 100%	10	5	Age 60 with 10 YOS	1.5% x AFC x YOS	3% annual non-compounded with max. annual increase \$300
11	Missouri [9]	N	14.5%	State 0% Local: 100%	5	3	Age 60 with 5 YOS; Any age with 30 YOS; or Age + YOS ≥ 80	2.5% x AFC x YOS	Increase in CPI-U is between 0-5%: 2.0% Increase in CPI-U is 5% or more: 5.0% No increase in CPI-U: No COLA
12	New York [10]	Y	Based on salary ≤\$45,000: 3.0% \$45,000-\$55,000: 3.5% \$55,000-\$75,000: 4.5% \$75,000-\$100,000: 5.75% ≥\$100,000: 6.0%	State: 0% Local: 100%	10	5	Age 63 with 20 YOS	1.75% x YOS (1-20) + 2.0% x YOS (>20)	50% of CPI; 1.0% minimum; 3.0% maximum; Adjustment is limited to first \$18,000 of employee's allowance
13	North Carolina	Y	6.0%	State 0% Local: 100%	5	4	Age 60 with 25 YOS, Age 65 with 5 YOS, or Any age with 30 YOS	1.82% x AFC x YOS	Subject to legislative approval
14	Ohio [11]	N	14% DB	State: 0% Local: 100%	5	5	Any age with 30 YOS; or Age 65 with 5 YOS	2.2% x AFC x 30 YOS	2.0%
15	Pennsylvania	Y	T-E: 7.5% (with shared risk of 9.5%) T-F: 10.30% (with shared risk 12.3%)	State: 50% Local: 50%	10 or Age 65 with ≥ 3 YOS	3	Age 65 with 3 YOS; or Age + 35 YOS ≥ 92	T-E: 2.0% x AFC x YOS T-F: 2.5% x AFC x YOS	No automatic COLA; General Assembly or Governor can grant a COLA
16	South Carolina	Y	8.66%	State: 100% Local: 0%	8	5	Age 65 with 8 YOS; or Age + YOS ≥ 90	1.82% x AFC x YOS	1.0%; \$500 maximum
17	Tennessee	Y	5% into a DB Plan 2% into a DC Plan (Automatic enrollment to DC Plan with opt-out feature and may elect to adjust contributions)	State: 0% Local: 100%	5	5	Age 65 with 5 YOS; Age + YOS ≥ 90	DB: 1.0% x AFC x YOS DC: Employer contribution is 5.0% into a 401K	Increase in CPI is: 0.5% - 1.0%: 1.0% 1.0%+: equal to increase in CPI, not to exceed 3.0%
18	Texas	N	7.7%	State: 50% Local: 50%	5	3	Age 65 with 5 YOS; Age 62 + ≥ 80 YOS (with minimum of 5 YOS)	2.3% x AFC x YOS	Any COLAs must be approved by State Legislature
19	Virginia	Y	4% into a DB Plan 1% into a DC Plan	State 0% Local: 100%	DB: 5 DC: 4	5	Age 67 with 5 YOS; Age + YOS ≥ 90	DB: 1.0 x AFC x YOS DC: Employer contribution is 1.0% plus 100% match on the first 1.0%; 83% on 1.5%; 75% on 2.0%; 70% on 2.5%; 66% on 3.0%; 64% on 3.5%; and 62.5% on 4.0%	First 2% increase in CPI-U + 50% of any additional increase; 3.0% maximum

Count	State	Social Security	Employee Contribution	Percentage of Local and State Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
20	West Virginia	Y	6.0%	State: 100% Local: 0%	10	5	Age 62 with 10 YOS	2.0% x AFC x YOS	None
21	Wisconsin	Y	6.6%	State: 0% Local: 100%	5	3	Age 65 with 5 YOS; or Age 57 with 30 YOS	1.6% x AFC x YOS	Plan does not provide a COLA; however, annual annuity increases and decreases dependent on trust fund investment performance and current and future projected funding needs 2016: 0.5% increase

	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
1	Kentucky	Y	8%	5	N/A	Any age with 25 YOS; Age 60 w 5 YOS	Employer Contribution is 7.5% Annual interest rate of 4.0% (If the system's geometric average net investment return for the previous five years exceeds 4.0% then the member's account will be credited with 75% of the amount of return over 4.0%) Accumulated Account Balance divided by Actuarial Factor (determined by age at retirement)	Authorized by Legislature
2	California	N	11.5%	5	3	Age 50 with 5 YOS	Age 50-56: 2.0% x YOS X AFC increasing 0.1% for each year max 2.7% x YOS x FAS at 57	Increase in CPI; 2% max
3	Colorado	N	10.0%	5	1/12 of Highest 3 YOS	Age 65 with 5 YOS; Age 55 with 20 YOS; Any age with 30 YOS	2.5% x AFC x YOS	Lesser of CPI-W or 2.0%
4	Florida	Y	3.0%	8	Highest 8	Age 60 with 8 YOS; Any age with 30 YOS	3.0% x AFC x YOS	Retirement service earned on or after 7/1/2011 not subject to a COLA
5	Georgia	Y	1.25% into a DB Plan First 1%: 100% match additional 4% up to 50% match into a 401K plan	DB: 10 DC: 5	2	Age 60 with 10 YOS; Any age 30 YOS	DB: 1.0% x AFC x YOS 401K: Employer contribution of 100% on first 1.0% plus for each additional 1.0% contributed by member the Employer with match 50% up to 4.0% (total additional match up to 2.0%)	N/A
6	Illinois	N	12.5%	10	8 (capped at \$106,800)	Age 60 with 20 YOS	3.0% x AFC x YOS	Lesser of 50% of CPI or 3.0%
7	Indiana	N	6.0%	20	1	Age 52 with 20 YOS	50% of base salary + 1% for each 6 mos. from 20-32 YOS	Increase in CPI; 3% max
8	Iowa	N	11.4%	4	3	Age 55 with 22 YOS	60.5% x AFC + 2.75% x AFC x YOS (23-33 YOS)	N/A
9	Massachusetts	N	12% (+2% on earning of \$30,000)	10	5	Any age with 20 YOS	50% x AFC + 2.5% x AFC x YOS (21+) (maximum of 75%)	Subject to legislative approval; 3% max
10	Michigan	N	4% pension component 4% optional savings component (First 2% to health benefits and employer match; max 2%)	10 Pension Component 4 Savings Component	2	Any age with 25 YOS; Age 50 with 10 YOS;	60% x AFC (25+ YOS); 2% x AFC x YOS ( $\leq$ 25 YOS)	2.0% with maximum annual increase of \$500
11	Missouri	Y	4.0%	10	3	Age 55 with 10 YOS	1.7% + 0.8% until age 62	80% of increase in CPI-U; 5% maximum
12	New York	Y	Based on salary 3%: $\leq$ \$45,000 3.5%: \$45,000-\$55,000 4.5%: \$55,000-\$75,000 5.75%: \$75,000-\$100,000 6%: $\geq$ \$100,000	10	5	Any age with 20 YOS	50% x AFC + 1.66% x AFC x YOS (21+ YOS) (maximum of 70%)	50% of CPI; 1.0% minimum; 3.0% maximum; Adjustment is limited to first \$18,000 of employee's allowance
13	North Carolina	Y	6.0%	5	4	Age 55 with 5 YOS; Any age with 30 YOS	1.82% x AFC x YOS	Ad hoc basis; dependent on availability of funds and CPI

	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
14	Ohio	N	12.5%	20	5	Age 52 with 20 YOS; Age 48 with 25 YOS	2.5% x AFC x YOS (1-20 YOS) +2.2.5% per year from 20-25, + 2.0% per year 25+ maximum 79.25% AFC at 34+ YOS	1.25% Set annually by the board
15	Pennsylvania	N	6.25% (Plus a shared risk contribution not to exceed an additional 2%) May elect higher contribution rate for 2.5% benefit multiplier Rate: 9.3%	10	3	Any age with 20 YOS	2.0% x AFC x YOS (less than 20 YOS), 50% of AFC (20-25 YOS), or 75% of AFC (25+ YOS) 9.3% contribution rate: 2.5% x AFC x YOS	Ad hoc basis
16	South Carolina	Y	9.24%	8	5	Age 55 with 8 YOS; Any age with 27 YOS	2.14%	1.0%; \$500 maximum
17	Tennessee	Y	5% into a DB Plan 2% into a DC Plan (Automatic enrollment to DC Plan with opt-out feature and may elect to adjust contributions)	5	5	Age 60 with 5 YOS; Any age with 30 YOS	DB: 1.0% x AFC x YOS +0.75% up to SS age DC: Employer contribution is 5.0% into a 401K	Increase in CPI; 3.0% maximum
18	Texas	Y	9.5% +0.5% to the Law Enforcement Custodial Supplemental Retirement Fund	10	3 Supplemental Benefit: 5	Any age 20 YOS	2.8% x AFC x YOS Supplemental benefit: 0.5% x AFC x YOS	Ad hoc basis
19	Virginia	Y	5.0%	5	5	50/25; 60/5	1.85% x YOS + Hazardous Duty Supplement until Social Security Age	First 2% increase in CPI-U + 50% of any additional increase; 3.0% maximum
20	West Virginia	N	12.0%	10	5	Age 50 with 25 YOS; Age 52 with 20 YOS;	2.75% x AFC x YOS	1.0%
21	Wisconsin	Y	6.6%	5	3	Age 53 w 25 YOS; Age 54	2.0% x AFC x YOS	Plan does not provide COLA; however, annual annuity increases and decreases dependent on trust fund investment performance and current and future projected funding needs 2016: 0.5% increase

	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
1	Kentucky	Y	5.0%	5	N/A	Age 65 with 5 YOS; Age 57 + YOS $\geq$ 87	Employer Contribution is 4.0% Accumulated Account Balance divided by Actuarial Factor (determined by age at retirement)	No automatic COLA; requires Hybrid Cash Balance Plan at 100% funding and authorization by the legislature
2	California	N	8.0%	5	Final judicial salary	Age 65 with 20 YOS; Age 70 with 5 YOS	3.75% x AFC x YOS	CPI; 3% Maximum
3	Colorado	N	8.0%	5	1/12 of Final judicial salary	Age 65; Age 58 with 30 YOS; Any age with 35 YOS	2.5% x AFC x YOS	2.0% (positive investment year) Lesser of 2.0% or CPI-W (negative investment year)
4	Florida [1]	Y	3.0%	8	Highest 8	Age 65 with 8 YOS; Any age with 33 YOS	3.33% x AFC x YOS	Retirement service earned on or after 7/1/2011 not subject to a COLA
5	Georgia [2]	Y	7.5%	10	Final judicial salary or 2 years (dependent on position)	Age 60 with 16 YOS	66.67% x AFC + 1.0 x AFC x YOS (above 16 & below 24)	Ad hoc basis
6	Illinois	N	11.0% May elect to not participate in the Survivor's Annuity Benefit: 8.5%	8	8	Age 67 with 8 YOS	3.0% x AFC x YOS	Lesser of 3.0% or CPI-U
7	Indiana	Y	6% (max at 22 YOS)	8	Final judicial salary	Age 65 with 8 YOS; Age 55 + YOS $\geq$ 85	<12 YOS: 3.0% x AFC x YOS 12 YOS+: 50% x AFC + 1.0% x AFC x YOS	Tied to judicial salary increases
8	Iowa [3]	Y	9.35%	4	3	Age 50 with 20 YOS; Age 65 with 4 YOS	3.25% x AFC x YOS	Cost of living dividend; max 3%
9	Massachusetts [4]	N	Based on salary: 8.0%: $\leq$ 30,000 9.0%: \$30,000-\$45,000 10%: \$45,000+	10	Final judicial salary	Age 65 with 15 YOS; Age 70 with 10 YOS	5% x AFC x YOS	Subject to legislative approval; 3% max
10	Michigan [5]	Y	No mandatory contribution Employer match 100% up to 3%	4	N/A	Withdrawals prior to age 59.5 subject to a 10% penalty	N/A	N/A
11	Missouri	Y	4.0%	Immediate	Final judicial salary	Age 62 with 20 YOS; 67 with 12 YOS	50% x AFC	80% of CPI; 5% maximum
12	New York	Y	Based on salary: 3.0%: $\leq$ \$45,000 3.5%: \$45,000-\$55,000 4.5%: \$55,000-\$75,000 5.75%: \$75,000-\$100,000 6.0%: $\geq$ \$100,000	10	5	Age 63 with 20 YOS	1.75% x AFC x YOS (1-20) + 2.0% x AFC x YOS (21+)	50% of increase in CPI; 1.0% minimum; 3.0% maximum; Adjustment is limited to first \$18,000 of annuity
13	North Carolina	Y	6.0%	5	10	Age 65 with 5 YOS; Age 50 with 24 YOS	Multiplier ranges from 3.02% to 4.02% x AFC x YOS (based on judicial service level)	No automatic COLA; dependent on CPI and availability of funds
14	Ohio	N	10.0%	5	5	Age 67 with 5 YOS; Age 55 with 32 YOS	2.2% x AFC x YOS (1-35) + 2.5% x AFC YOS (36+)	Increase in CPI; 3% maximum

	State	Social Security	Employee Contribution	Vesting (Years)	AFC Period (Years)	Normal Retirement Eligibility (Age/YOS)	Benefit Formula	COLA
15	Pennsylvania	Y	Judges: 10% for 10 YOS, 7.5% 11+ YOS Magisterial Judge: 7.5%	5	3	Age 60 with 3 YOS; Any age with 35 YOS	2.0% x AFC x YOS (1-10) x 2.0 + 1.5% x AFC x YOS (11+) x 2.0	No automatic COLA; General Assembly or Governor can grant a COLA
16	South Carolina	Y	10.0%	10	Final judicial salary	Age 70 with 15 YOS; Age 65 with 20 YOS; any age with 25 YOS	71.3% x AFC + 2.67% x AFC YOS (26+)	Tied to judicial salary increases
17	Tennessee	Y	5% into a DB Plan 2% into a DC Plan (Automatic enrollment to DC Plan with opt-out feature)	DB: 8 DC: Immediate	5	Age 60 with 8 YOS; Age 55 with 24 YOS	DB: 1.6% x AFC x YOS DC: Employer contribution is 5.0%	CPI < 1%: 0.5% CPI ≥ 1%: full increase in CPI; 3.0% Maximum
18	Texas	Y	7.2%	12	Final judicial salary	Age + 12+YOS > 70; Any age with 20 YOS; Age 60 with 10 YOS Age 65 with 12 YOS	50% of AFC Judges who make contribution after 20 YOS or Rule of 70 with 12 YOS receive additional 2.3% x AFC x YOS (max 90%)	No automatic COLA: determined by legislature
19	Virginia	Y	4% into a DB Plan 1% into a DC Plan	DB: 5 DC: 4	5	Age 65 with 5 YOS; Age 60 with 30 YOS	DB: 1.0 x AFC x YOS DC: Employer contribution is 1.0% plus 100% match on the first 1.0%; 83% on 1.5%; 75% on 2.0%; 70% on 2.5%; 66% on 3.0%; 64% on 3.5%; and 62.5% on 4.0%	Increase in the CPI-U (max of 2%) + 1/2 of any additional (max of 1%); maximum 3%
20	West Virginia	Y	7.0%	14	3	Age 65 with 16 YOS; Any age with 24 YOS	75% x AFC	Judges hired to prior to July 1, 2005: Tied to judicial salary increases Judges hired post July 1, 2005: None
21	Wisconsin	Y	6.6%	5	3	Age 62 with 5 YOS	1.6% x AFC x YOS	By design does not provide COLA; however, annual annuity increases and decreases dependent on trust fund investment performance and current and future projected funding needs



State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
	Kentucky (Non-Hazardous)	1.0%	Retiree receives subsidy towards premium	Retiree receives subsidy towards premium	Non-Hazardous Employees: Retirement System pays \$12.99 per/mo. per YOS (dollar amount is adjusted 1.5% annually)	Non-Hazardous Employees: Retirement System pays \$12.99 per/mo. per YOS (dollar amount is adjusted 1.5% annually)
1	Kentucky (Hazardous)	1.0%	Retiree receives subsidy towards premium	Retiree receives subsidy towards premium	Hazardous Employees: Retirement System pays \$19.48 per/mo. per YOS (dollar amount is adjusted 1.5% annually)	Hazardous Employees: Retirement System pays \$19.48 per/mo. per YOS (dollar amount is adjusted 1.5% annually)
2	California	N/A Health insurance plan is funded on a "pay-as-you-go" basis BU 12 and BU 16 employees and employers contribute 0.5%	With maximum subsidy; ^0% of health insurance premium cost 10% of premium cost for family members	With maximum subsidy; ^0% of health insurance premium cost 10% of premium cost for family members	Subsidy depends on BU and YOS < 10 YOS or <15 YOS: 0% 20+ YOS or 25+ YOS: 100%	Subsidy depends on BU and YOS < 10 YOS or <15 YOS: 0% 20+ YOS or 25+ YOS: 100%
3	Colorado	No evidence found	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS
4	Florida	N/A	100% of premium (minus subsidy)	100% of premium (minus subsidy)	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
5	Georgia	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retirees and Spouses will pay a portion of the premium based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage	Retirees and Spouses will pay a portion of the premiums based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage; no subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option	Premium subsidy for single coverage that ranges based on YOS ≤ 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%	No subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option Premium subsidy for single coverage that ranges based on YOS < 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%
6	Illinois	N/A Health insurance plan is funded on a "pay-as-you-go" basis	5.0% of the premium for each YOS < 20 YRS Retiree receiving benefits from state retirement system who are not eligible for Medicare may waive healthcare coverage and receive a monthly financial incentive equal to \$500 per/mo. (20+ YOS) and \$150 per/mo. (< 20 YOS)	5.0% of the premium for each YOS < 20 YRS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS
7	Indiana	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retiree pays 100% premium	Retiree pays 100% premium	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)
8	Iowa	N/A Health insurance plan is funded on a "pay-as-you-go" basis	100% of premium	100% of premium	N/A	N/A
9	Massachusetts	N/A Health insurance previously funded on a "pay-as-you-go" basis but currently being funded by a Master Settlement Agreement with tobacco companies to fund its OPEB liability over the next ten years	20% of monthly premium New retirees may contribute 25% after 2016 if approved by legislature	20% of monthly premium New retirees may contribute 25% after 2016 if approved by legislature	80%	80% A small subset of retirees who are age 65+ who are not eligible for Medicare because the Commonwealth does not participate in SS, the retired employee are enrolled in the same health plan available to active employees under age 65
10	Michigan [3]	For employees hired on or after 1/1/2012: Voluntary contribution to the Personal Health Care Fund with an employer match of 2%	N/A	N/A	N/A	N/A

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
11	Missouri	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employer subsidy is based on YOS Minimum retiree contribution 35%	Employer subsidy is based on YOS Minimum retiree contribution 35%	2.5% x YOS (max 65%)	2.5% x YOS (max 65%)
12	New York	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	State reimburses 100% of the Medicare Part B premium Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage
13	North Carolina	Active members do not make contributions to OPEB	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Medicare retirees have the option of 1 of 4 fully insured Medicare Advantage/Prescription Drug Plan options or the self-funded Traditional 70/30 PPO plan offered to non-Medicare members. If the Traditional 70/30 Plan selected, the self-funded State Health Plan coverage is secondary to Medicare. Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%
14	Ohio [4]	Active members do not make contributions to OPEB	Retiree pays 100% premium minus subsidy	Retiree pays 100% premium minus subsidy	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018
15	Pennsylvania	N/A Health insurance plan is funded on a "pay-as-you-go" basis Monthly premium for active employees is \$3.22 per/mo.	Non-Medicare eligible retirees contribute 3% of Average Final Compensation	Medicare eligible retirees contribution 1.5% of Average Final Compensation	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
16	South Carolina	pay-as-you-go" basis Monthly premium for active employees is \$3.22 per/mo.	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS
17	Tennessee [1]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Current Retirees: same base premium as active employees with an adjustment for YOS 30+ YOS: 20% of premium ≥ 20 but ≤ 30 YOS: 30% of premium ≤ 20 YOS: 40% of premium  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Current Retirees: Flat rate premium subsidized by YOS retiree premiums after subsidies 30+ YOS: \$88.47 per/mo. ≥ 20 but ≤ 30 YOS: \$100.97 per mo. ≥ 15 but ≤ 20 YOS: \$113.47per/mo. Non-subsidized retirees and dependents pay \$138.47 per/mo.  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Retirees under 65 pay the same base premium as active employees with an adjustment for YOS 30+ YOS: 80% subsidized ≥ 20 but ≤ 30 YOS: 70% subsidized ≤ 20 YOS: 60% subsidized	Flat rate premium subsidized by YOS 30+ YOS: \$50.00 per/mo. ≥ 20 but ≤ 30 YOS: \$37.50 per mo. ≥ 15 but ≤ 20 YOS: \$25.00 per/mo.
18	Texas	N/A Health insurance plan is funded on a "pay-as-you-go" basis	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	100% of retiree health premiums 50% of dependents' premiums	100% of retiree health premiums 50% of dependents' premiums
19	Virginia	N/A	Retirees pay 100% of premium w/ 15 YOS premium is offset by the retiree health credit program (credit only applies to single coverage)	At age 65 required to enroll in Medicare Advantage 65 Plan to supplement Medicare monthly rates range from \$154 or \$322 based on coverage (i.e., medical; medical + dental)	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium
20	West Virginia [2]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employees hired after 7/1/2010 will pay 100% of the premium	Employees hired after 7/1/2010 will pay 100% of the premium	N/A	N/A
21	Wisconsin	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Full 2015 monthly rates range from \$602.10 to \$1,392.80 for single coverage ; \$1,497.80-\$3,477.80 for family coverage; retiree contributes percent of premium	N/A At age 65 required to enroll in Medicare	Determined by employer established in one of three ways: 1) min 50% but not more than 88% of average cost of Tier 1 plan; 2) min 50% but not more than 105% of the premium for the lowest-cost plan; 3) health plan three-tiered premium contribution structure established by the Group Insurance Board, subject to the 88% of the average cost of Tier 1 plan	N/A No plans offered

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
	Kentucky (Non-Hazardous)	DC	Individual/ Family	15 YOS	Prescription drug coverage is included in all medical plans offered by the Kentucky Employees' Health Plan (KEHP)
1	Kentucky (Hazardous)	DC	Individual/ Family	15 YOS	Prescription drug coverage is included in all medical plans offered by the Kentucky Employees' Health Plan (KEHP)
2	California	DB	Individual/ Family	20 or 25 YOS (maximum subsidy)	Employer Group Waiver Plan with a Wrap feature
3	Colorado	DC	Individual/Family	Age 60 + YOS $\geq$ 90	Employer Group Waiver Plan Medicare Part D prescription drug coverage provide subsidies to reduce premiums: 1) Monthly direct subsidy based on number of enrollees; 2) Quarterly Coverage Gap Discount Program; 3) Catastrophic Coverage Federal Reinsurance
4	Florida	Access Only	Individual/ Family	Age 65 with 8 YOS; Any age 33 YOS	Medicare prescription drug coverage and Medicare Advantage Plans for prescription drug coverage

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
5	Georgia	DB	Individual/ Family	Any age 25 YOS; Age 65 with 10 YOS	Medicare prescription drug coverage included in medical
6	Illinois	DB	Individual/ Family	Age 67 with 10 YOS	Medicare Advantage Prescription Drug coverage
7	Indiana	DB	Individual/Family	Age 65 with 10 YOS; Age 60 with 15 YOS; Age 55 + YOS ≥ 85	No evidence Prior to July 1, 2014 medical plan must include coverage for prescription drug coverage comparable to a Medicare plan that provides prescription drug benefits
8	Iowa	Access Only	Individual/ Family	Age 55	Medicare Prescription Drug coverage available
9	Massachusetts	DB	Individual/ Family	20 YOS; Age 55 with 10 YOS	Prescription drug coverage for Medicare and Non-Medicare
10	Michigan [3]	DC	N/A	4 YOS	State does not provide prescription drug coverage for employees hired on or after 1/1/2012

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
11	Missouri	DB	Individual/Family	Age 67 with 10 YOS; Age 55 + YOS $\geq$ 90	Medicare prescription drug coverage included in medical
12	New York	DB	Individual/Family	10 YOS	Prescription drug component are the same share of employer contribution of the premium
13	North Carolina	DB	Individual/ Family	Age 65 with 5 YOS; Age 50 with 20 YOS Any age with 30 YOS	Prescription drug coverage Coverage becomes secondary when retiree becomes eligible for Medicare
14	Ohio [4]	DB	Individual/Family (Spousal and Dependent coverage being phased out)	10 YOS	Prescription drug coverage
15	Pennsylvania	DB	Individual/Family	25 YOS or 20 YOS and superannuation age 60	Prescription drug coverage

State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription	
16	South Carolina	DB	Individual/ Spouse	5 YOS	Medicare eligible members have the option of Employer Group Waiver Plan with/a Wrap feature 50% coverage for "donut-hole" coverage gap (assumption of "donut-hole" gap to be eliminated by 2020) Federal drug subsidies must be used
17	Tennessee [1]	DC for Medicare-eligible	Individual/ Family	10 YOS w/ 3 YRS of coverage 20 YOS w/ 1 YR of coverage	Medicare Supplement Plan does not include pharmacy
18	Texas	DB	Individual/ Family	10 YOS	Employer Group Waiver Plan plus Commercial Wrap
19	Virginia	DC	Individual/ Family (retiree credit only for employee)	15 YOS for Retiree Health Insurance Credit Program	Advantage 65 Tier system for coverage of drugs \$360 annual deductible for covered brand name drugs, no deductible for generic
20	West Virginia [2]	Access Only	Individual/ Family	Age 60 with 5 YOS; Age 55 + YOS ≥ 80	Prescription drug coverage
21	Wisconsin	Access only	Individual/ Family	Min Age 55 with 5 YOS Norm Age 65 with 5 YOS; Age 57 with 30 YOS	Prescription drug coverage for Medicare eligible retirees through a self funded plan. Wrap product is also included to provide full coverage during the Medicare "donut hole"



State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	
1	Kentucky	Non-University members: 3.75% University members: 2.775% Established on a "pay-as-you-go-basis"	Premium subsidy that ranges based on YOS 0-14.99 YOS: 100% 15-19.99 YOS: 55% 20-24.99 YOS: 35% 25-25.99 YOS: 10% 26-26.99 YOS: 5% 27+ YOS: 0% Spousal coverage at full cost	Premium subsidy that ranges based on YOS 0-14.99 YOS: 100% 15-19.99 YOS: 55% 20-24.99 YOS: 35% 25-25.99 YOS: 10% 26-26.99 YOS: 5% 27+ YOS: 0% Spousal coverage at full cost	Premium subsidy that ranges based on YOS 0-14.99 YOS: 0% 15-19.99 YOS: 45% 20-24.99 YOS: 65% 25-25.99 YOS: 90% 26-26.99 YOS: 95% 27+ YOS: 100% Spousal coverage at full cost
2	California	1.45% Health insurance plan is funded on a "pay-as-you-go" basis	100% of premium	100% of premium	CalSTRS does not provide health insurance coverage; however, retiree and spouses are able to continue health insurance coverage at their own cost As an active employee, CalSTRS contributes 1.45% of members wages toward earning coverage under Medicare
3	Colorado	No evidence found	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS
4	Florida	N/A	100% of premium (minus subsidy)	100% of premium (minus subsidy)	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.
5	Georgia	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retirees and Spouses will pay a portion of the premium based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage	Retirees and Spouses will pay a portion of the premiums based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage; no subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option	Premium subsidy for single coverage that ranges based on YOS ≤ 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	
6	Illinois	Based FY2016; 1.07% of pay are made to a Teachers Health Insurance Security Fund (school districts contribute 0.80% and state contributes 1.07%) Benefit obligations are funded on a "pay-as-you-go" basis	Premium rates for retiree depend on coverage elected and whether a managed care plan is available 75% subsidy for retiree that elect a managed care plan or elect the Teachers' Choice Health Plan (TCHP) if a managed care plan is either not available or partially available; 50% subsidy for retiree that elect the TCHP when a managed care plan is available; Medicare primary dependent beneficiaries enrolled in a managed care plan or in the TCHP when no managed care plan is available receive a premium subsidy	Premium rates for retiree depend on coverage elected and whether a managed care plan is available 75% subsidy for retiree that elect a managed care plan or elect the Teachers' Choice Health Plan (TCHP) if a managed care plan is either not available or partially available; 50% subsidy for retiree that elect the TCHP when a managed care plan is available; Medicare primary dependent beneficiaries enrolled in a managed care plan or in the TCHP when no managed care plan is available receive a premium subsidy	School districts contribute 0.80 percent of pay; State contributes 1.07 percent of pay; Premium for retiree is not permitted to increase by more than 5% per year per statute Subsidy ranges between 50-75% based on what plan election
7	Indiana	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retiree pays 100% premium	Retiree pays 100% premium	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)
8	Iowa	N/A Health insurance plan is funded on a "pay-as-you-go" basis	100% of premium	100% of premium	N/A
9	Massachusetts	N/A Health insurance previously funded on a "pay-as-you-go" basis but currently being funded by a Master Settlement Agreement with tobacco companies to fund its OPEB liability over the next ten years	15%	15%	75%
10	Michigan [3]	For employees hired on or after 9/4/2012: Voluntary contribution to the Personal Health Care Fund with an employer match of 2%	N/A	N/A	N/A
11	Missouri	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employer subsidy is based on YOS Minimum retiree contribution 35%	Employer subsidy is based on YOS Minimum retiree contribution 35%	2.5% x YOS (max 65%)
12	New York	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	
13	North Carolina	Active members do not make contributions to OPEB	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Medicare retirees have the option of 1 of 4 fully insured Medicare Advantage/Prescription Drug Plan options or the self-funded Traditional 70/30 PPO plan offered to non-Medicare members If the Traditional 70/30 Plan selected, the self-funded State Health Plan coverage is secondary to Medicare Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%
14	Ohio	Active members do not make contributions to OPEB	Retiree pays 100% premium minus subsidy	Retiree pays 100% premium minus subsidy	2.1% x YOS (up to a max of 63%)
15	Pennsylvania	Active members do not make contributions to OPEB	Non-Medicare eligible retirees contribute 3% of Average Final Compensation	Medicare eligible retirees contribution 1.5% of Average Final Compensation	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)
16	South Carolina	N/A Health insurance plan is funded on a "pay-as-you-go" basis Monthly premium for active employees is \$3.22 per/mo.	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS
17	Tennessee [1]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Current Retirees: same base premium as active employees with an adjustment for YOS 30+ YOS: 20% of premium ≥ 20 but ≤ 30 YOS: 30% of premium ≤ 20 YOS: 40% of premium  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Current Retirees: Flat rate premium subsidized by YOS retiree premiums after subsidies 30+ YOS: \$88.47 per/mo. ≥ 20 but ≤ 30 YOS: \$100.97 per mo. ≥ 15 but ≤ 20 YOS: \$113.47per/mo. Non-subsidized retirees and dependents pay \$138.47 per/mo.  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Retirees under 65 pay the same base premium as active employees with an adjustment for YOS 30+ YOS: 80% subsidized ≥ 20 but ≤ 30 YOS: 70% subsidized ≤ 20 YOS: 60% subsidized
18	Texas	Active employee contribute 1%; The state contributes 0.65% percent of school district payroll; School districts contribute 55% of payroll; Health insurance benefits are financed on a "pay-as-you-go" basis	Free basic level coverage for eligible retirees and optional coverage for retirees and their dependents	Free basic level coverage for eligible retirees and optional coverage for retirees and their dependents	100% of premium for retiree coverage; a percentage of premium for dependent coverage

	State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65
19	Virginia	N/A	Retirees pay 100% of premium w/ 15 YOS premium is offset w/ by the retiree health credit program (credit only applies to single coverage)	At age 65 required to enroll in Medicare Advantage 65 Plan to supplement Medicare monthly rates range from \$154 or \$322 based on coverage (i.e., medical; medical + dental)	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium
20	West Virginia [2]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employees hired after 7/1/2010 will pay 100% of the premium	Employees hired after 7/1/2010 will pay 100% of the premium	N/A
21	Wisconsin	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Full 2015 monthly rates range from \$602.10 to \$1,392.80 for single coverage ; \$1,497.80-\$3,477.80 for family coverage; retiree contributes percent of premium	N/A At age 65 required to enroll in Medicare	Determined by employer established in one of three ways: 1) min 50% but not more than 88% of average cost of Tier 1 plan; 2) min 50% but not more than 105% of the premium for the lowest-cost plan; 3) health plan three-tiered premium contribution structure established by the Group Insurance Board, subject to the 88% of the average cost of Tier 1 plan

	State	Employer Contribution, 65 and Over	DB or DC Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/Retire from Sponsor)	Prescription
1	Kentucky	Premium subsidy that ranges based on YOS 0-14.99 YOS: 0% 15-19.99 YOS: 45% 20-24.99 YOS: 65% 25-25.99 YOS: 90% 26-26.99 YOS: 95% 27+ YOS: 100% Spousal coverage at full cost	DB	Individual/Spouse	15 YOS	Moved Medicare Eligible Health Plan drug plan from Medicare Part D Subsidy to Employer Group Waiver Prescription Drug Plan Participate private drug manufactures' 50% subsidy in Medicare Part D's coverage gap (the "donut hole") Member of the Know Your Rx Coalition
2	California	0%	DB	Individual/Spouse	2.0% at age 60: Age 50 with 30 YOS; 2.0% at age 62: Age 55 with 5 YOS	No program for Medicare Part D
3	Colorado	1.02% of payroll Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	DC	Individual/Family	Age 60 + YOS ≥ 90	Employer Group Waiver Plan Medicare Part D prescription drug coverage provide subsidies to reduce premiums: 1) Monthly direct subsidy based on number of enrollees; 2) Quarterly Coverage Gap Discount Program; 3) Catastrophic Coverage Federal Reinsurance
4	Florida	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.	Access Only	Individual/Family	Age 65 with 8 YOS; Any age 33 YOS	Medicare prescription drug coverage and Medicare Advantage Plans for prescription drug coverage
5	Georgia	No subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option Premium subsidy for single coverage that ranges based on YOS < 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%	DB	Individual/Family	Any age 25 YOS; Age 65 with 10 YOS	Medicare prescription drug coverage included in medical

	State	Employer Contribution, 65 and Over	DB or DC Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/Retire from Sponsor)	Prescription
6	Illinois	Retiree must enroll in Medicare Parts A and B to receive reduced premium available to Medicare eligible participants Teachers' Choice Health Plan (TCHP) pays the 20% of approved charges not covered by Medicare. If provider does not accept Medicare assignment TCHP pays all amounts Medicare does not cover, up to the Medicare maximum limiting charges	DB	Individual/ Family	8 YOS	Prescription drug coverage included in the plan
7	Indiana	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)	DB	Individual/Family	Age 65 with 10 YOS; Age 60 with 15 YOS; Age 55 + YOS ≥ 85	No evidence Prior to July 1, 2014 medical plan must include coverage for prescription drug coverage comparable to a Medicare plan that provides prescription drug benefits
8	Iowa	N/A	Access Only	Individual/ Family	Age 55	Medicare Prescription Drug coverage available
9	Massachusetts	75%	DB	Individual/ Family	20 YOS; Age 55 with 10 YOS	Medicare prescription drug coverage included in medical
10	Michigan [3]	N/A	DC	N/A	4 YOS	State does not provide prescription drug coverage for employees hired on or after 9/4//2012
11	Missouri	2.5% x YOS (max 65%)	DB	Individual/Family	Age 67 with 10 YOS; Age 55 + YOS ≥ 90	Medicare prescription drug coverage included in medical
12	New York	State reimburses 100% of the Medicare Part B premium Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	DB	Individual/Family	10 YOS	Prescription drug component are the same share of employer contribution of the premium

State	Employer Contribution, 65 and Over	DB or DC Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/Retire from Sponsor)	Prescription	
13	North Carolina	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%	DB	Individual/ Family	Age 65 with 5 YOS; Age 50 with 20 YOS; Any age with 30 YOS	Prescription drug coverage Coverage becomes secondary when retiree becomes eligible for Medicare
14	Ohio	2.1% x YOS (up to a max of 63%); Partial Medicare Part B premium reimbursement	DB	Individual/ Family	Year of Retirement 2004-2023: 15 YOS Year of Retirement after 2023: 20 YOS	All health care plans offered to enrollees of Medicare Parts A and B, Part A-only or Part B-only include Medicare Part D prescription coverage
15	Pennsylvania	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)	DB	Individual/Family	25 YOS or 20 YOS and superannuation age 60	Prescription drug coverage
16	South Carolina	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS	DB	Individual/ Spouse	5 YOS	Medicare eligible members have the option of Employer Group Waiver Plan with/a Wrap feature 50% coverage for "donut-hole" coverage gap (assumption of "donut-hole" gap to be eliminated by 2020) Federal drug subsidies must be used
17	Tennessee [1]	Flat rate premium subsidized by YOS 30+ YOS: \$50.00 per/mo. ≥ 20 but ≤ 30 YOS: \$37.50 per mo. ≥ 15 but ≤ 20 YOS: \$25.00 per/mo.	DC for Medicare-eligible	Individual/ Family	10 YOS w/ 3 YRS of coverage 20 YOS w/ 1 YR of coverage	Medicare Supplement Plan does not include pharmacy
18	Texas	100% of premium for retiree coverage; a percentage of premium for dependent coverage	DB	Individual/ Family	10 YOS	Employer Group Waiver Plan plus Commercial Wrap

	State	Employer Contribution, 65 and Over	DB or DC Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/Retire from Sponsor)	Prescription
19	Virginia	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium	DC	Individual/ Family (retiree credit only for employee)	15 YOS for Retiree Health Insurance Credit Program	Advantage 65 Tier system for coverage of drugs \$360 annual deductible for covered brand name drugs, no deductible for generic Tier system designates fee for covered drugs
20	West Virginia [2]	N/A	Access Only	Individual/ Family	Age 60 with 5 YOS; Age 55 + YOS ≥ 80	Prescription drug coverage
21	Wisconsin	N/A No plans offered	Access only	Individual/ Family	Min Age 55 with 5 YOS Norm Age 65 with 5 YOS; Age 57 with 30 YOS	Prescription drug coverage for Medicare eligible retirees through a self funded plan. Wrap product is also included to provide full coverage during the Medicare "donut hole"



	State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	DB, DC, or Access Only Structure
1	Kentucky	Employee contributes 1.00%	Retiree receives subsidy towards premium	Retiree receives subsidy towards premium	Retirement System pays \$19.48 per/mo. per YOS (dollar amount is adjusted 1.5% annually)	Retirement System pays \$19.48 per/mo. per YOS (dollar amount is adjusted 1.5% annually)	DC
2	California	Employee and employer contribution of 0.5%	Retiree contributes remainder of premium after subsidy Subsidy based on YOS; < 10 YOS: 0% 20+ YOS: 100%	Retiree contributes remainder of premium after subsidy Subsidy based on YOS; < 10 YOS: 0% 20+ YOS: 100%	Subsidy based on YOS; < 10 YOS: 0% 20+ YOS: 100%	Subsidy based on YOS; < 10 YOS: 0% 20+ YOS: 100%	DB
3	Colorado	No evidence found	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	DC
4	Florida	N/A	100% of premium (minus subsidy)	100% of premium (minus subsidy)	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.	Access Only
5	Georgia	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retirees and Spouses will pay a portion of the premium based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage	Retirees and Spouses will pay a portion of the premiums based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage; no subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option	Premium subsidy for single coverage that ranges based on YOS ≤ 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%	No subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option Premium subsidy for single coverage that ranges based on YOS < 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%	DB
6	Illinois	N/A Health insurance plan is funded on a "pay-as-you-go" basis	5.0% of the premium for each YOS < 20 YRS Retiree receiving benefits from state retirement system who are not eligible for Medicare may waive healthcare coverage and receive a monthly financial incentive equal to \$500 per/mo. (20+ YOS) and \$150 per/mo. (< 20 YOS)	5.0% of the premium for each YOS < 20 YRS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS	DB

	State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	DB, DC, or Access Only Structure
7	Indiana	\$20.00 per paycheck Health insurance plan is funded on a "pay-as-you-go" basis	Percentage of total premium: 7/1/2016-6/30/2018: 50% 7/1/2018: 100%	Percentage of total premium: 7/1/2016-6/30/2018: 50% 7/1/2018 onwards: 100%	Percentage of total premium: 7/1/2016-6/30/2018: 50% 7/1/2018: 100% For retirees after 6/30/2007 but before 7/1/2017 a one time retirement bonus contribution will be credited to retiree's account within 60 days of retirement \$1,000 x YOS	Percentage of total premium: 7/1/2016-6/30/2018: 50% 7/1/2018 onwards: 100% Plus a Medicare Part D retiree drug subsidy reimbursement For retirees after 6/30/2007 but before 7/1/2017 a one time retirement bonus contribution will be credited to retiree's account within 60 days of retirement \$1,000 x YOS	DB
8	Iowa	N/A Health insurance plan is funded on a "pay-as-you-go" basis	100% of premium	100% of premium	N/A	N/A	Access Only
9	Massachusetts	N/A Health insurance previously funded on a "pay-as-you-go" basis but currently being funded by a Master Settlement Agreement with tobacco companies to fund its OPEB liability over the next ten years	20% of monthly premium	20% of monthly premium	80%	80% A small subset of retirees who are age 65+ who are not eligible for Medicare because the Commonwealth does not participate in SS, the retired employee are enrolled in the same health plan available to active employees under age 65	DB
10	Michigan [3]	For employees hired on or after 6/10/2012: Voluntary contribution to the Personal Health Care Fund with an employer match of 2%	N/A	N/A	N/A	N/A	DC
11	Missouri	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employer subsidy is based on YOS Minimum retiree contribution 35%	Employer subsidy is based on YOS Minimum retiree contribution 35%	2.5% x YOS (max 65%)	2.5% x YOS (max 65%)	DB
12	New York	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	State reimburses 100% of the Medicare Part B premium Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	DB

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	DB, DC, or Access Only Structure	
13	North Carolina	Active members do not make contributions to OPEB	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Medicare retirees have the option of 1 of 4 fully insured Medicare Advantage/Prescription Drug Plan options or the self-funded Traditional 70/30 PPO plan offered to non-Medicare members If the Traditional 70/30 Plan selected, the self-funded State Health Plan coverage is secondary to Medicare Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50%	5.49% of payroll Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%	5.49% of payroll Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%	DB
14	Ohio	Active members do not make contributions to OPEB	Retiree pays 100% premium minus subsidy	Retiree pays 100% premium minus subsidy	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018	DB
15	Pennsylvania	Contribution requirements are established within collective bargaining agreements Plan members are not required to make contributions	Retiree does not contribute towards premium	Retiree does not contribute towards premium	For FY2015 \$850 for each current active eligible employee per bi-weekly pay period to the fund	For FY2015 \$850 for each current active eligible employee per bi-weekly pay period to the fund	DB
16	South Carolina	N/A Health insurance plan is funded on a "pay-as-you-go" basis Monthly premium for active employees is \$3.22 per/mo.	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS	DB
17	Tennessee [1]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Current Retirees: same base premium as active employees with an adjustment for YOS 30+ YOS: 20% of premium ≥ 20 but ≤ 30 YOS: 30% of premium ≤ 20 YOS: 40% of premium  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Current Retirees: Flat rate premium subsidized by YOS retiree premiums after subsidies 30+ YOS: \$88.47 per/mo. ≥ 20 but ≤ 30 YOS: \$100.97 per mo. ≥ 15 but ≤ 20 YOS: \$113.47per/mo. Non-subsidized retirees and dependents pay \$138.47 per/mo.  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Retirees under 65 pay the same base premium as active employees with an adjustment for YOS 30+ YOS: 80% subsidized ≥ 20 but ≤ 30 YOS: 70% subsidized ≤ 20 YOS: 60% subsidized	Flat rate premium subsidized by YOS 30+ YOS: \$50.00 per/mo. ≥ 20 but ≤ 30 YOS: \$37.50 per mo. ≥ 15 but ≤ 20 YOS: \$25.00 per/mo.	DC for Medicare-eligible

	State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	DB, DC, or Access Only Structure
18	Texas	N/A Health insurance plan is funded on a "pay-as-you-go" basis	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	100% of retiree health premiums 50% of dependents' premiums	100% of retiree health premiums 50% of dependents' premiums	DB
19	Virginia	N/A	Retirees pay 100% of premium w/ 15 YOS premium is offset w/ by the retiree health credit program (credit only applies to single coverage)	At age 65 required to enroll in Medicare Advantage 65 Plan to supplement Medicare monthly rates range from \$154 or \$322 based on coverage (i.e., medical; medical + dental)	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium	DC
20	West Virginia [2]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employees hired after 7/1/2010 will pay 100% of the premium	Employees hired after 7/1/2010 will pay 100% of the premium	N/A	N/A	Access Only
21	Wisconsin	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Full 2015 monthly rates range from \$602.10 to \$1,392.80 for single coverage ; \$1,497.80-\$3,477.80 for family coverage; retiree contributes percent of premium	N/A At age 65 required to enroll in Medicare	Determined by employer established in one of three ways: 1) min 50% but not more than 88% of average cost of Tier 1 plan; 2) min 50% but not more than 105% of the premium for the lowest-cost plan; 3) health plan three-tiered premium contribution structure established by the Group Insurance Board, subject to the 88% of the average cost of Tier 1 plan	N/A No plans offered	Access only

	State	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
1	Kentucky	Individual/ Family	15 YOS	Prescription drug coverage is included in all medical plans offered by the Kentucky Employees' Health Plan (KEHP)
2	California	Individual/Family	20 YOS (maximum subsidy)	Medicare Part D prescription drug plan and an Employer Group Waiver Plan
3	Colorado	Individual/Family	Any age 30 YOS; Age 50 with 25 YOS; Age 55 with 20 YOS; Age 65 with 5 YOS	Employer Group Waiver Plan Medicare Part D prescription drug coverage provide subsidies to reduce premiums: 1) Monthly direct subsidy based on number of enrollees; 2) Quarterly Coverage Gap Discount Program; 3) Catastrophic Coverage Federal Reinsurance
4	Florida	Individual/ Family	Age 65 with 8 YOS; Any age 33 YOS	Medicare prescription drug coverage and Medicare Advantage Plans for prescription drug coverage
5	Georgia	Individual/ Family	Any age 30 YOS Age 55 with 10 YOS	Medicare prescription drug coverage included in medical
6	Illinois	Individual/ Family	Age 60 with 20 YOS	Medicare Advantage Prescription Drug coverage

	State	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
7	Indiana	Individual/ Family	25 YOS; Age 65 with 10 YOS; Age 60 with 15 YOS; Age 55 + YOS $\geq$ 85	No evidence Prior to July 1, 2014 medical plan must include coverage for prescription drug coverage comparable to a Medicare plan that provides prescription drug benefits
8	Iowa	Individual/ Family	Age 55	Medicare Prescription Drug coverage available
9	Massachusetts	Individual/ Family	20 YOS; Age 55	Prescription drug coverage for Medicare and Non-Medicare
10	Michigan [3]	N/A	4 YOS	State does not provide prescription drug coverage for employees hired on or after 6/10/2012
11	Missouri	Individual/Family	Age 55with 10 YOS;	Medicare prescription drug coverage included in medical
12	New York	Individual/Family	10 YOS	Prescription drug component are the same share of employer contribution of the premium

	State	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
13	North Carolina	Individual/ Family	Age 50 with 15 YOS; Age 55 with 5 YOS; Any with 30 YOS	Prescription drug coverage Coverage becomes secondary when retiree becomes eligible for Medicare
14	Ohio	Individual/ Family	20 YOS	Prescription drug coverage
15	Pennsylvania	Individual/Family	Age 55 with 20 YOS; or 25 YOS	Prescription drug coverage
16	South Carolina	Individual/ Spouse	5 YOS	Medicare eligible members have the option of Employer Group Waiver Plan with/a Wrap feature 50% coverage for "donut-hole" coverage gap (assumption of "donut-hole" gap to be eliminated by 2020) Federal drug subsidies must be used
17	Tennessee [1]	Individual/ Family	10 YOS w/ 3 YRS of coverage 20 YOS w/ 1 YR of coverage	Medicare Supplement Plan does not include pharmacy

	State	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
18	Texas	Individual/ Family	10 YOS	Employer Group Waiver Plan plus Commercial Wrap
19	Virginia	Individual/Family (retiree credit only for employee)	15 YOS for Retiree Health Insurance Credit Program	Advantage 65 Tier system for coverage of drugs \$360 annual deductible for covered brand name drugs, no deductible for generic Tier system designates fee for covered drugs
20	West Virginia [2]	Individual/ Family	Age 60 with 5 YOS; Age 55 + YOS $\geq$ 80	Prescription drug coverage
21	Wisconsin	Individual/ Family	Min Age 55 with 5 YOS Norm Age 65 with 5 YOS; Age 57 with 30 YOS	Prescription drug coverage for Medicare eligible retirees through a self funded plan. Wrap product is also included to provide full coverage during the Medicare "donut hole"



State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
1	Kentucky	Employee contributes 1.00%	Percentage of medical insurance premium paid by the plan 20+ YOS: 0% ≥ 15 < 20 YOS: 25% ≥ 10 < 15 YOS: 50% ≥ 4 < 10 YOS: 75% < 4 YOS: 0%	Percentage of medical insurance premium paid by the plan 20+ YOS: 0% ≥ 15 < 20 YOS: 25% ≥ 10 < 15 YOS: 50% ≥ 4 < 10 YOS: 75% < 4 YOS: 0%	Percentage of medical insurance premium paid by the plan 20+ YOS: 100% ≥ 15 < 20 YOS: 75% ≥ 10 < 15 YOS: 50% ≥ 4 < 10 YOS: 25% < 4 YOS: 0%	Percentage of medical insurance premium paid by the plan 20+ YOS: 100% ≥ 15 < 20 YOS: 75% ≥ 10 < 15 YOS: 50% ≥ 4 < 10 YOS: 25% < 4 YOS: 0%
2	California	N/A Health insurance plan is funded on a "pay-as-you-go" basis	100% of total premium plus 2%	100% of employer subsidy with 10 YOS	0%	Percentage of employer subsidy ≥ 5 YOS: 50% 5-10 YOS: Pro-rated between 50% to 100% 10+ YOS: 100%
3	Colorado	No evidence found	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	Health care subsidy to offset premium based on YOS Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree under age 65 for 2015 is \$230 per month with a 5% reduction for each year less than 20 YOS	1.02% of payroll Maximum subsidy for retiree above age 65 for 2015 is \$115 per month with a 5% reduction for each year less than 20 YOS
4	Florida	N/A	100% of premium (minus subsidy)	100% of premium (minus subsidy)	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.	1.26% Health Insurance Subsidy Contribution Rate The Retiree Health Insurance Subsidy Program gives retirees and beneficiaries a monthly payment equal to YOS x \$5, ranging from \$30 to \$150 per/mo.
5	Georgia	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retirees and Spouses will pay a portion of the premium based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage	Retirees and Spouses will pay a portion of the premiums based on the retirees' service at retirement, ranging from 25% to 100% for single coverage and 45% to 100% for spousal coverage; no subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option	Premium subsidy for single coverage that ranges based on YOS ≤ 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%	No subsidy is available to Medicare eligible members not enrolled in a Medicare Advantage Option Premium subsidy for single coverage that ranges based on YOS < 10 YOS: 0%; 30+ YOS: 75% Subsidy for eligible dependents ranges from 0% to 55%

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
6	Illinois	N/A Health insurance plan is funded on a "pay-as-you-go" basis	5.0% of the premium for each YOS < 20 YRS Retiree receiving benefits from state retirement system who are not eligible for Medicare may waive healthcare coverage and receive a monthly financial incentive equal to \$500 per/mo. (20+ YOS) and \$150 per/mo. (< 20 YOS)	5.0% of the premium for each YOS < 20 YRS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS	The State Employees Insurance Act of 1971 (SEIA) requires the State to contribute towards retiree's coverage an amount equal to 5% of the cost for each YOS; maximum benefit of 100% for 20+ YOS
7	Indiana	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Retiree pays 100% premium	Retiree pays 100% premium	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)	Within 60 days of retirement a one time bonus contribution will be credited to retiree's account \$1,000 x YOS (For retirees after 6/30/2007, but before 7/1/2017)
8	Iowa	N/A Health insurance plan is funded on a "pay-as-you-go" basis	100% of premium	100% of premium	N/A	N/A
9	Massachusetts	N/A Health insurance previously funded on a "pay-as-you-go" basis but currently being funded by a Master Settlement Agreement with tobacco companies to fund its OPEB liability over the next ten years	20% of monthly premium	20% of monthly premium	80%	A small subset of retirees who are age 65+ who are not eligible for Medicare because the Commonwealth does not participate in SS, the retired employee are enrolled in the same health plan available to active employees under age 65
10	Michigan [3]	Voluntary contribution to the Personal Health Care Fund with an employer match of 2%	N/A	N/A	N/A	N/A
11	Missouri	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employer subsidy is based on YOS Minimum retiree contribution 35%	Employer subsidy is based on YOS Minimum retiree contribution 35%	2.5% x YOS (max 65%)	2.5% x YOS (max 65%)

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
12	New York	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage	State reimburses 100% of the Medicare Part B premium Grade 9 and below: 12% of retiree premium 27% of dependent coverage Grade 10 and above: 16% of retiree premium 31% of dependent coverage
13	North Carolina	Active members do not make contributions to OPEB	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Medicare retirees have the option of 1 of 4 fully insured Medicare Advantage/Prescription Drug Plan options or the self-funded Traditional 70/30 PPO plan offered to non-Medicare members. If the Traditional 70/30 Plan selected, the self-funded State Health Plan coverage is secondary to Medicare. Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 100% 10 to 19.99 YOS: 50% 20+ YOS: 0%	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%	Contributions defined as a percentage of total premium costs based on YOS 5 to 9.99 YOS: 0% 10 to 19.99 YOS: 50% 20+ YOS: 100%
14	Ohio [4]	Active members do not make contributions to OPEB	Retiree pays 100% premium minus subsidy	Retiree pays 100% premium minus subsidy	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018	Employer provides a monthly allowance for retiree and spouse to purchase coverage; spousal allowance will be eliminated in 2018
15	Pennsylvania	Active members do not make contributions to OPEB	Non-Medicare eligible retirees contribute 3% of Average Final Compensation	Medicare eligible retirees contribution 1.5% of Average Final Compensation	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)	Approximately \$334 for each current active eligible employee per bi-weekly pay period to the fund (rates for FY2015)
16	South Carolina	N/A Health insurance plan is funded on a "pay-as-you-go" basis Monthly premium for active employees is \$3.22 per/mo.	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires on or after 5/2/2008 who retire are eligible for 100% employer subsidy with 25+ YOS, 50% with 15-24 YOS, and 0% with <15 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS	New hires after 5/2/2008 retirees are eligible for 100% employer funding with 25+ YOS and 50% with 15-24 YOS
17	Tennessee [1]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Current Retirees: same base premium as active employees with an adjustment for YOS 30+ YOS: 20% of premium ≥ 20 but ≤ 30 YOS: 30% of premium ≤ 20 YOS: 40% of premium  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Current Retirees: Flat rate premium subsidized by YOS retiree premiums after subsidies 30+ YOS: \$88.47 per/mo. ≥ 20 but ≤ 30 YOS: \$100.97 per mo. ≥ 15 but ≤ 20 YOS: \$113.47 per/mo. Non-subsidized retirees and dependents pay \$138.47 per/mo.  Employees hired on or after 7/1/2015 will not be eligible to receive retiree health insurance coverage	Retirees under 65 pay the same base premium as active employees with an adjustment for YOS 30+ YOS: 80% subsidized ≥ 20 but ≤ 30 YOS: 70% subsidized ≤ 20 YOS: 60% subsidized	Flat rate premium subsidized by YOS 30+ YOS: \$50.00 per/mo. ≥ 20 but ≤ 30 YOS: \$37.50 per mo. ≥ 15 but ≤ 20 YOS: \$25.00 per/mo.

State	Active Employee Contribution toward OPEB	Retiree Premium Co-Share, Under 65	Retiree Premium Co-Share, 65 and Over	Employer Contribution, Under 65	Employer Contribution, 65 and Over	
18	Texas	N/A Health insurance plan is funded on a "pay-as-you-go" basis	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	0% of retiree health insurance premiums; 50% of dependents' premiums: Retiree contributes any premium over and above state contribution	100% of retiree health premiums 50% of dependents' premiums	100% of retiree health premiums 50% of dependents' premiums
19	Virginia	N/A	Retirees pay 100% of premium w/ 15 YOS premium is offset w/ by the retiree health credit program (credit only applies to single coverage)	At age 65 required to enroll in Medicare Advantage 65 Plan to supplement Medicare monthly rates range from \$154 or \$322 based on coverage (i.e., medical; medical + dental)	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium	Retiree Health Insurance Credit Program \$4 per/mo. per YOS reimbursement against health premium
20	West Virginia [2]	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Employees hired after 7/1/2010 will pay 100% of the premium	Employees hired after 7/1/2010 will pay 100% of the premium	N/A	N/A
21	Wisconsin	N/A Health insurance plan is funded on a "pay-as-you-go" basis	Full 2015 monthly rates range from \$602.10 to \$1,392.80 for single coverage ; \$1,497.80-\$3,477.80 for family coverage; retiree contributes percent of premium	N/A At age 65 required to enroll in Medicare	Determined by employer established in one of three ways: 1) min 50% but not more than 88% of average cost of Tier 1 plan; 2) min 50% but not more than 105% of the premium for the lowest-cost plan; 3) health plan three-tiered premium contribution structure established by the Group Insurance Board, subject to the 88% of the average cost of Tier 1 plan	N/A No plans offered

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
1	Kentucky	DB	Individual/Family	15 YOS	
2	California	DB	Individual/Family	10+ YOS (maximum subsidy)	Employer Group Waiver Plan with a Wrap feature
3	Colorado	DC	Individual/Family	Age 60 + YOS $\geq$ 90	Employer Group Waiver Plan Medicare Part D prescription drug coverage provide subsidies to reduce premiums: 1) Monthly direct subsidy based on number of enrollees; 2) Quarterly Coverage Gap Discount Program; 3) Catastrophic Coverage Federal Reinsurance
4	Florida	Access Only	Individual/Family	Age 65 with 8 YOS; Any age 33 YOS	Medicare prescription drug coverage and Medicare Advantage Plans for prescription drug coverage
5	Georgia	DB	Individual/Family	Age 60 with 10 YOS	Medicare prescription drug coverage included in medical

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
6	Illinois	DB	Individual/ Family	Age 67 with 8 YOS	Medicare Advantage Prescription Drug coverage
7	Indiana	DB	Individual/Family	Age 65 with 8 YOS; Age 55 + YOS $\geq$ 85	No evidence Prior to July 1, 2014 medical plan must include coverage for prescription drug coverage comparable to a Medicare plan that provides prescription drug benefits
8	Iowa	Access Only	Individual/ Family	Age 55	Medicare Prescription Drug coverage available
9	Massachusetts	DB	Individual/ Family	20 YOS; Age 55 with 10 YOS	Prescription drug coverage for Medicare and Non-Medicare Generic: \$10, \$25 Formulary: \$30, \$70 Non-Formulary: \$65, \$165
10	Michigan [3]	DC	N/A	4 YOS	State does not provide prescription drug coverage for employees hired on or after 1/1/2012
11	Missouri	DB	Individual/Family	Age 67 with 10 YOS; Age 55 + YOS $\geq$ 90	Medicare prescription drug coverage included in medical

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
12	New York	DB	Individual/Family	10 YOS	Prescription drug component are the same share of employer contribution of the premium
13	North Carolina	DB	Individual/Family	Age 65 with 5 YOS; Age 50 with 20 YOS Any age with 30 YOS	Prescription drug coverage Coverage becomes secondary when retiree becomes eligible for Medicare
14	Ohio [4]	DB	Individual/Family (Spousal and Dependent coverage being phased out)	10 YOS	Prescription drug coverage
15	Pennsylvania	DB	Individual/Family	25 YOS or 20 YOS and superannuation age 60	Prescription drug coverage
16	South Carolina	DB	Individual/Spouse	5 YOS	Medicare eligible members have the option of Employer Group Waiver Plan with/a Wrap feature 50% coverage for "donut-hole" coverage gap (assumption of "donut-hole" gap to be eliminated by 2020) Federal drug subsidies must be used
17	Tennessee [1]	DC for Medicare-eligible	Individual/Family	10 YOS w/ 3 YRS of coverage 20 YOS w/ 1 YR of coverage	Medicare Supplement Plan does not include pharmacy

	State	DB, DC, or Access Only Structure	Coverage: Single, Spouse, Family	Benefit Eligibility (Age/YOS/ Retire from Sponsor)	Prescription
18	Texas	DB	Individual/ Family	10 YOS	Employer Group Waiver Plan plus Commercial Wrap
19	Virginia	DC	Individual/ Family (retiree credit only for employee)	15 YOS for Retiree Health Insurance Credit Program	<p>Advantage 65</p> <p>Tier system for coverage of drugs \$360 annual deductible for covered brand name drugs, no deductible for generic</p> <p>Tier system designates fee for covered drugs</p>
20	West Virginia [2]	Access Only	Individual/ Family	Age 60 with 5 YOS; Age 55 + YOS $\geq$ 80	Prescription drug coverage
21	Wisconsin	Access Only	Individual/ Family	Min Age 55 with 5 YOS Norm Age 65 with 5 YOS; Age 57 with 30 YOS	Prescription drug coverage for Medicare eligible retirees through a self funded plan. Wrap product is also included to provide full coverage during the Medicare "donut hole"





## **Appendix C: Full Investment Analysis**



# Kentucky Retirement Systems Investment Analysis

May 22, 2017

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PFM Group  
Consulting LLC

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In conjunction with:  
PRM Consulting Group  
Stites & Harbison PLLC

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215-557-1465  
[pfm.com](http://pfm.com)



# **Overview of the Market Environment (7/1/2003 - 6/30/2016)**



## Summary of Market Environment

- ◆ 2003 – Recovery from Tech bubble; Beginning of Iraq War
- ◆ 2004 – US economy grows at 4.4%, best in 5 years
- ◆ 2005 – Hurricane Katrina; Rising oil prices; Rising US deficits
- ◆ 2006 – Stock market and housing prices reach new highs
- ◆ 2007 – Beginning of housing crisis; Slowing GDP in US
- ◆ 2008 – US financial crisis (“The Great Recession”)
- ◆ 2009 – Global equity recovery & spreads at historic levels
- ◆ 2010 – Continued recovery with high equity correlations; Flash Crash
- ◆ 2011 – European financial crisis; US credit downgrade
- ◆ 2012 – Slow recovery with low rates
- ◆ 2013 – Continued slow recovery with low rates; Taper Tantrum
- ◆ 2014 – Fears of global slowdown
- ◆ 2015 – Continued fears of global slowdown; Greece default; Fed uncertainty
- ◆ 2016 – Brexit; Fed uncertainty; US election



# Stock Market Recovery

## S&P 500 Price Index

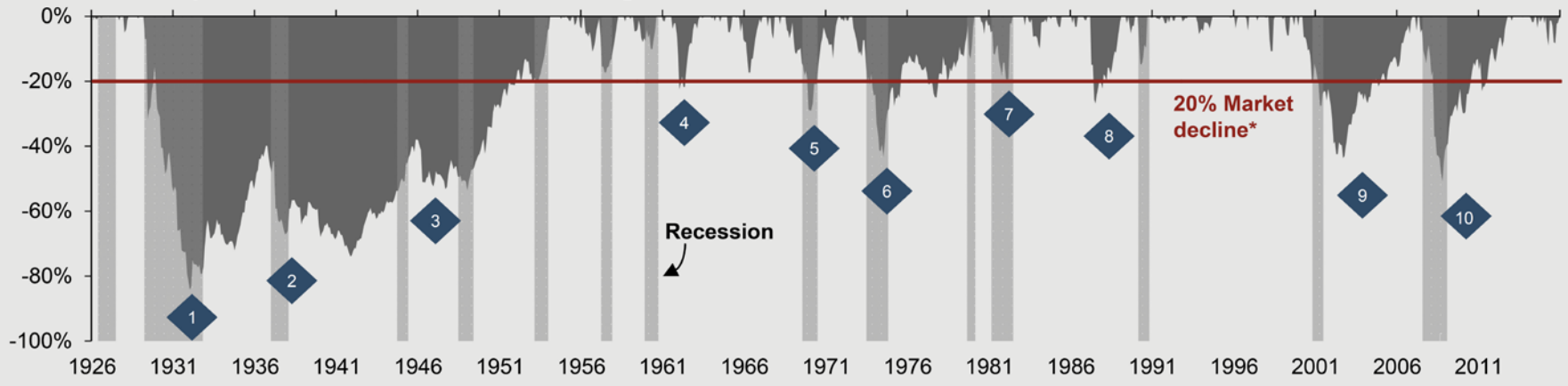


Source: JP Morgan Guide to the Markets, 3Q16



# Bear & Bull Markets

**S&P 500 composite declines from all-time highs**



## Characteristics of bull and bear markets

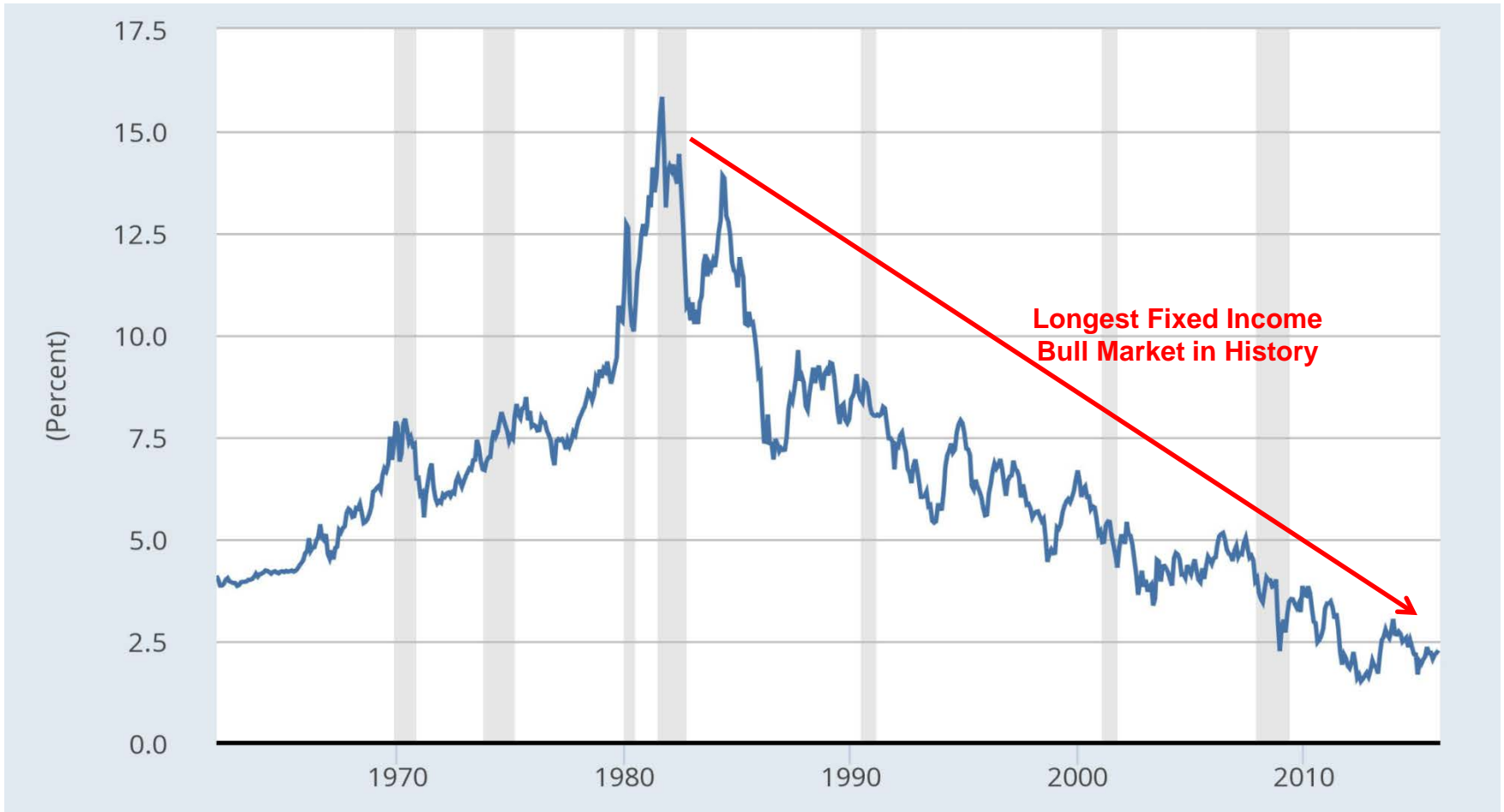
Market Corrections	Bear markets			Macro environment				Bull markets		
	Market peak	Bear return*	Duration (months)*	Recession	Commodity spike	Aggressive Fed	Extreme valuations	Bull begin date	Bull return	Duration (months)
1 Crash of 1929 - Excessive leverage, irrational exuberance	Sep 1929	-86%	33	◆			◆	Jul 1926	152%	38
2 1937 Fed Tightening - Premature policy tightening	Mar 1937	-60%	63	◆		◆		Mar 1935	129%	24
3 Post WWII Crash - Post-war demobilization, recession fears	May 1946	-30%	37	◆			◆	Apr 1942	158%	50
4 Flash Crash of 1962 - Flash crash, Cuban Missile Crisis	Dec 1961	-28%	7	◆			◆	Oct 1960	39%	14
5 Tech Crash of 1970 - Economic overheating, civil unrest	Nov 1968	-36%	18	◆	◆	◆		Oct 1962	103%	74
6 Stagflation - OPEC oil embargo	Jan 1973	-48%	21	◆	◆			May 1970	74%	32
7 Volcker Tightening - Whip Inflation Now	Nov 1980	-27%	21	◆	◆	◆		Mar 1978	62%	33
8 1987 Crash - Program trading, overheating markets	Aug 1987	-34%	3				◆	Aug 1982	229%	61
9 Tech Bubble - Extreme valuations, .com boom/bust	Mar 2000	-49%	31	◆			◆	Oct 1990	417%	115
10 Global Financial Crisis - Leverage/housing, Lehman collapse	Oct 2007	-57%	17	◆	◆	◆		Oct 2002	101%	61
Current Cycle								Mar 2009	210%	89
<b>Averages</b>	-	<b>-45%</b>	<b>25</b>					-	<b>152%</b>	<b>54</b>

Source: JP Morgan Guide to the Markets, 3Q16



## Fixed Income: 30 Years of Declining Rates

10-Year U.S. Treasury Yield  
1962 - Current

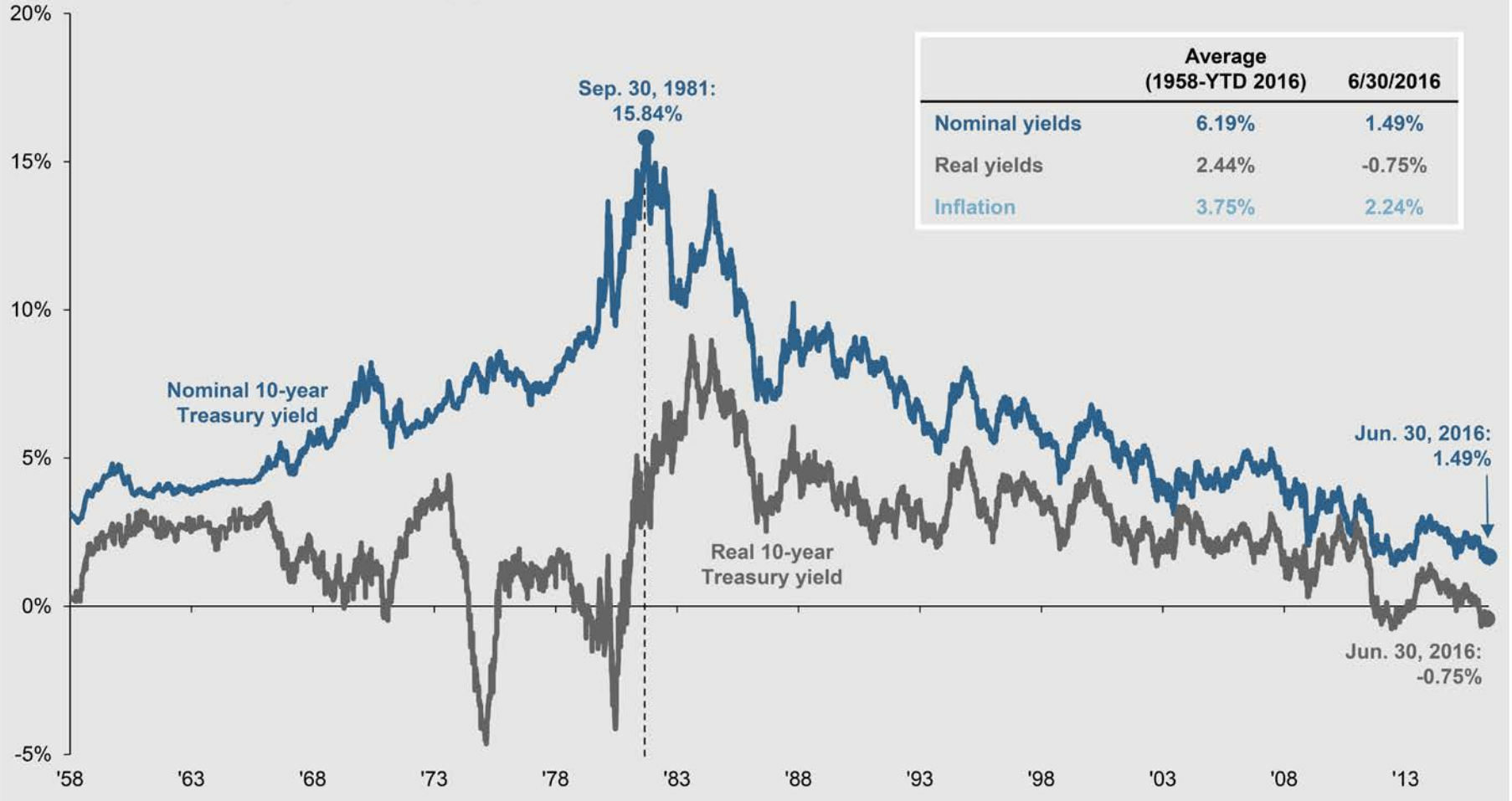


Source: St. Louis Federal Reserve as of 12/31/15



# Real Interest Rates

Nominal and real 10-year Treasury yields



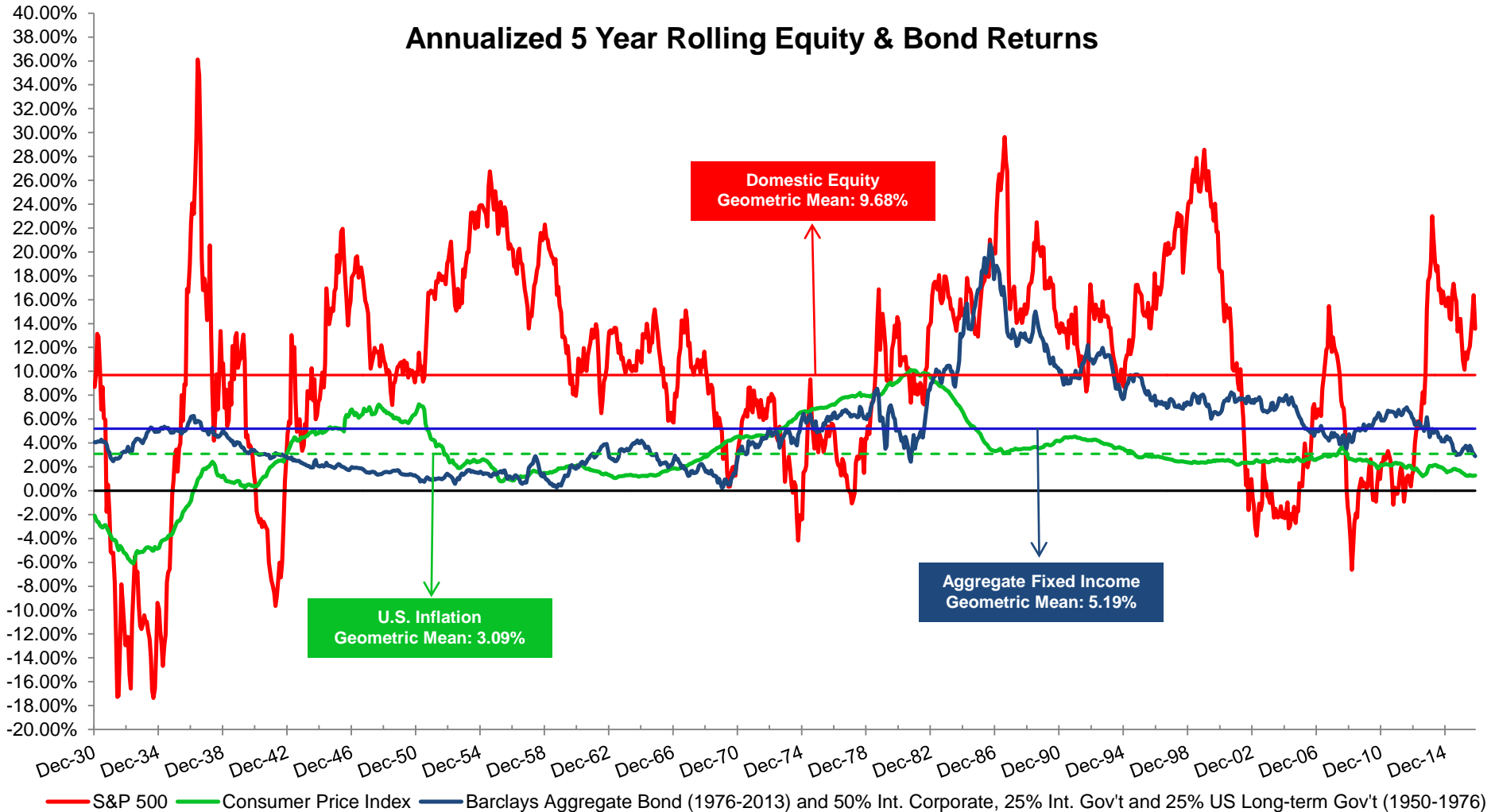
Source: JP Morgan Guide to the Markets, 3Q16





# Long-Term Historical Market Returns

## Annualized 5 Year Rolling Equity & Bond Returns



— S&P 500 — Consumer Price Index — Barclays Aggregate Bond (1976-2013) and 50% Int. Corporate, 25% Int. Gov't and 25% US Long-term Gov't (1950-1976)

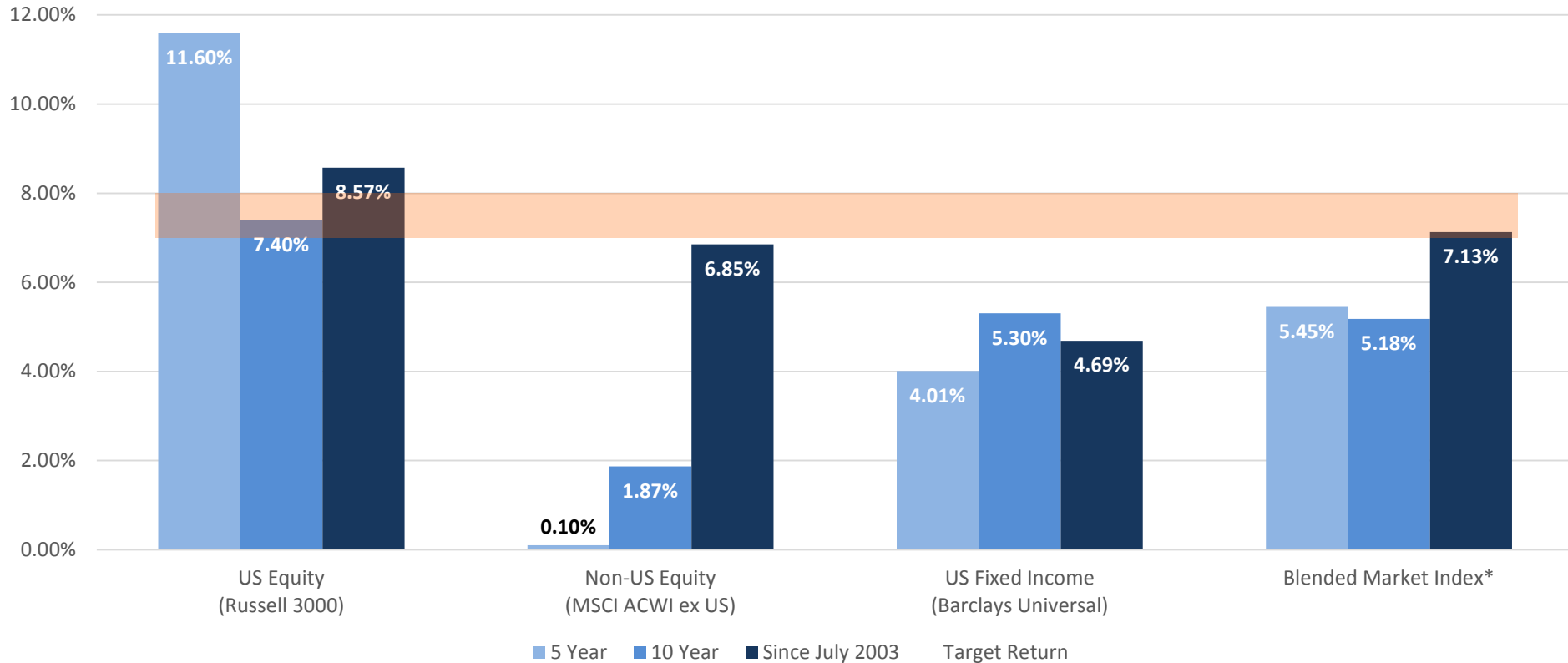
Source: Morningstar as of 10/31/16



## Market Returns Since June 30, 2003

Investment environment during past decade, including “Great Recession”, has been difficult for retirement plans targeting a 7 – 8% annual return

Annualized Returns as of June 30, 2016

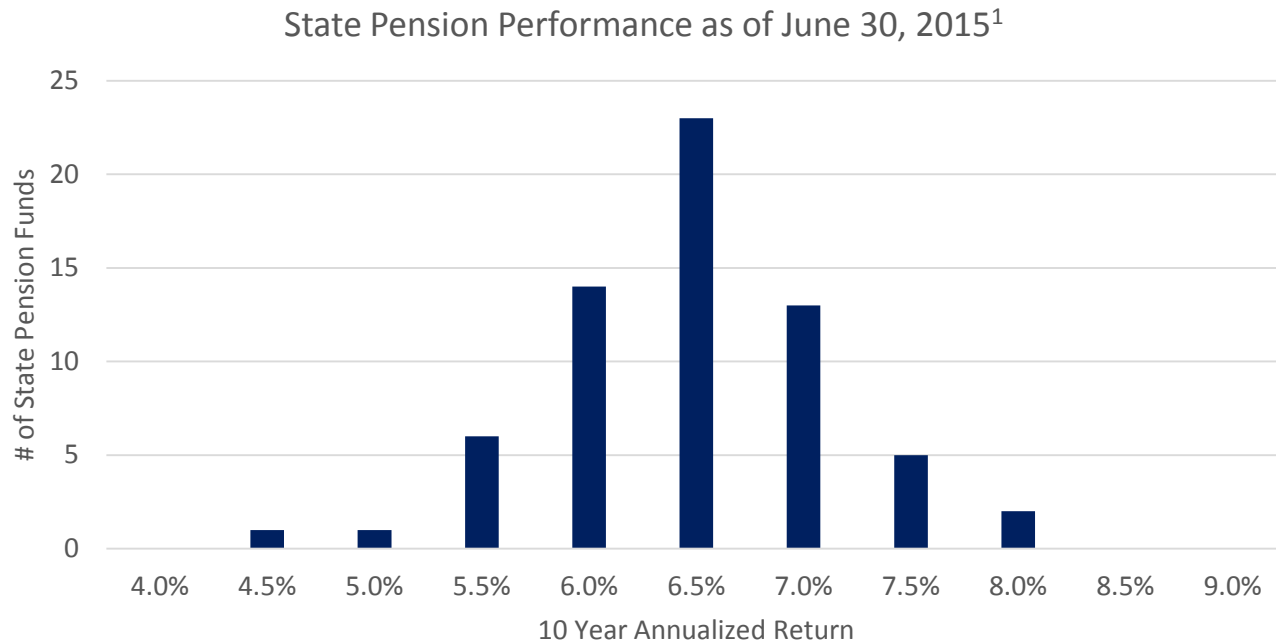


\*Blended Market Index: 35% Russell 3000, 35% MSCI ACWI ex US, 30% Barclays Universal



## State Pension Plan Investment Returns

- State pension plans as a whole have lagged their investment return assumptions, according to a study conducted by Cliffwater LLC<sup>1</sup>
  - Average state pension plan earned just 6.84% for 10 years ending June 30, 2015
  - Returns ranged from 4.75% - 8.35% with top quartile at only 7.13%
  - Median actuarial return assumption was 8.00%



<sup>1</sup>Cliffwater LLC: "An Examination of State Pension Performance: 2006 to 2015", September 2016



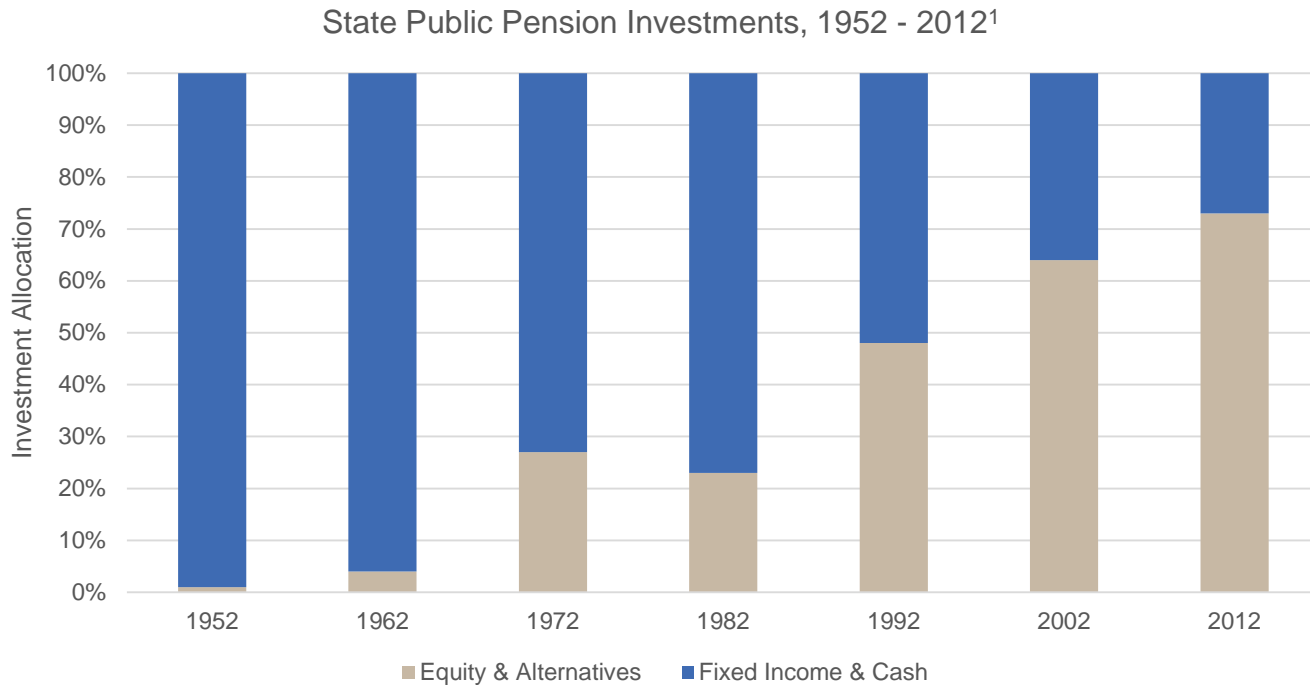
# Asset Allocation & Alternative Investments



## Historical Public Pension Investment Allocations

### Public pension plans have increased investment allocations to more risky assets

- Decline in 30-year Treasury yields has lowered the probability of achieving investment assumptions and increased investments in alternative asset classes (i.e. hedge funds, private equity, real estate, etc.)
- Spread between median return assumption and 30-year Treasury yield increased from 0.33% in 1992 to 4.83% in 2012<sup>1</sup>



<sup>1</sup>The Pew Charitable Trusts: "State Public Pension Investments Shift Over Past 30 Years", June 2014

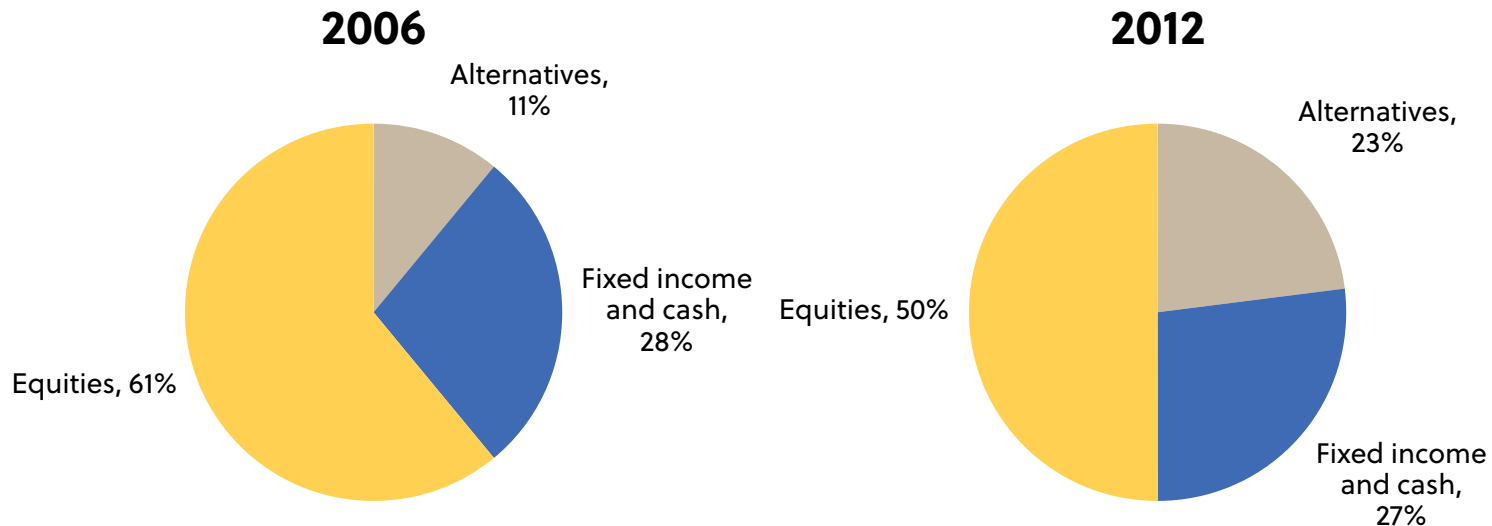


## Allocation to Alternative Investments

- Allocations to both equity and fixed income have declined, while allocations to alternative assets has more than doubled from 2006 – 2012
  - Trend is similar to that experienced by many endowment/foundation funds

### State Public Pensions Include More Alternative Investments

Share of pension assets in alternatives have more than doubled



<sup>1</sup>The Pew Charitable Trusts: “State Public Pension Investments Shift Over Past 30 Years”, June 2014

<sup>2</sup>Analysis by the Pew Charitable Trusts of State Comprehensive Annual Financial Reports, Public 100, and the Federal Reserve Financial Accounts of the United States



## Alternative vs. Traditional Market Returns

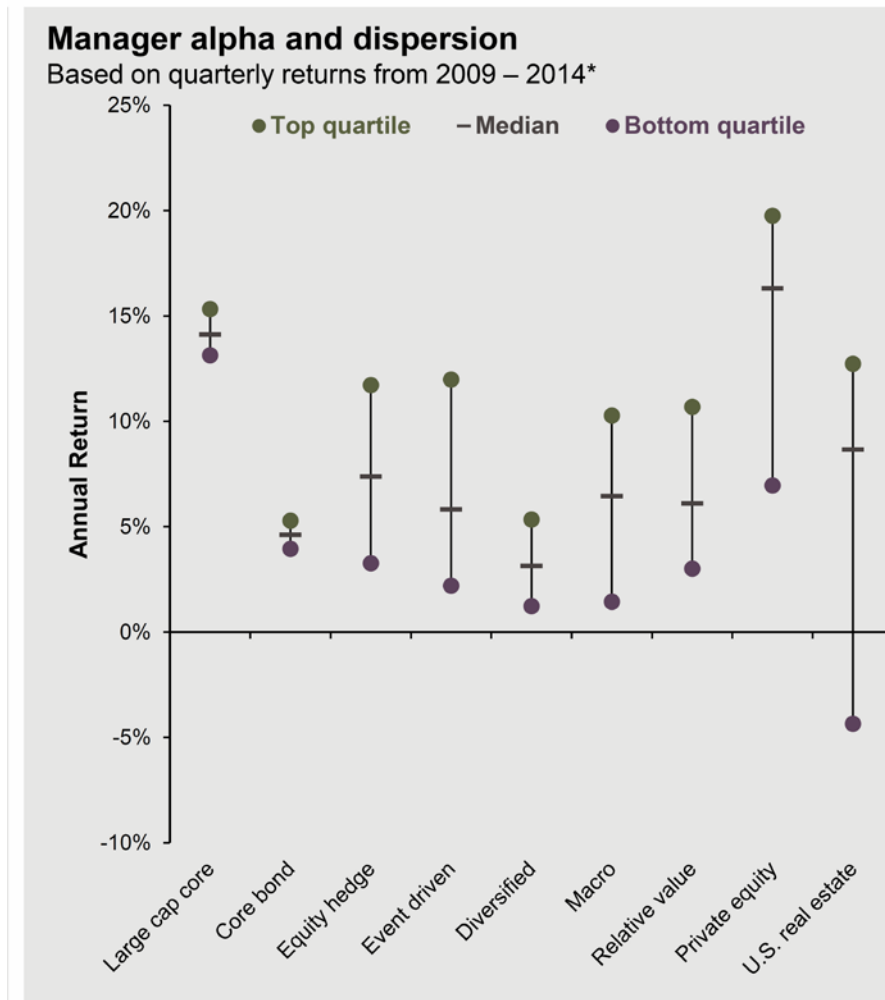
- ◆ A broad market index of traditional asset classes has fallen short of 7 – 8% retirement plan investment return assumptions over most trailing periods
- ◆ Hedge funds have significantly lagged most asset classes for the trailing period analyzed
- ◆ Based on representative index data, private equity (including privately-held real estate investments) has preformed better than a broad market portfolio of traditional asset classes since July 2003

As of June 30, 2016	1 Year	3 Years	5 Years	10 Years	Since July 2003
<b>Blended Market Index*</b>	<b>-1.08%</b>	<b>5.67%</b>	<b>5.45%</b>	<b>5.18%</b>	<b>7.13%</b>
HFRI Fund of Funds Composite Index ( <i>Hedge Funds</i> )	-5.40%	1.92%	1.63%	1.58%	3.09%
CA US Private Equity Index ( <i>Private Equity</i> )	10.64%	11.61%	11.52%	7.41%	14.29%
NCREIF Property Index ( <i>Private Real Estate</i> )	3.20%	11.23%	11.37%	10.76%	9.28%

\*Blended Market Index: 35% Russell 3000, 35% MSCI ACWI ex US, 30% Barclays Universal



## Dispersion: Traditional vs. Alternative Investments



Source: JP Morgan Guide to the Markets, 3Q16





## Comparison to Similar State Plans

### Investment Allocations (Red is above average, Green is below average)

	Public Equity	Fixed Income	Real Estate / Real Assets	Hedge Funds	Alternatives	Cash
KRS Pension	50.98%	13.66%	13.18%	10.15%	10.20%	1.83%
KRS Insurance	54.85%	12.16%	13.30%	9.74%	8.13%	1.82%
KTRS Pension	61.00%	24.50%	5.40%	0.00%	5.70%	3.40%
KTRS Insurance	58.30%	32.90%	4.20%	0.00%	3.60%	1.00%
Judicial	74.30%	25.70%	0.00%	0.00%	0.00%	0.00%
Legislative	73.60%	26.40%	0.00%	0.00%	0.00%	0.00%
Average of Comparable States	44.74%	21.48%	13.05%	7.48%	12.08%	1.17%
Median of Comparable States	45.20%	23.00%	13.10%	7.60%	12.60%	0.90%
Illinois	50.70%	22.00%	13.10%	10.00%	4.00%	0.20%
Indiana	22.50%	20.60%	23.70%	9.40%	22.90%	0.90%
Ohio	40.90%	23.00%	10.00%	8.00%	18.10%	0.00%
West Virginia	54.40%	14.50%	10.40%	10.70%	9.60%	0.40%
Tennessee	55.00%	26.50%	12.50%	0.00%	4.90%	1.10%
Virginia	38.70%	28.80%	11.30%	7.60%	12.20%	1.40%
Missouri	24.10%	6.50%	18.00%	29.40%	22.00%	0.00%
Michigan	45.20%	11.60%	15.70%	7.10%	16.00%	4.40%
Georgia	65.30%	27.20%	0.00%	0.00%	0.30%	7.20%
North Carolina	44.40%	28.40%	13.40%	0.00%	12.60%	1.20%
Wisconsin	50.00%	27.00%	16.00%	6.00%	7.00%	-6.00%
South Carolina	32.30%	23.40%	17.30%	9.00%	14.50%	3.50%
Florida	58.10%	19.80%	8.30%	0.00%	12.90%	0.90%

Kentucky data is as of 6/30/2016; Comparative state data is as of 6/30/2015 (Public Pension Oversight Board Report, February 22, 2016); Ohio data is as of 12/31/2015 and Wisconsin data is as of 12/31/2014 per retirement system website



**KRS**



## KRS Pension Plan Overview

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$11.6 Billion
- Actuarial Accrued Liability (6/30/2016): \$29.7 Billion
- Investment Return Assumption (6/30/2016): 7.50% (down from 8.25% in 2005)

### ◆ Investment Consultants

- RV Kuhns (General Advisor)
- ORG Portfolio Management (Real Estate Advisor)
- Pension Consulting Alliance (Private Equity Advisor)
- Albourne America (Hedge Funds & Real Assets Advisor)

### ◆ Investment Managers

- 129 total managers/products, including 3 managed internally (S&P 500 Index, Midcap Index, and TIPS portfolio)

### ◆ Custodial Bank

- Bank of New York Mellon

Information received from KRS as of 6/30/2016. Asset/Liability Data includes KERS, KERS-H, CERS, CERS-H and SPRS.



## KRS Pension – Performance Attribution

- ◆ Total plan actual investment performance falls in the bottom quartile for all trailing periods provided and significantly lags KRS' 7.5% investment return assumption
- ◆ Asset allocation has been the primary detractor of relative performance
  - International equity allocation increased from 40% of public equity to 50% of public equity in 2011 and has lagged the Russell 3000 Index by more than 1,100 basis points annualized
  - Hedge fund allocation of roughly 10% was added in 2011 and has lagged the Russell 3000 Index by nearly 800 basis points annualized
  - Real return allocation has averaged 8-10% of the portfolio during the past 5 years and has lagged the Russell 3000 Index by more than 800 basis points annualized
  - Private equity allocation has added value over public equity for most trailing periods, but the investment return has lagged KRS' benchmark (Russell 3000 Index + 3%) by 260 basis points annualized for the past 10 years
- ◆ Performance at the asset class level has generally been in-line with the relevant index for longer periods (10+ years), with the exception of real estate, indicating manager selection has not been a significant detractor of performance
- ◆ Although the plan has a lower standard deviation (volatility) than most of its peers, it has failed to keep pace in up-markets since 2003

Source: RV Kuhns quarterly performance report as of 6/30/2016



## KRS Pension – Investment Policy Targets

- ◆ KRS has changed investment policy targets four times since 2010
- ◆ Target asset allocations for Plans began to diverge in 2011 despite having the same target return goal of 7.5%
- ◆ Overall target allocations to alternatives have increased and allowable ranges have narrowed

2010 Investment Policy	Target Allocations (All Plans)	Allowable Range
Domestic Equity	30.0%	20 - 50%
International Equity	20.0%	10 - 30%
Fixed Income - TIPS	10.0%	0 - 15%
Fixed Income - Market	20.0%	12 - 32%
Fixed Income - High Yield	5.0%	0 - 10%
Alternative Investments	12.0%	1 - 15%
Cash Equivalents	3.0%	1 - 15%

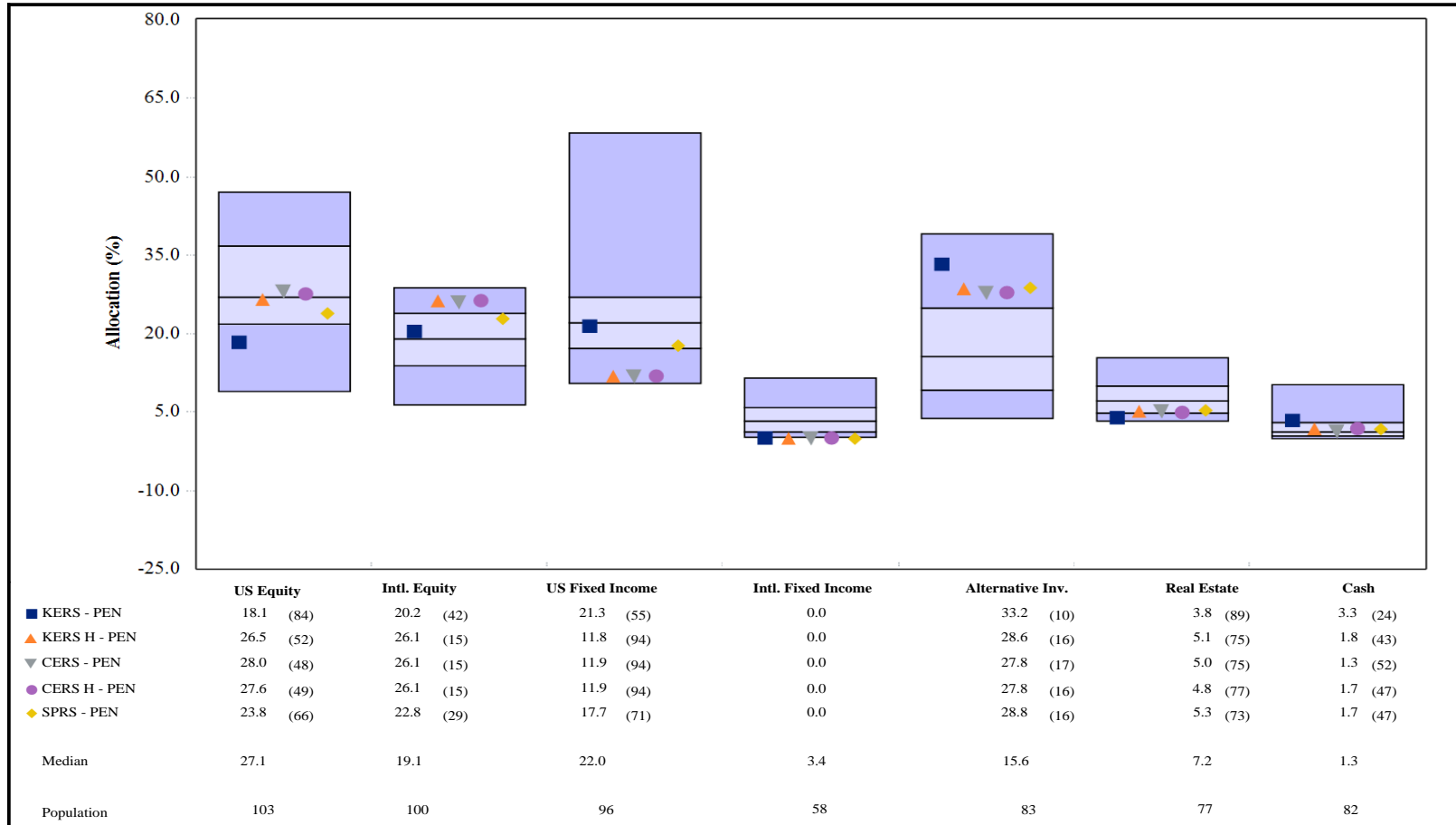
2015 Investment Policy	KERS	KERS H	CERS	CERS H	SPRS	Allowable Range (+/- Target)
US Equity	22.0%	26.5%	26.5%	26.5%	23.0%	5.0%
Non US Equity	20.0%	26.5%	26.5%	26.5%	23.0%	5.0%
Global Fixed Income	10.0%	6.0%	6.0%	6.0%	9.0%	2.0%
Credit Fixed Income	12.0%	6.0%	6.0%	6.0%	9.0%	2.0%
Real Estate	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Absolute Return	10.0%	10.0%	10.0%	10.0%	10.0%	2.0%
Real Return	8.0%	8.0%	8.0%	8.0%	8.0%	2.0%
Private Equity	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Cash	3.0%	2.0%	2.0%	2.0%	3.0%	2.0%





# KRS Pension – Asset Allocation Comparison

Asset Allocation Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016



Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



## KRS Pension – Actual Performance vs. Benchmarks

As of June 30, 2016	3 Years	5 Years	7 Years	10 Years	Jul-2003 To Jun-2016
KERS - PEN	4.99	5.11	8.44	4.89	6.23
KERS - PEN Benchmark	5.75	5.82	8.82	5.45	6.55
<i>Over/Under Performance</i>	<i>-0.76</i>	<i>-0.71</i>	<i>-0.38</i>	<i>-0.56</i>	<i>-0.32</i>
KERS H - PEN	5.35	5.32	8.60	5.00	6.31
KERS H - PEN Benchmark	5.34	5.57	8.64	5.33	6.46
<i>Over/Under Performance</i>	<i>0.01</i>	<i>-0.25</i>	<i>-0.04</i>	<i>-0.33</i>	<i>-0.15</i>
CERS - PEN	5.07	5.16	8.48	4.91	6.25
CERS - PEN Benchmark	5.32	5.56	8.63	5.32	6.45
<i>Over/Under Performance</i>	<i>-0.25</i>	<i>-0.40</i>	<i>-0.15</i>	<i>-0.41</i>	<i>-0.20</i>
CERS H - PEN	5.39	5.35	8.62	5.01	6.32
CERS H - PEN Benchmark	5.32	5.56	8.63	5.32	6.45
<i>Over/Under Performance</i>	<i>0.07</i>	<i>-0.21</i>	<i>-0.01</i>	<i>-0.31</i>	<i>-0.13</i>
SPRS - PEN	4.98	5.10	8.44	4.89	6.23
SPRS - PEN Benchmark	5.43	5.63	8.68	5.35	6.48
<i>Over/Under Performance</i>	<i>-0.45</i>	<i>-0.53</i>	<i>-0.24</i>	<i>-0.46</i>	<i>-0.25</i>

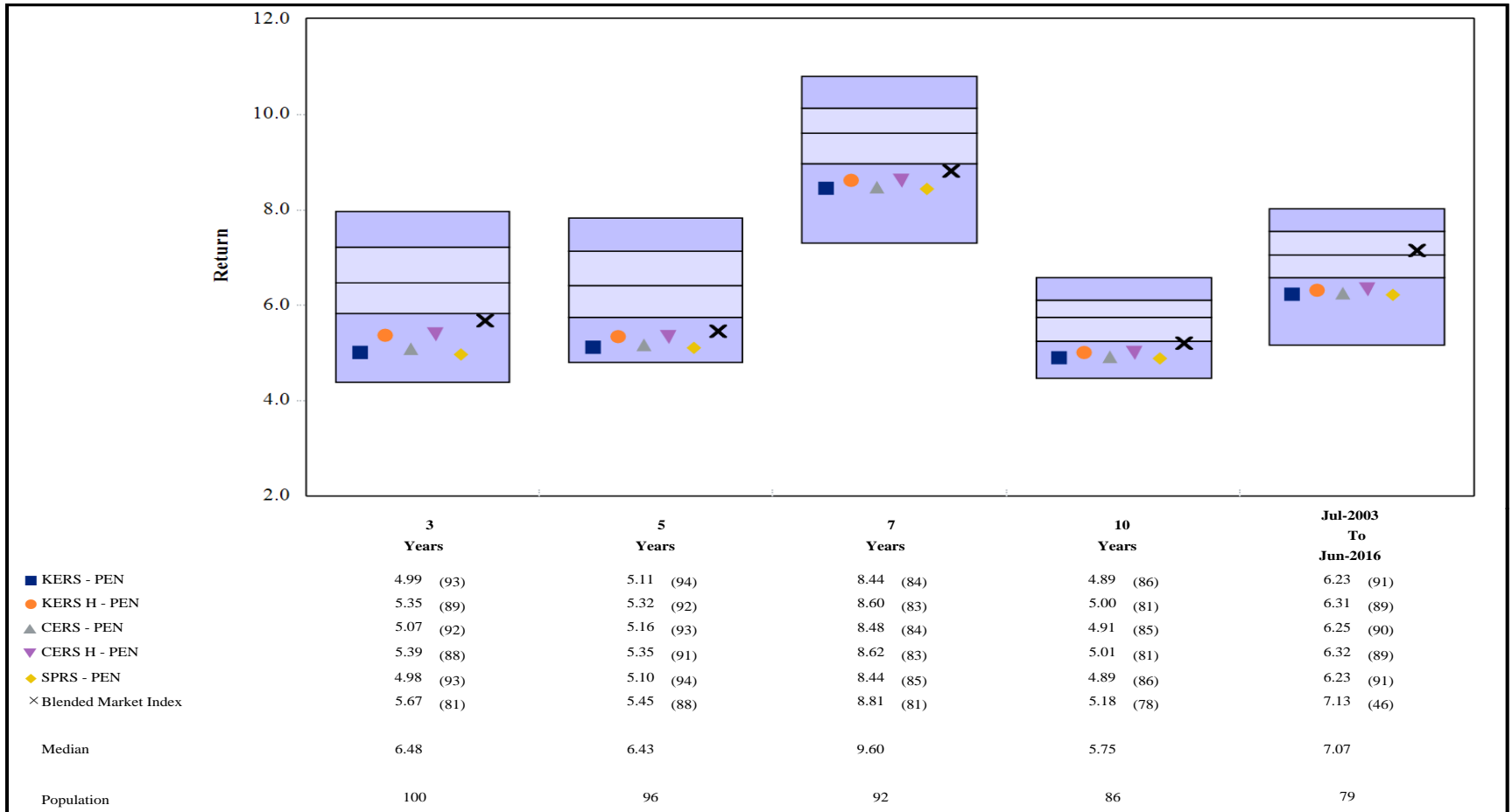
Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16.





# KRS Pension – Trailing Investment Performance

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

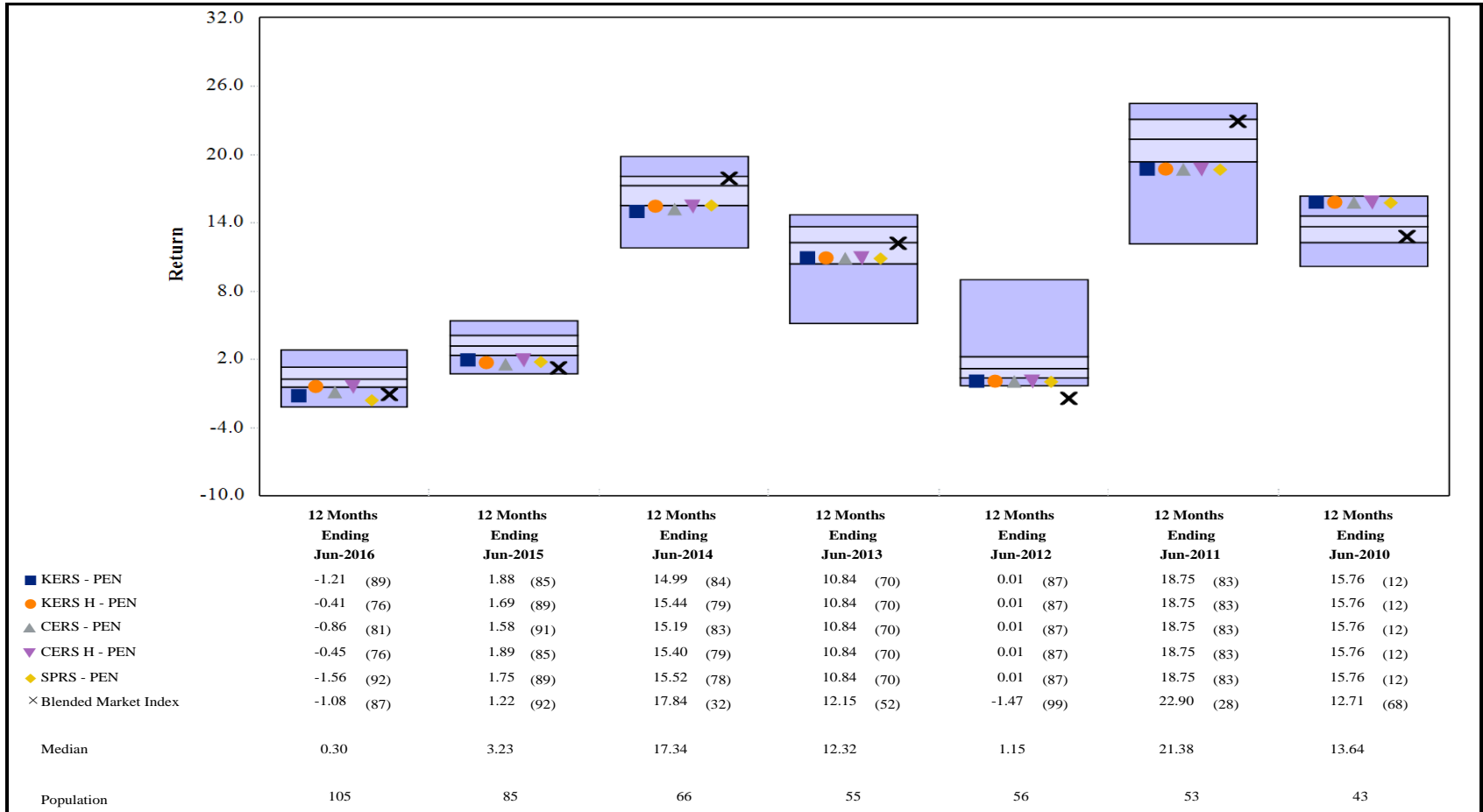


Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Pension – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

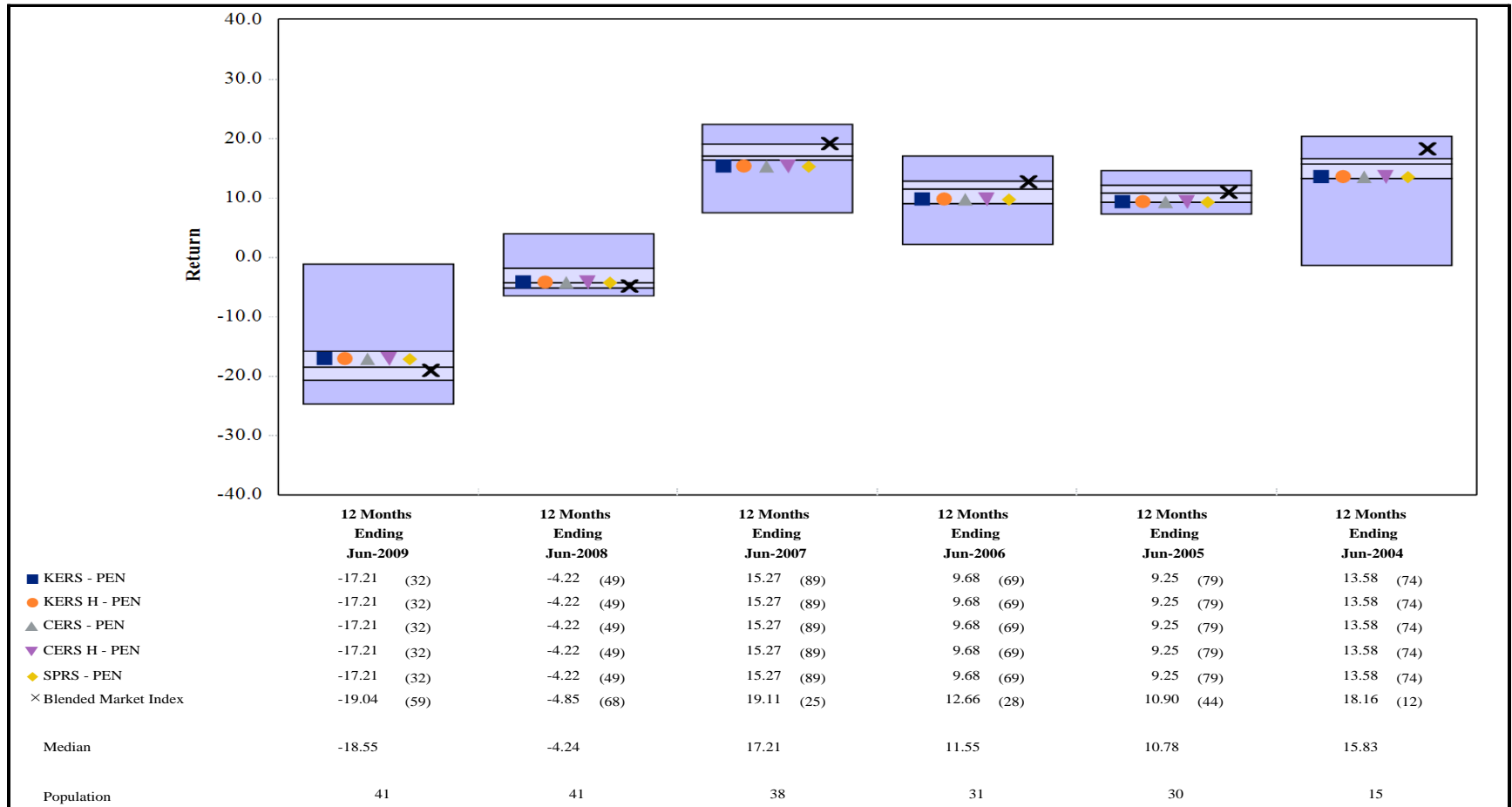


Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Pension – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016



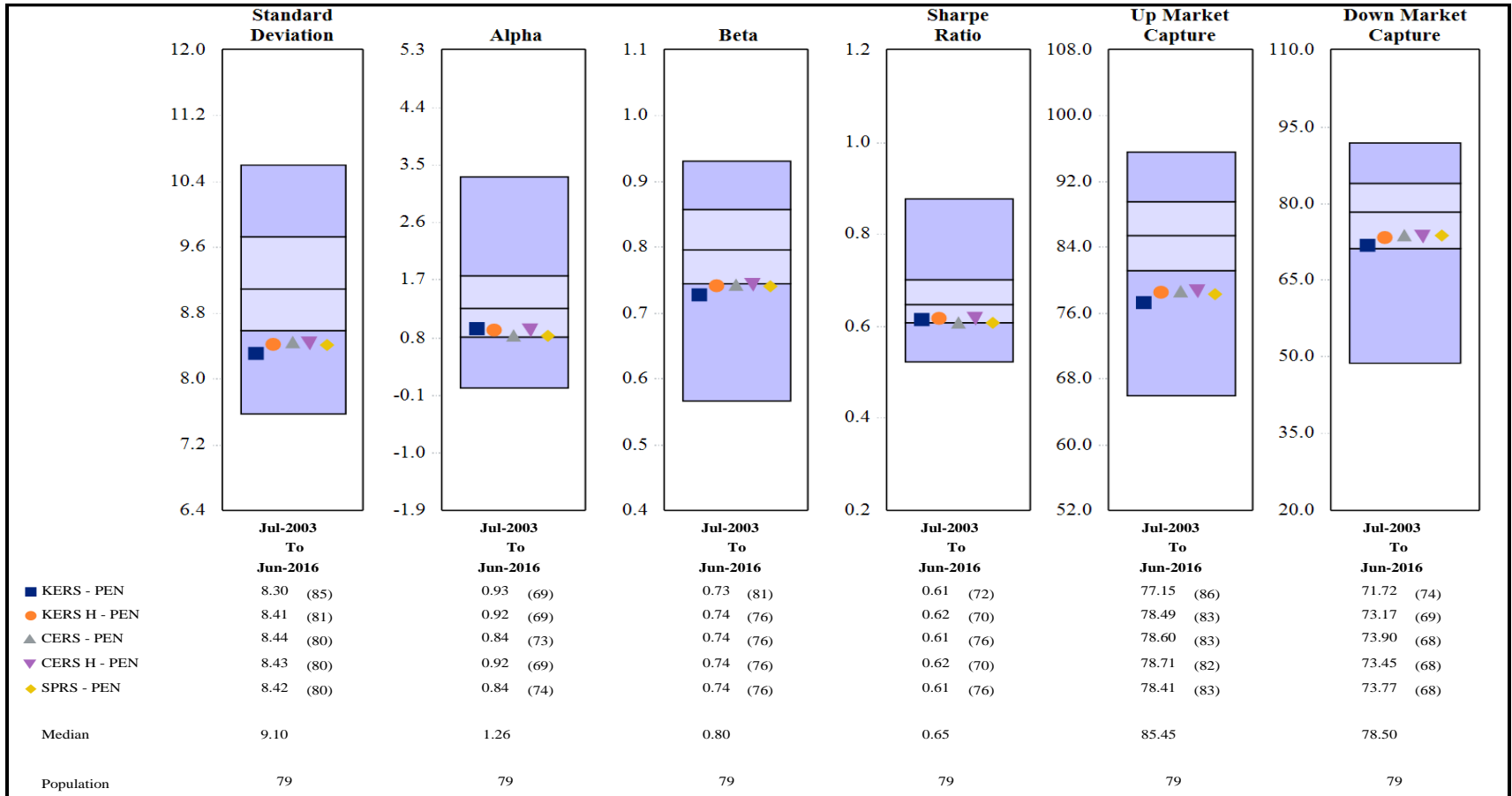
Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Pension – Investment Risk Statistics

Plan Sponsor Peer Group Analysis-Multi Statistics  
 All Public Plans > \$1 Billion vs. Blended Market Index

As of June 30, 2016



Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



## KRS Insurance Plan Overview

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$4.6 Billion
- Actuarial Accrued Liability (6/30/2016): \$7.6 Billion
- Investment Return Assumption (6/30/2016): 7.50% (down from 8.25% in 2005)

### ◆ Investment Consultants

- RV Kuhns (General Advisor)
- ORG Portfolio Management (Real Estate Advisor)
- Pension Consulting Alliance (Private Equity Advisor)
- Albourne America (Hedge Funds & Real Assets Advisor)

### ◆ Investment Managers

- 132 total managers/products, including 3 managed internally (S&P 500 Index, Midcap Index, and TIPS portfolio)

### ◆ Custodial Bank

- Bank of New York Mellon

Information received from KRS as of 6/30/2016. Asset/Liability Data includes KERS, KERS-H, CERS, CERS-H and SPRS.



## KRS Insurance – Performance Attribution

- ◆ Total plan actual investment performance falls in bottom quartile for all trailing periods shown and significantly lags KRS' 7.5% investment return assumption
- ◆ Asset allocation has been the primary detractor of relative performance
  - International equity allocation increased from 30% of public equity to nearly 50% of public equity in 2011 and has lagged the Russell 3000 Index by more than 1,100 basis points annually
  - Hedge fund allocation of roughly 10% was added in 2011 and has lagged the Russell 3000 Index by nearly 800 basis points annually
  - Real return allocation has averaged 10% of the portfolio during the past 5 years and has lagged the Russell 3000 Index by more than 800 basis points annually
  - Private equity allocation has added value over public equity for most trailing periods, but has lagged its benchmark (Russell 3000 Index + 3%) by 26 basis points annually for past 10 years
- ◆ Performance at the asset class level has generally been in-line with the relevant index for longer periods (10+ years), with the exception of real estate, indicating manager selection has not been a significant detractor of performance
- ◆ Both the standard deviation and down-market capture have been in the top percentile of peers since 2003, resulting in significant volatility and poor performance

Source: RV Kuhns quarterly performance report as of 6/30/2016



## KRS Insurance – Investment Policy Targets

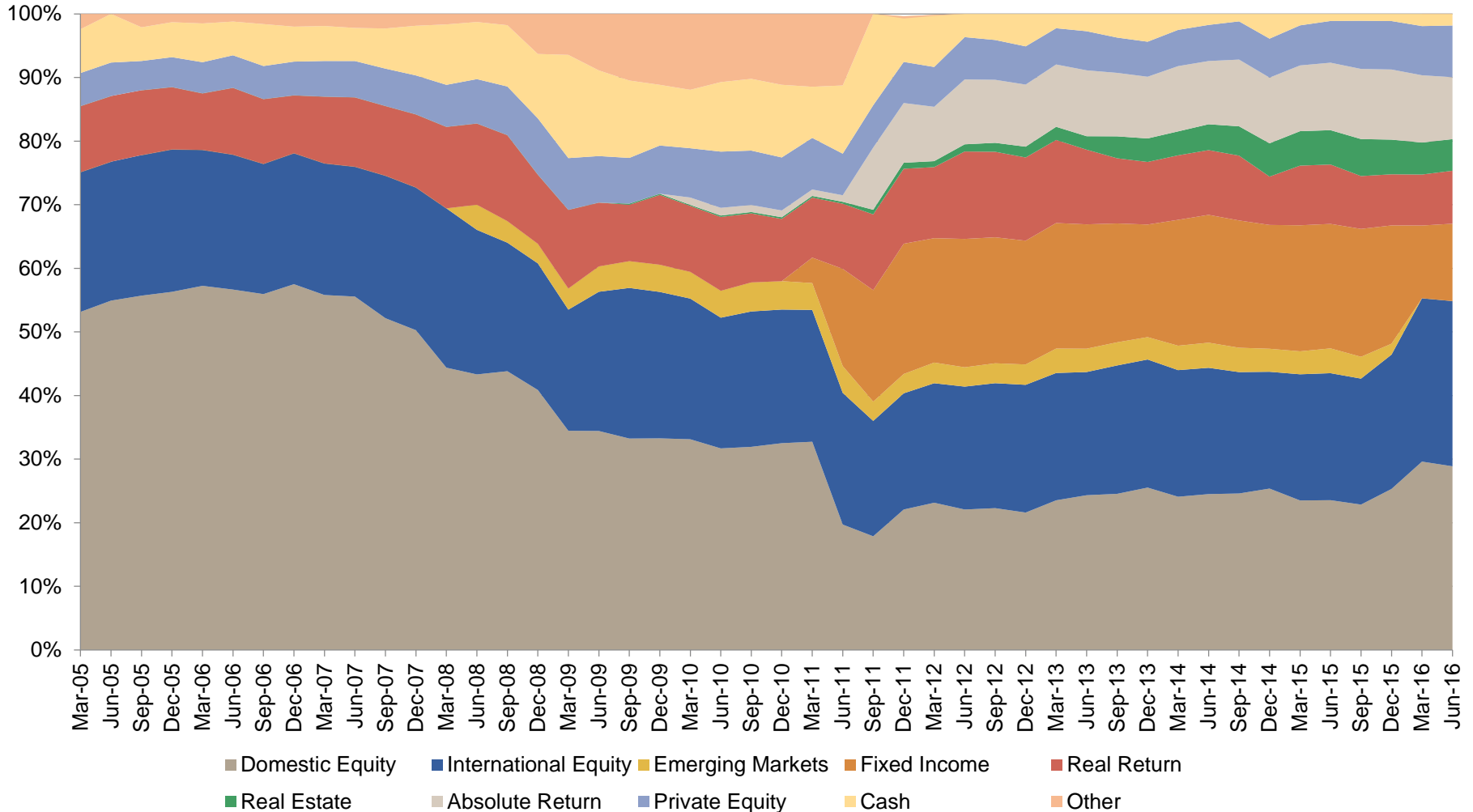
- ◆ KRS has changed investment policy targets four times since 2010
- ◆ Target asset allocations for KERS differed from others in 2011 policy but has remained consistent in all other versions (although actual allocations have differed)
- ◆ Overall target allocations to alternatives have increased and allowable ranges have narrowed

2010 Investment Policy	Target Allocations (All Plans)	Allowable Range
Domestic Equity	35.0%	25 - 65%
International Equity	30.0%	20 - 40%
Fixed Income - TIPS	12.0%	0 - 15%
Fixed Income - Market	0.0%	0 - 30%
Fixed Income - High Yield	5.0%	0 - 5%
Alternative Investments	15.0%	1 - 20%
Cash Equivalents	3.0%	1 - 10%

2015 Investment Policy	KERS	KERS H	CERS	CERS H	SPRS	Allowable Range (+/- Target)
US Equity	26.5%	26.5%	26.5%	26.5%	26.5%	5.0%
Non US Equity	26.5%	26.5%	26.5%	26.5%	26.5%	5.0%
Global Fixed Income	6.0%	6.0%	6.0%	6.0%	6.0%	2.0%
Credit Fixed Income	6.0%	6.0%	6.0%	6.0%	6.0%	2.0%
Real Estate	5.0%	5.0%	5.0%	5.0%	5.0%	2.0%
Absolute Return	10.0%	10.0%	10.0%	10.0%	10.0%	2.0%
Real Return	8.0%	8.0%	8.0%	8.0%	8.0%	2.0%
Private Equity	10.0%	10.0%	10.0%	10.0%	10.0%	3.0%
Cash	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%



## KRS Insurance – Historical Asset Allocation



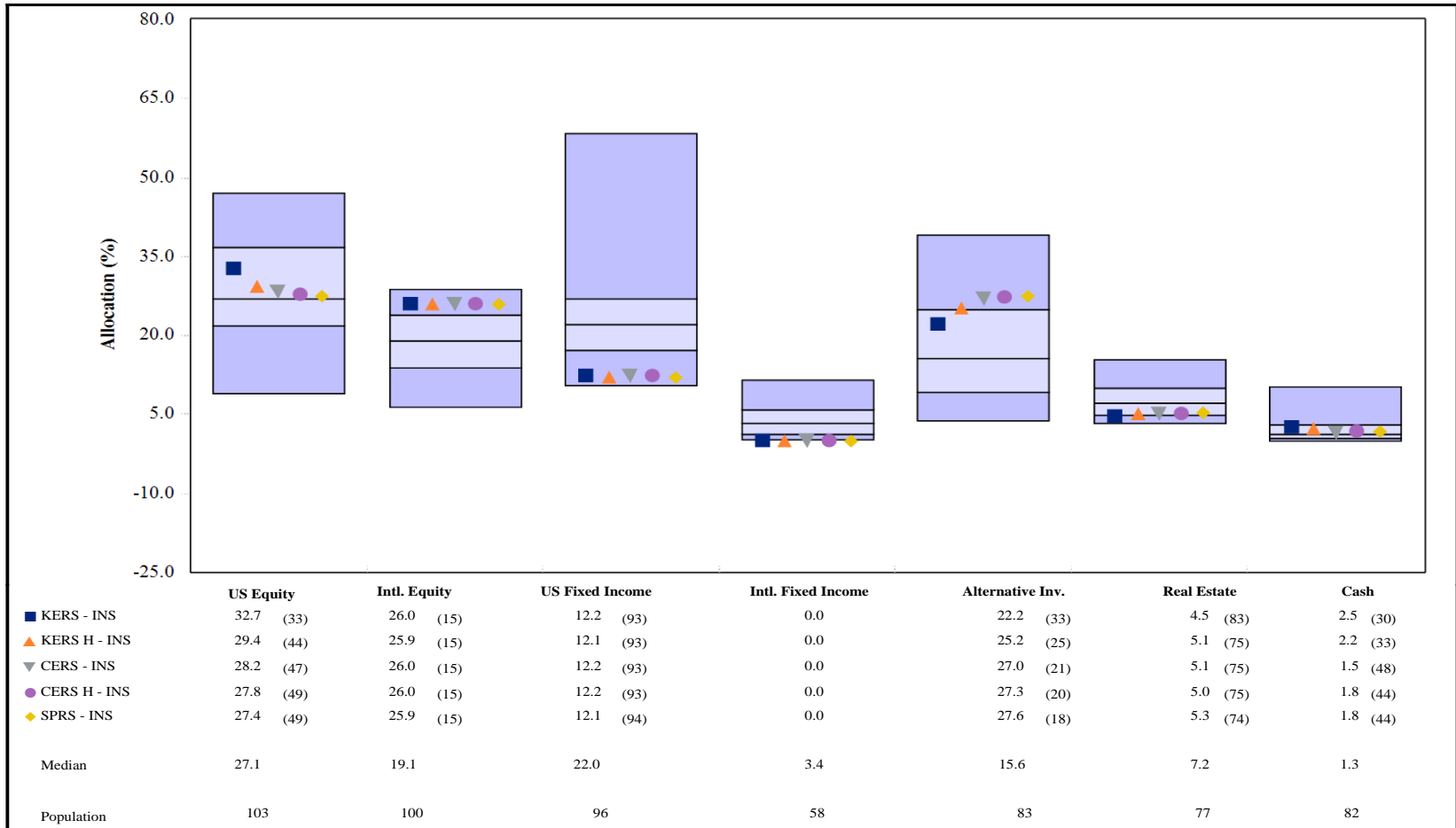
Source: RV Kuhns Quarterly Investment Performance Reports from 2005 - 2016. Reports prior to 2005 were not provided.





# KRS Insurance – Asset Allocation Comparison

Asset Allocation Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016



Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



## KRS Insurance – Actual Performance vs. Benchmarks

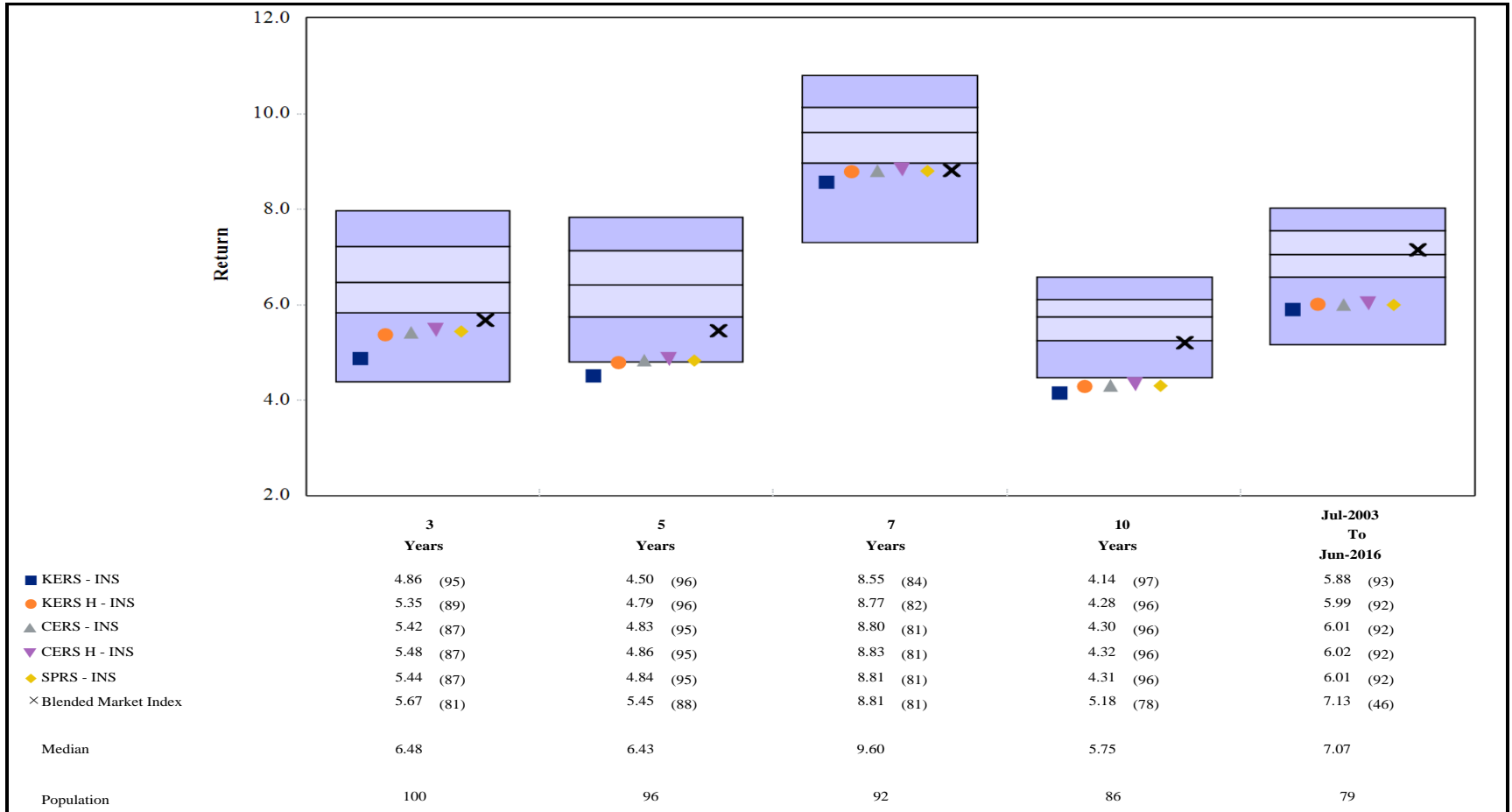
As of June 30, 2016	3 Years	5 Years	7 Years	10 Years	Jul-2003 To Jun-2016
KERS - INS	4.86	4.50	8.55	4.14	5.88
KERS - INS Benchmark	5.41	5.52	9.42	4.69	6.58
<i>Over/Under Performance</i>	<i>-0.55</i>	<i>-1.02</i>	<i>-0.87</i>	<i>-0.55</i>	<i>-0.70</i>
KERS H - INS	5.35	4.79	8.77	4.28	5.99
KERS H - INS Benchmark	5.51	5.58	9.46	4.72	6.60
<i>Over/Under Performance</i>	<i>-0.16</i>	<i>-0.79</i>	<i>-0.69</i>	<i>-0.44</i>	<i>-0.61</i>
CERS - INS	5.42	4.83	8.80	4.30	6.01
CERS - INS Benchmark	5.59	5.63	9.50	4.75	6.62
<i>Over/Under Performance</i>	<i>-0.17</i>	<i>-0.80</i>	<i>-0.70</i>	<i>-0.45</i>	<i>-0.61</i>
CERS H - INS	5.48	4.86	8.83	4.32	6.02
CERS H - INS Benchmark	5.59	5.63	9.50	4.75	6.62
<i>Over/Under Performance</i>	<i>-0.11</i>	<i>-0.77</i>	<i>-0.67</i>	<i>-0.43</i>	<i>-0.60</i>
SPRS - INS	5.44	4.84	8.81	4.31	6.01
SPRS - INS Benchmark	5.61	5.64	9.51	4.75	6.63
<i>Over/Under Performance</i>	<i>-0.17</i>	<i>-0.80</i>	<i>-0.70</i>	<i>-0.44</i>	<i>-0.62</i>

Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16.



# KRS Insurance – Trailing Investment Performance

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

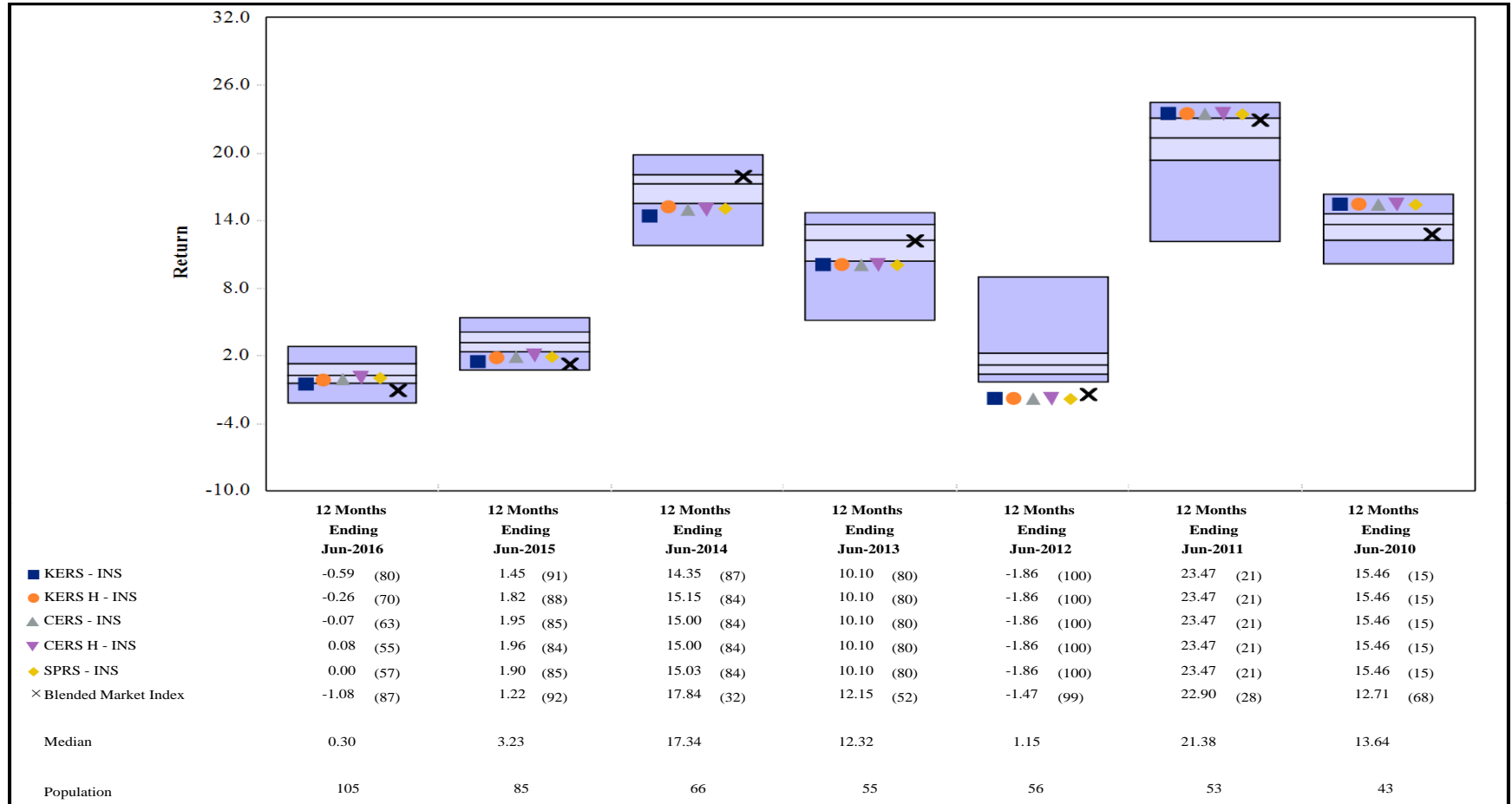


Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Insurance – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

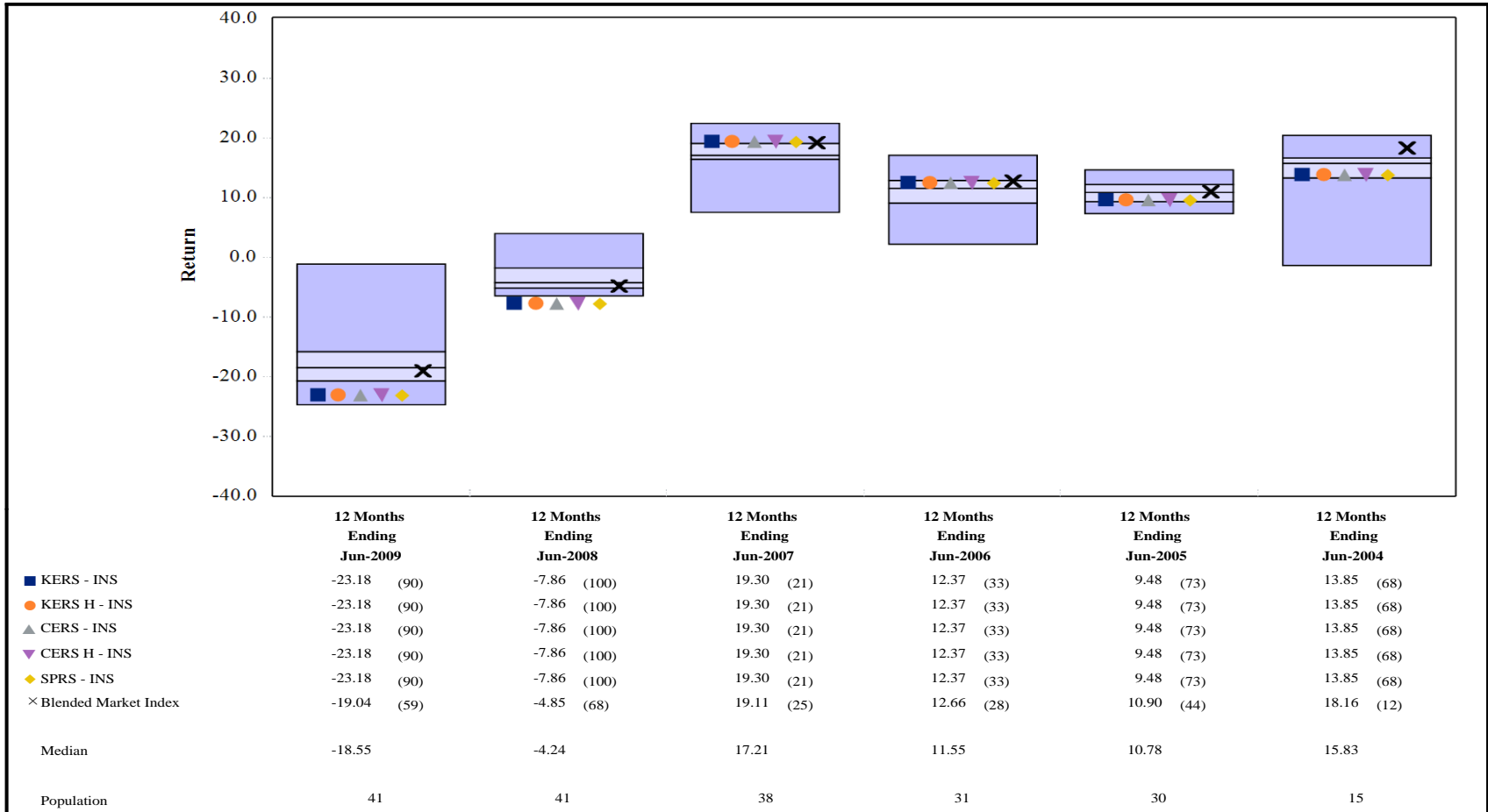


Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Insurance – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016



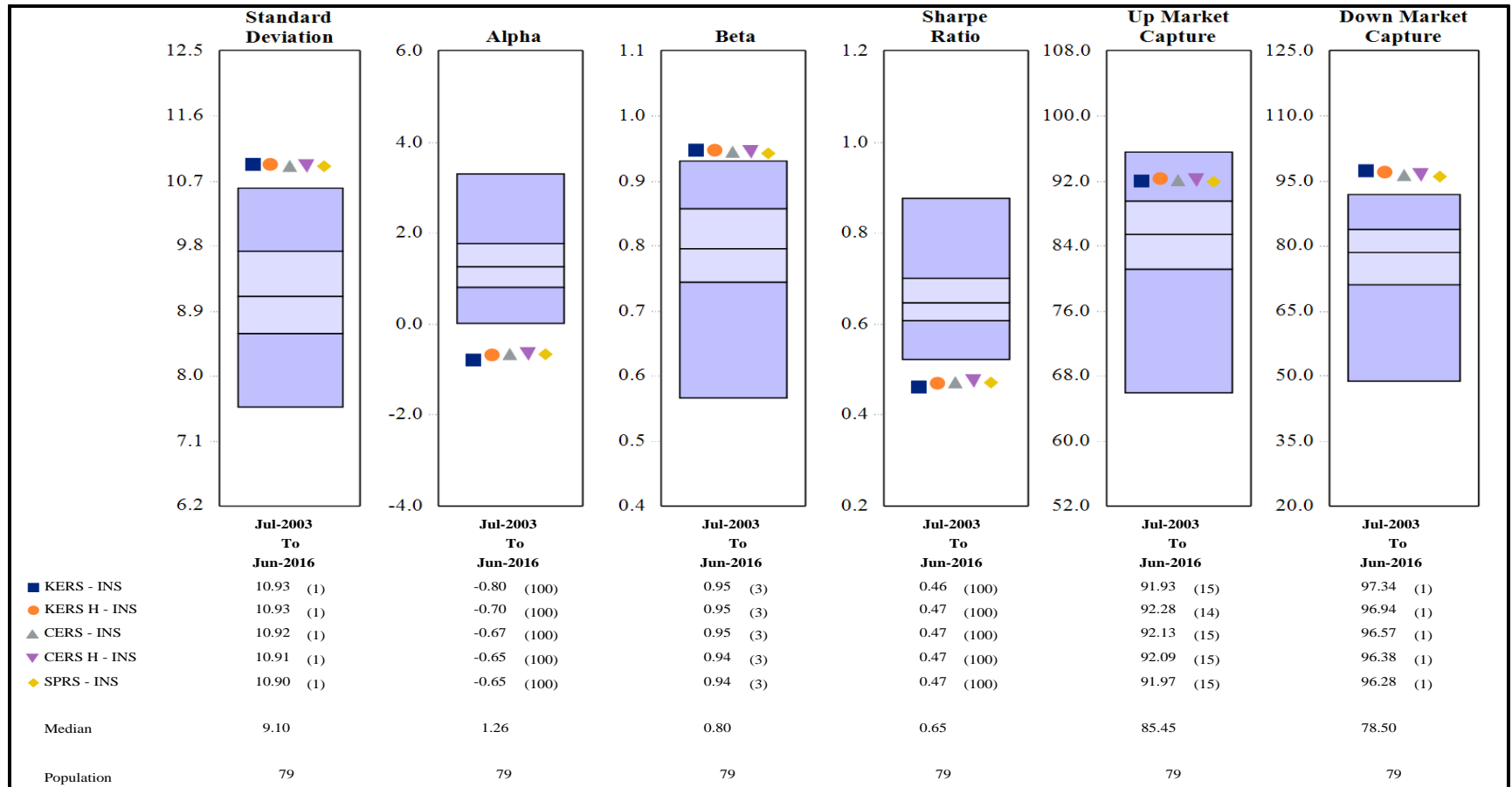
Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# KRS Insurance – Investment Risk Statistics

Plan Sponsor Peer Group Analysis-Multi Statistics  
All Public Plans > \$1 Billion vs. Blended Market Index

As of June 30, 2016



Source: RV Kuhns Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS



## TRS Pension Plan Overview

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$17.5 Billion
- Actuarial Accrued Liability (6/30/2016): \$32.0 Billion
- Investment Return Assumption (6/30/2016): 7.50%

### ◆ Investment Consultants

- Aon Hewitt (General Advisor)

### ◆ Investment Committee Advisors

- Bevis Longstreth
- George Philip

### ◆ Investment Managers

- 90 total managers/products, including 10 managed internally (see Transparency & Fees for detail)

### ◆ Custodial Bank

- Bank of New York Mellon





## TRS Pension – Investment Performance Attribution

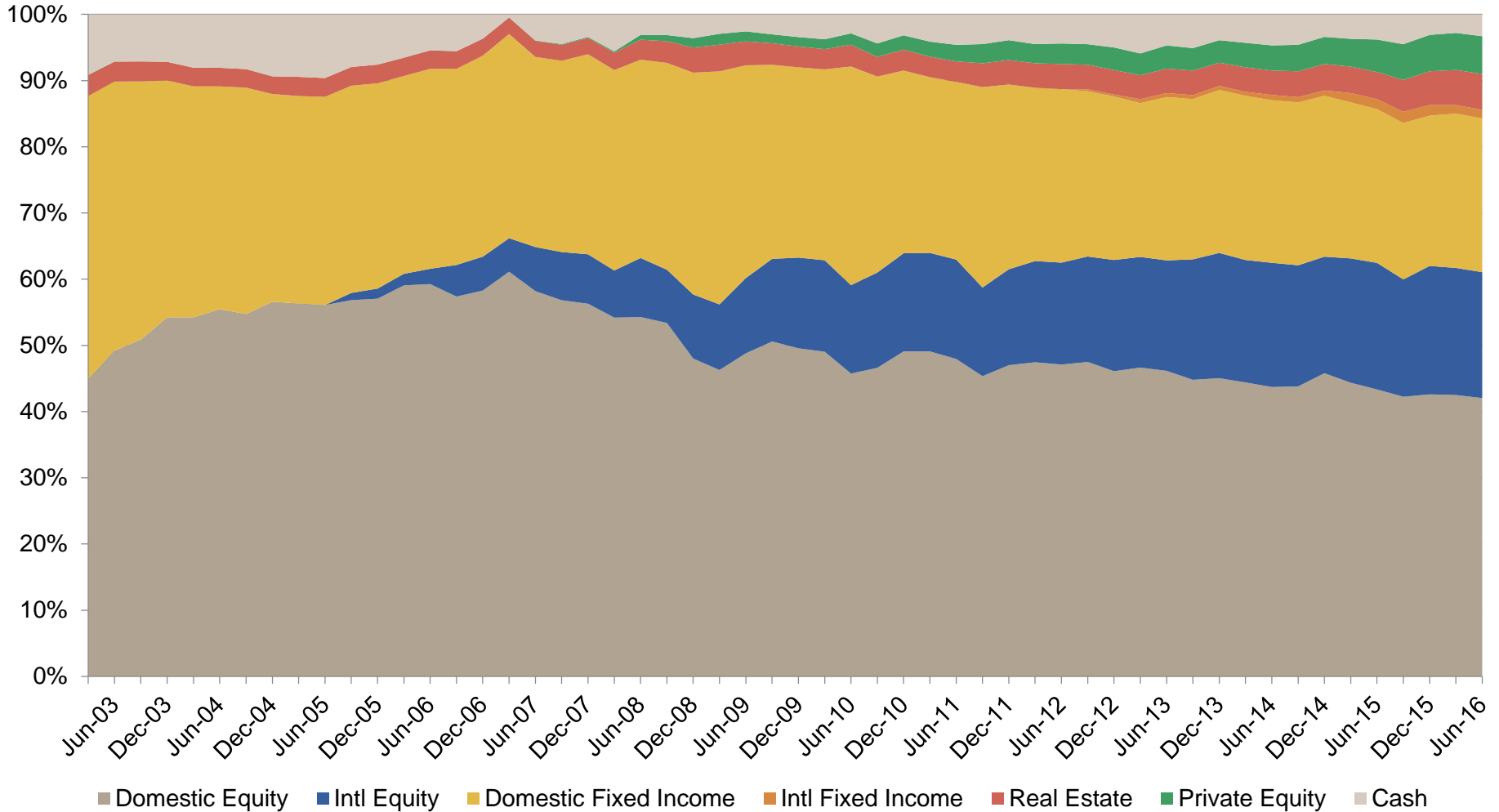
- ◆ Compared to a peer universe of public plans > \$1 billion, the Pension Plan's performance ranked in the 19th percentile over ten years (6.29% return) but only 76th since July 2003 (6.58% return), the beginning date of the monthly returns data provided by TRS.
- ◆ From FY 2009-2016, the Pension Plan's performance ranked above the 50th percentile in 6 out of the 8 fiscal year periods but ranked close to the 90th percentile each year from FY 2004-2008.
- ◆ International equity was absent from the portfolio until July 2005 and has gradually increased to 19%.
  - The low allocation to international equity relative to domestic hurt performance from 2003-2007 but has contributed to the outperformance from 2008-2015.
- ◆ The Plan has become more aggressive over time, with fixed income representing 43% of the portfolio in March 2003 and gradually decreasing to 25% as of June 2016.
- ◆ The private equity allocation helped overall performance with a return of 9.64% since it was included in the portfolio in July 2008 compared to a return of 8.68% for the Russell 3000.

Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16

Note: TRS benchmark performance was not provided as part of the monthly return data included in the analysis



## TRS Pension – Historical Asset Allocation

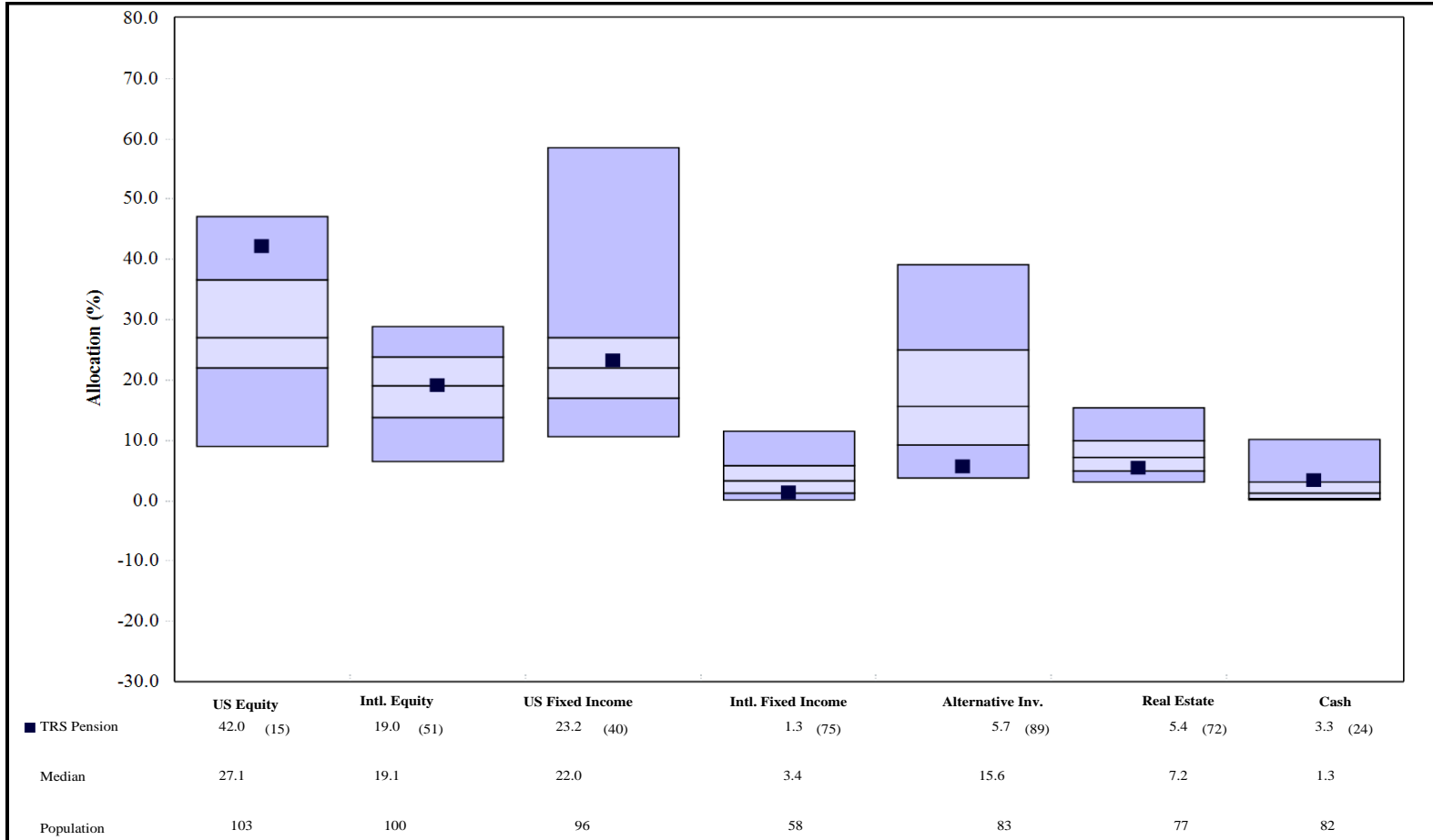


Source: Segal RogersCasey Quarterly Investment Performance Reports from 2003-2016



# TRS Pension – Asset Allocation Comparison

ASSET ALLOCATION ANALYSIS  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

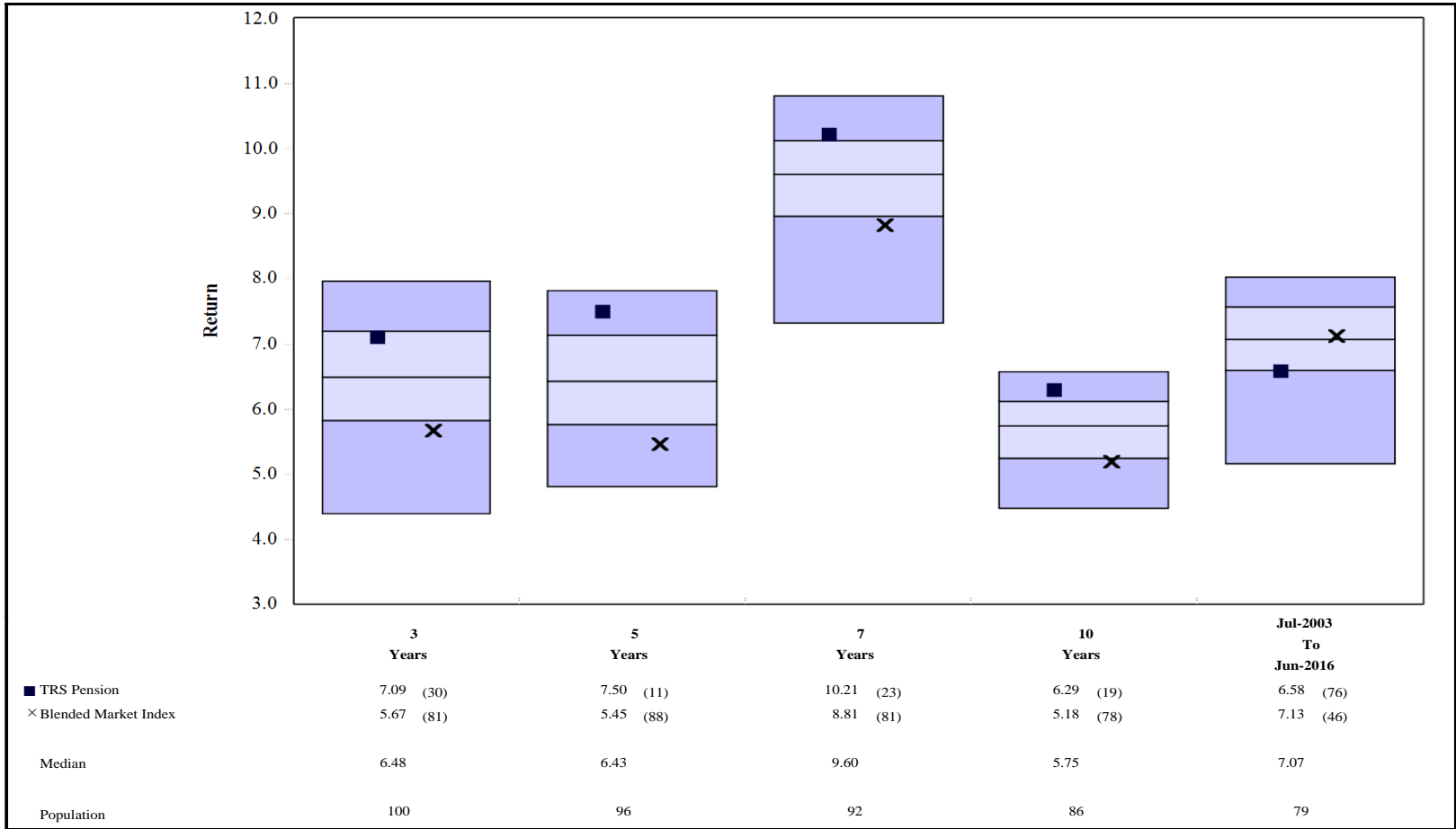


Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Pension – Trailing Investment Performance

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

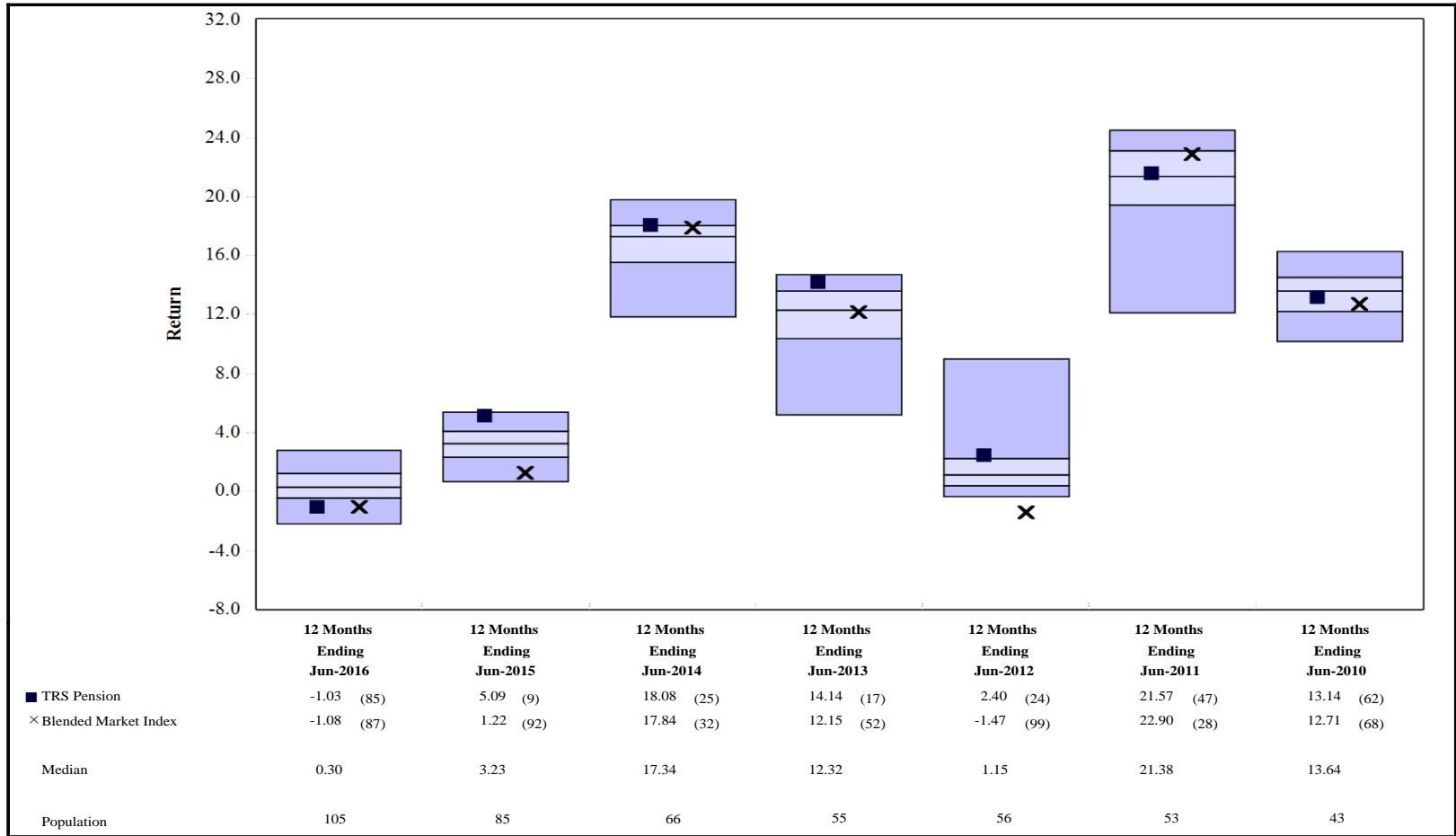


Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Pension – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016

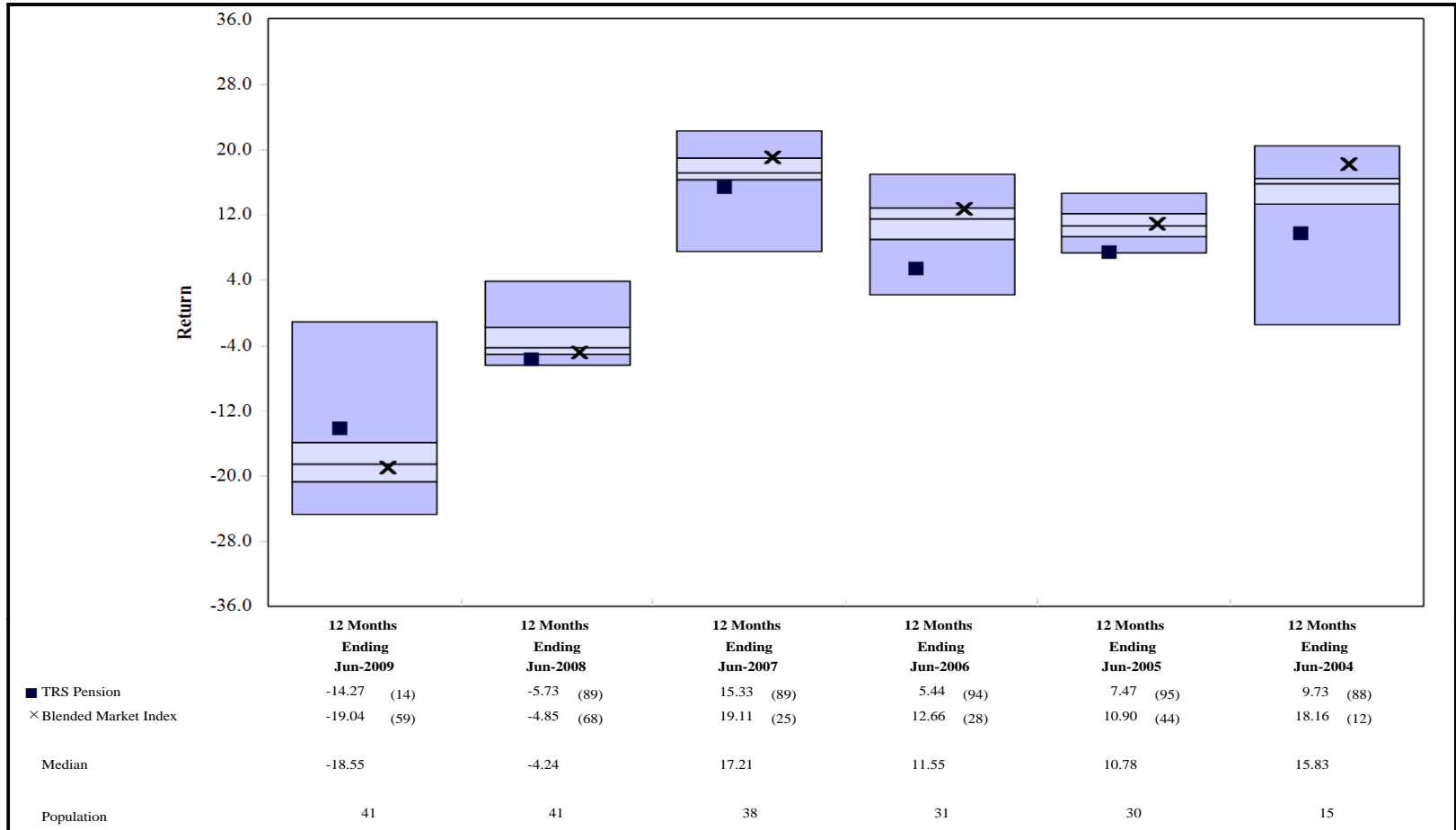


Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Pension – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$1 Billion  
 As of June 30, 2016



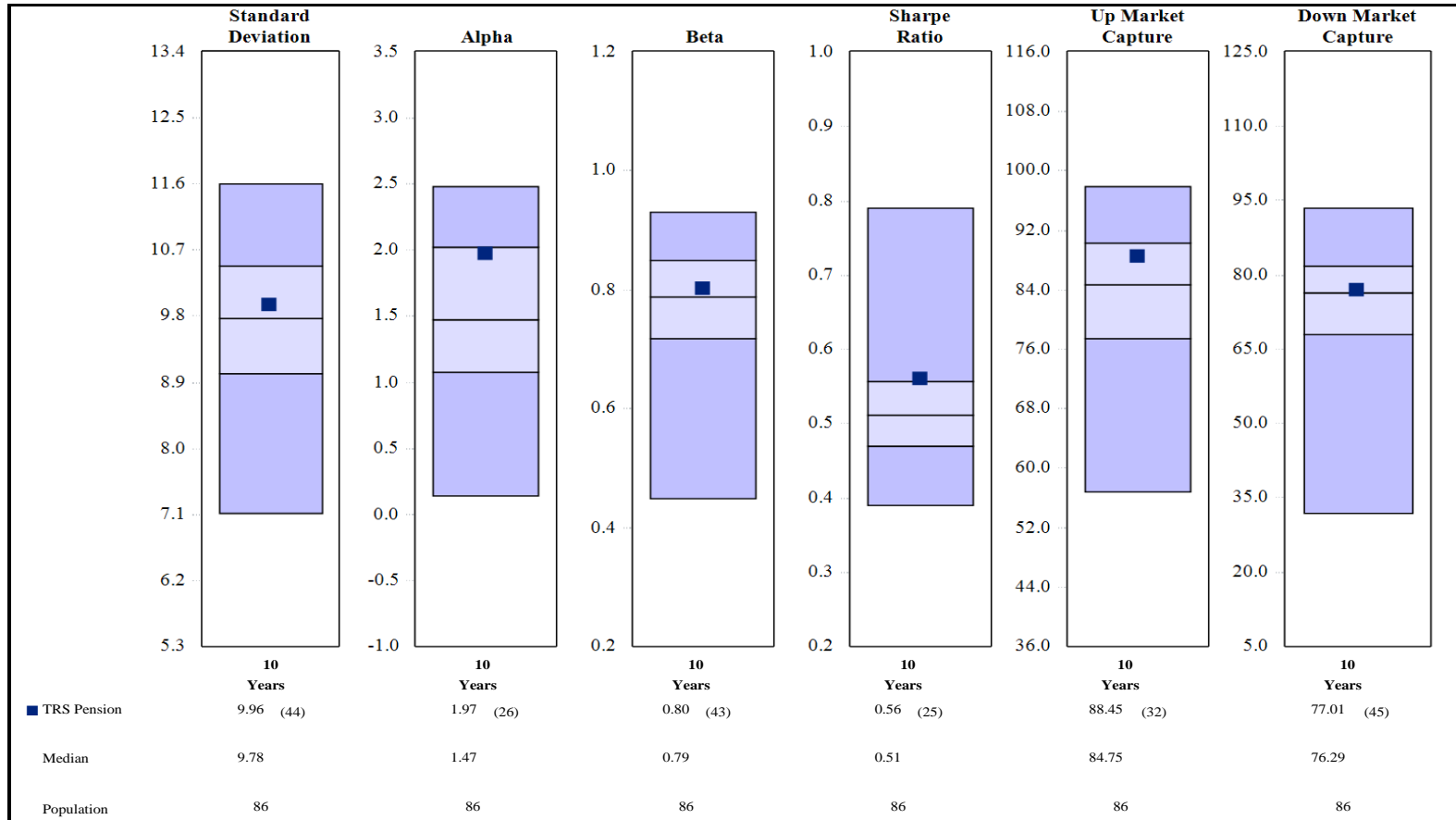
Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Pension – Investment Risk Statistics

Plan Sponsor Peer Group Analysis-Multi Statistics  
All Public Plans > \$1 Billion vs. Blended Market Index

As of June 30, 2016



Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



## TRS Medical Overview

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$795.1 Million
- Actuarial Accrued Liability (6/30/2016): \$3.6 Billion
- Investment Return Assumption (6/30/2016): 8.0% since 2010 (up from 4.5% in 2007)

### ◆ Investment Consultants

- Aon Hewitt (General Advisor)

### ◆ Investment Managers

- 26 total managers/products, including 1 managed internally (see Transparency & Fees for detail)

### ◆ Custodial Bank

- Bank of New York Mellon





## TRS Medical – Investment Performance Attribution

- ◆ Compared to a peer universe of public plans > \$500 million, the Medical Plan's performance ranked below the 90th percentile for the 1, 3, and 5 year trailing periods. While the underperformance in the earlier years can be attributed to cash needs, the year to date 2016 return of 2.68% ranks in the 61st percentile and the 2015 return of -1.37% ranked in the 88th percentile.
- ◆ The portfolio has gradually become more aggressive (risky) over time. When excluding cash, the return seeking investments (public and private equity and real estate) to fixed income ratio went from 50/50 in 2011 to 67/33 in 2016.
- ◆ Cash allocation was high, ranging between 9%-27%, until around the beginning of 2015, when it stayed within a 1%-3% range. This was the main detractor of overall underperformance prior to 2015.
- ◆ Using a single global equity manager (BlackRock Fund B) gives the manager complete control of the allocation breakout between domestic vs. international equity, rather than the investment advisor, and makes it difficult to evaluate how the overall portfolio allocation has changed over time.
- ◆ The private equity and real estate composites have outperformed the global equity manager but the small allocations to these asset classes resulted in only a minor impact to total returns.

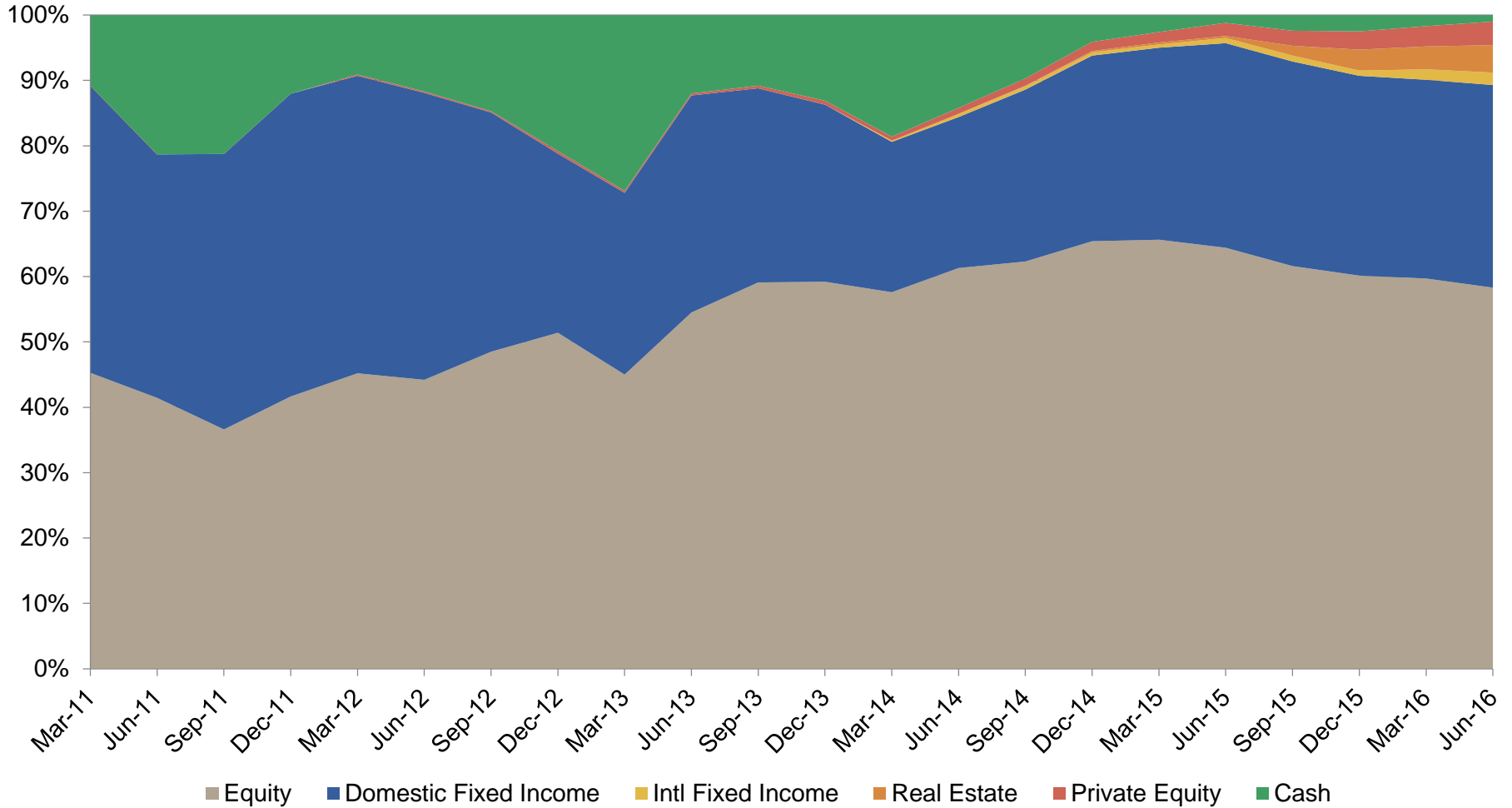
As of 6/30/16	1 Year	3 Years
BlackRock Fund B	-3.39%	6.63%
Private Equity Composite	10.68%	13.40%
Non-Core Real Estate	20.32%	N/A

Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16

Note: TRS benchmark performance was not provided as part of the monthly return data included in the analysis



## TRS Medical – Historical Asset Allocation

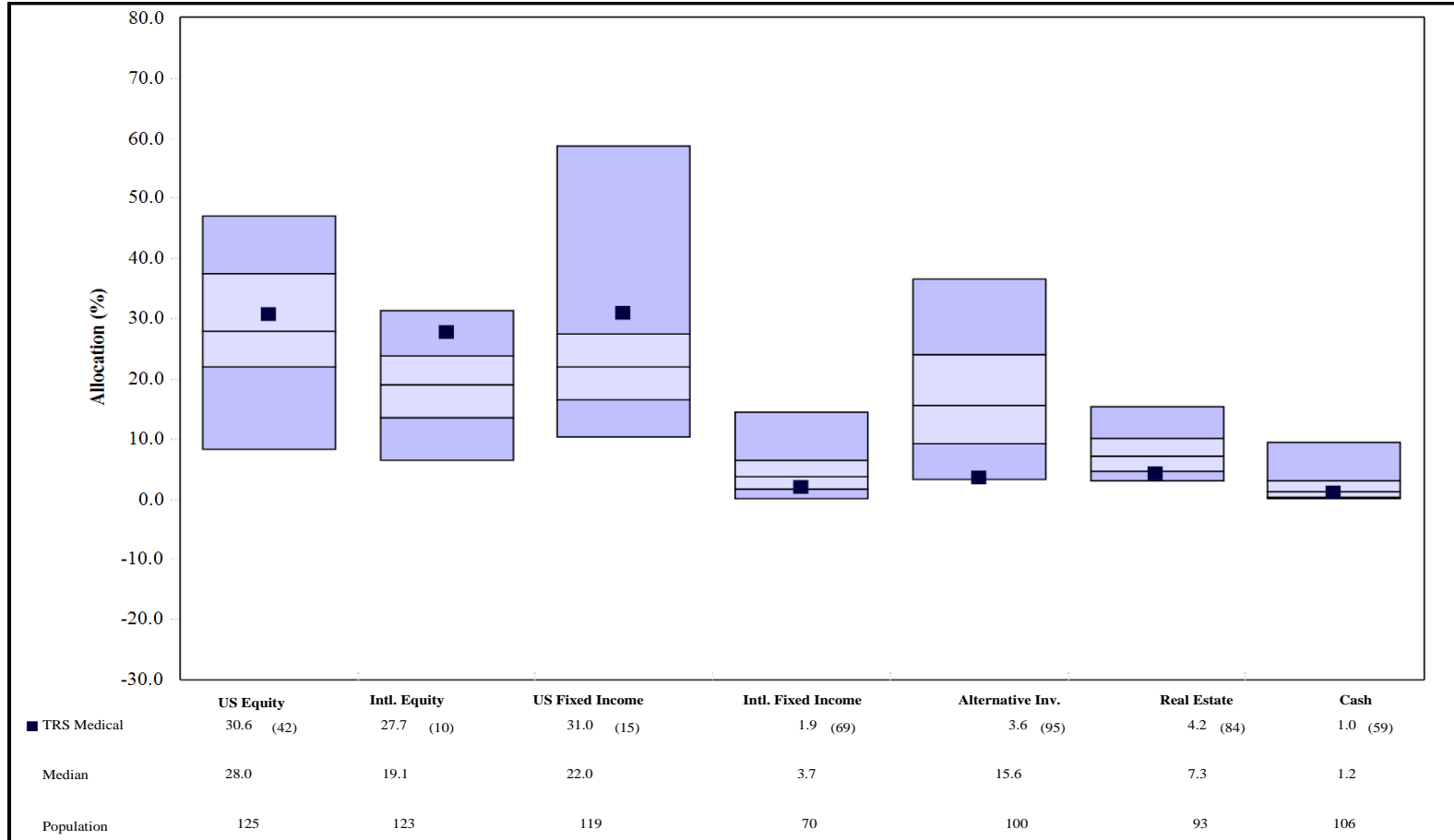


Source: Segal RogersCasey Quarterly Investment Performance Reports from 2011-2016



# TRS Medical – Asset Allocation Comparison

Asset Allocation Analysis  
 All Public Plans > \$500 Million  
 As of June 30, 2016

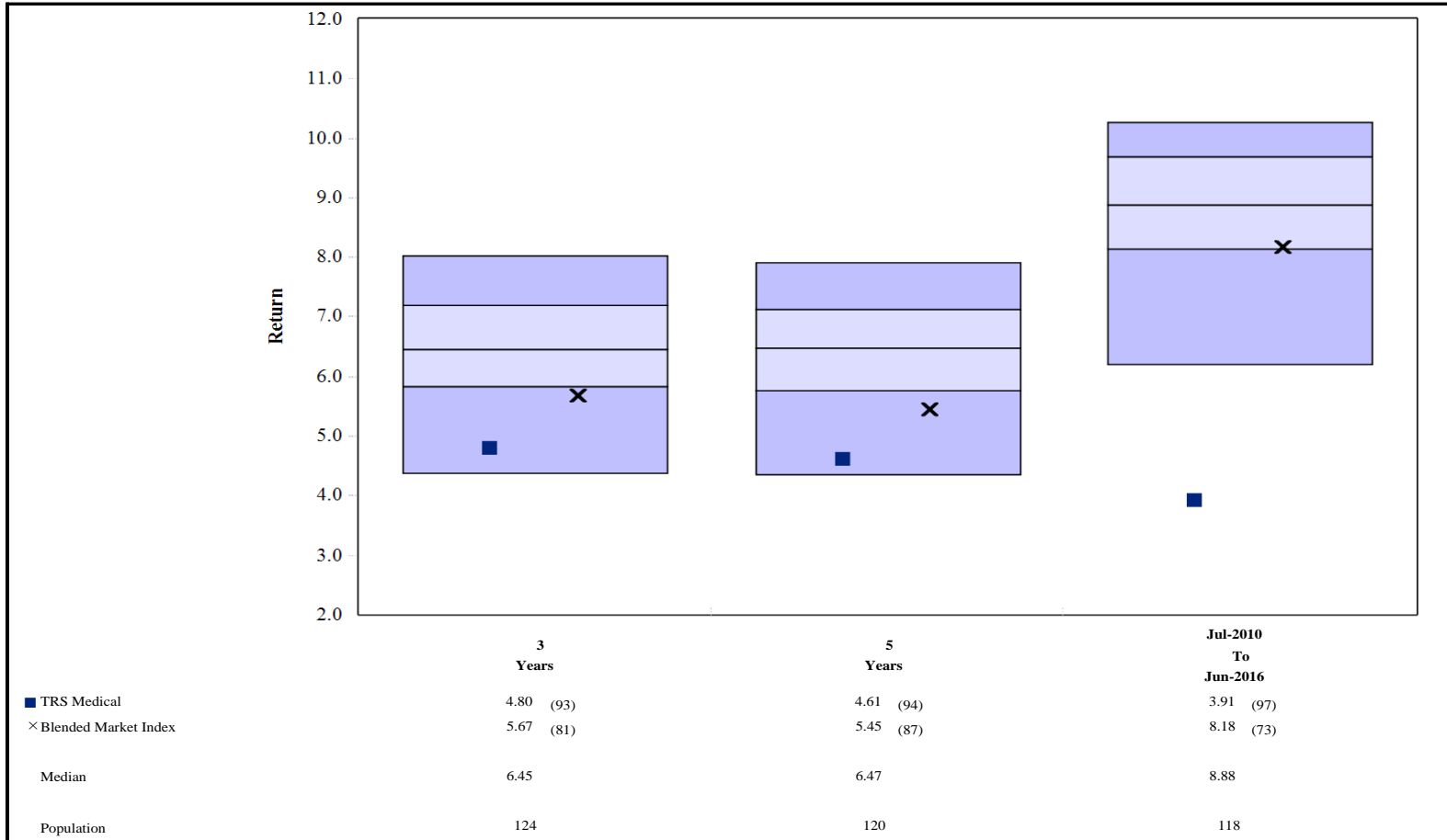


Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings. The US and international equity allocation for the Medical Plan is estimated based on the weights in the MSCI ACWI IMI index as of 10/31/16



# TRS Medical – Trailing Investment Performance

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$500 Million  
 As of June 30, 2016

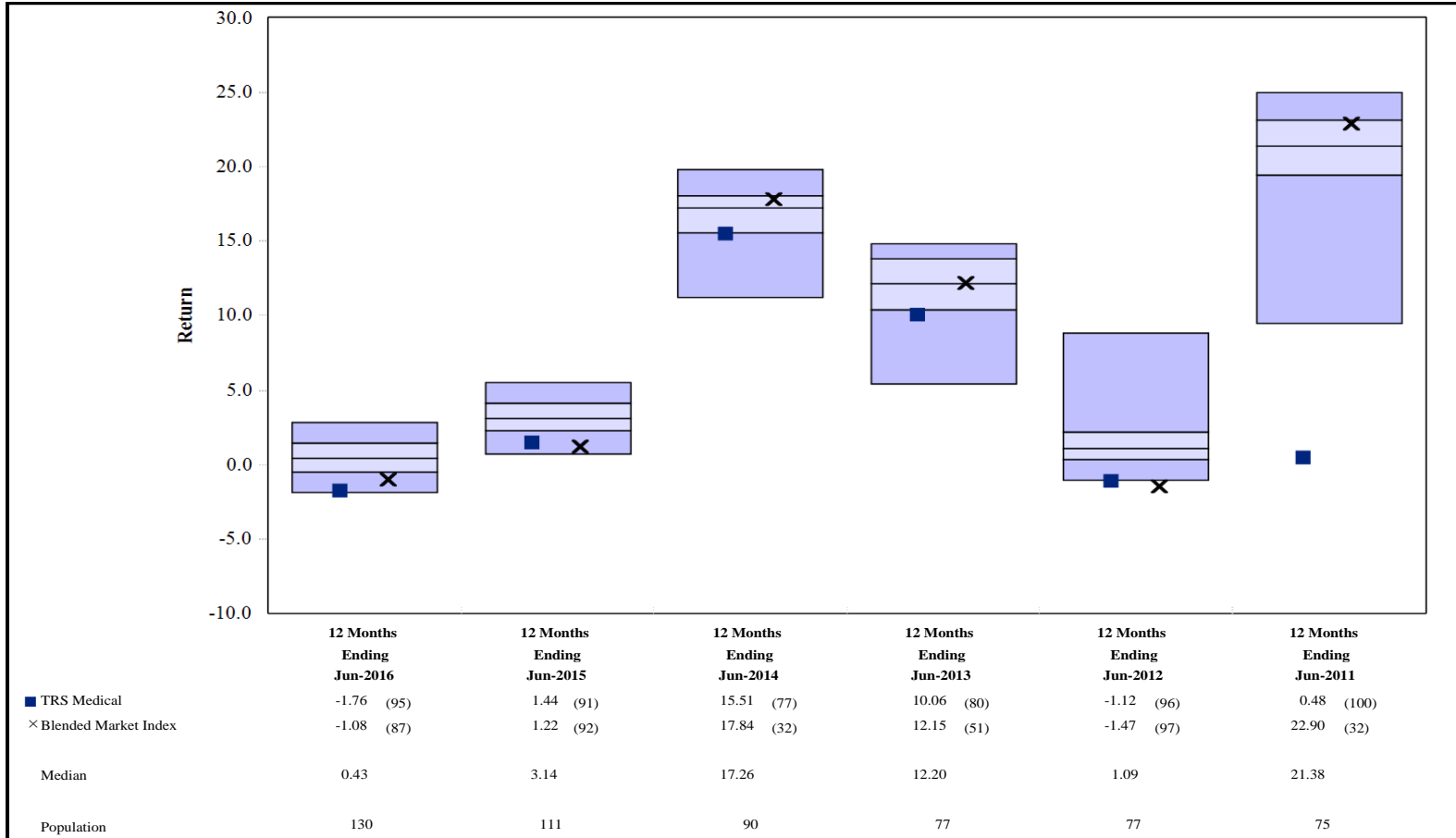


Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Medical – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans > \$500 Million  
 As of June 30, 2016



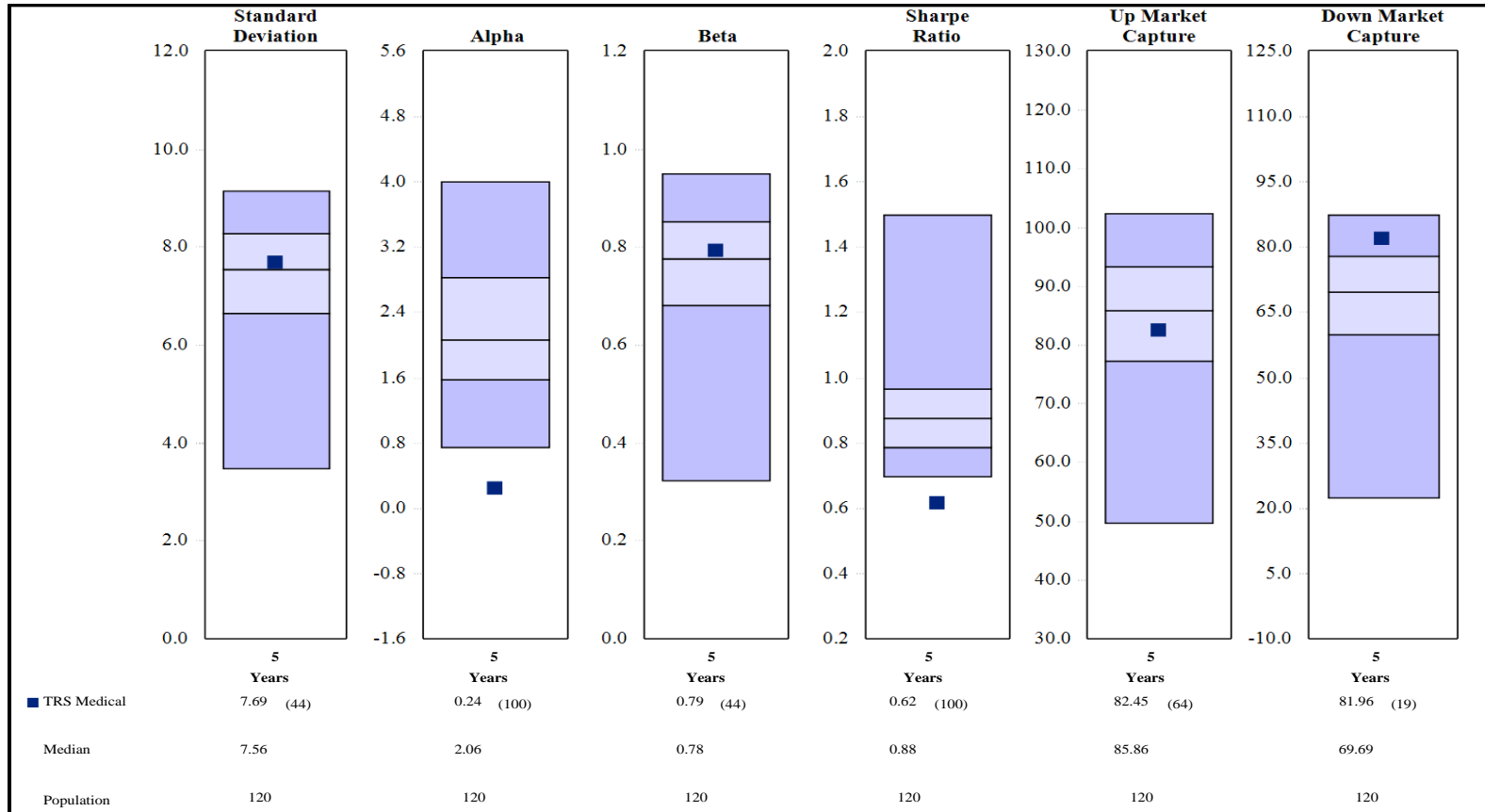
Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



# TRS Medical – Investment Return Statistics

Plan Sponsor Peer Group Analysis-Multi Statistics  
 All Public Plans > \$500 Million vs. Blended Market Index

As of June 30, 2016



Source: Segal RogersCasey Quarterly Investment Performance Reports as of 6/30/16 and Investment Metrics peer group data. Parentheses contain percentile rankings.



**KJFRS**



## Kentucky Judicial Review

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$325.2 Million
- Actuarial Accrued Liability (6/30/2016): \$441.2 Million
- Investment Return Assumption (6/30/2016): 7.0% (down from 7.5% in 2009)

### ◆ Investment Consultants/Manager

- Hilliard Lyons (General Advisor) – Trades individual securities

### ◆ Custodial Bank

- State Street

### ◆ Exclusive Broker

- Lexington Investment Company (see KJFRS – Fee Observations for other services they provide)





## Kentucky Legislators Review

### ◆ Asset / Liability Data

- Actuarial Value of Assets (6/30/2016): \$96.0 Million
- Actuarial Accrued Liability (6/30/2016): \$106.9 Million
- Investment Return Assumption (6/30/2016): 7.0% (down from 7.5% in 2009)

### ◆ Investment Consultants/Manager

- Hilliard Lyons (General Advisor) – Trades individual securities

### ◆ Custodial Bank

- State Street

### ◆ Exclusive Broker

- Lexington Investment Company (see KJFRS – Fee Observations for other services they provide)



## KJFRS – Investment Performance Attribution

- ◆ Since 2004, both Plans have done very well, ranking in the 9th percentile against the peer universe of public plans < \$500 million.
- ◆ Equity allocation is invested entirely in US equities, which has been the major contributor to relative outperformance in recent years but hurt performance from 2003-2007.
- ◆ Outside of 2008-2009, asset allocations remained relatively consistent and no other asset classes have been introduced.
- ◆ Although the performance has been strong, adding other asset groups such as international equities or high yield bonds could diversify the portfolio.

### Domestic vs. International Equity Index Returns

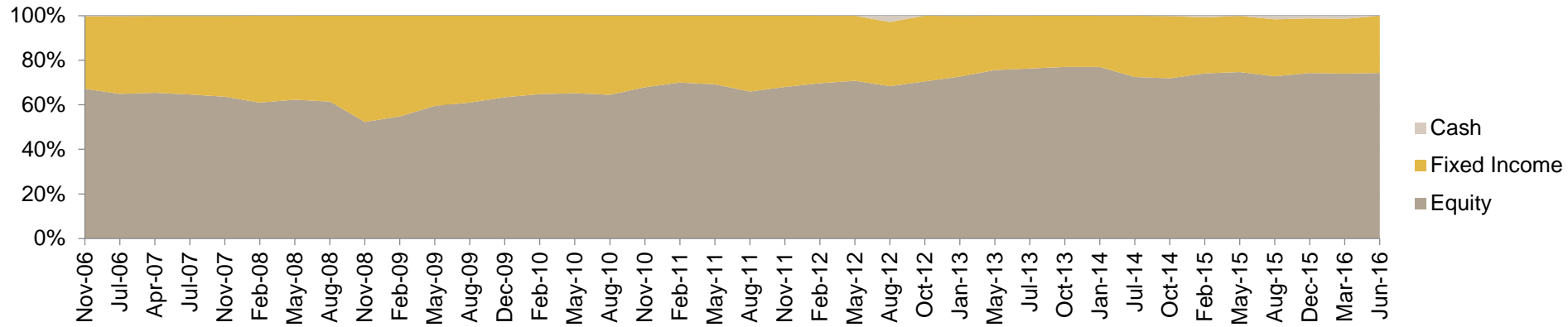
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
S&P 500	28.7%	10.9%	4.9%	15.8%	5.5%	-37.0%	26.5%	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%
Russell 3000 Index	31.1%	12.0%	6.1%	15.7%	5.1%	-37.3%	28.3%	16.9%	1.0%	16.4%	33.6%	12.6%	0.5%
MSCI EAFE	38.6%	20.3%	13.5%	26.3%	11.2%	-43.4%	31.8%	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%
MSCI AC World ex USA	40.8%	20.9%	16.6%	26.7%	16.7%	-45.5%	41.4%	11.2%	-13.7%	16.8%	15.3%	-3.9%	-5.7%

Source: Investment Metrics

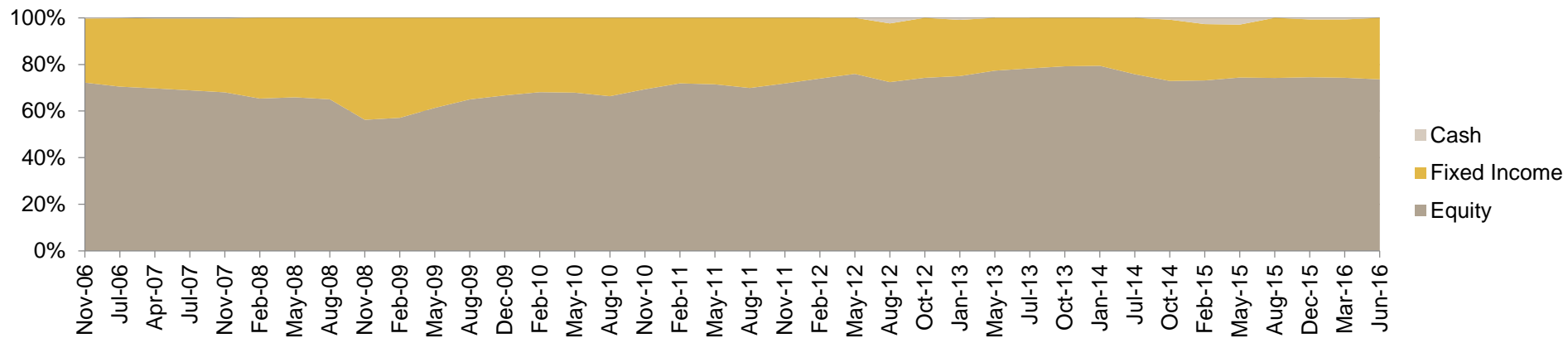


# KJFRS – Historical Asset Allocation

## Judicial



## Legislators

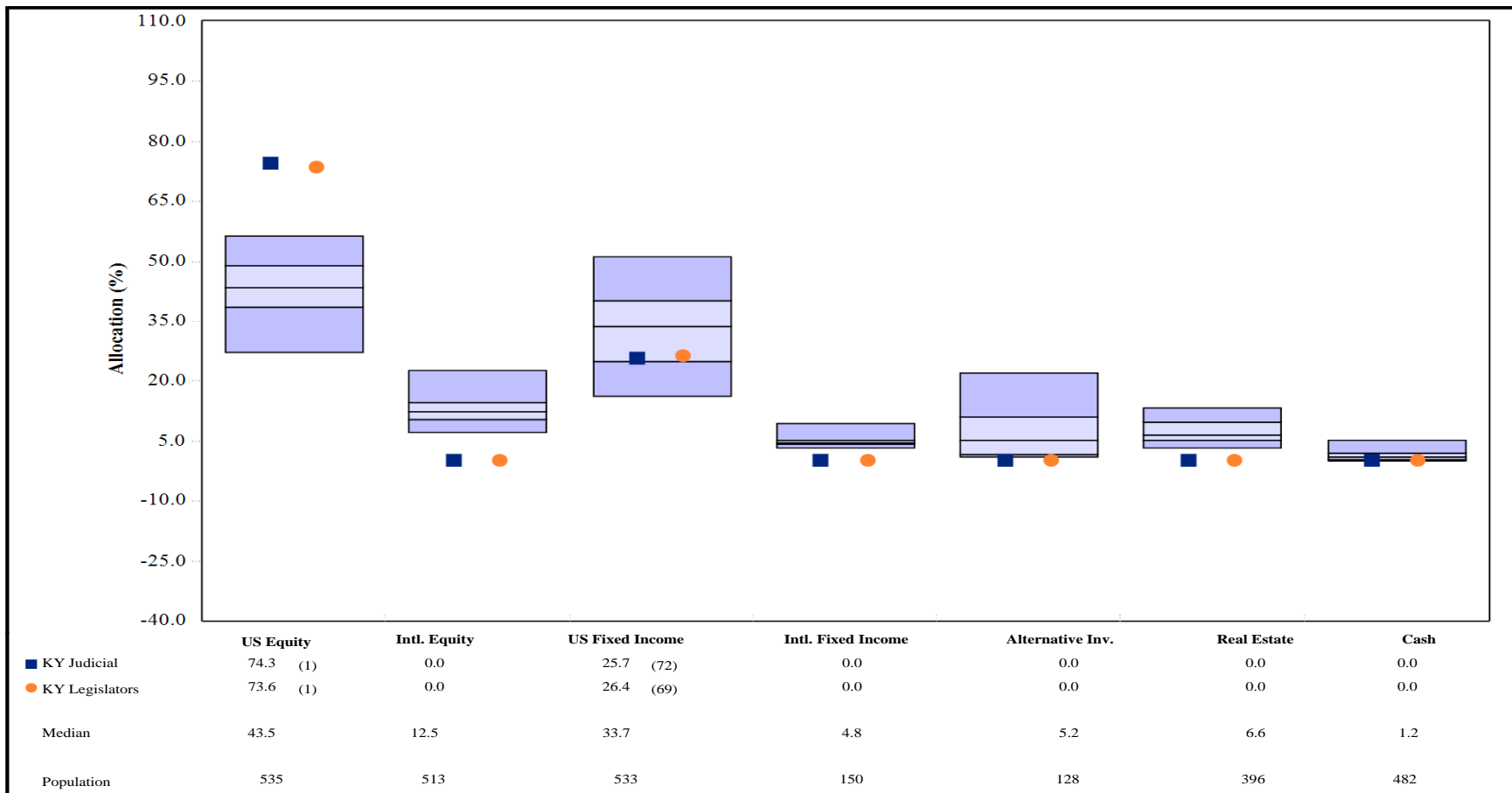


Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds from 2006-2016



# KJFRS – Asset Allocation Comparison

Asset Allocation Analysis  
 All Public Plans < \$500M  
 As of June 30, 2016

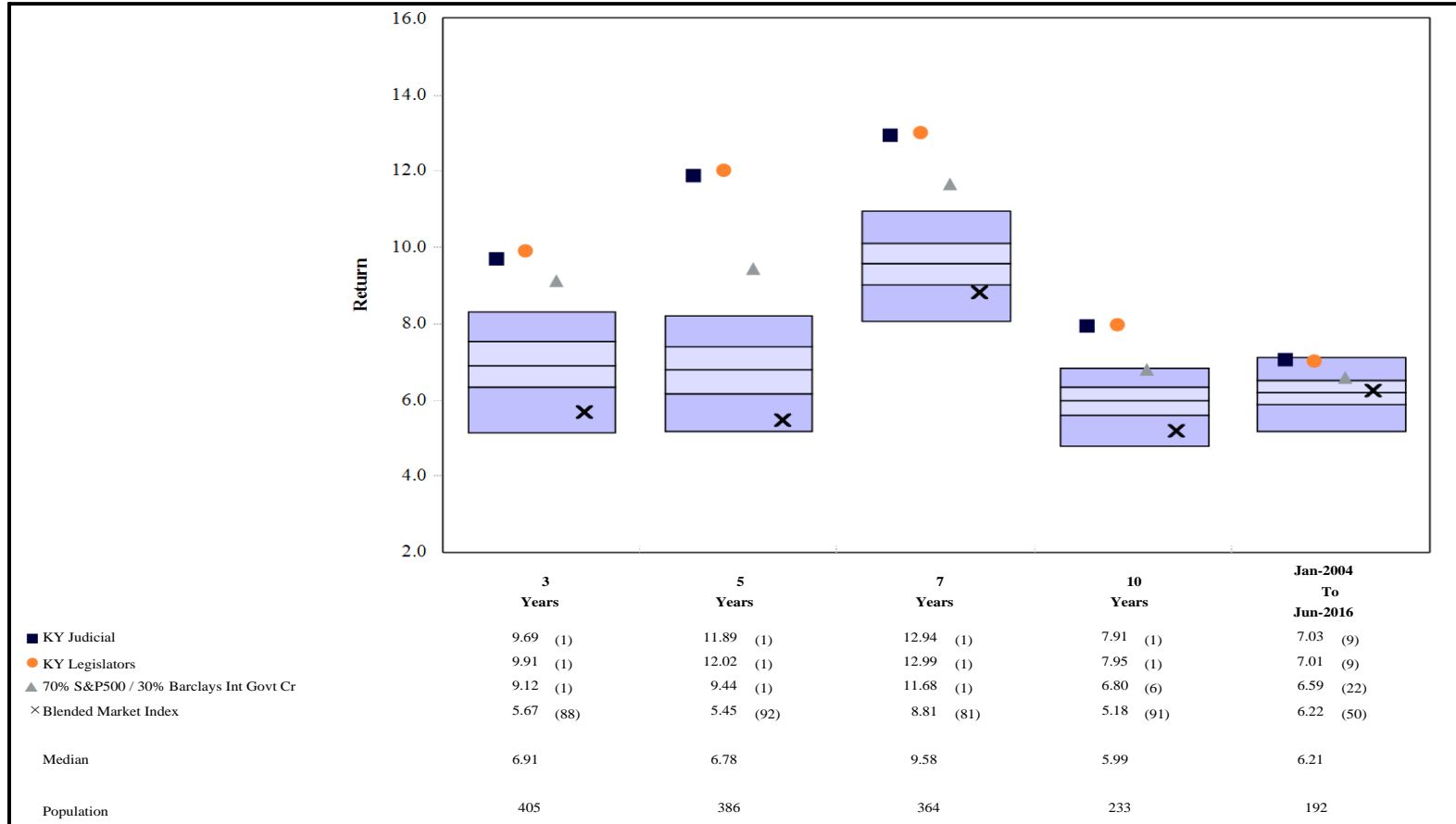


Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds as of 6/30/2016 & Investment Metrics peer group data. Parentheses contain percentile rankings.



# KJFRS – Trailing Investment Performance

Plan Sponsor Peer Group Analysis  
 All Public Plans < \$500 Million  
 As of June 30, 2016

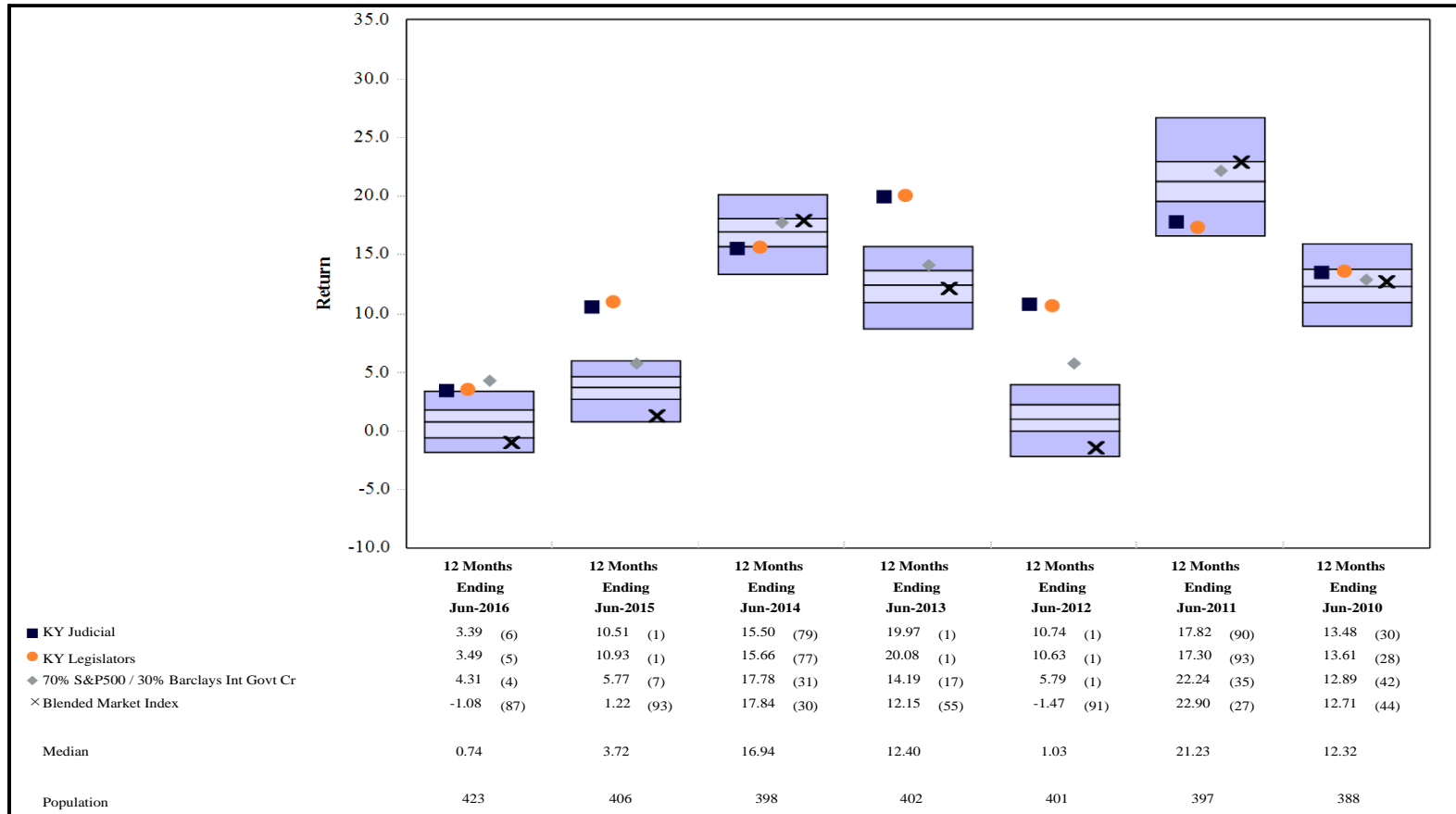


Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds as of 6/30/2016 & Investment Metrics peer group data. Parentheses contain percentile rankings.



# KJFRS – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
All Public Plans < \$500M  
As of June 30, 2016

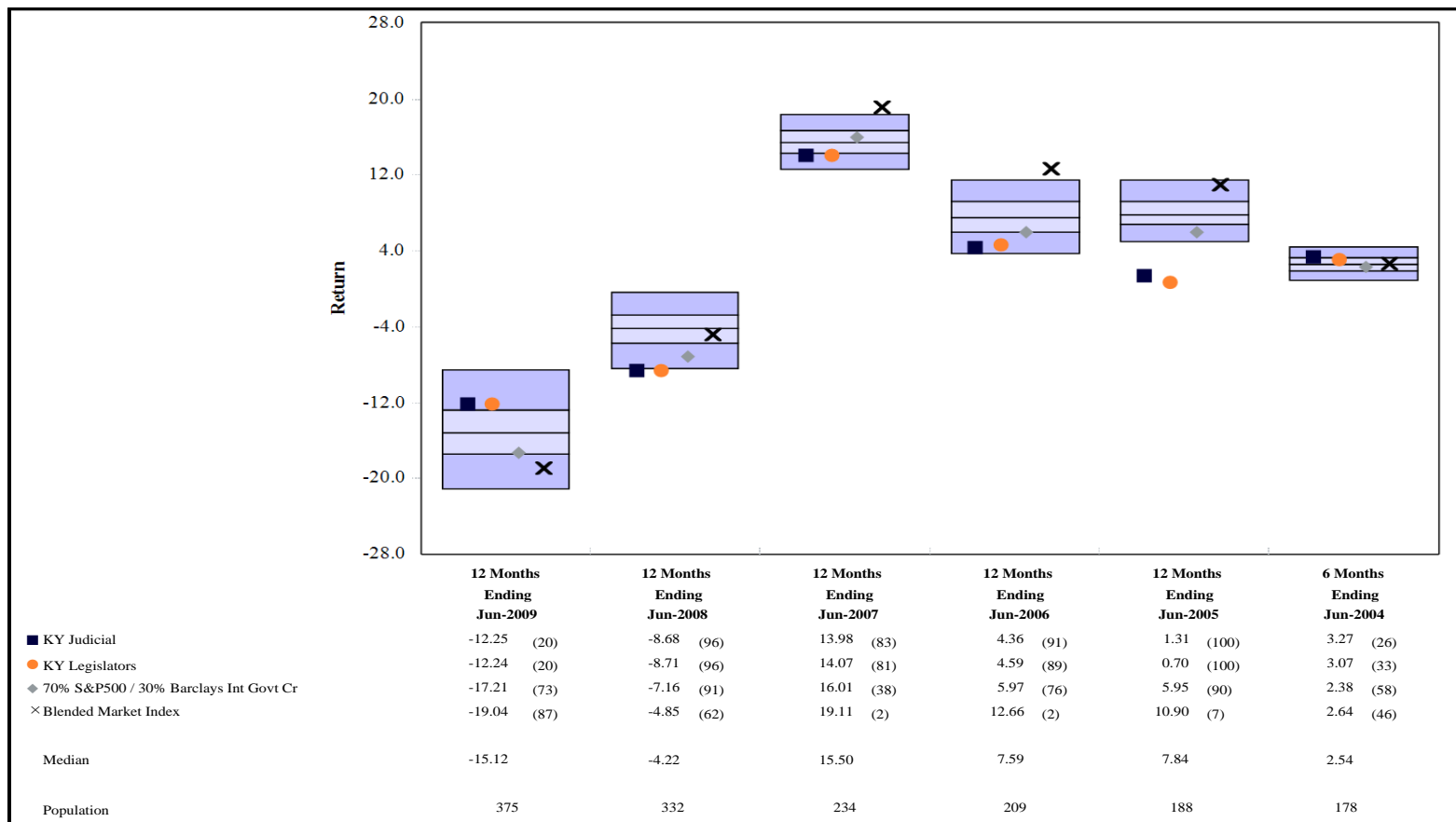


Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds as of 6/30/2016 & Investment Metrics peer group data. Parentheses contain percentile rankings.



# KJFRS – Fiscal Year Investment Returns

Plan Sponsor Peer Group Analysis  
 All Public Plans < \$500M  
 As of June 30, 2016



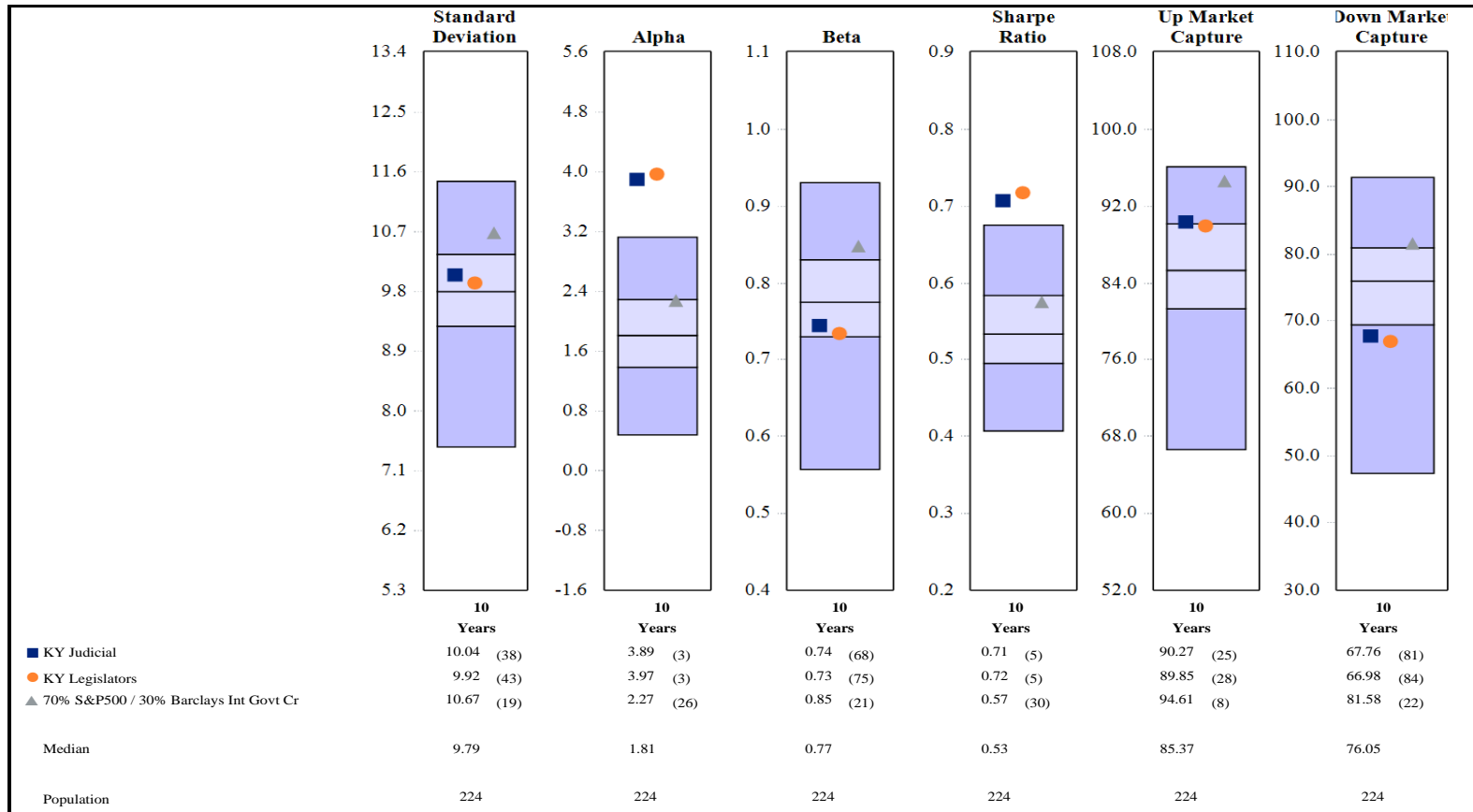
Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds as of 6/30/2016 & Investment Metrics peer group data. Parentheses contain percentile rankings.



# KJFRS – Investment Risk Statistics

Plan Sponsor Peer Group Analysis-Multi Statistics  
All Public Plans < \$500M vs. Blended Market Index

As of June 30, 2016



Source: Lexington Investment Company Report for Kentucky Judicial & Legislators Retirement Funds as of 6/30/2016 & Investment Metrics peer group data. Parentheses contain percentile rankings.





# Fees



## Transparency & Fees

- ◆ Increase in alternative investments has led to demand for greater transparency
  - Traditional equity & fixed income investments typically have a simple and easy-to-compare fee structure
  - Alternative investments typically include both asset-based and performance-fees, hurdle rates, carried interest and other hidden costs that are hard to quantify and compare
  
- ◆ Disclosure requirements have not kept pace with rapid shift to alternative investments
  - GASB 67 states that “investment-related costs should be reported as investment expense if they are separable from (a) investment income and (b) the administrative expense of the plan”
  - Separating performance-based fees for alternatives is difficult and not required by GASB, resulting in inconsistent performance reporting across the universe of plans



## Peer Comparisons are Difficult

- Study by CEM Benchmarking shed light on lack of transparency & consistency<sup>1</sup>
  - Roughly half of the costs incurred by private equity investments are related to performance-based fees
  - Performance-based fees were typically not included in fee disclosures by most state retirement plans
  - South Carolina Retirement System was criticized for having highest fees in the country (1.58% in 2013), but study found they were simply providing more transparency than their peers
  
- Although transparency is limited, reported fees for state plans increased from 0.28% in 2006 to 0.37% in 2012, largely due to an increase in alternative investments<sup>2</sup>
  - Reported fees are likely significantly understated as most state plans do not report performance-based fees and other hidden costs

<sup>1</sup>CEM Benchmarking: "The Time Has Come For Standardized Total Cost Disclosure For Private Equity", April 2015

<sup>2</sup>The Pew Charitable Trusts: "State Public Pension Investments Shift Over Past 30 Years", June 2014



## Fee Comparison

KRS Combined Pension Plans			
Asset Class	Assets	Weight	Fee
Fixed Income	\$1,468,145,621	13.87%	0.43%
US Equity	\$2,794,007,868	26.40%	0.12%
Non-US Equity	\$2,680,498,325	25.33%	0.31%
Absolute Return	\$1,091,634,600	10.32%	0.93%
Real Return	\$908,251,594	8.58%	0.82%
Real Estate	\$508,967,595	4.81%	1.06%
Private Equity	\$1,130,046,686	10.68%	1.31%
<b>Total Portfolio</b>	<b>\$10,581,552,289</b>		<b>0.53%</b>

Teachers Pension Plan			
Asset Class	Assets	Weight	Fee
Fixed Income	\$2,959,786,075	17.60%	0.01%
Equity	\$10,423,111,549	61.97%	0.13%
Additional Categories	\$1,337,755,631	7.95%	0.65%
Real Estate	\$899,933,835	5.35%	0.78%
Alternatives	\$903,427,729	5.37%	1.60%
Cash	\$296,766,244	1.76%	
<b>Total Portfolio</b>	<b>\$16,820,781,063</b>		<b>0.26%</b>

Judicial Plan			
Asset Class	Assets	Weight	Fee
US Equity	\$250,491,358	74.29%	
Fixed Income	\$86,689,198	25.71%	
<b>Total Portfolio</b>	<b>\$337,180,556</b>		<b>0.06%</b>

KRS Combined Insurance Plans			
Asset Class	Assets	Weight	Fee
Fixed Income	\$510,456,234	12.28%	0.47%
US Equity	\$1,212,540,645	29.16%	0.13%
Non-US Equity	\$1,089,601,818	26.20%	0.34%
Absolute Return	\$405,379,091	9.75%	0.89%
Real Return	\$349,720,954	8.41%	0.79%
Real Estate	\$208,905,457	5.02%	1.05%
Private Equity	\$381,855,078	9.18%	1.35%
<b>Total Portfolio</b>	<b>\$4,158,459,277</b>		<b>0.51%</b>

Teachers Medical Plan			
Asset Class	Assets	Weight	Fee
Fixed Income	\$58,096,830	9.12%	
Equity	\$341,128,241	53.55%	0.06%
Additional Categories	\$199,849,405	31.37%	0.34%
Real Estate	\$17,995,520	2.83%	2.80%
Alternatives	\$18,251,931	2.87%	4.35%
Cash	\$1,654,670	0.26%	
<b>Total Portfolio</b>	<b>\$636,976,596</b>		<b>0.34%</b>

Legislators Plan			
Asset Class	Assets	Weight	Fee
US Equity	\$73,298,389	73.59%	
Fixed Income	\$26,309,849	26.41%	
<b>Total Portfolio</b>	<b>\$99,608,239</b>		<b>0.06%</b>

KRS - As of June 30, 2016. Based on RV Kuhns 2Q16 report. See KRS Manager Fees slides for more detail.

TRS - Market values are based on average assets in each manager based on the prior 4 quarters' portfolio summary.

KJFRS - As of 6/30/16. Fee is estimated based on asset size of each Plan and the maximum Hilliard Lyons fee which is roughly 6 basis points



## KRS – Money Manager Fees

- ◆ Internal KRS report includes aggregate management fees for all underlying managers, but is largely inconsistent with detailed fees shown in RV Kuhns report on KRS
  - Weighted average fees based on assets (6/30/16): Pension – 0.66%; Insurance – 0.62%
  - Footnote indicates there are cases where actual negotiated fees are lower than standard fee shown
- ◆ RV Kuhns quarterly report includes a fee schedule for all underlying managers, except private equity investments
  - Weighted average fees based on assets (6/30/16): Pension – 0.53%; Insurance – 0.51%
  - Fees for private equity investments were based on internal KRS report
- ◆ Fee schedules could not be verified as individual manager contracts were not included in the analysis
- ◆ Fees listed above do not include performance-based fees or other hidden costs and do not include administrative/operational costs of internally managed accounts



## KRS – Internally Reported Fees

### Combined Pension Fund

Asset Class	Pension Assets	Pension %	Pension Fees (\$)	Pension Fees (%)
Fixed Income	\$1,464,664,653	13.93%	\$6,836,322	0.47%
US Equity	\$2,758,985,003	26.24%	\$6,138,507	0.22%
Non-US Equity	\$2,666,867,817	25.36%	\$13,681,936	0.51%
Absolute Return	\$1,093,730,099	10.40%	\$13,335,942	1.22%
Real Return	\$901,317,994	8.57%	\$8,418,391	0.93%
Real Estate	\$500,421,742	4.76%	\$6,026,513	1.20%
Private Equity	\$1,130,046,686	10.75%	\$14,839,208	1.31%
<b>Total Portfolio</b>	<b>\$10,516,033,994</b>		<b>\$69,276,819</b>	<b>0.66%</b>

### Combined Insurance Fund

Asset Class	Insurance Assets	Insurance %	Insurance Fees (\$)	Insurance Fees (%)
Fixed Income	\$507,059,837	12.27%	\$2,430,580	0.48%
US Equity	\$1,197,518,941	28.98%	\$2,158,175	0.18%
Non-US Equity	\$1,083,850,554	26.23%	\$5,440,493	0.50%
Absolute Return	\$409,979,004	9.92%	\$4,899,846	1.20%
Real Return	\$347,109,310	8.40%	\$3,051,576	0.88%
Real Estate	\$205,027,628	4.96%	\$2,451,415	1.20%
Private Equity	\$381,855,078	9.24%	\$5,166,361	1.35%
<b>Total Portfolio</b>	<b>\$4,132,400,352</b>		<b>\$25,598,448</b>	<b>0.62%</b>

\*As of June 30, 2016. Market values are estimated per report.



## KRS – RV Kuhns Reported Fees

### Combined Pension Fund

Asset Class	Pension Assets	Pension %	Pension Fees (\$)	Pension Fees (%)
Fixed Income	\$1,468,145,621	13.87%	\$6,269,459	0.43%
US Equity	\$2,794,007,868	26.40%	\$3,440,147	0.12%
Non-US Equity	\$2,680,498,325	25.33%	\$8,281,421	0.31%
Absolute Return	\$1,091,634,600	10.32%	\$10,103,081	0.93%
Real Return	\$908,251,594	8.58%	\$7,482,710	0.82%
Real Estate	\$508,967,595	4.81%	\$5,388,985	1.06%
Private Equity (Based on Internal Fee Report)	\$1,130,046,686	10.68%	\$14,839,208	1.31%
<b>Total Portfolio</b>	<b>\$10,581,552,289</b>		<b>\$55,805,011</b>	<b>0.53%</b>

### Combined Insurance Fund

Asset Class	Insurance Assets	Insurance %	Insurance Fees (\$)	Insurance Fees (%)
Fixed Income	\$510,456,234	12.28%	\$2,401,800	0.47%
US Equity	\$1,212,540,645	29.16%	\$1,559,295	0.13%
Non-US Equity	\$1,089,601,818	26.20%	\$3,737,086	0.34%
Absolute Return	\$405,379,091	9.75%	\$3,595,628	0.89%
Real Return	\$349,720,954	8.41%	\$2,760,906	0.79%
Real Estate	\$208,905,457	5.02%	\$2,192,810	1.05%
Private Equity (Based on Internal Fee Report)	\$381,855,078	9.18%	\$5,166,361	1.35%
<b>Total Portfolio</b>	<b>\$4,158,459,277</b>		<b>\$21,413,886</b>	<b>0.51%</b>

\*As of June 30, 2016. Market values are estimated per report.



## KRS Money Manager Fees (RV Kuhns Report)

Manager Name	Pension Assets	Pension %	Pension Fees (\$)	Pension Fees (%)	Insurance Assets	Insurance %	Insurance Fees (\$)	Insurance Fees (%)
<b>Fixed Income</b>	<b>\$1,468,145,621</b>	<b>13.87%</b>	<b>\$6,269,459</b>	<b>0.43%</b>	<b>\$510,456,234</b>	<b>12.28%</b>	<b>\$2,401,800</b>	<b>0.47%</b>
Cerberus	\$87,445,902	0.83%	\$874,459	1.00%	\$37,476,815	0.90%	\$374,768	1.00%
Columbia	\$246,258,224	2.33%	\$961,904	0.39%	\$45,012,470	1.08%	\$225,062	0.50%
Manulife	\$426,047,354	4.03%	\$1,177,618	0.28%	\$160,585,741	3.86%	\$513,964	0.32%
Marathon	\$190,615,394	1.80%	\$1,620,231	0.85%	\$78,048,402	1.88%	\$663,411	0.85%
NISA	\$303,968,735	2.87%	\$501,548	0.17%	\$103,128,307	2.48%	\$170,162	0.17%
Shenkman	\$84,512,993	0.80%	\$422,565	0.50%	\$39,385,454	0.95%	\$196,927	0.50%
Waterfall	\$129,297,019	1.22%	\$711,134	0.55%	\$46,819,045	1.13%	\$257,505	0.55%
<b>US Equity</b>	<b>\$2,794,007,868</b>	<b>26.40%</b>	<b>\$3,440,147</b>	<b>0.12%</b>	<b>\$1,212,540,645</b>	<b>29.16%</b>	<b>\$1,559,295</b>	<b>0.13%</b>
Invesco	\$190,731,761	1.80%	\$228,878	0.12%				
Internal S&P 500	\$1,561,176,822	14.75%	\$0	0.00%	\$741,507,084	17.83%	\$0	0.00%
Internal US Mid Cap	\$276,038,037	2.61%	\$0	0.00%	\$146,933,083	3.53%	\$0	0.00%
Westfield Capital Management	\$106,632,612	1.01%	\$670,663	0.63%	\$42,659,506	1.03%	\$302,287	0.71%
River Road Asset Management - DAV	\$96,208,710	0.91%	\$507,939	0.53%	\$46,919,401	1.13%	\$272,097	0.58%
River Road Asset Management - FAV	\$34,593,087	0.33%	\$121,076	0.35%	\$14,825,622	0.36%	\$51,890	0.35%
Westwood Holdings Group	\$95,566,518	0.90%	\$534,766	0.56%	\$38,209,587	0.92%	\$258,548	0.68%
Systematic Financial Management	\$187,042,366	1.77%	\$885,669	0.47%	\$78,436,467	1.89%	\$451,246	0.58%
Sasco Capital	\$43,666,843	0.41%	\$248,334	0.57%	\$18,307,234	0.44%	\$121,536	0.66%
Northern Trust Structured	\$202,351,112	1.91%	\$242,821	0.12%	\$84,742,661	2.04%	\$101,691	0.12%
<b>Non-US Equity</b>	<b>\$2,680,498,325</b>	<b>25.33%</b>	<b>\$8,281,421</b>	<b>0.31%</b>	<b>\$1,089,601,818</b>	<b>26.20%</b>	<b>\$3,737,086</b>	<b>0.34%</b>
American Century	\$328,640,941	3.11%	\$1,398,496	0.43%	\$131,679,817	3.17%	\$600,803	0.46%
Franklin Templeton	\$226,294,129	2.14%	\$1,067,677	0.47%	\$83,790,120	2.01%	\$481,451	0.57%
LSV Asset Management	\$392,633,740	3.71%	\$2,555,802	0.65%	\$174,796,841	4.20%	\$1,248,781	0.71%
Lazard Asset Management	\$471,978,371	4.46%	\$2,523,903	0.53%	\$168,773,401	4.06%	\$1,078,254	0.64%
BlackRock ACWI ex US	\$1,101,353,361	10.41%	\$605,744	0.06%	\$472,809,497	11.37%	\$260,045	0.06%
BlackRock ACWI ex US Small Cap					\$57,752,142	1.39%	\$67,752	0.12%
NTGI International Small Cap	\$159,597,783	1.51%	\$129,799	0.08%				
<b>Absolute Return</b>	<b>\$1,091,634,600</b>	<b>10.32%</b>	<b>\$10,103,081</b>	<b>0.93%</b>	<b>\$405,379,091</b>	<b>9.75%</b>	<b>\$3,595,628</b>	<b>0.89%</b>
Anchorage	\$15,000,000	0.14%	\$225,000	1.50%	\$5,000,000	0.12%	\$75,000	1.50%
BAAM Henry Clay	\$302,010,996	2.85%	\$1,510,055	0.50%	\$119,009,368	2.86%	\$595,047	0.50%
BlackRock GAO	\$22,500,000	0.21%	\$112,500	0.50%	\$7,500,000	0.18%	\$37,500	0.50%
Coatue Qual Partners	\$15,915,885	0.15%	\$238,738	1.50%	\$5,305,295	0.13%	\$79,579	1.50%
Davidson-Kempner	\$30,823,466	0.29%	\$462,352	1.50%	\$10,274,489	0.25%	\$154,117	1.50%
DB H2O	\$10,872,583	0.10%	\$163,089	1.50%				
DSAM	\$14,984,208	0.14%	\$299,684	2.00%	\$4,994,736	0.12%	\$99,895	2.00%
Finisterre	\$18,750,000	0.18%	\$281,250	1.50%	\$6,250,000	0.15%	\$93,750	1.50%
Glenview Institution	\$12,818,087	0.12%	\$256,362	2.00%	\$4,272,696	0.10%	\$85,454	2.00%
HBK	\$31,049,500	0.29%	\$465,743	1.50%	\$10,349,833	0.25%	\$155,247	1.50%
JANA Partners	\$13,252,019	0.13%	\$265,040	2.00%	\$4,417,340	0.11%	\$88,347	2.00%
Knighthead	\$14,012,913	0.13%	\$280,258	2.00%	\$4,670,971	0.11%	\$93,419	2.00%
Libremax Capital	\$15,101,448	0.14%	\$302,029	2.00%	\$5,033,816	0.12%	\$100,676	2.00%
Luxor	\$10,114,818	0.10%	\$177,009	1.75%	\$3,371,606	0.08%	\$59,003	1.75%
Myriad	\$26,638,786	0.25%	\$532,776	2.00%	\$8,879,595	0.21%	\$177,592	2.00%
PAAMCO	\$143,282,845	1.35%	\$1,074,621	0.75%	\$53,960,070	1.30%	\$404,701	0.75%
Pine River	\$14,491,708	0.14%	\$217,376	1.50%	\$4,830,569	0.12%	\$72,459	1.50%
Prisma	\$325,114,412	3.07%	\$2,275,801	0.70%	\$128,958,399	3.10%	\$902,709	0.70%
QMS Diversified	\$15,269,414	0.14%	\$305,388	2.00%	\$5,089,804	0.12%	\$101,796	2.00%
Scopia PX	\$14,216,472	0.13%	\$213,247	1.50%	\$4,738,824	0.11%	\$71,082	1.50%
Tourbillon Global Equity	\$25,415,040	0.24%	\$444,763	1.75%	\$8,471,680	0.20%	\$148,254	1.75%

\*As of June 30, 2016





## KRS Money Manager Fees (RV Kuhns Report)

Manager Name	Pension Assets	Pension %	Pension Fees (\$)	Pension Fees (%)	Insurance Assets	Insurance %	Insurance Fees (\$)	Insurance Fees (%)
<b>Real Return</b>	<b>\$908,251,594</b>	<b>8.58%</b>	<b>\$7,482,710</b>	<b>0.82%</b>	<b>\$349,720,954</b>	<b>8.41%</b>	<b>\$2,760,906</b>	<b>0.79%</b>
Amerra Agri Fund	\$33,352,450	0.32%	\$500,287	1.50%	\$13,451,087	0.32%	\$201,766	1.50%
Amerra Agri Holdings	\$31,361,664	0.30%	\$470,425	1.50%	\$16,887,050	0.41%	\$253,306	1.50%
BTG Pactual	\$4,848,832	0.05%	\$72,732	1.50%	\$2,178,461	0.05%	\$32,677	1.50%
Magnetar MTP	\$71,249,946	0.67%	\$1,068,749	1.50%	\$22,003,665	0.53%	\$330,055	1.50%
Magnetar MTP EOF	\$10,582,370	0.10%	\$158,736	1.50%	\$3,527,457	0.08%	\$52,912	1.50%
Nuveen	\$214,970,397	2.03%	\$1,522,308	0.71%	\$87,950,581	2.11%	\$684,629	0.78%
Oberland Capital	\$3,923,836	0.04%	\$78,477	2.00%	\$1,762,882	0.04%	\$35,258	2.00%
PIMCO All Asset	\$317,862,013	3.00%	\$2,749,506	0.87%	\$104,062,433	2.50%	\$900,140	0.87%
Taurus Mine Finance	\$7,979,054	0.08%	\$99,738	1.25%	\$3,520,693	0.08%	\$44,009	1.25%
Tortoise	\$74,219,810	0.70%	\$742,198	1.00%	\$22,398,172	0.54%	\$223,982	1.00%
Internal TIPS	\$136,597,608	1.29%	\$0	0.00%	\$71,833,626	1.73%	\$0	0.00%
Tensaska Power Fund	\$1,303,614	0.01%	\$19,554	1.50%	\$144,847	0.00%	\$2,173	1.50%
<b>Real Estate</b>	<b>\$508,967,595</b>	<b>4.81%</b>	<b>\$5,388,985</b>	<b>1.06%</b>	<b>\$208,905,457</b>	<b>5.02%</b>	<b>\$2,192,810</b>	<b>1.05%</b>
DivcoWest IV	\$21,415,398	0.20%	\$321,231	1.50%	\$9,472,192	0.23%	\$142,083	1.50%
GAP VI	\$21,269,967	0.20%	\$319,050	1.50%	\$9,348,854	0.22%	\$140,233	1.50%
GAP VII	\$18,936,751	0.18%	\$284,051	1.50%	\$8,310,371	0.20%	\$124,656	1.50%
H/2 Core Debt	\$18,068,902	0.17%	\$135,517	0.75%	\$7,621,479	0.18%	\$57,161	0.75%
H/2 Credit Partners	\$72,997,928	0.69%	\$729,979	1.00%	\$28,388,083	0.68%	\$283,881	1.00%
Harrison St. Core Equity	\$73,124,850	0.69%	\$548,436	0.75%	\$28,798,042	0.69%	\$215,985	0.75%
L-A VII	\$20,065,431	0.19%	\$300,981	1.50%	\$8,805,692	0.21%	\$132,085	1.50%
Mesa West Core Debt	\$57,599,432	0.54%	\$460,795	0.80%	\$30,077,154	0.72%	\$240,617	0.80%
Prologis	\$57,152,689	0.54%	\$571,527	1.00%	\$21,973,559	0.53%	\$219,736	1.00%
Rubenstein II	\$17,492,531	0.17%	\$262,388	1.50%	\$7,737,081	0.19%	\$116,056	1.50%
Stockbridge Smart Markets	\$78,096,435	0.74%	\$663,820	0.85%	\$31,581,045	0.76%	\$268,439	0.85%
Walton VI	\$19,463,584	0.18%	\$291,954	1.50%	\$2,162,620	0.05%	\$32,439	1.50%
Walton VII	\$33,283,697	0.31%	\$499,255	1.50%	\$14,629,285	0.35%	\$219,439	1.50%
<b>Private Equity (Based on Fee Sheet)</b>	<b>\$1,130,046,686</b>	<b>10.68%</b>	<b>\$14,839,208</b>	<b>1.31%</b>	<b>\$381,855,078</b>	<b>9.18%</b>	<b>\$5,166,361</b>	<b>1.35%</b>
Arbor Investments	\$3,134,745	0.03%	\$62,695	2.00%	\$348,305	0.01%	\$6,966	2.00%
Arcano Capital	\$25,273,331	0.24%	\$151,640	0.60%	\$2,808,148	0.07%	\$16,849	0.60%
Ares	\$4,909,105	0.05%	\$73,637	1.50%	\$2,588,001	0.06%	\$38,820	1.50%
Bay Hills Capital I	\$48,498,443	0.46%	\$363,738	0.75%	\$5,388,716	0.13%	\$40,415	0.75%
Bay Hills Capital II	\$83,965,942	0.79%	\$629,745	0.75%	\$9,329,549	0.22%	\$69,972	0.75%
Bay Hills Capital III	\$13,468,792	0.13%	\$101,016	0.75%	\$11,577,049	0.28%	\$86,828	0.75%
BDCM Oppt Fund	\$9,017,410	0.09%	\$157,805	1.75%	\$6,189,013	0.15%	\$108,308	1.75%
Blackstone Capital Partners V	\$16,986,630	0.16%	\$127,400	0.75%	\$4,469,890	0.11%	\$33,524	0.75%
Blackstone Capital Partners VI	\$57,032,988	0.54%	\$427,747	0.75%	\$38,021,992	0.91%	\$285,165	0.75%
CVC European Equity Partners VI	\$8,686,609	0.08%	\$130,299	1.50%	\$4,589,980	0.11%	\$68,850	1.50%
CM Growth Partners I	\$13,134,725	0.12%	\$197,021	1.50%	\$1,459,412	0.04%	\$21,891	1.50%
Columbia Capital Equity Partners IV	\$17,710,905	0.17%	\$150,543	0.85%	\$1,967,880	0.05%	\$16,727	0.85%
Crestview Partners	\$8,656,104	0.08%	\$129,842	1.50%	\$4,660,977	0.11%	\$69,915	1.50%
Crestview Partners II	\$46,620,487	0.44%	\$815,859	1.75%	\$5,180,052	0.12%	\$90,651	1.75%
Crestview Partners III					\$4,593,717	0.11%	\$80,390	1.75%
DAG Ventures II	\$7,162,240	0.07%	\$179,056	2.50%	\$795,795	0.02%	\$19,895	2.50%
DAG Ventures III	\$8,054,924	0.08%	\$80,549	1.00%	\$894,979	0.02%	\$8,950	1.00%
DAG Ventures IV	\$91,466,381	0.86%	\$914,664	1.00%	\$10,162,931	0.24%	\$101,629	1.00%
DAG Ventures V	\$29,527,028	0.28%	\$295,270	1.00%	\$25,836,150	0.62%	\$258,361	1.00%
DBSOF III	\$6,017,774	0.06%	\$75,222	1.25%	\$18,053,322	0.43%	\$225,667	1.25%
DCM Partners	\$15,386,744	0.15%	\$384,669	2.50%	\$1,709,638	0.04%	\$42,741	2.50%

\*As of June 30, 2016



## KRS Money Manager Fees (RV Kuhns Report)

Manager Name	Pension Assets	Pension %	Pension Fees (\$)	Pension Fees (%)	Insurance Assets	Insurance %	Insurance Fees (\$)	Insurance Fees (%)
Essex Woodlands	\$22,317,871	0.21%	\$446,357	2.00%	\$4,959,531	0.12%	\$99,191	2.00%
GTCR	\$5,607,845	0.05%	\$84,118	1.50%	\$623,083	0.01%	\$9,346	1.50%
Green Equity Investors IV	\$5,172,546	0.05%	\$51,725	1.00%	\$574,727	0.01%	\$5,747	1.00%
Green Equity Investors V	\$55,664,899	0.53%	\$834,973	1.50%	\$6,184,989	0.15%	\$92,775	1.50%
Green Equity Investors VI	\$25,836,759	0.24%	\$387,551	1.50%	\$22,607,166	0.54%	\$339,107	1.50%
Green Equity Investors VII	\$25,000,000	0.24%	\$375,000	1.50%	\$25,000,000	0.60%	\$375,000	1.50%
HIG BioVentures II	\$2,900,731	0.03%	\$58,015	2.00%	\$2,470,991	0.06%	\$49,420	2.00%
HIG Capital Partner V	\$2,586,402	0.02%	\$51,728	2.00%	\$1,362,305	0.03%	\$27,246	2.00%
HIG Ventures II	\$8,754,610	0.08%	\$196,979	2.25%	\$972,734	0.02%	\$21,887	2.25%
Harvest Partners V	\$12,640,691	0.12%	\$63,203	0.50%	\$1,404,526	0.03%	\$7,023	0.50%
Harvest Partners VI	\$23,770,602	0.22%	\$159,263	0.67%	\$9,709,125	0.23%	\$65,051	0.67%
Harvest Partners VII	\$20,000,000	0.19%	\$400,000	2.00%	\$20,000,000	0.48%	\$400,000	2.00%
Hellman & Friedman Capital Partners	\$4,696,134	0.04%	\$35,221	0.75%	\$1,761,060	0.04%	\$13,208	0.75%
Horsley Bridge Partners	\$48,573,789	0.46%	\$485,738	1.00%	\$5,397,085	0.13%	\$53,971	1.00%
Institutional Venture Partners XI					\$39,762	0.00%	\$795	2.00%
Institutional Venture Partners XII	\$11,056,260	0.10%	\$221,125	2.00%	\$1,228,372	0.03%	\$24,567	2.00%
JW Childs Partners	\$508	0.00%	\$5	1.00%	\$56	0.00%	\$1	1.00%
Keyhaven Capital Partners	\$13,789,036	0.13%	\$124,101	0.90%	\$1,532,115	0.04%	\$13,789	0.90%
Levine Leichtman Capital Partners V	\$34,342,539	0.32%	\$515,138	1.50%	\$17,917,847	0.43%	\$268,768	1.50%
Matlin Patterson Global Advisors	\$22,815	0.00%	\$285	1.25%	\$2,536	0.00%	\$32	1.25%
Matlin Patterson Global Advisors II	\$1,962,091	0.02%	\$0	0.00%	\$218,009	0.01%	\$0	0.00%
Matlin Patterson Global Advisors III	\$29,364,410	0.28%	\$381,737	1.30%	\$3,262,777	0.08%	\$42,416	1.30%
Merit Capital Partners, Mezzanine Fund IV	\$10,013,049	0.09%	\$175,228	1.75%	\$1,112,561	0.03%	\$19,470	1.75%
Mill Road Capital Management	\$22,535,476	0.21%	\$450,710	2.00%	\$2,503,941	0.06%	\$50,079	2.00%
New Mountain Partners II	\$466,243	0.00%	\$9,325	2.00%	\$93,253	0.00%	\$1,865	2.00%
New Mountain Partners III	\$30,615,947	0.29%	\$535,779	1.75%	\$6,803,538	0.16%	\$119,062	1.75%
New Mountain Partners IV	\$16,010,462	0.15%	\$280,183	1.75%	\$8,395,726	0.20%	\$146,925	1.75%
Oak Hill Capital Partners II	\$4,535,214	0.04%	\$56,690	1.25%	\$503,912	0.01%	\$6,299	1.25%
Oak Hill Capital Partners III	\$21,251,360	0.20%	\$371,899	1.75%	\$7,870,874	0.19%	\$137,740	1.75%
OCM Opportunities Fund VII(b)					\$655,666	0.02%	\$9,835	1.50%
Riverside Company	\$21,895,535	0.21%	\$437,911	2.00%	\$11,541,428	0.28%	\$230,829	2.00%
Sun Capital Partners					\$1,261,449	0.03%	\$25,229	2.00%
Technology Crossover Ventures, TCX VI					\$650,597	0.02%	\$11,841	1.82%
Triton Advisors	\$9,936,297	0.09%	\$168,917	1.70%	\$5,237,637	0.13%	\$89,040	1.70%
Vantagepoint Venture Capital Partners 2006	\$4,739,083	0.04%	\$94,782	2.00%	\$526,565	0.01%	\$10,531	2.00%
Vantagepoint Venture Capital Partners IV	\$12,192,735	0.12%	\$243,855	2.00%	\$1,354,749	0.03%	\$27,095	2.00%
Vista Equity Partners III	\$20,399,214	0.19%	\$407,984	2.00%	\$2,266,581	0.05%	\$45,332	2.00%
Vista Equity Partners IV	\$32,093,448	0.30%	\$481,402	1.50%	\$27,338,858	0.66%	\$410,083	1.50%
Vista Equity Partners VI	\$2,999,466	0.03%	\$29,995	1.00%	\$2,999,466	0.07%	\$29,995	1.00%
Warburg Pincus Private Equity IX	\$5,899,893	0.06%	\$88,498	1.50%	\$1,179,979	0.03%	\$17,700	1.50%
Warburg Pincus Private Equity X	\$19,145,480	0.18%	\$287,182	1.50%	\$3,705,584	0.09%	\$55,584	1.50%
Wayzata Investment Partners II	\$1,377,142	0.01%	\$20,657	1.50%	\$153,053	0.00%	\$2,296	1.50%
Wayzata Investment Partners III	\$13,032,225	0.12%	\$195,483	1.50%	\$1,448,024	0.03%	\$21,720	1.50%
Wayzata Investment Partners	\$12,136,575	0.11%	\$182,049	1.50%	\$6,397,346	0.15%	\$95,960	1.50%
<b>Total Portfolio</b>	<b>\$10,581,552,289</b>		<b>\$55,805,011</b>	<b>0.53%</b>	<b>\$4,158,459,277</b>		<b>\$21,413,886</b>	<b>0.51%</b>

\*As of June 30, 2016



## KRS – Additional Third-Party Fees

### ◆ Investment Advisors / Consultants

- RV Kuhns (General Advisor) – \$395K in 2011 increasing annually by greater of 2% or CPI plus \$20K per custodian search and \$55K per asset/liability study
- ORG Portfolio Management (Real Estate Advisor) – \$275K in 2008 increasing annually by CPI
- Pension Consulting Alliance (Private Equity Advisor) – \$375K in 2014 increasing annually by 3%
- Albourne America (Hedge Funds & Real Assets Advisor) – \$240K annually for hedge fund advisory and \$240K annually for real assets advisory, plus minor costs for additional scope (i.e. due diligence on funds not covered by Albourne or more than 25 funds in total)

### ◆ Custody

- Bank of New York Mellon – 0.15bps US assets under custody and 0.50bps – 90bps for non-US assets depending on market, plus various fees for trading and additional services (compliance, performance reporting, portfolio analytics, etc.)

Note: RV Kuhns provides overall investment advisory services, including, but not limited to, asset allocation, manager due diligence and performance reporting. ORG Portfolio Management, Pension Consulting Alliance and Albourne America provide manager sourcing and due diligence for specific alternative asset classes.



## KRS – Impact of Separating CERS from KRS

- ◆ Aggregating assets among all plans has resulted in significant purchasing power
  - Pension (6/30/16): \$10.8b (KERS: \$1.9b; KERS H: \$0.5b; CERS: \$6.1b; CERS H: \$2.0b; SPRS: \$0.2b)
  - Insurance (6/30/16): \$4.2b (KERS: \$0.7b; KERS H: \$0.4b; CERS: \$1.9b; CERS H: \$1.1b; SPRS: \$0.2b)
- ◆ More than one-third of portfolio is invested in managers with tiered fee schedule, resulting in lower fees when assets are aggregated
- ◆ Separating CERS assets from other plans will reduce purchasing power and result in higher fees based on current tiered fee schedules
  - CERS weighted average fees would remain largely unchanged if they could retain the same contract terms, increasing by less than 1bp (\$450k for Pension, \$210k for Insurance)
  - KERS & SPRS weighted average fees would be more adversely impacted due to smaller asset size, increasing by roughly 3bps (\$805k for Pension, \$260k for Insurance)
  - Estimates are based on manager fee schedules outlined in RV Kuhns quarterly report plus private equity manager fee schedules from internal KRS report
- ◆ Fee impact noted above is likely understated as separation would also limit the ability to negotiate reduced fees in the future as the aggregate asset size is reduced if the plans are separated
  - Separation may also impact ability to negotiate fees with other providers (i.e. consultants, custodian, etc.)
- ◆ Separating illiquid alternative assets (private equity, etc.) may not be possible in near-term



## TRS Pension – Money Manager Fees

Manager Name	Average Assets	Weight (%)	Fee (\$)	Estimated Fee (%)
<b>US Equity</b>	<b>7,227,745,605</b>	<b>42.97%</b>	<b>7,993,371</b>	<b>0.11%</b>
S&P 500 Stock Index	2,407,019,909	14.31%		
S&P 400 Stock Index	358,305,863	2.13%		
S&P 600 Stock Index	228,779,840	1.36%		
GE Asset Management	679,008,206	4.04%	800,000	0.12%
Todd Stocks	1,121,881,910	6.67%	1,295,310	0.12%
Todd Alpha	317,257,741	1.89%		
UBS Global Asset Management	894,108,091	5.32%	2,980,341	0.33%
UBS Alpha Relationship	186,780,288	1.11%		
Wellington Large Cap	577,664,568	3.43%	2,917,720	0.51%
WMC Mid Cap Opportunities Stocks	296,735,033	1.76%		
WMC Small Cap Stocks	160,204,155	0.95%		
<b>Non-US Equity</b>	<b>3,195,365,944</b>	<b>19.00%</b>	<b>5,485,385</b>	<b>0.17%</b>
Baillie Gifford	744,403,479	4.43%	2,800,298	0.38%
Baring Asset Management, Inc.	500,864,579	2.98%	2,419,271	0.48%
Todd International	695,244,102	4.13%		
Todd International Intrinsic Opp Value	82,769,864	0.49%		
UBS All Country World Ex US	610,602,503	3.63%		
Blackrock ACWI ex US IMI	561,481,418	3.34%	265,816	0.05%
<b>Fixed Income</b>	<b>2,959,786,075</b>	<b>17.60%</b>	<b>379,314</b>	<b>0.01%</b>
Internal Bond	186,162,458	1.11%		
In House Bond	540,116,505	3.21%		
In House Intermediate	731,886,672	4.35%		
In House Long Bond	530,422,646	3.15%		
Tax Shelter Annuity 403 (B)	356,873	0.00%		
Life Insurance Trust (Retired)	88,077,448	0.52%		
Fort Washington Investment Broad Market	428,822,980	2.55%	150,088	0.03%
Galliard Capital Mangement	453,940,493	2.70%	229,226	0.05%

Source: Schedule of Contracted and Administrative Investment Expenses as of June 30, 2016



## TRS Pension – Money Manager Fees

Manager Name	Average Assets	Weight (%)	Fee (\$)	Estimated Fee (%)
<b>Real Estate</b>	<b>899,933,835</b>	<b>5.35%</b>	<b>7,010,123</b>	<b>0.78%</b>
Real Estate Equity	387,252,470	2.30%		
Prudential PRISA	278,776,042	1.66%	1,814,682	0.65%
Angelo Gordon Net Lease Fund III	17,395,751	0.10%	456,007	2.62%
Blackstone Partners Fund VII, L.P.	51,314,639	0.31%	557,515	1.09%
Blackstone Partners Fund VIII, L.P.	11,863,813	0.07%	666,667	5.62%
Carlyle Realty Partners Fund VI, L.P.	30,781,430	0.18%	381,472	1.24%
Carlyle Realty Partners Fund VII, L.P.	14,363,663	0.09%	652,867	4.55%
Landmark Real Estate Fund VII	16,608,873	0.10%	490,087	2.95%
Rockwood Capital Real Estate Fund IX, L.P.	36,332,699	0.22%	513,750	1.41%
Rockwood Capital Real Estate Fund X, L.P.	0	0.00%	366,694	
TA Realty Associates Fund X, L.P.	52,119,456	0.31%	1,047,882	2.01%
TA Realty Associates Fund XI, L.P.	3,125,000	0.02%	62,500	2.00%
<b>Additional Categories</b>	<b>1,337,755,631</b>	<b>7.95%</b>	<b>8,701,619</b>	<b>0.65%</b>
Angelo Gordon Select Partners Advantage Fund	2,370,842	0.01%	22,704	0.96%
Avenue Capital Special Situations Fund VI, L.P.	61,501,601	0.37%	256,879	0.42%
Babson European Capital	101,132,500	0.60%	464,860	0.46%
Columbia High Yield Fund	100,885,523	0.60%	113,586	0.11%
Fort Washington Investments High Yield	290,635,127	1.73%	581,271	0.20%
Golub Capital - Pearls II, LLC	128,684,402	0.77%	1,077,023	0.84%
Highbridge Principle Strategies Fund III, L.P.	44,980,948	0.27%	760,027	1.69%
Marathon Credit Fund	243,235,858	1.45%	2,309,805	0.95%
Marathon European Credit Fund II	63,904,948	0.38%	798,839	1.25%
Marathon European Credit Fund III	16,992,558	0.10%	111,952	0.66%
Oaktree European Capital Solutions Fund, L.P.	3,822,009	0.02%	39,873	1.04%
Oaktree European Dislocation Fund, L.P.	11,921,294	0.07%	304,448	2.55%
Oaktree Opportunities Fund IX, L.P.	47,377,976	0.28%	795,406	1.68%
Oaktree Opportunities Fund X, L.P.	3,179,715	0.02%	215,459	6.78%
Rogge Global International Fund	46,100,732	0.27%	70,924	0.15%
Shenkman Capital	171,029,600	1.02%	778,563	0.46%

Source: Schedule of Contracted and Administrative Investment Expenses as of June 30, 2016



## TRS Pension – Money Manager Fees

Manager Name	Average Assets	Weight (%)	Fee (\$)	Estimated Fee (%)
<b>Alternatives</b>	<b>903,427,729</b>	<b>5.37%</b>	<b>14,469,348</b>	<b>1.60%</b>
Actis Global Fund IV, L.P.	28,080,076	0.17%	995,000	3.54%
Alinda Infrastructure Fund II, L.P.	56,618,450	0.34%	589,702	1.04%
APAX Fund VIII, L.P.	31,520,067	0.19%	338,829	1.07%
Audax Mezzanine Fund III, L.P.	13,208,100	0.08%	253,149	1.92%
Audax Private Equity Fund IV, L.P.	19,216,226	0.11%		
Audax Private Equity Fund V, L.P.	397,571	0.00%	94,556	23.78%
Capital South Fund III, L.P.	883,440	0.01%		
Carlyle Europe Partners IV, L.P.	13,381,877	0.08%	1,723,472	12.88%
Carlyle Global Finacial Services Fund II, L.P.	14,124,488	0.08%	615,441	4.36%
Chrysalis Fund III, L.P.	20,009,652	0.12%	313,469	1.57%
Fort Washington Fund V, L.P.	11,867,500	0.07%	80,315	0.68%
Fort Washington Fund VI, L.P.	33,271,792	0.20%	200,070	0.60%
Fort Washington Fund VIII, L.P.	8,868,212	0.05%	115,938	1.31%
Fort Washington Fund IX, L.P.	353,633	0.00%	958	0.27%
Fort Washington Fund IX-K, L.P.	350,000	0.00%	1,838	0.53%
Gavea V	3,762,316	0.02%	600,000	15.95%
Hancock Bluegrass LLC Oregon	29,351,758	0.17%	237,592	0.81%
Hellman and Friedman Fund VII, L.P.	44,102,556	0.26%	736,473	1.67%
IJM Global	103,345,006	0.61%	1,006,503	0.97%
JP Morgan Maritime Fund, L.P.	29,226,211	0.17%	493,870	1.69%
KKR Fund 2006, L.P.	16,417,614	0.10%	-31,692	-0.19%
KKR European Fund III, L.P.	50,896,820	0.30%	247,351	0.49%
KKR European Fund IV, L.P.	7,926,225	0.05%	433,593	5.47%
Landmark Equity Partners Fund XIV, L.P.	15,577,542	0.09%	298,400	1.92%
Landmark Equity Partners Fund XV, L.P.	8,588,078	0.05%	283,366	3.30%
Lexington Capital Partners Fund VII, L.P.	16,484,602	0.10%	191,609	1.16%
Lexington Capital Partners Fund VIII, L.P.	6,983,831	0.04%	192,032	2.75%
Molpus Lake Superior Michigan	107,636,974	0.64%	897,165	0.83%
Molpus Lake Superior Hiwassee	8,183,678	0.05%	67,171	0.82%
Molpus Seven States	57,127,279	0.34%	563,282	0.99%
NGP Natural Resources Fund X, L. P.	32,850,959	0.20%	567,649	1.73%
NGP Natural Resources Fund XI, L.P.	6,141,538	0.04%	376,697	6.13%
Oaktree European Principal Fund III, L.P.	23,100,341	0.14%	390,698	1.69%
Oaktrec Mezzanine Fund III, L.P.	9,574,041	0.06%	125,263	1.31%
Oaktree Mezzanine Fund IV, L.P.	6,817,821	0.04%	69,602	1.02%
Stepstone Partners Fund III, L.P.	19,917,921	0.12%	173,715	0.87%
Public Pension Capital	3,802,855	0.02%	914,973	24.06%
Riverstone/Carlyle Energy and Power Fund IV, L.P.	26,627,557	0.16%	168,757	0.63%
Riverstone Energy and Power Fund V, L.P.	16,833,126	0.10%	142,542	0.85%
<b>Cash</b>	<b>296,766,244</b>	<b>1.76%</b>		
<b>Total Portfolio</b>	<b>16,820,781,063</b>		<b>44,039,160</b>	<b>0.26%</b>

Source: Schedule of Contracted and Administrative Investment Expenses as of June 30, 2016



## TRS Medical – Money Manager Fees

Manager Name	Average Assets	Weight (%)	Fee (\$)	Estimated Fee (%)
<b>Equity</b>	<b>341,128,241</b>	<b>53.55%</b>	<b>191,346</b>	<b>0.06%</b>
Black Rock	341,128,241	53.55%	191,346	0.06%
<b>Fixed Income</b>	<b>58,096,830</b>	<b>9.12%</b>		
Internal Bond	58,096,830	9.12%		
<b>Real Estate</b>	<b>17,995,520</b>	<b>2.83%</b>	<b>503,596</b>	<b>2.80%</b>
Blackstone VIII	2,372,762	0.37%	133,333	5.62%
Carlyle VII	2,872,733	0.45%	130,574	4.55%
Landmark VII	3,321,775	0.52%	98,017	2.95%
Rockwood Capital X		0.00%	76,078	
TA Realty XI	625,000	0.10%	12,499	2.00%
Prudential	8,803,250	1.38%	53,095	0.60%
<b>Additional Categories</b>	<b>199,849,405</b>	<b>31.37%</b>	<b>683,241</b>	<b>0.34%</b>
Highbridge Principal Strategies Fund III, L.P.	4,498,095	0.71%	76,002	1.69%
Columbia High Yield Fund	7,389,208	1.16%	12,755	0.17%
Fort Washington Investments High Yield	54,575,528	8.57%	109,151	0.20%
Marathon Credit Fund	98,550,328	15.47%	288,632	0.29%
Marathon European Credit Fund II	4,260,330	0.67%	53,256	1.25%
Marathon European Credit Fund III	2,265,674	0.36%	14,927	0.66%
Oaktree European Capital Solutions	829,568	0.13%	13,613	1.64%
Shenkman Capital	27,480,674	4.31%	114,905	0.42%
<b>Alternative</b>	<b>18,251,931</b>	<b>2.87%</b>	<b>794,571</b>	<b>4.35%</b>
Actis Global Fund IV, L.P.	2,808,358	0.44%	100,000	3.56%
Audax Private Equity Fund V	265,047	0.04%	31,519	11.89%
Carlyle Europe IV	2,676,376	0.42%	345,034	12.89%
Fort Washington Private Equity III, L.P.	1,783,506	0.28%	37,500	2.10%
Fort Washington Fund VII, L.P.	3,740,217	0.59%	37,500	1.00%
Fort Washington Fund VIII, L.P.	2,533,782	0.40%	33,125	1.31%
Fort Washington Fund IX, L.P.	99,743	0.02%	270	0.27%
Fort Washington Fund IX-K, L.P.	100,000	0.02%	252	0.25%
KKR European IV, L.P.	1,585,243	0.25%	86,721	5.47%
Landmark Fund XV, L.P.	1,431,350	0.22%	47,311	3.31%
NGP Natural Resources XI, L.P.	1,228,309	0.19%	75,339	6.13%
<b>Cash</b>	<b>1,654,670</b>	<b>0.26%</b>		
<b>Total</b>	<b>636,976,596</b>		<b>2,172,754</b>	<b>0.34%</b>

Source: Schedule of Contracted and Administrative Investment Expenses as of June 30, 2016





## TRS – Additional Third-Party Fees

### ◆ Investment Consultants

- Aon Hewitt - \$358,850
- Bevis Longstreth - \$50,137
- George Philip - \$38,962

### ◆ Custody

- The Bank of New York Mellon - \$380,233 (Pension) and \$30,275 (Medical)

### ◆ Legal & Research

- Reinhart Boerner Van Deuren - \$5,560
- Ice Miller - \$84,697

### ◆ Other

- Other Administrative and Operational (includes Personnel, Subscription services, etc.) - \$2,918,364 (Pension) and \$77,091 (Medical)

Source: Schedule of Contracted and Administrative Investment Expenses as of June 30, 2016



## TRS Pension and Medical – Fee Observations

- ◆ TRS provided a Schedule of Contracted and Administrative Investment Expenses for the year ended June 30, 2016 for both the Pension and Medical Plans. This document had the dollar amounts paid to investment managers but did not include the fee as a percent of assets. To estimate this value, PFM calculated the average assets in each manager based on the 9/30/15, 12/31/15, 3/31/16, and 6/30/16 Portfolio Summary Report and backed into the estimated fee shown in the previous slides.
- ◆ Although the overall estimated expense ratio for both Plans is reasonable at 0.26% for the Pension and 0.34% for the Medical, this does not include the cost of the internally managed funds, which represent roughly 30% of total assets for the Pension and 10% for the Medical.
- ◆ The real estate and private equity managers generally have the highest fees and reported amounts are likely understated by not including all of the costs associated with managing the funds. However, the Plans maintain a reasonable expense ratio by allocating a majority of the assets to low cost equity and fixed income managers.
- ◆ Rockwood Capital Real Estate Fund X, L.P does not appear on any of the Portfolio Summary reports from 9/30/2016 – 6/30/16 but a fee is listed for this fund in the Schedule of Contracted and Administrative Investment Expenses report for the year ended June 30, 2016 for both Plans.
- ◆ An average of \$883,440 has been invested in Capital South Fund III, L.P. over the past 4 quarters but a fee is not listed (Pension).
- ◆ Investment manager agreements were not reviewed but should be used to verify fee schedules



## KJFRS – Fee Observations

◆ Hilliard Lyons is the manager for both Judicial and Legislators Plans.

- Stated fee = 8 basis points
- Maximum fee = \$261,000
- Minimum fee = \$214,000
- 8 basis points of the current market value of both Plans (\$436 million) exceeds the maximum fee. The maximum fee translates to approximately 6 basis points of the market value of the Plans.

◆ Lexington Investment Company is the broker for both Judicial and Legislators Plans.

- All equity commissions at \$0.05 per share
- Broker also provides:
  - Quarterly performance valuations
  - Indices for use in measurement of performance
  - Asset allocation compliance reports
  - Cash flow projections
  - Determination of cash available for investment



## Steps To Improve Transparency

- ◆ The Pew Charitable Trusts has outlined the following steps to improve transparency<sup>1</sup>:
  - Publish investment policy statements and make them accessible to the public
  - Adopt comprehensive fee-reporting standards, such as those proposed by the Institutional Limited Partners Association's Fee Transparency Initiative
  - Report results by asset class, net and gross of fees
  - Disclose bottom-line performance, both net and gross of fees
  - Expand reporting to include performance results for longer periods (10+ years)

<sup>1</sup>The Pew Charitable Trusts: "Making State Pension Investments More Transparent", February 2016



## Glossary of Terms

- ◆ **Traditional Investments** – Typically consists of conventional investment types, such as publicly traded stocks, bonds and cash.
- ◆ **Alternative Investments** – An asset class that is not one of the traditional investment types and may include hedge funds, private equity, managed futures, real estate, commodities, timber, infrastructure and derivatives. These asset classes may have limited liquidity, high minimums and high fees, but can exhibit a low correlation with traditional investments. They are often organized in a limited partnership structure that are open to a limited number of accredited investors.
- ◆ **Standard Deviation** – A statistical measure of the range of a portfolio's performance, the variability of a return around its average return over a specified time period
- ◆ **Alpha** – A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market, or a portfolio's non-systemic return.
- ◆ **Beta** – A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk.
- ◆ **Sharpe Ratio** – Represents the excess rate of return over the risk free return divided by the standard deviation of the excess return. The result is the absolute rate of return per unit of risk. The higher the value, the better the portfolio's historical risk-adjusted performance.
- ◆ **Up Market Capture** – The ratio of average portfolio return over the benchmark during periods of positive benchmark return. Higher values indicate better relative performance.
- ◆ **Down Market Capture** – The ratio of average portfolio return over the benchmark during periods of negative benchmark return. Lower values indicate better relative performance.