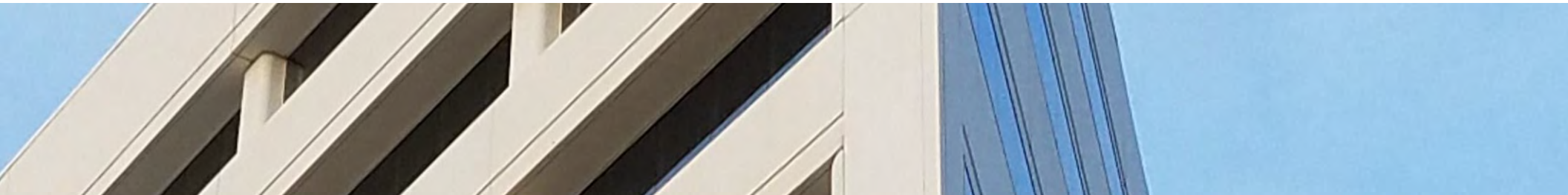




# WILSHIRE ASSOCIATES

Wilshire Consulting

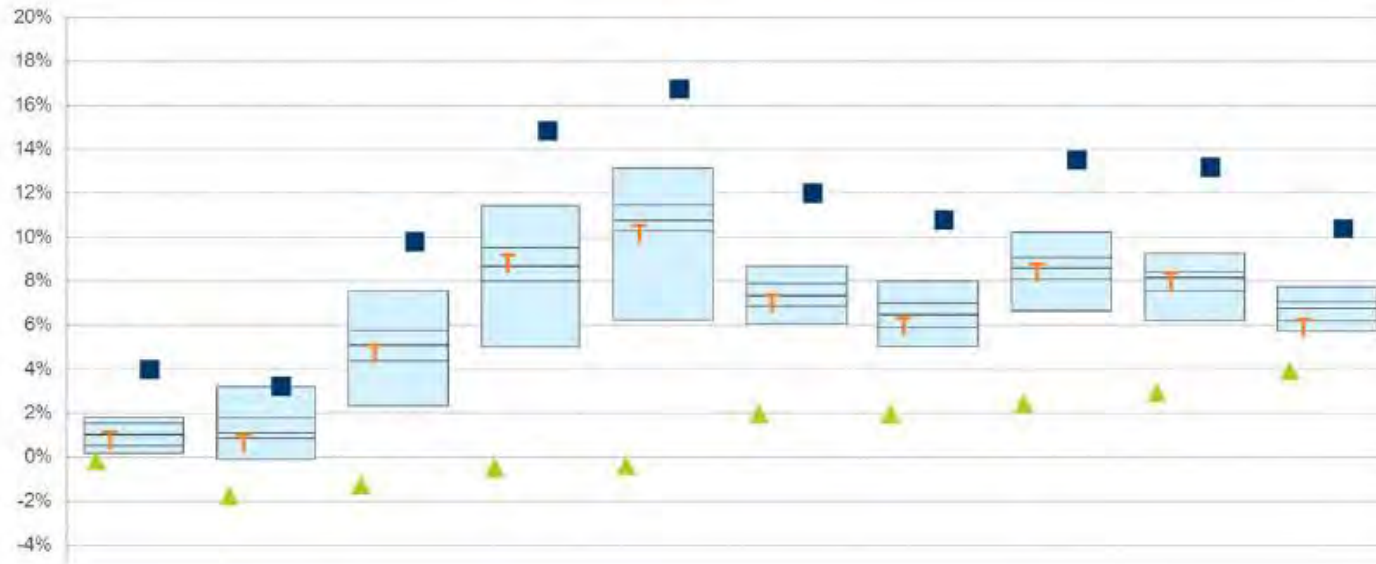


California Public Employees' Retirement System  
Universe Comparison Report – June 30, 2018

# Total Fund – Universe Comparison

## California Public Employees Retirement Performance Comparison

Total Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018

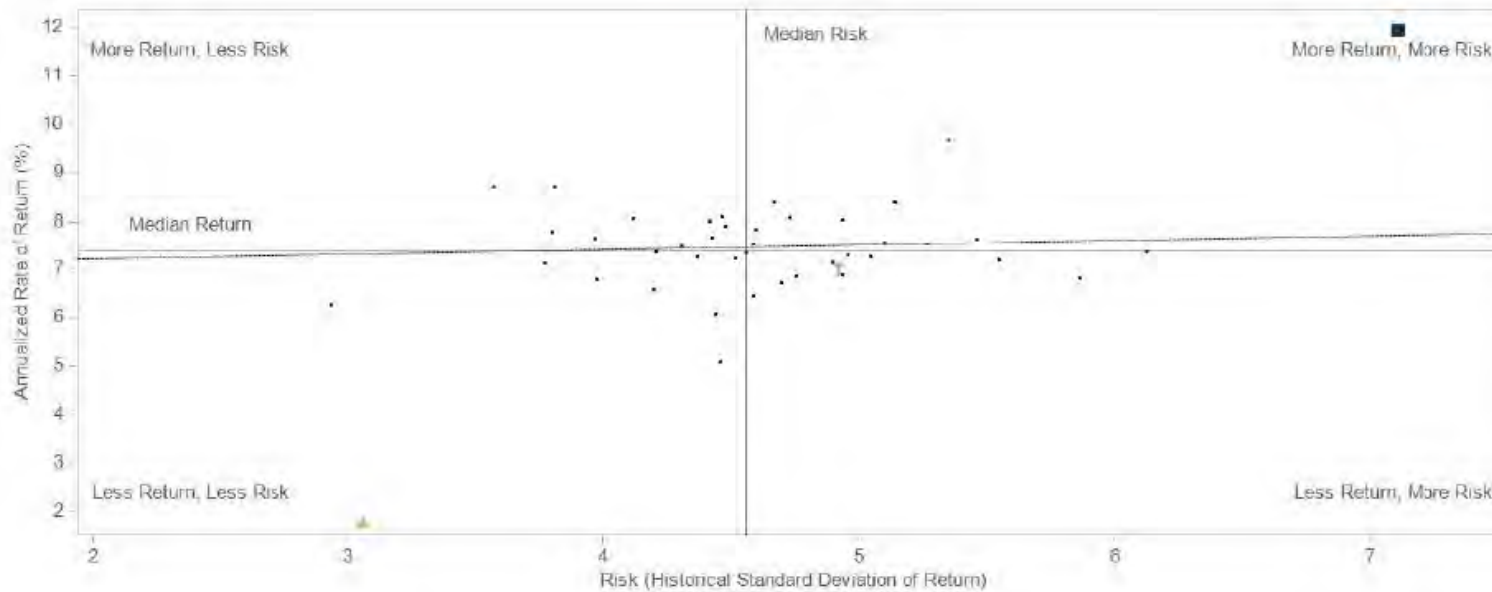


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	1.80	3.20	7.58	11.43	13.14	8.70	8.00	10.22	9.27	7.74
25th	1.53	1.77	5.77	9.52	11.47	7.90	7.01	9.08	8.44	7.06
50th	1.03	1.12	5.10	8.70	10.78	7.36	6.50	8.61	8.15	6.78
75th	0.53	0.87	4.40	7.99	10.29	6.87	5.91	8.07	7.57	6.19
95th	0.20	-0.10	2.36	5.00	6.24	6.06	5.04	6.66	6.22	5.72
No. Of Obs	41	41	41	41	41	41	41	41	41	37
<b>T</b> Total Plan - Composite	0.62 (70)	0.50 (90)	4.58 (62)	8.67 (52)	10.01 (80)	6.88 (72)	5.81 (77)	8.28 (60)	7.85 (55)	5.75 (90)
<b>■</b> Wilshire 5000	3.83 (1)	3.04 (5)	9.63 (1)	14.66 (1)	16.59 (1)	11.85 (1)	10.64 (1)	13.36 (1)	13.03 (1)	10.23 (1)
<b>▲</b> Barclays Govt/Credit	-0.33 (100)	-1.90 (100)	-1.42 (100)	-0.63 (100)	-0.52 (100)	1.83 (100)	1.80 (100)	2.29 (100)	2.77 (100)	3.78 (100)

# Total Fund – Risk and Returns

## California Public Employees Retirement Risk vs Total Returns of Public Funds > \$10 Billion

3 Years Ending June 30, 2018



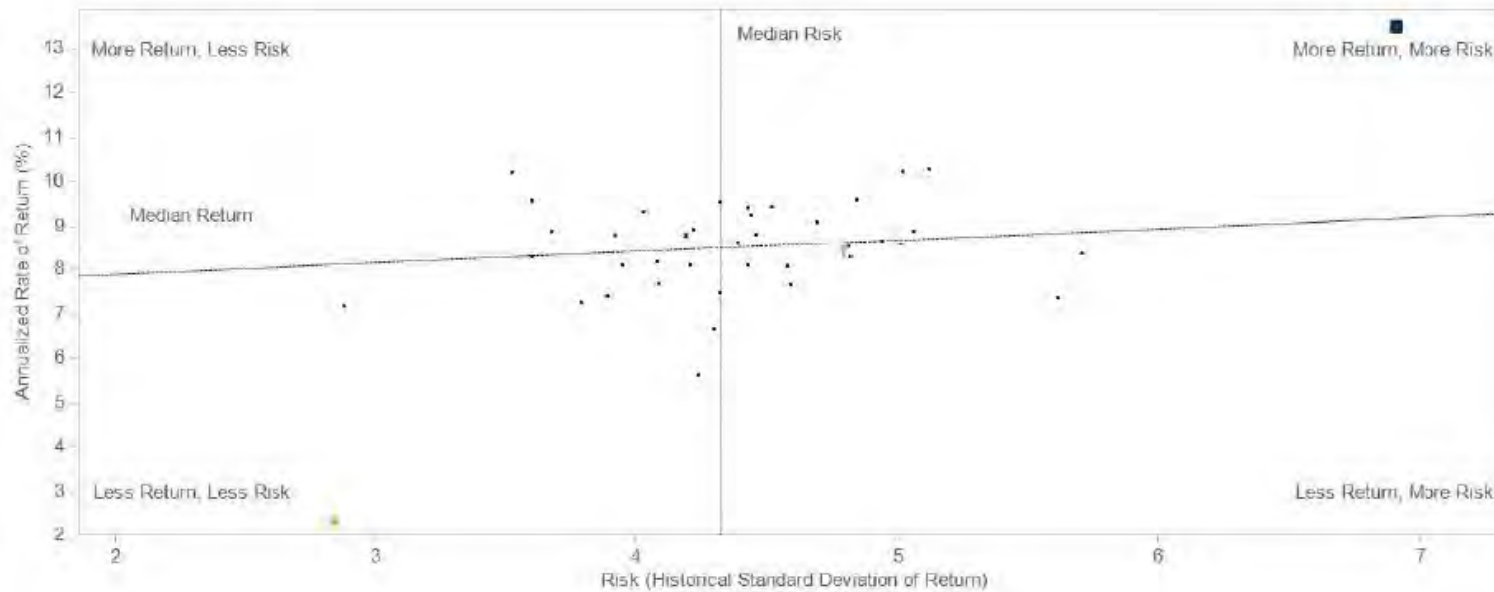
Alpha: 7  
Beta: 0.1  
R-Squared: 0.01

	Risk Value	Risk Rank	Return Value	Return Rank
Total Plan - Composites	4.94	27	8.88	72
Wilshire 5000	7.13	1	11.85	1
Barclays Aggregate	3.08	98	1.72	100
Median	4.56		7.36	

# Total Fund – Risk and Returns

## California Public Employees Retirement Risk vs Total Returns of Public Funds > \$10 Billion

5 Years Ending June 30, 2018

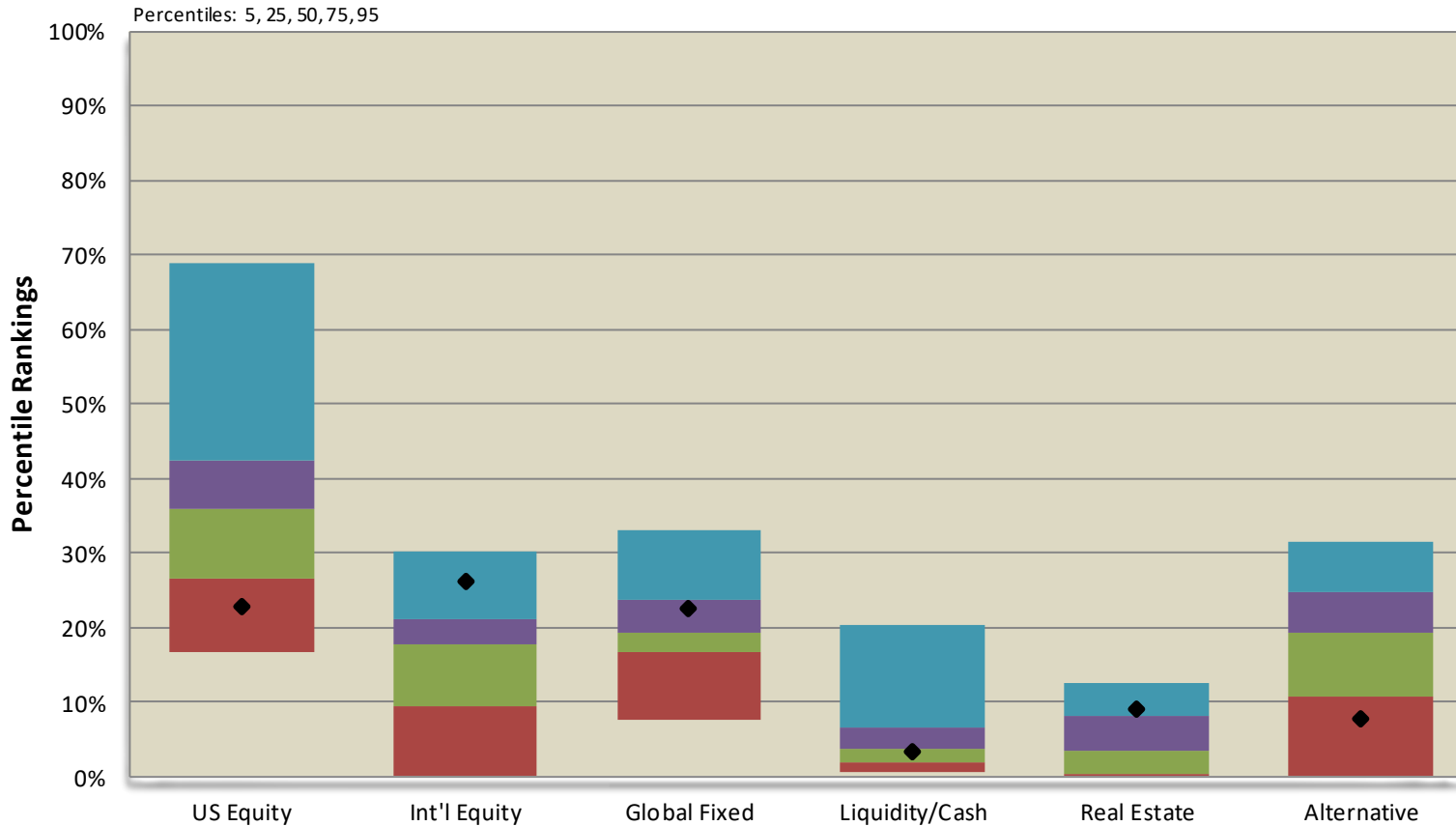


Alpha: 7.37  
Beta: 0.26  
R-Squared: 0.02

	Risk Value	Risk Rank	Return Value	Return Rank
Total Plan - Composites	4.81	25	8.28	60
Wilshire 5000	6.93	1	13.36	1
Barclays Aggregate	2.86	99	2.27	100
Median	4.32		8.61	

# Asset Allocation Ranking – Universe Analysis

## Asset Allocation Ranking of Public Funds > \$10 Billion

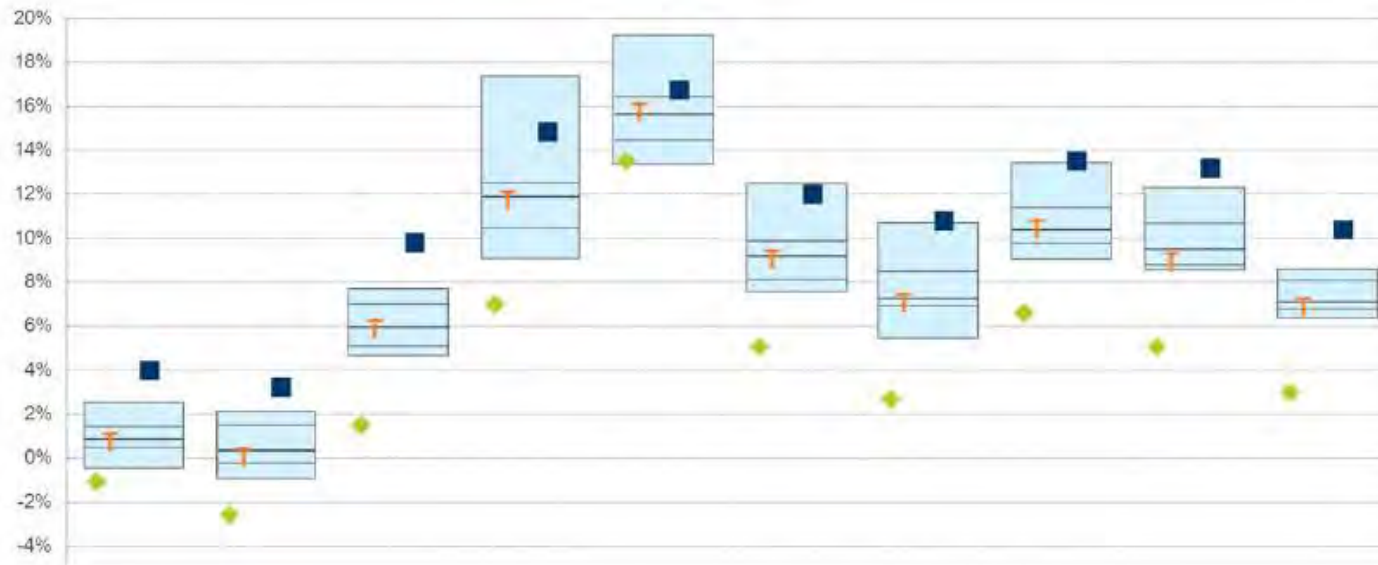


Percentile Rankings	US Equity	Int'l Equity	Global Fixed	Liquidity/Cash	Real Estate	Alternative
5th	68.83%	30.08%	33.18%	20.43%	12.47%	31.57%
25th	42.34%	21.04%	23.66%	6.50%	8.03%	24.82%
50th	35.99%	17.78%	19.42%	3.70%	3.39%	19.22%
75th	26.63%	9.38%	16.64%	1.98%	0.38%	10.74%
95th	16.70%	0.06%	7.54%	0.53%	0.00%	0.00%
<b>CalPERS</b>	<b>22.70% (84)</b>	<b>26.14% (14)</b>	<b>22.48% (31)</b>	<b>3.34% (53)</b>	<b>9.04% (22)</b>	<b>7.72% (84)</b>

# Growth: Public Equity – Universe Comparison

## California Public Employees Retirement Performance Comparison

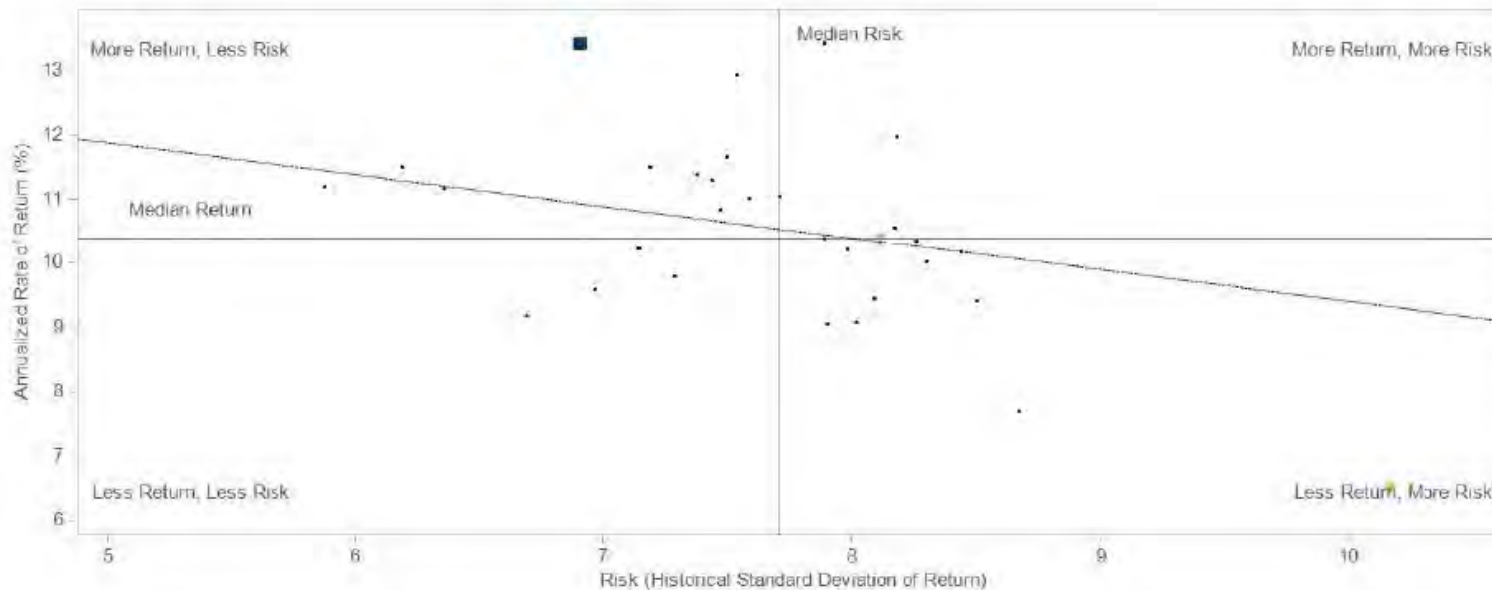
Total Equity Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	2.53	2.13	7.71	17.37	19.25	12.48	10.72	13.44	12.31	8.63
25th	1.43	1.52	7.01	12.51	16.42	9.89	8.50	11.40	10.69	8.07
50th	0.88	0.38	5.94	11.90	15.63	9.19	7.28	10.40	9.60	7.11
75th	0.49	-0.22	5.10	10.47	14.45	8.12	6.91	9.79	8.81	6.79
95th	-0.44	-0.90	4.66	9.07	13.34	7.60	5.47	9.05	8.55	6.37
No. Of Obs	34	32	32	32	32	32	31	31	26	21
T Total Plan - Composite	0.60 (65)	-0.09 (68)	5.75 (56)	11.57 (56)	15.59 (53)	8.92 (56)	6.91 (75)	10.28 (53)	8.78 (75)	6.74 (75)
■ Wilshire 5000	3.83 (1)	3.04 (1)	8.63 (1)	14.66 (12)	16.59 (15)	11.85 (5)	10.64 (5)	13.36 (5)	13.03 (1)	10.23 (1)
◆ MSCI EAFE (Net)	-1.24 (100)	-2.75 (100)	1.36 (100)	8.84 (100)	13.35 (92)	4.90 (100)	2.54 (99)	6.44 (99)	4.89 (100)	2.84 (100)

# Growth: Public Equity – Risk and Returns

California Public Employees Retirement  
 Risk vs Total Equity Returns of Public Funds > \$10 Billion  
 5 Years Ending June 30, 2018



Alpha: 14.4  
 Beta: -0.5  
 R-Squared: 0.08

	Risk Value	Risk Rank	Return Value	Return Rank
Total Plan - Composites	8.13	28	10.28	53
Wilshire 5000	8.93	88	13.36	5
MSCI EAFE (Net)	10.18	5	8.44	99
Median	7.71		10.40	

# Growth: US Equity – Universe Comparison

## California Public Employees Retirement Performance Comparison

US Equity Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	4.48	4.52	11.78	21.17	21.08	14.50	12.81	15.25	14.34	10.81
25th	4.11	3.57	10.11	15.49	17.32	11.99	10.85	13.83	13.26	10.36
50th	3.50	2.75	9.46	14.71	16.59	11.34	10.24	12.95	12.71	9.96
75th	1.62	1.73	7.28	11.88	14.77	9.41	8.80	11.60	12.03	9.43
95th	0.61	-0.01	4.82	9.08	13.52	8.00	7.35	9.48	10.99	8.01

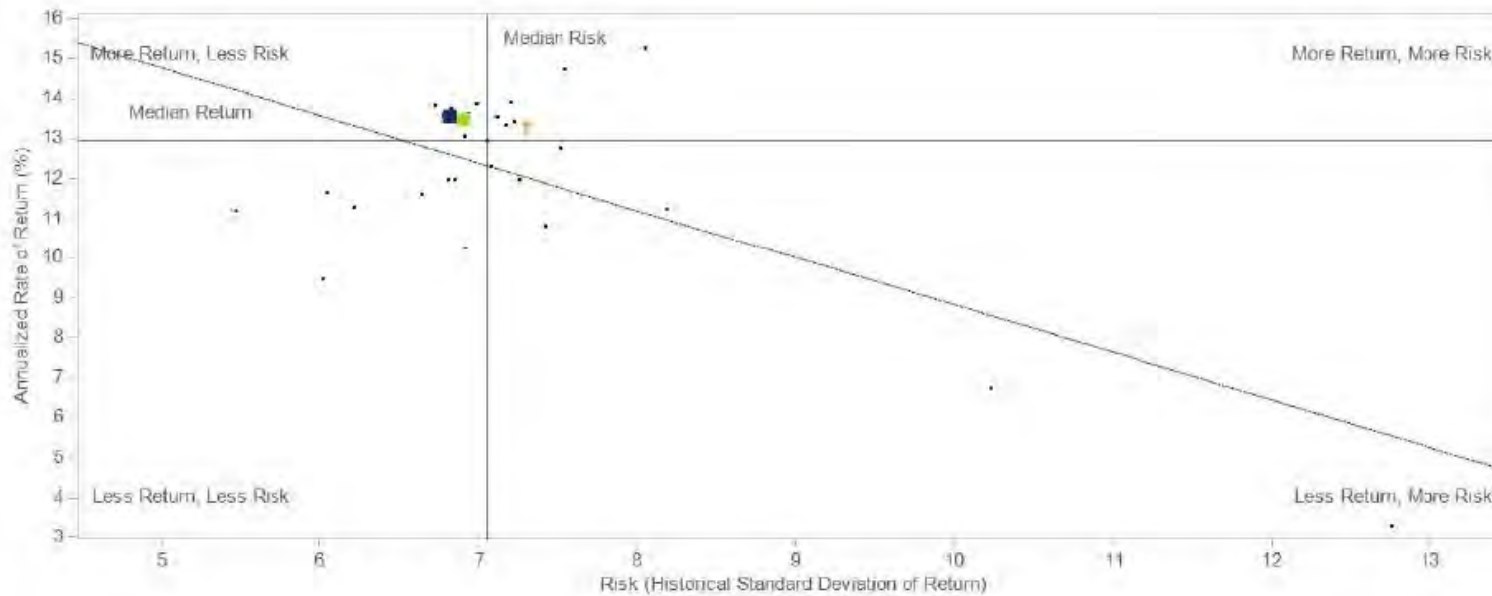
No. Of Obs	33	31	30	30	30	30	30	30	27	22
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Total Plan - Composite	3.53 (48)	2.79 (48)	9.37 (53)	14.76 (46)	18.87 (32)	11.34 (50)	10.11 (50)	13.11 (42)	12.88 (46)	10.17 (30)
S&P 500	3.44 (50)	2.65 (53)	9.47 (46)	14.38 (50)	16.12 (60)	11.93 (28)	10.79 (28)	13.42 (35)	13.24 (25)	10.17 (30)
Wilshire 5000	3.83 (37)	3.04 (46)	9.83 (42)	14.86 (50)	16.59 (50)	11.85 (28)	10.64 (35)	13.36 (39)	13.03 (28)	10.23 (30)



# Growth: US Equity – Risk and Returns

California Public Employees Retirement  
 Risk vs US Equity Returns of Public Funds > \$10 Billion  
 5 Years Ending June 30, 2018



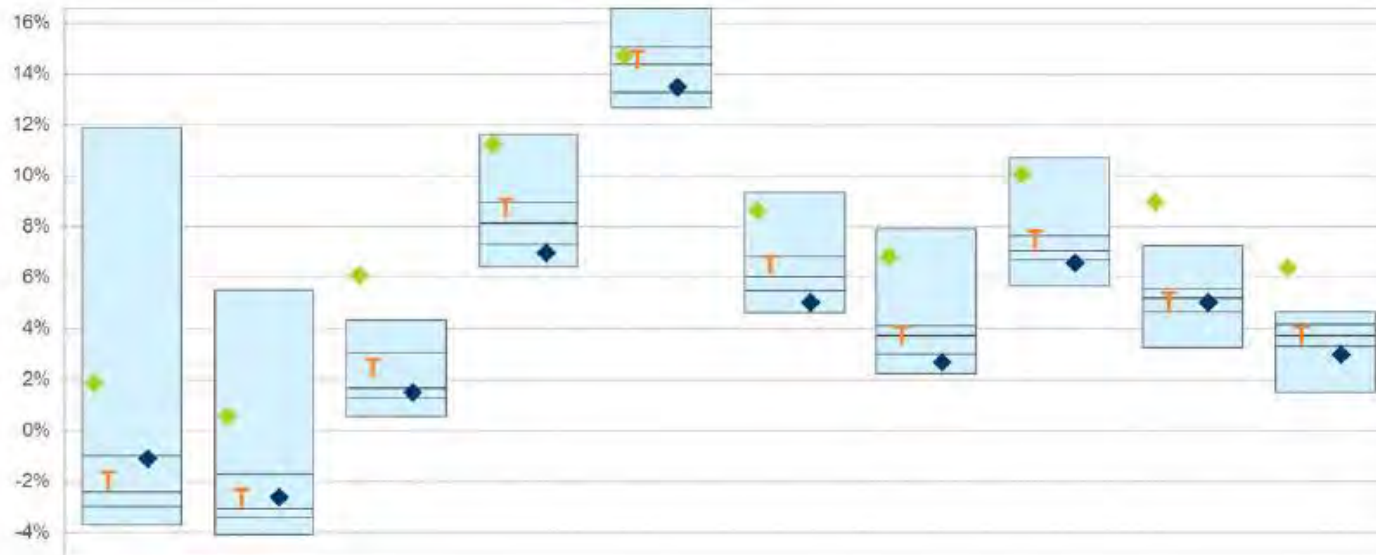
Alpha: 20.72  
 Beta: -1.19  
 R-Squared: 0.43

	Risk Value	Risk Rank	Return Value	Return Rank
Total Plan - Composites	7.33	25	13.11	42
S&P 500	6.85	71	13.42	35
Wilshire 5000	6.93	57	13.36	39
Median	7.05		12.95	

# Growth: International Equity – Universe Comparison

## California Public Employees Retirement Performance Comparison

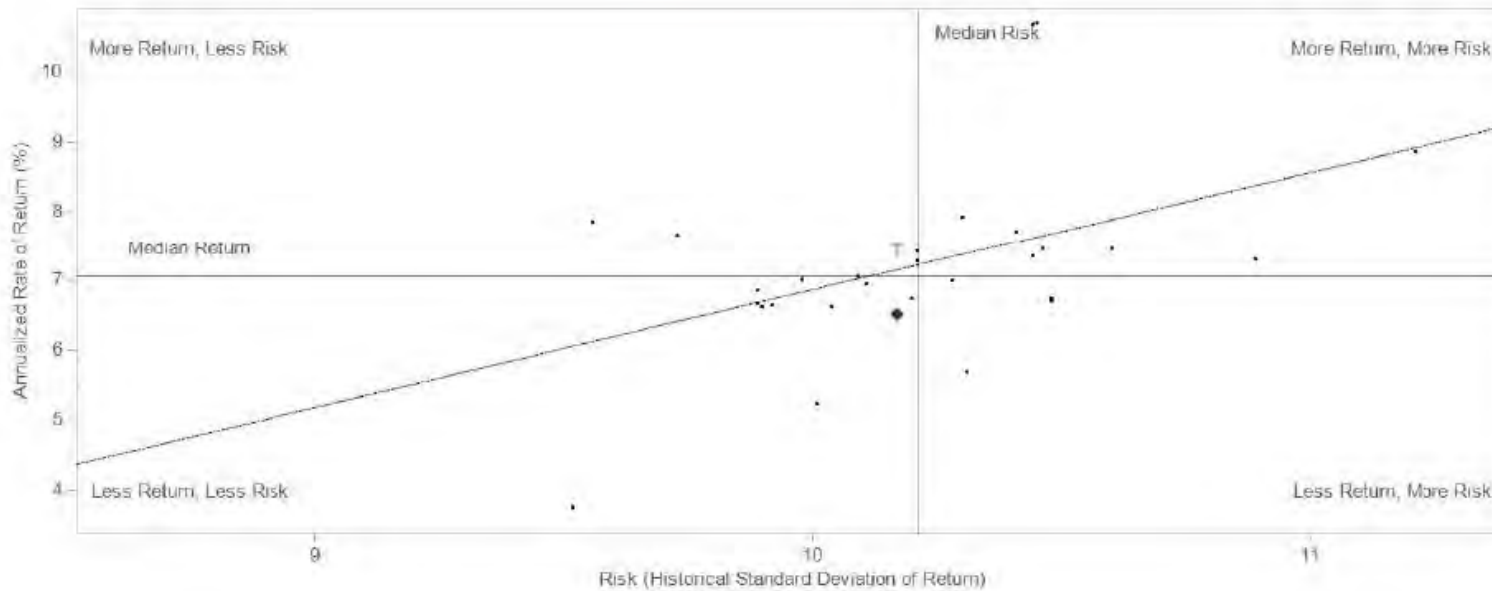
Non-US Equity Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	11.89	5.52	4.33	11.63	16.57	9.36	7.92	10.69	7.25	4.65
25th	-0.98	-1.70	3.05	8.96	15.06	6.84	4.12	7.66	5.57	4.17
50th	-2.39	-3.07	1.87	8.14	14.36	6.03	3.73	7.08	5.20	3.72
75th	-2.97	-3.39	1.30	7.31	13.27	5.50	3.01	6.71	4.66	3.32
95th	-3.69	-4.08	0.56	6.42	12.68	4.63	2.25	5.69	3.27	1.50
No. Of Obs	33	31	31	31	29	29	29	29	27	21
T Total Plan - Composite	-2.08 (34)	-2.77 (40)	2.33 (34)	8.64 (34)	14.43 (46)	6.39 (32)	3.62 (50)	7.37 (35)	4.95 (66)	3.61 (65)
◆ MSCI EAFE (Net)	-1.24 (25)	-2.75 (40)	1.36 (64)	6.84 (85)	13.35 (67)	4.90 (87)	2.54 (91)	6.44 (91)	4.88 (66)	2.84 (81)
◆ MSCI World (Net)	1.73 (5)	0.43 (5)	5.96 (1)	11.08 (5)	14.58 (42)	8.48 (9)	6.67 (5)	9.94 (5)	8.84 (1)	6.26 (1)

# Growth: International Equity – Risk and Returns

California Public Employees Retirement  
 Risk vs Non-US Equity Returns of Public Funds > \$10 Billion  
 5 Years Ending June 30, 2018



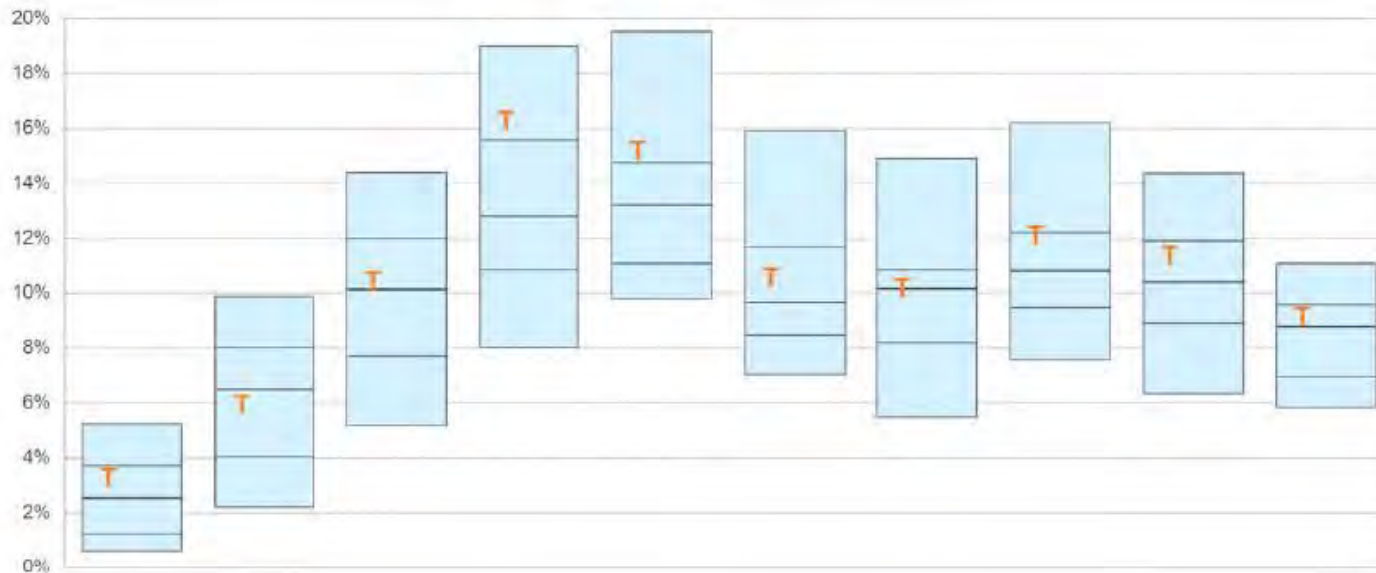
Alpha: -10.03  
 Beta: 1.69  
 R-Squared: 0.21

	Risk Value	Risk Rank	Return Value	Return Rank
T Total Plan - Composites	10.18	53	7.37	35
◆ MSCI EAFE (Net)	10.18	53	8.44	91
Median	10.21		7.06	

# Growth: Private Equity – Universe Comparison

## California Public Employees Retirement Performance Comparison

Total Private Equity Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	5.23	9.89	14.39	18.98	19.52	15.90	14.90	16.18	14.35	11.08
25th	3.72	8.02	11.99	15.58	14.75	11.70	10.85	12.21	11.90	9.57
50th	2.54	6.51	10.15	12.79	13.22	9.67	10.16	10.83	10.40	8.79
75th	1.25	4.04	7.71	10.85	11.08	8.49	8.21	9.48	8.91	6.95
95th	0.63	2.21	5.18	8.02	9.80	7.03	5.48	7.57	6.38	5.86

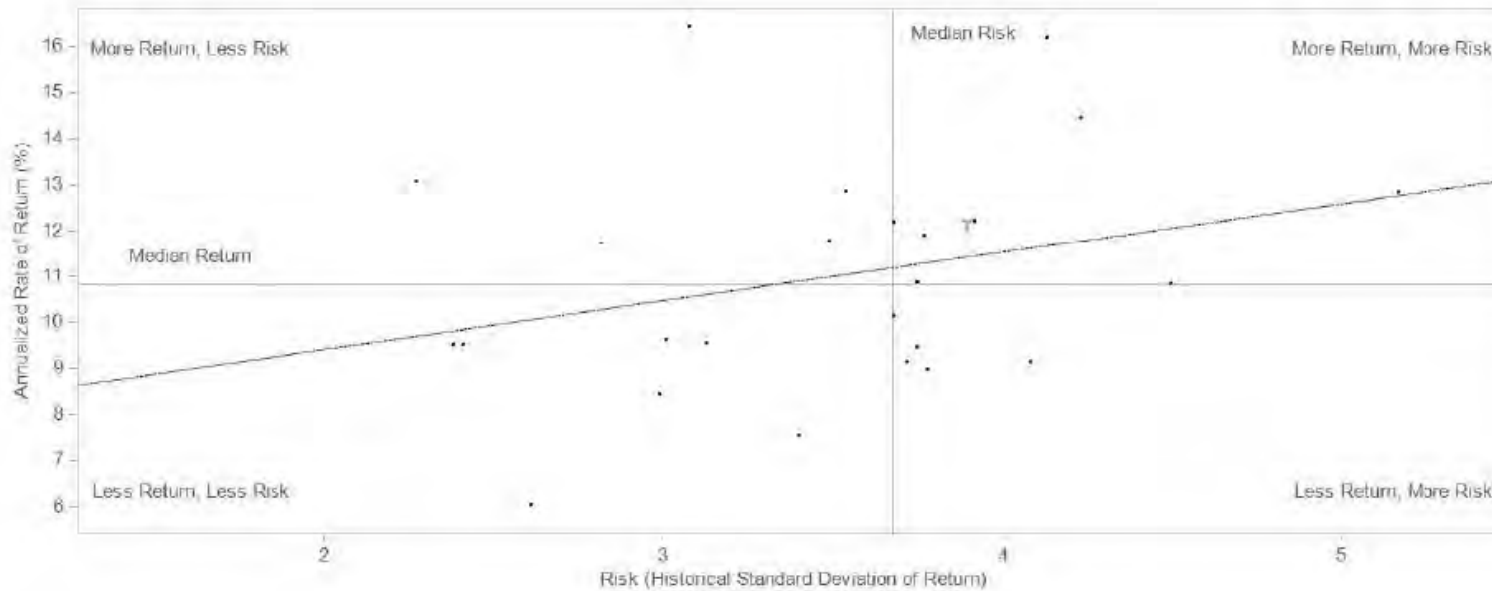
No. Of Obs	31	29	29	27	27	27	25	25	23	19
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T Total Plan - Composite	3.16 (25)	5.83 (67)	10.33 (46)	16.16 (21)	15.08 (21)	10.47 (39)	10.08 (50)	12.00 (29)	11.25 (33)	9.03 (40)
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# Growth: Private Equity – Risk and Return

## California Public Employees Retirement Risk vs Total Private Equity Returns of Public Funds > \$10 Billion

5 Years Ending June 30, 2018



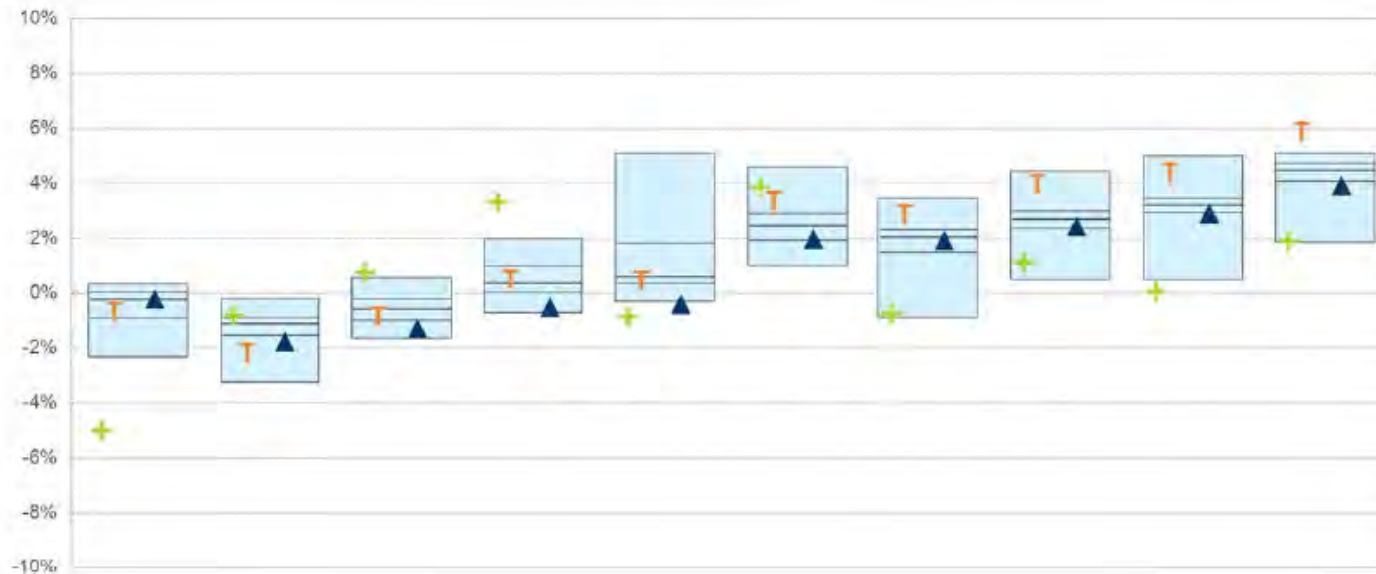
Alpha: 7.3  
Beta: 1.06  
R-Squared: 0.09

	Risk Value	Risk Rank	Return Value	Return Rank
Total Plan - Composites	3.91	21	12.00	29
Median	3.88		10.83	

# Income – Universe Comparison

## California Public Employees Retirement Performance Comparison

Total Fixed Income Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018

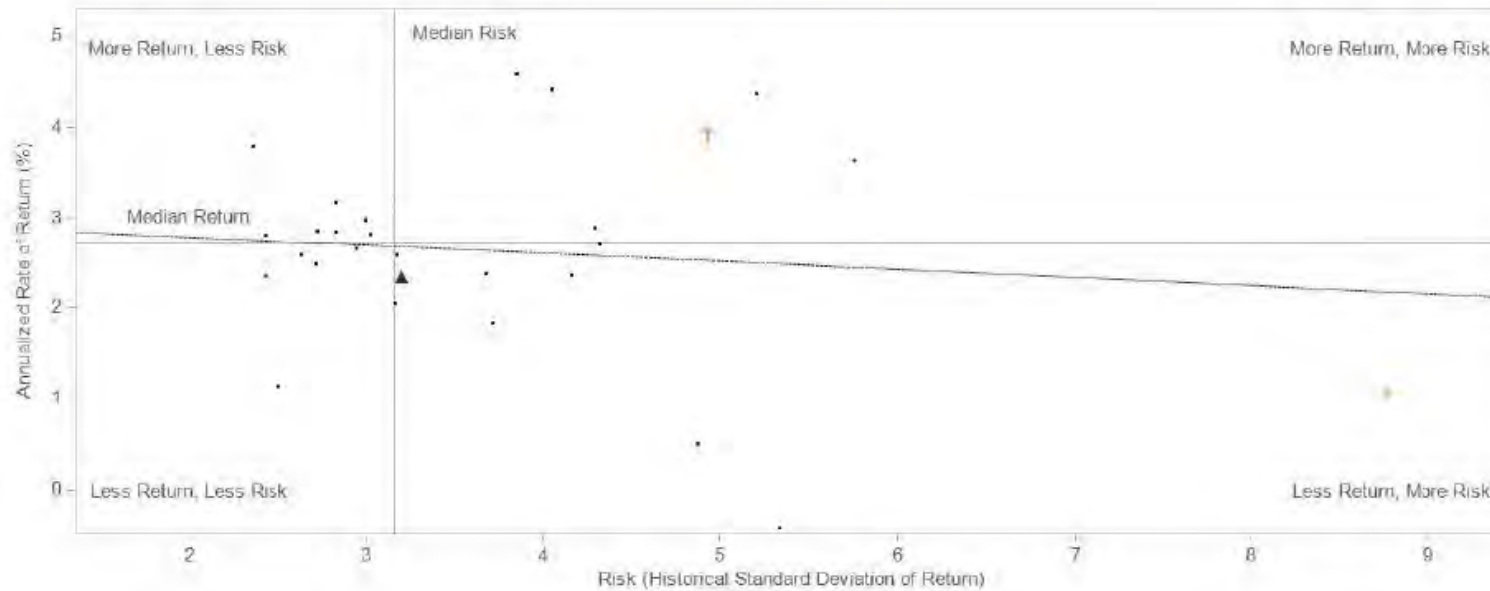


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	0.33	-0.18	0.58	1.88	5.12	4.59	3.48	4.42	5.01	5.12
25th	0.05	-0.87	-0.20	1.00	1.84	2.89	2.32	2.98	3.48	4.72
50th	-0.22	-1.11	-0.58	0.37	0.60	2.46	2.03	2.71	3.22	4.46
75th	-0.89	-1.51	-0.99	0.04	0.37	1.93	1.49	2.36	2.93	4.07
95th	-2.32	-3.25	-1.62	-0.69	-0.29	1.03	-0.87	0.50	0.51	1.86
No. Of Obs	33	31	31	29	29	27	25	25	22	19
T Total Plan - Composite	-0.79 (88)	-2.28 (92)	-0.96 (71)	0.39 (46)	0.35 (75)	3.25 (21)	2.77 (17)	3.88 (9)	4.27 (10)	5.76 (1)
▲ Barclays Govt/Credit	-0.33 (85)	-1.90 (81)	-1.42 (92)	-0.63 (91)	-0.52 (99)	1.83 (79)	1.80 (62)	2.29 (79)	2.77 (79)	3.78 (81)
+ Citi Non-US Gov Bond	-5.11 (100)	-0.92 (28)	0.63 (1)	3.22 (1)	-0.98 (99)	3.74 (13)	-0.87 (99)	1.01 (94)	-0.08 (100)	1.78 (99)

# Income – Risk and Returns

## California Public Employees Retirement Risk vs Total Fixed Income Returns of Public Funds > \$10 Billion

5 Years Ending June 30, 2018



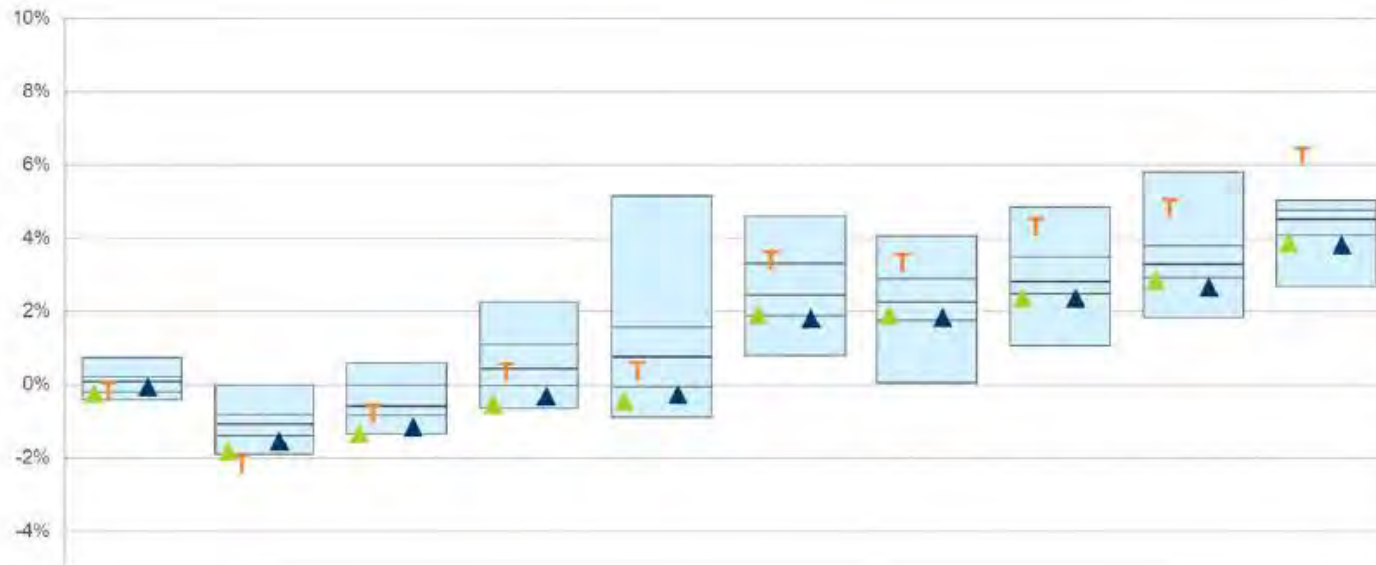
Alpha: 2.97  
Beta: -0.09  
R-Squared: 0.01

	Risk Value	Risk Rank	Return Value	Return Rank
T Total Plan - Composites	4.96	9	3.86	9
▲ Barclays Govt/Credit	3.23	41	2.29	79
+ Citi Non-US Gov Bond	8.79	1	1.01	94
Median	3.17		2.71	

# US Income – Universe Comparison

## California Public Employees Retirement Performance Comparison

US Fixed Income Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



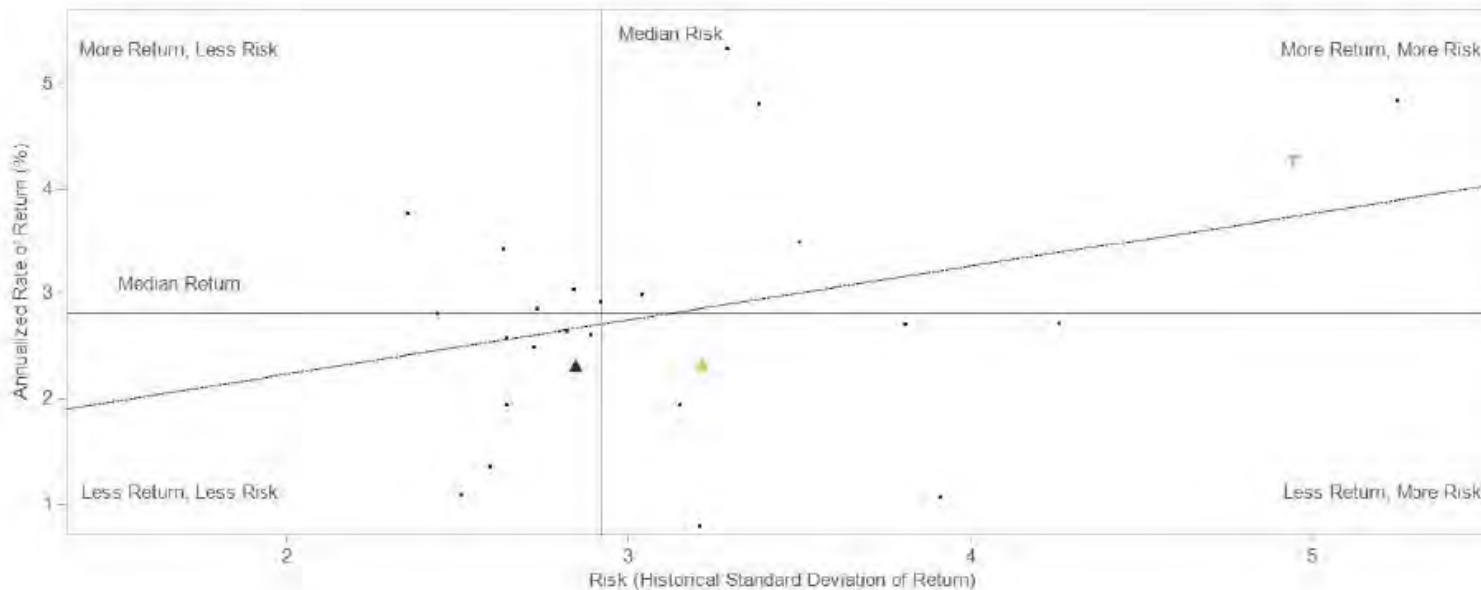
Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	0.75	0.00	0.60	2.27	5.16	4.59	4.06	4.85	5.80	5.05
25th	0.22	-0.80	0.00	1.11	1.57	3.32	2.89	3.50	3.80	4.77
50th	0.08	-1.08	-0.57	0.44	0.76	2.46	2.26	2.82	3.30	4.52
75th	-0.19	-1.38	-0.84	-0.01	-0.04	1.89	1.76	2.49	2.93	4.07
95th	-0.42	-1.88	-1.34	-0.64	-0.89	0.80	0.05	1.07	1.84	2.68
No. Of Obs	33	31	31	29	29	27	24	24	22	19
T Total Plan - Composite	-0.26 (92)	-2.24 (95)	-0.88 (81)	0.27 (53)	0.29 (64)	3.31 (25)	3.25 (20)	4.22 (10)	4.73 (5)	6.14 (1)
▲ Barclays Aggregate	-0.16 (68)	-1.62 (81)	-1.23 (88)	-0.40 (91)	-0.36 (87)	1.72 (75)	1.75 (75)	2.27 (75)	2.57 (79)	3.72 (81)
▲ Barclays Govt/Credit	-0.33 (92)	-1.90 (95)	-1.42 (95)	-0.63 (91)	-0.52 (91)	1.83 (75)	1.80 (70)	2.29 (75)	2.77 (79)	3.78 (81)



# US Income – Risk and Returns

## California Public Employees Retirement Risk vs US Fixed Income Returns of Public Funds > \$10 Billion

5 Years Ending June 30, 2018



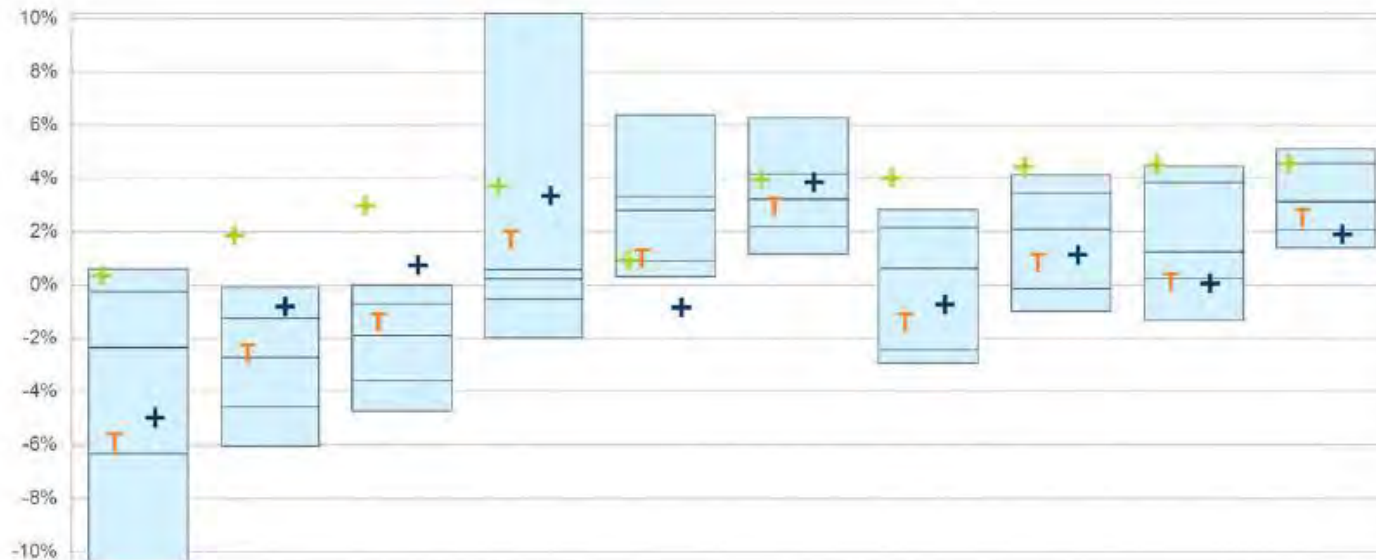
Alpha: 1.22  
Beta: 0.51  
R-Squared: 0.09

	Risk Value	Risk Rank	Return Value	Return Rank
T Total Plan - Composites	4.96	5	4.22	10
▲ Barclays Aggregate	2.86	54	2.27	75
▲ Barclays Govt/Credit	3.23	33	2.29	75
Median	2.92		2.82	

# International Income – Universe Comparison

## California Public Employees Retirement Performance Comparison

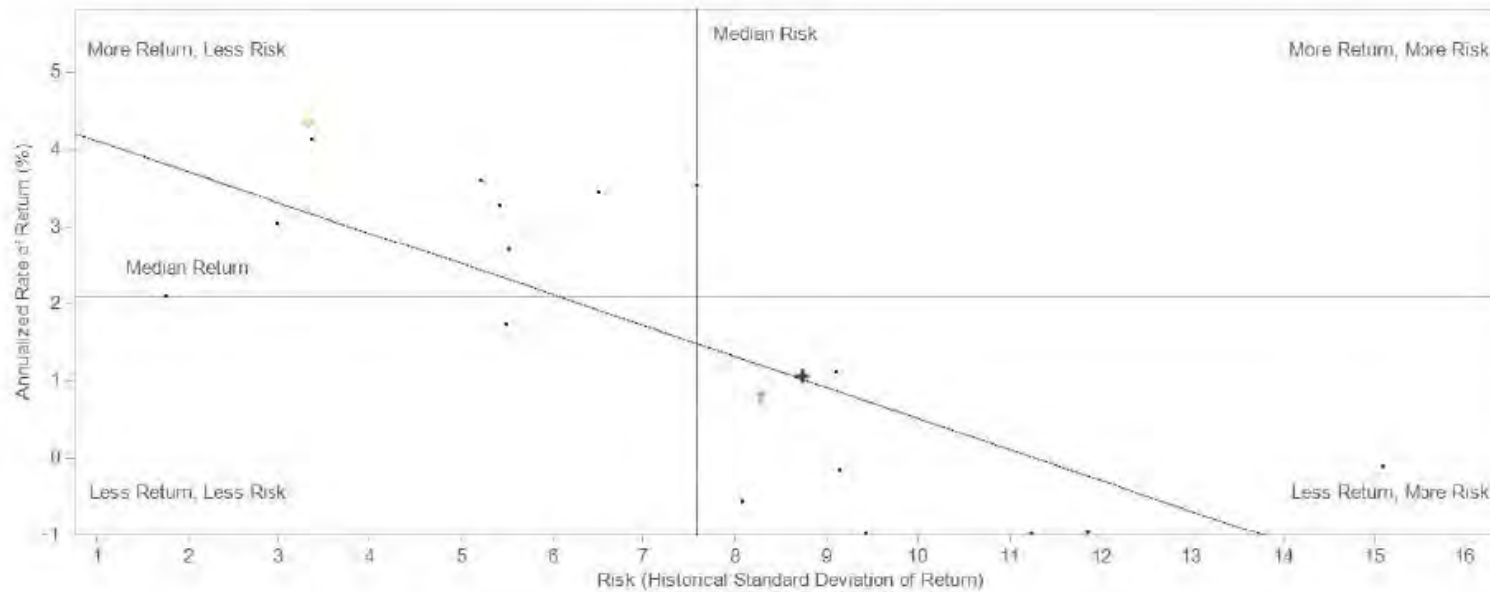
Non-US Fixed Income Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	0.61	-0.08	0.01	10.19	6.37	6.28	2.83	4.14	4.45	5.11
25th	-0.24	-1.23	-0.71	0.57	3.33	4.18	2.18	3.48	3.84	4.56
50th	-2.38	-2.71	-1.89	0.22	2.80	3.21	0.83	2.09	1.25	3.13
75th	-8.32	-4.58	-3.58	-0.52	0.92	2.17	-2.43	-0.14	0.24	2.06
95th	-10.43	-8.04	-4.72	-1.98	0.32	1.16	-2.93	-0.98	-1.34	1.40
No. Of Obs	29	27	27	25	23	20	17	17	15	11
T Total Plan - Composite	-8.01 (71)	-2.88 (48)	-1.50 (42)	1.58 (17)	0.89 (75)	2.83 (55)	-1.50 (82)	0.72 (62)	-0.02 (83)	2.40 (50)
+ Citi Non-US Gov Bond	-5.11 (71)	-0.92 (9)	0.63 (1)	3.22 (5)	-0.98 (100)	3.74 (25)	-0.87 (82)	1.01 (62)	-0.08 (83)	1.78 (87)
+ Citi Hedge NonUS Gov	0.23 (5)	1.73 (1)	2.85 (1)	3.57 (5)	0.81 (75)	3.85 (25)	3.89 (1)	4.30 (1)	4.38 (5)	4.41 (25)

# International Income – Risk and Returns

California Public Employees Retirement  
 Risk vs Non-US Fixed Income Returns of Public Funds > \$10 Billion  
 5 Years Ending June 30, 2018



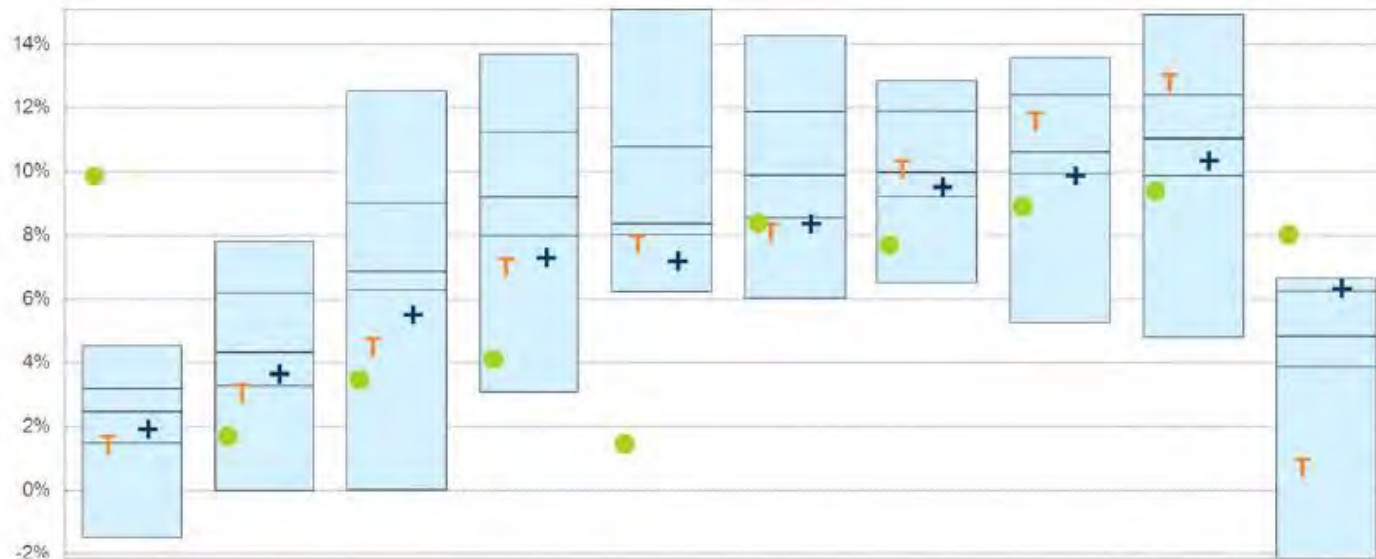
Alpha: 4.52  
 Beta: -0.4  
 R-Squared: 0.56

	Risk Value	Risk Rank	Return Value	Return Rank
T Total Plan - Composites	8.33	37	0.72	82
+ Citi Non-US Gov Bond	8.79	37	1.01	82
▲ Citi Hedge NonUS Gov	3.38	83	4.30	1
Median	7.58		2.09	

# Real Estate – Universe Comparison

## California Public Employees Retirement Performance Comparison

Total Real Estate Returns of Public Funds > \$10 Billion  
Cumulative Periods Ending : June 30, 2018

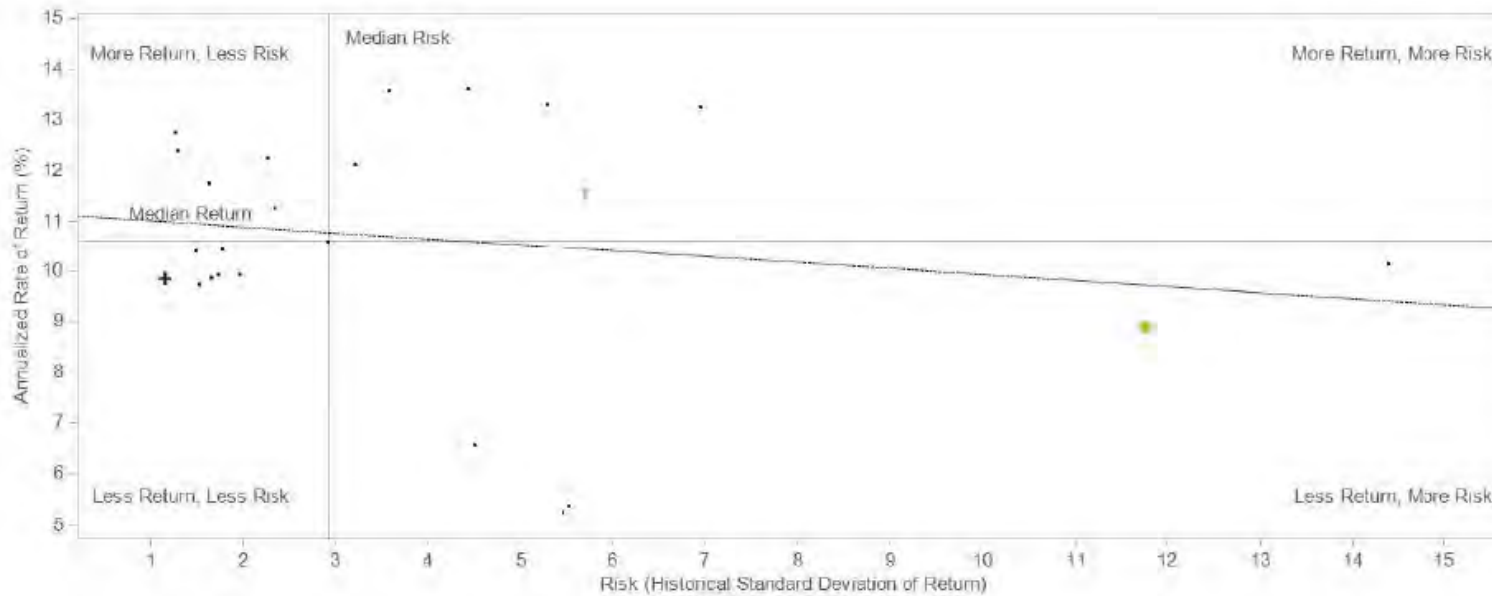


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	4.52	7.81	12.52	13.70	15.09	14.25	12.84	13.59	14.93	6.04
25th	3.18	6.20	9.01	11.24	10.79	11.88	11.90	12.42	12.42	6.26
50th	2.46	4.34	6.87	9.21	8.36	9.89	9.09	10.61	11.04	4.84
75th	1.49	3.28	6.28	7.99	8.03	8.56	9.23	9.95	9.87	3.88
95th	-1.47	0.00	0.01	3.07	6.23	6.02	6.53	5.25	4.81	-2.16
No. Of Obs	29	28	27	27	27	27	24	23	21	18
T Total Plan - Composite	1.33 (75)	2.94 (75)	4.40 (87)	6.90 (87)	7.63 (79)	7.99 (87)	9.96 (50)	11.46 (41)	12.69 (5)	0.81 (93)
+ NCREIF Property Indx	1.81 (60)	3.54 (71)	5.40 (83)	7.20 (87)	7.09 (87)	8.26 (87)	9.41 (70)	9.77 (79)	10.23 (60)	6.22 (25)
● Wilshire RESI	9.74 (1)	1.60 (83)	3.35 (91)	4.00 (91)	1.35 (100)	8.27 (87)	7.59 (79)	8.80 (84)	9.27 (87)	7.91 (1)

# Real Estate – Risk and Returns

## California Public Employees Retirement Risk vs Total Real Estate Returns of Public Funds > \$10 Billion

5 Years Ending June 30, 2018



Alpha: 11.14  
Beta: -0.12  
R-Squared: 0.02

	Risk Value	Risk Rank	Return Value	Return Rank
T Total Plan - Composites	5.77	15	11.46	41
+ NCREIF Property Indx	1.21	100	9.77	79
● Wilshire RESI	11.82	5	8.80	84
Median	2.93		10.81	

Wilshire Consulting



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