

2020 Q2 INVESTMENT SUMMARY: BOARD REPORT

MODOT & PATROL EMPLOYEES' RETIREMENT SYSTEM

August 2020

Kevin Leonard, Partner

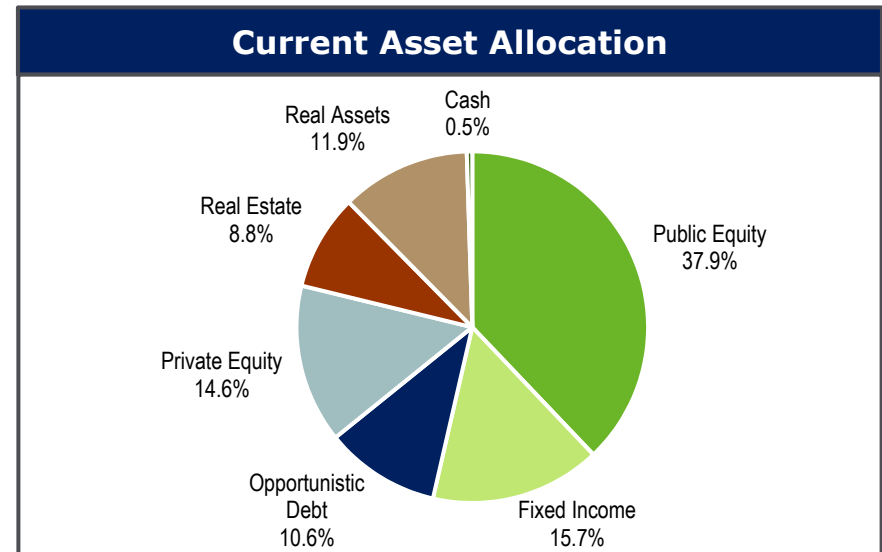
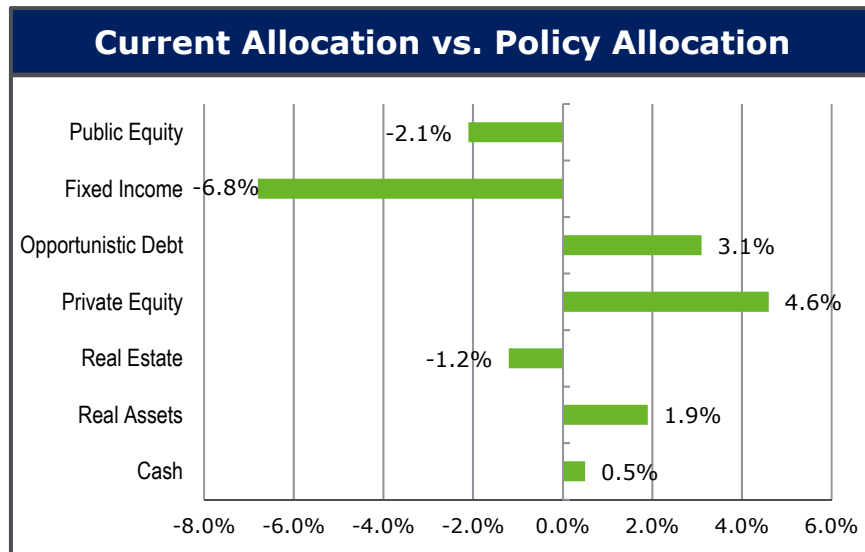
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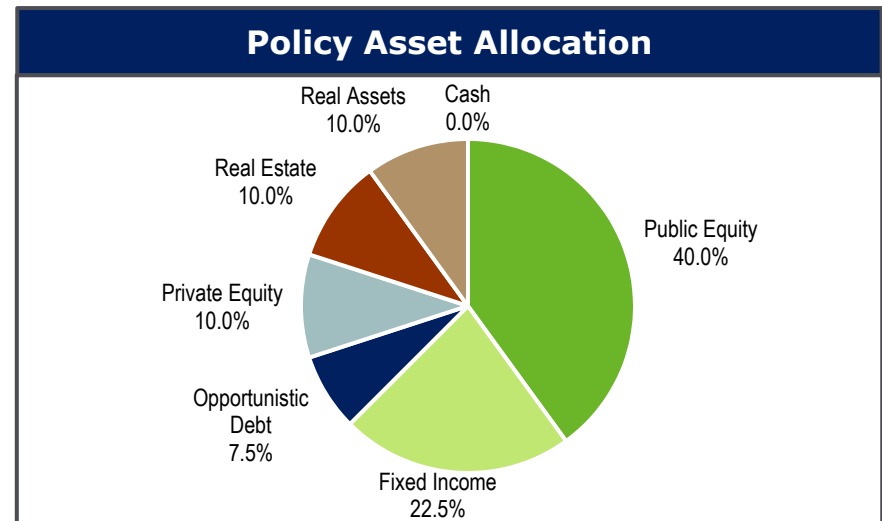
ASSET ALLOCATION – CURRENT vs. POLICY



Current Allocation vs. Policy Allocation

	Current	Policy (%)	Current (%)	Difference* (%)
Public Equity	\$895,040,448	40.0	37.9	-2.1
Fixed Income	\$369,830,439	22.5	15.7	-6.8
Opportunistic Debt	\$250,886,734	7.5	10.6	3.1
Private Equity	\$345,207,198	10.0	14.6	4.6
Real Estate	\$208,436,563	10.0	8.8	-1.2
Real Assets	\$281,649,907	10.0	11.9	1.9
Cash	\$10,779,096	--	0.5	0.5
Total	\$2,361,830,385	100.0	100.0	

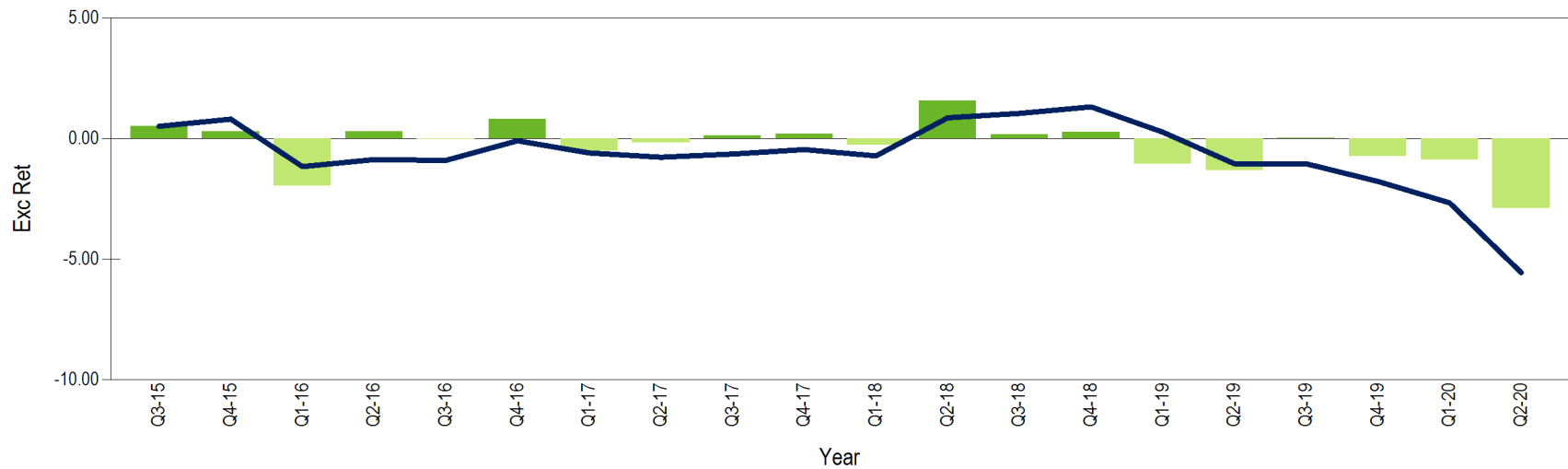
* Difference between Policy and Current Allocation



TOTAL FUND PERFORMANCE SUMMARY

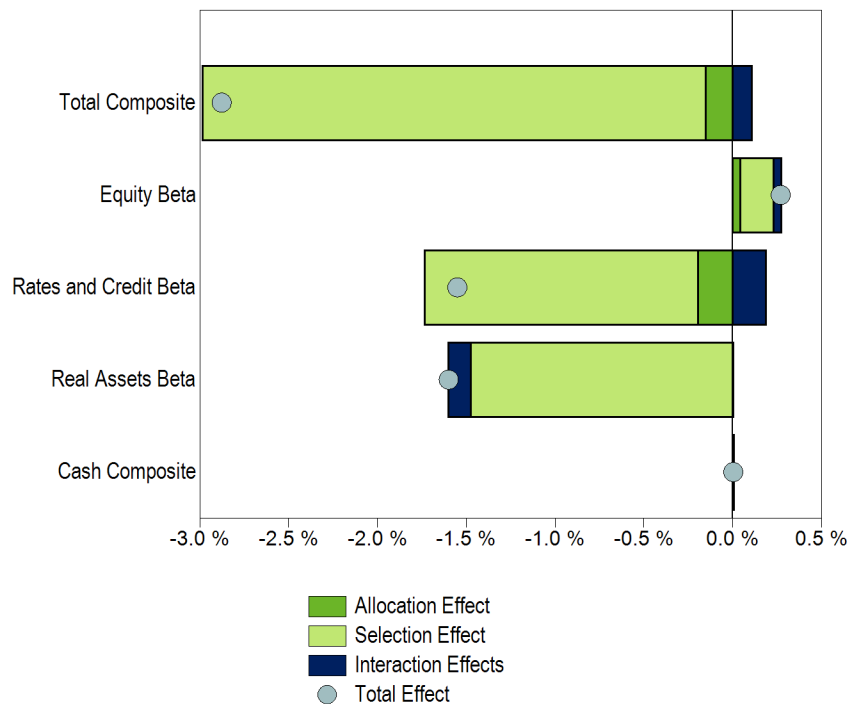
	Market Value	3 Mo	YTD	1 Yr	3 Yrs	5 Yrs	10 Yrs
Total Composite	\$2,361,830,385	4.02%	-5.23%	-0.47%	5.19%	5.51%	8.80%
<i>Policy Index</i>		6.91%	-1.63%	4.03%	6.82%	6.65%	8.20%
<i>InvMetrics Public DB Net Median</i>		13.16%	-2.56%	3.57%	6.00%	5.93%	8.08%

Quarterly and Cumulative Excess Performance



TOTAL FUND ATTRIBUTION ANALYSIS

Attribution Effects 3 Months Ending June 30, 2020



Attribution Summary 3 Months Ending June 30, 2020

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Equity Beta	11.3%	10.8%	0.5%	0.2%	0.0%	0.0%	0.2%
Rates and Credit Beta	0.2%	5.3%	-5.1%	-1.5%	0.0%	0.2%	-1.3%
Real Asset Beta	-7.2%	-0.2%	-7.0%	-1.5%	-0.2%	-0.1%	-1.8%
Cash Composite	0.1%	0.0%	0.1%	0.0%	-0.1%	0.0%	-0.1%
Total	4.0%	6.9%	-2.9%	-2.8%	-0.2%	0.1%	-2.9%

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated return shown on the performance summary.

The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark return.

The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite.

May not add due to rounding

Allocation Effect - The return attributable to the asset allocation of the portfolio

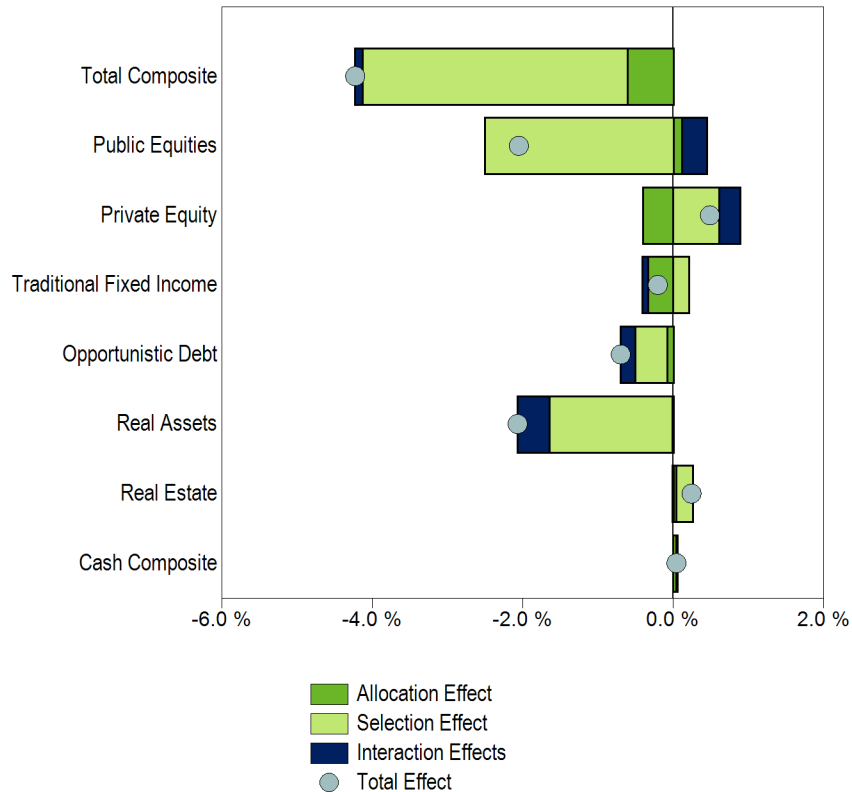
Selection Effect - The return attributable to the managers' security selection

Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects



TOTAL FUND ATTRIBUTION ANALYSIS

**Attribution Effects Relative to Policy Index
1 Year Ending June 30, 2020**



Attribution Summary 1 Year Ending June 30, 2020							
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Public Equities	-4.6%	2.1%	-6.7%	-2.5%	0.0%	0.3%	-2.2%
Private Equity	3.4%	-4.2%	7.6%	0.6%	-0.4%	0.3%	0.5%
Traditional Fixed Income	10.9%	10.0%	0.9%	0.2%	-0.3%	-0.1%	-0.2%
Opportunistic Debt	-5.0%	0.0%	-5.1%	-0.4%	-0.1%	-0.2%	-0.8%
Real Assets	-11.4%	4.7%	-16.0%	-1.6%	0.0%	-0.4%	-2.1%
Real Estate	3.8%	1.7%	2.1%	0.2%	0.0%	0.0%	0.2%
Cash Composite	1.4%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	-0.5%	4.0%	-4.5%	-3.5%	-0.8%	-0.1%	-4.5%

Note: Plan attribution calculations are returns based and the results shown reflect the composites shown. As a result, the total returns shown may vary from the calculated return shown on the performance summary.

The target return shown for each composite is a custom index, based on aggregated policy indices. This policy index asset weights the underlying policy indices of each option in the plan and the respective benchmark return.

The allocation, selection, and interaction effects are calculated using the custom index described above along with the policy or target weight of each composite.

May not add due to rounding

Allocation Effect - The return attributable to the asset allocation of the portfolio

Selection Effect - The return attributable to the managers' security selection

Interaction Effect - The return attributable to the interaction between the Allocation and Selection Effects



MPERS

TOTAL COMPOSITE

As of June 30, 2020	Policy %	% of Portfolio	Market Value (\$)	3 Mo (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank
Total Composite	100.00	100.00	2,361,830,385	4.02	99	-5.23	91	-0.47	95	5.19	71	5.51	70	8.80	21
<i>Policy Index</i>				6.91	96	-1.63	32	4.03	41	6.82	28	6.65	21	8.20	45
Equity Beta	50.00	52.51	1,240,247,646	11.26		-8.26		-1.72							
Public Equities *	40.00	37.90	895,040,448	19.07	58	-11.35	74	-4.62	70	1.83	71	3.69	70	8.57	61
<i>MSCI ACWI</i>				19.22	56	-6.25	54	2.11	51	6.14	46	6.46	44	9.16	50
Private Equity	10.00	14.62	345,207,198	-5.14		-2.49		3.40		12.07		10.16		12.58	
<i>MO Hwy Priv. Equ. Index - Lagged</i>				-18.96		-10.97		-4.17		8.25		9.91		13.82	
Rates and Credit Beta	30.00	26.28	620,717,173	0.21		0.96		4.41							
Traditional Fixed Income	22.50	15.66	369,830,439	2.31	95	8.31	2	10.88	2	7.10	2	6.50	2	7.03	3
<i>Fixed Income Custom Benchmark</i>				3.71	87	7.21	2	10.02	3	5.87	6	4.85	17	4.33	44
Opportunistic Debt	7.50	10.62	250,886,734	-2.77	99	-9.62	99	-5.04	95	4.53	3				
<i>BBgBarc US High Yield TR</i>				10.18	28	-3.80	45	0.03	37	3.33	25	4.79	14	6.68	13
Real Assets Beta	20.00	20.75	490,086,470	-7.19		-7.34		-5.21							
Real Assets	10.00	11.93	281,649,907	-11.22		-12.59		-11.37		0.07		0.73			
<i>CPI + 4% (Unadjusted)</i>				0.86		2.31		4.67		5.78		5.61		5.75	
Real Estate	10.00	8.83	208,436,563	-1.35		0.35		3.80		8.23		8.41		11.98	
<i>MODOT Real Estate Blend</i>				-1.47		-0.77		1.71		5.10		6.73		9.95	
Cash Composite	--	0.46	10,779,096	0.09		0.43		1.43		1.59		1.07		0.46	
<i>91 Day T-Bills</i>				0.03		0.40		1.30		1.66		1.13		0.59	

* May include the use of derivatives

Total Composite is ranked in the IFx Public DB (peer) Net+ Universe

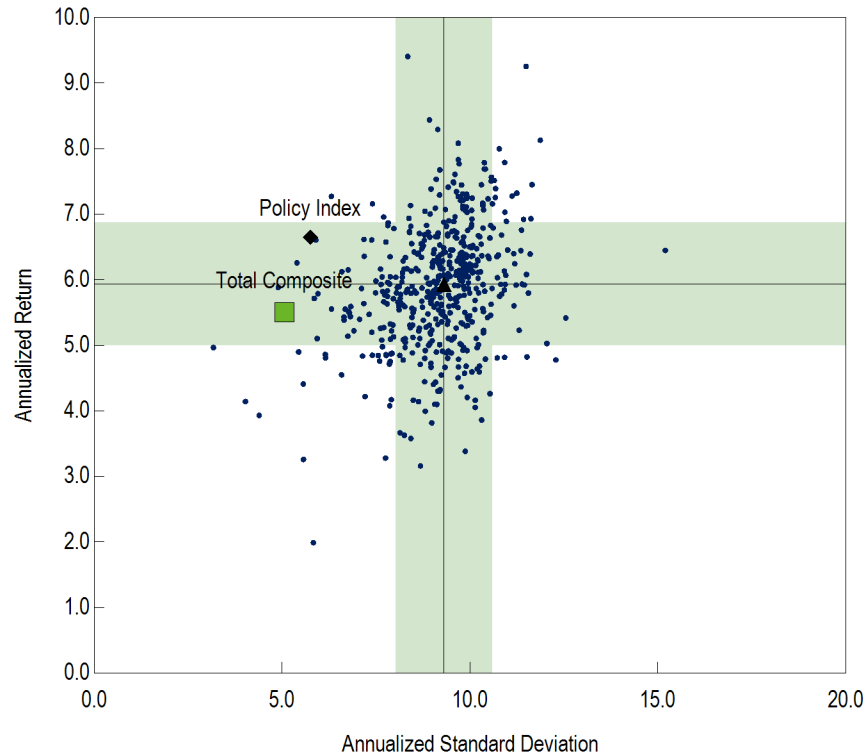
Public Equities Composite is ranked in the eV Global All Cap Equity Net Universe Fixed Income Composite is ranked in the eV All Global

Fixed Inc Net Universe Opportunistic Debt Composite is ranked in the eV US High Yield Fixed Inc Net Universe



TOTAL FUND RISK/RETURN - 5 YEARS

5 Years Ending June 30, 2020



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

Statistics Summary 5 Years Ending June 30, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	5.51%	70	5.06%	1
Policy Index	6.65%	21	5.75%	2

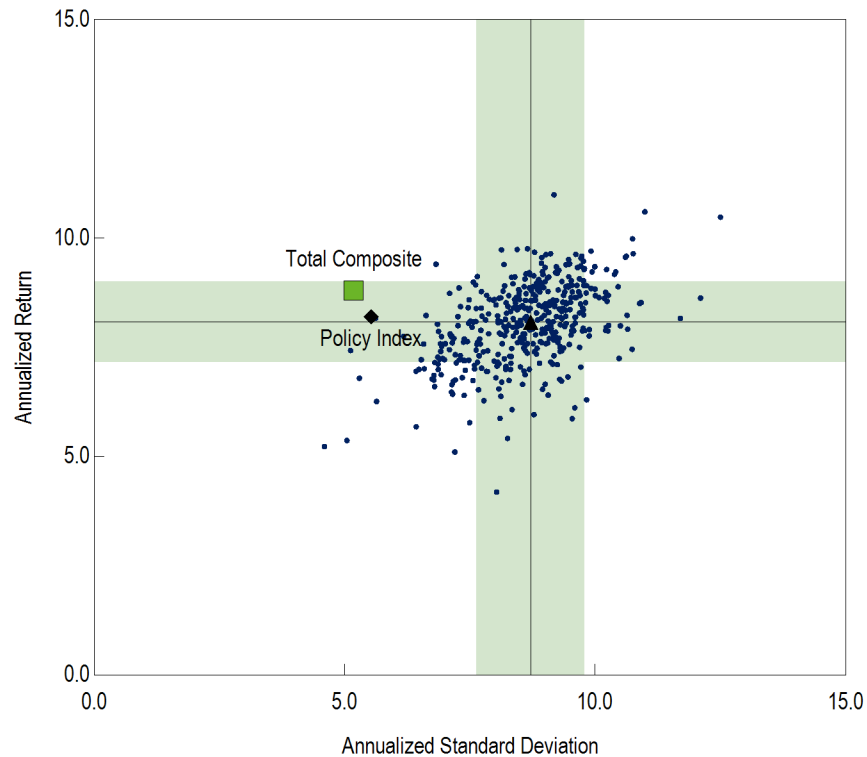
Statistics Summary 5 Years Ending June 30, 2020

	Sharpe Ratio	Rank
Total Composite	0.86	2
Policy Index	0.96	1



TOTAL FUND RISK/RETURN - 10 YEARS

10 Years Ending June 30, 2020



429 Portfolios

- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

Statistics Summary

10 Years Ending June 30, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	8.80%	21	5.18%	1
Policy Index	8.20%	45	5.53%	1

Statistics Summary

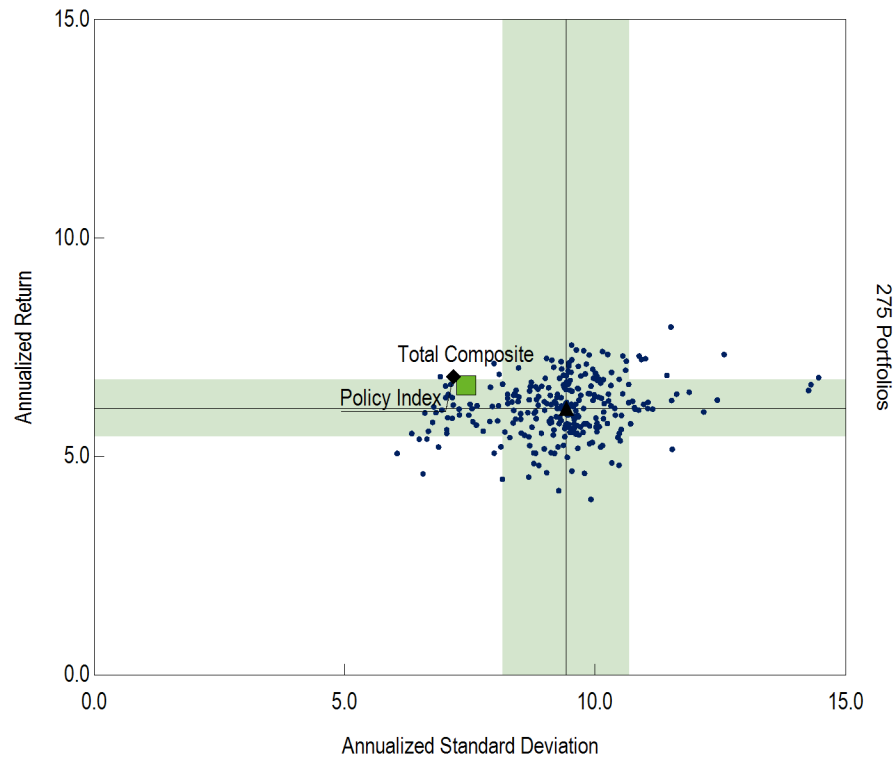
10 Years Ending June 30, 2020

	Sharpe Ratio	Rank
Total Composite	1.59	1
Policy Index	1.38	1



TOTAL FUND RISK/RETURN - 15 YEARS

15 Years Ending June 30, 2020



- Total Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB Net

275 Portfolios

Statistics Summary

15 Years Ending June 30, 2020

	Anlzd Ret	Rank	Anlzd Std Dev	Rank
Total Composite	6.63%	22	7.42%	10
Policy Index	6.82%	14	7.17%	9

Statistics Summary

15 Years Ending June 30, 2020

	Sharpe Ratio	Rank
Total Composite	0.73	3
Policy Index	0.78	1



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- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
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- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
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