

NORTH CAROLINA
DEPARTMENT OF STATE TREASURER



Dale R. Folwell, CPA
STATE TREASURER OF NORTH CAROLINA
DALE R. FOLWELL, CPA

INVESTMENT MANAGEMENT DIVISION

Performance Review

August 17, 2017



Cost-Efficiencies Initiative Update

- Goal:
 - Obtain \$100 million of incremental cost-efficiencies for the NCRS investment program, consistent with fiduciary requirements and the NCRS investment objectives
 - The \$100 million goal would be measured on a cumulative basis over a four-year timeframe

- Progress to date:

Fully Executed Activities

Investment-related services: renegotiations / restructuring
Investment manager terminations / renegotiations

Sub-Total

Approx. Annual Savings (\$000)

\$3,126

\$49,307

\$52,433

In Process

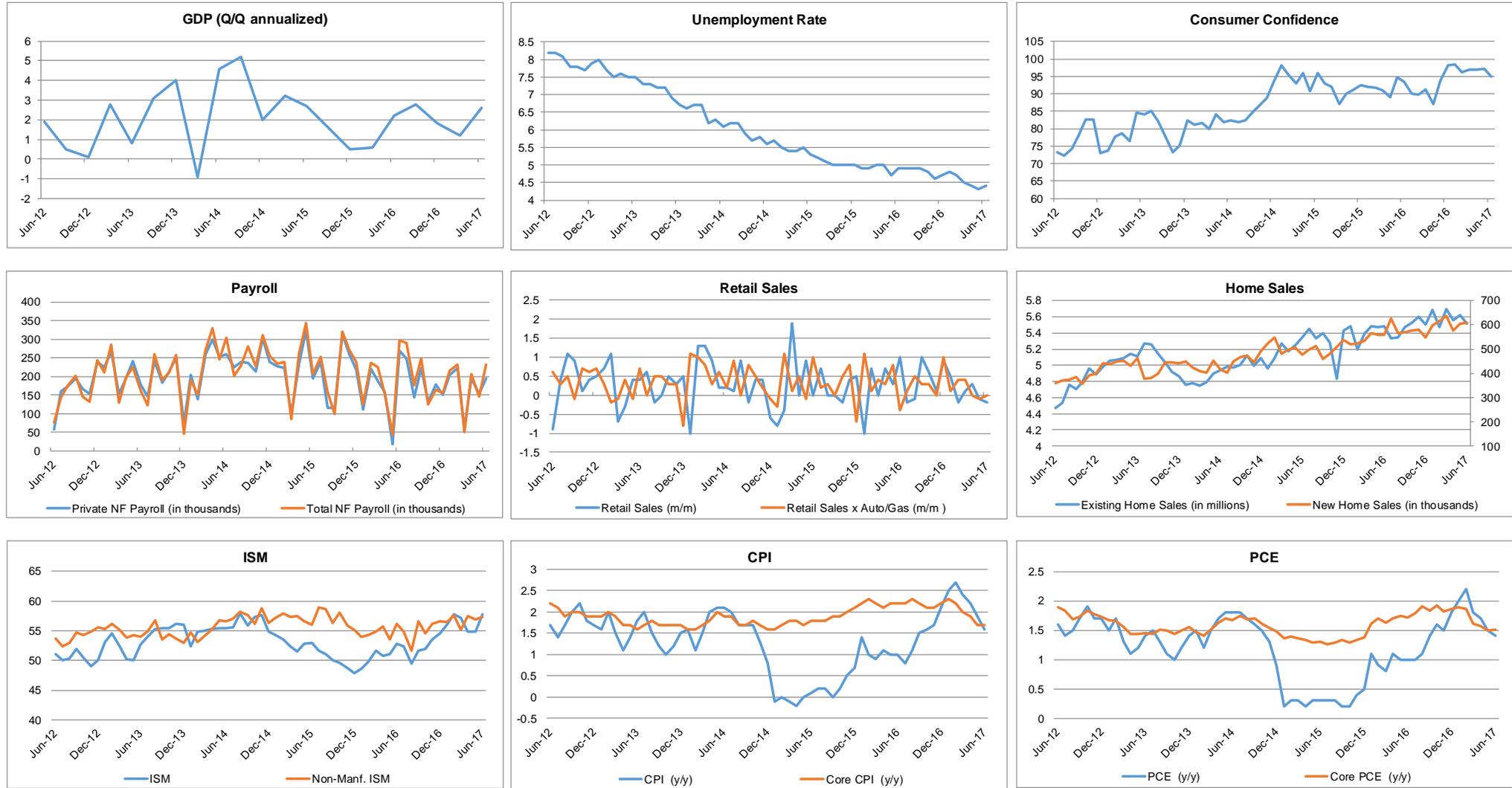
Investment manager renegotiations / restructuring

\$10,202

Grand Total

\$62,635

US Economic Environment



Source: Bloomberg; Data as of 06/30/17



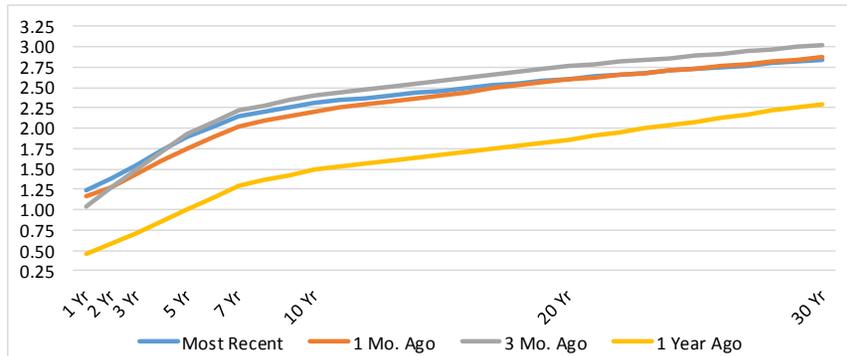
Global Economic Environment

Countries	Real GDP YoY		Unemployment		CPI YoY		Countries	Real GDP YoY		Unemployment		CPI YoY	
	Date	Value	Date	Value	Date	Value		Date	Value	Date	Value	Date	Value
U.S.	06/17	2.1	06/17	4.4	06/17	1.6	Asia/Pacific/Latam						
Europe							China	06/17	6.9			06/17	1.5
Germany	03/17	1.7	06/17	5.7	06/17	1.6	India	03/17	6.1			06/17	1.1
France	06/17	1.8	06/17	9.6	06/17	0.7	Japan	03/17	1.3	06/17	2.8	06/17	0.4
U.K.	06/17	1.7	05/17	4.5	06/17	2.6	Indonesia	03/17	5.0			06/17	4.4
Italy	03/17	1.2	06/17	11.1	06/17	1.2	Brazil	03/17	-0.4			06/17	3.0
Spain	06/17	3.1	06/17	17.1	06/17	1.5	Australia	03/17	1.7	06/17	5.6	06/17	1.9

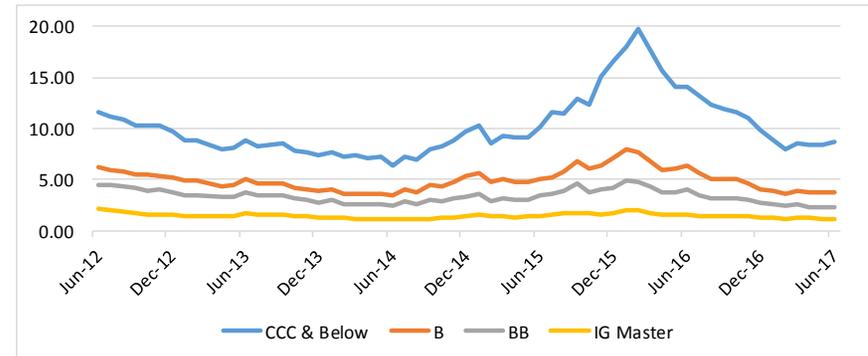


Market Environment

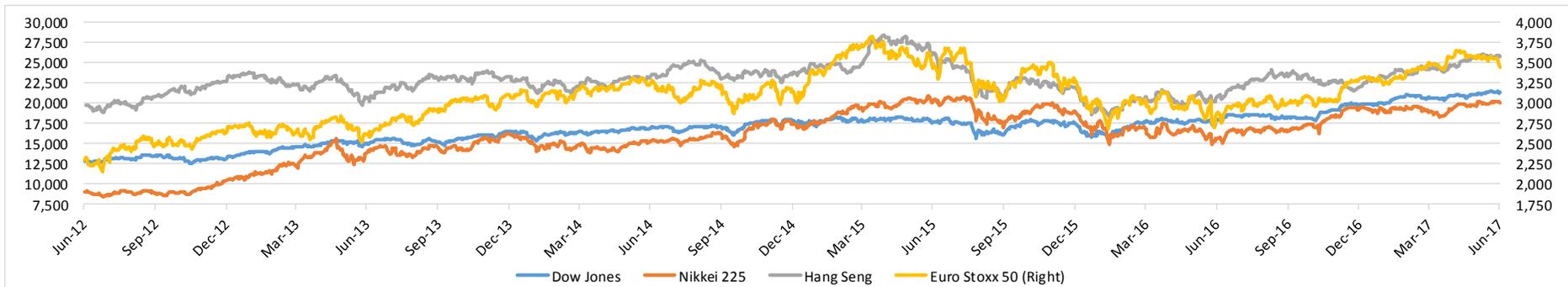
UST (Constant Maturity) Curve



Corporate Credit OAS (BofAML Indices)



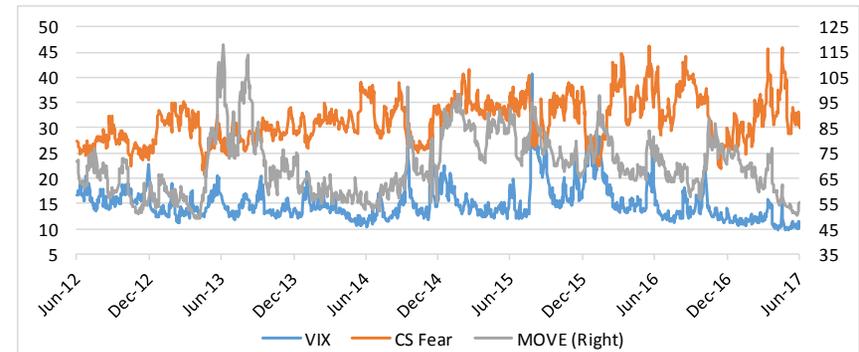
Global Equity Markets



US Dollar Trade Weighted Broad Index

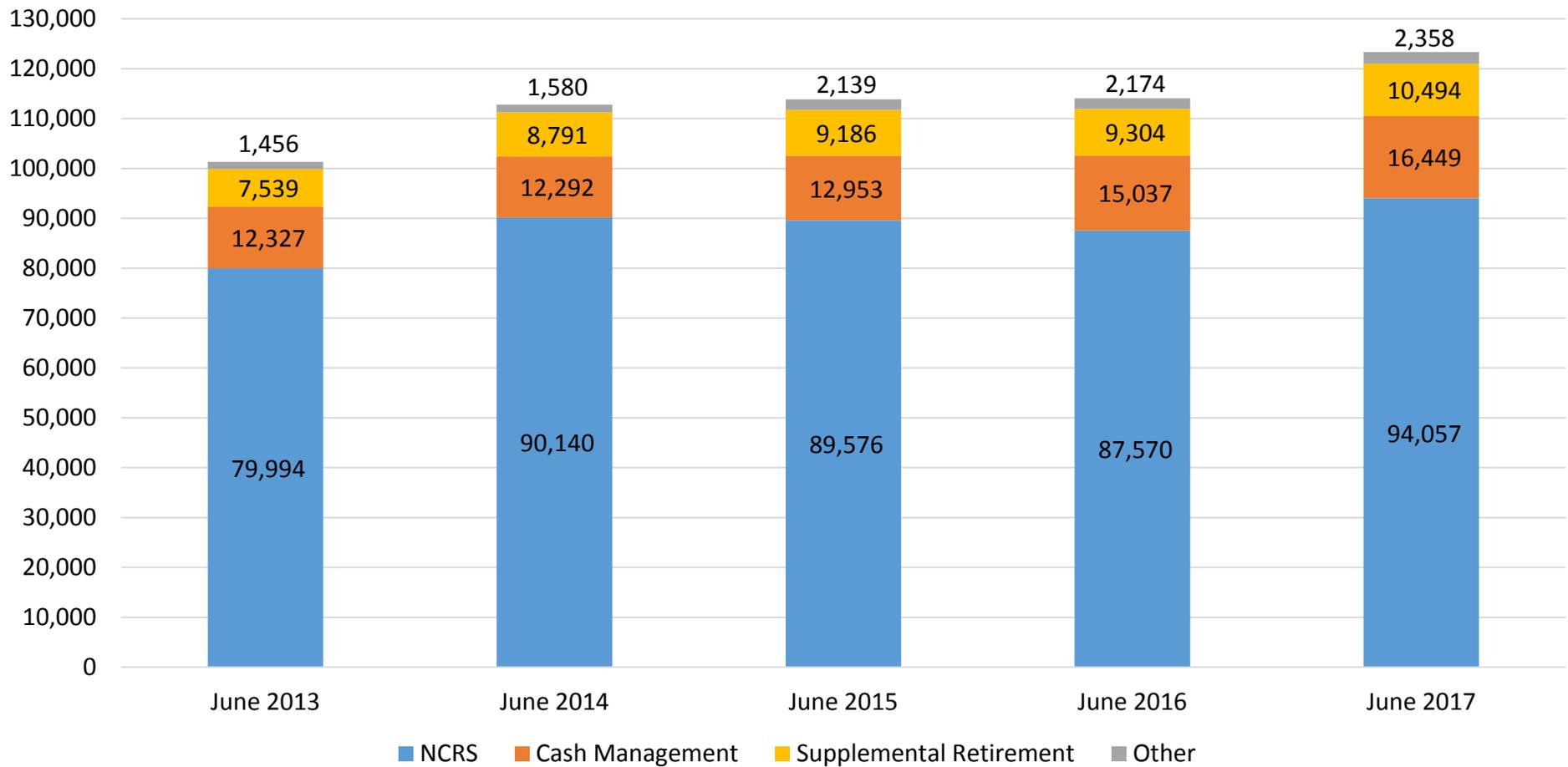


Volatility Indicators



Assets Under Management (\$MM)

\$123.2 Billion as of June 30, 2017



Note: The Cash Management Program does not include Assets with Fiscal Agent which are reflected in the Bond Proceeds Fund. These funds which may have been reported in the Cash Management Program previously have now been removed for all years shown in this report to more accurately reflect the Cash Management Program balance.



NCRS Asset Allocation

As of June 30, 2017

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
Growth	\$49,351	52.47%	58.00%	37.00%	71.00%	-5.53%	(\$5,202)
Public Equity	35,332	37.56%	42.00%	37.00%	47.00%	-4.44%	(4,172)
Private Equity	4,825	5.13%	6.00%	0.00%	8.75%	-0.87%	(818)
Non Core Real Estate	3,670	3.90%	3.00%	0.00%	8.00%	0.90%	848
Opportunistic Fixed Income	5,524	5.87%	7.00%	0.00%	7.50%	-1.13%	(1,060)
Rates & Liquidity	31,931	33.95%	29.00%	24.00%	42.00%	4.95%	4,654
IG Fixed Income & Cash	28,248	30.03%	28.00%	24.00%	32.00%	2.03%	1,912
Pension Cash	3,683	3.92%	1.00%	0.00%	10.00%	2.92%	2,742
Inflation Sensitive & Diversifiers	11,020	11.72%	11.00%	4.00%	16.00%	0.72%	674
Inflation Sensitive	6,504	6.92%	6.00%	2.00%	7.50%	0.92%	861
Core Real Estate	4,516	4.80%	5.00%	2.00%	10.00%	-0.20%	(187)
Multi-Strategy	1,754	1.87%	2.00%	0.00%	4.00%	-0.13%	(127)
Grand Total	\$94,057	100.00%					



NCRS Asset Allocation (Unaudited)

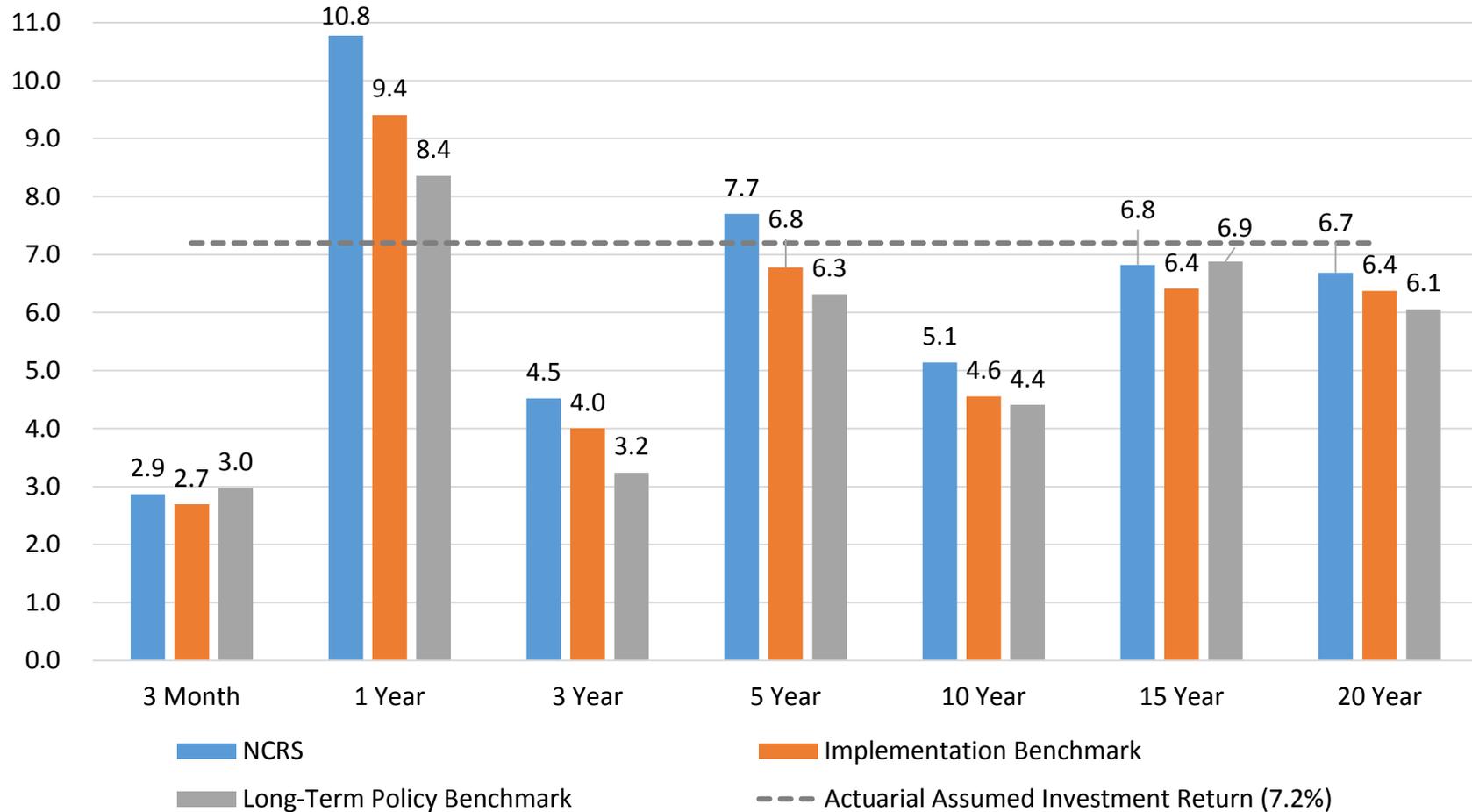
As of August 8, 2017

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
Growth	\$50,527	53.20%	58.00%	37.00%	71.00%	-4.80%	(\$4,560)
Public Equity	36,504	38.43%	42.00%	37.00%	47.00%	-3.57%	(3,387)
Private Equity	4,870	5.13%	6.00%	0.00%	8.75%	-0.87%	(829)
Non Core Real Estate	3,692	3.89%	3.00%	0.00%	8.00%	0.89%	843
Opportunistic Fixed Income	5,461	5.75%	7.00%	0.00%	7.50%	-1.25%	(1,187)
Rates & Liquidity	31,821	33.50%	29.00%	24.00%	42.00%	4.50%	4,277
IG Fixed Income & Cash	28,405	29.91%	28.00%	24.00%	32.00%	1.91%	1,812
Pension Cash	3,416	3.60%	1.00%	0.00%	10.00%	2.60%	2,466
Inflation Sensitive & Diversifiers	10,853	11.43%	11.00%	4.00%	16.00%	0.43%	406
Inflation Sensitive	6,438	6.78%	6.00%	2.00%	7.50%	0.78%	740
Core Real Estate	4,415	4.65%	5.00%	2.00%	10.00%	-0.35%	(334)
Multi-Strategy	1,776	1.87%	2.00%	0.00%	4.00%	-0.13%	(123)
Grand Total	\$94,977	100.00%					



NCRS Total Net Portfolio Return vs. Benchmarks

As of June 30, 2017



Notes:

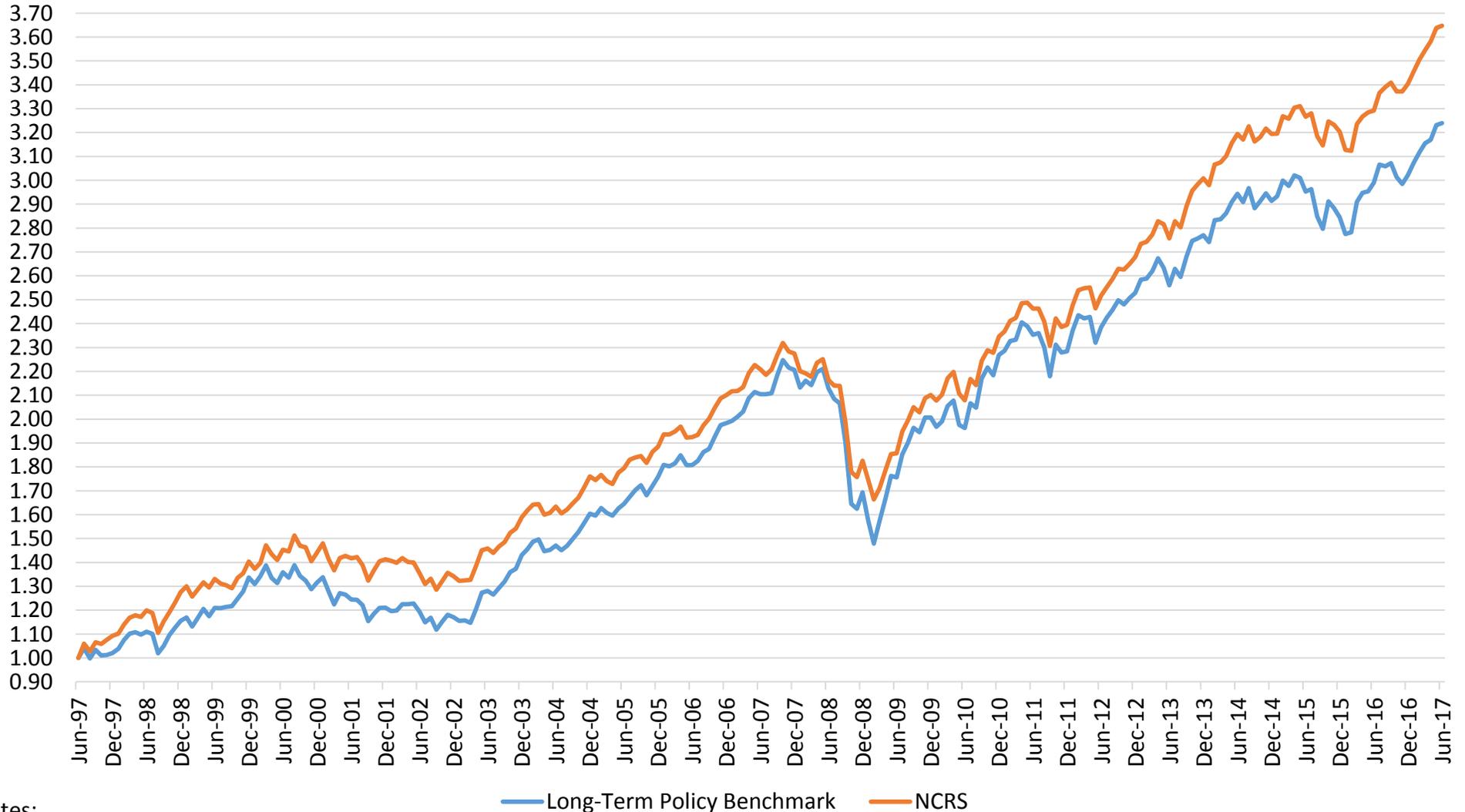
Returns for periods greater than one year are annualized.

Implementation Benchmark is a blend of the Asset Class Benchmarks at policy weights. It is currently weighted as follows: 58% Growth Benchmark, 29% Rates & Liquidity Benchmark, 11% Inflation Sensitive & Diversifiers Benchmark, and 2% Multi-Strategy Benchmark.

Long-Term Policy Benchmark is comprised of 57% MSCI ACWI IMI Net, 33% BOAML 5+ Years U.S. Treasury Index, 6% Bloomberg Commodity Index, and 4% BOAML 1-3 Years U.S. Inflation-Linked Treasury Index.



Growth of a Dollar Through June 30, 2017



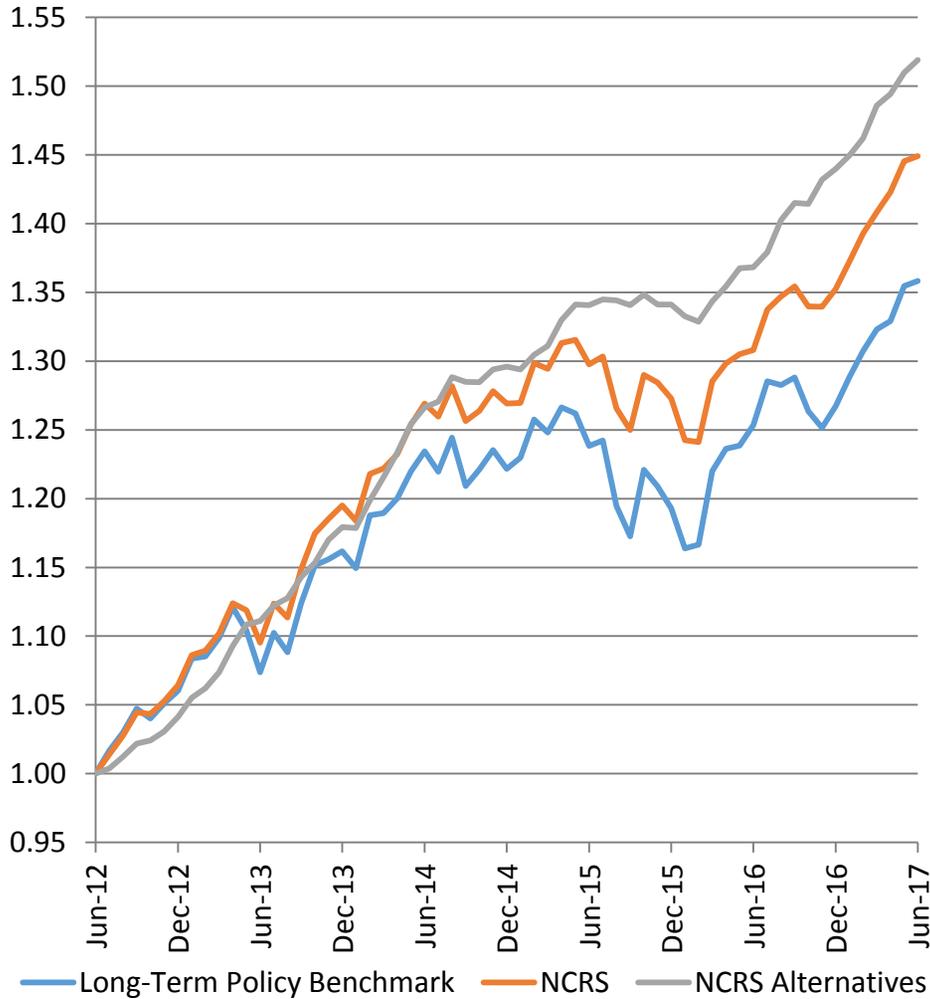
Notes:

Long-Term Policy Benchmark is comprised of 57% MSCI ACWI IMI Net, 33% BOAML 5+ Years U.S. Treasury Index, 6% Bloomberg Commodity Index, and 4% BOAML 1-3 Years U.S. Inflation-Linked Treasury Index.

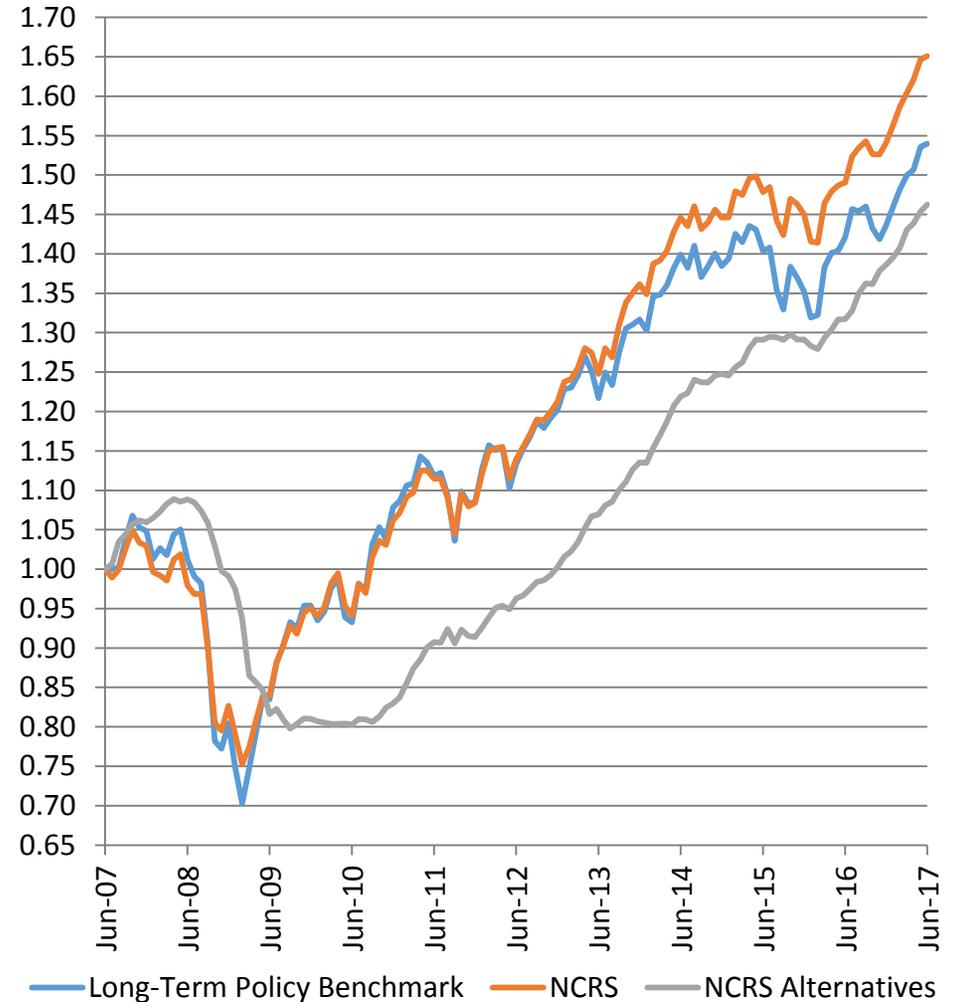


Growth of a Dollar

5 Years Ending June 30, 2017



10 Years Ending June 30, 2017



Note: NCRS Alternatives includes the following: Core Real Estate, Inflation Sensitive - Private Natural Resources, Inflation Sensitive - Real Assets and Other, Multi-Strategy Investments, Non Core Real Estate, Opportunistic Fixed Income, Private Equity, Equity Hedge Strategies and closed-end Public Natural Resource funds.



NCRS Net of Fees Return Attribution

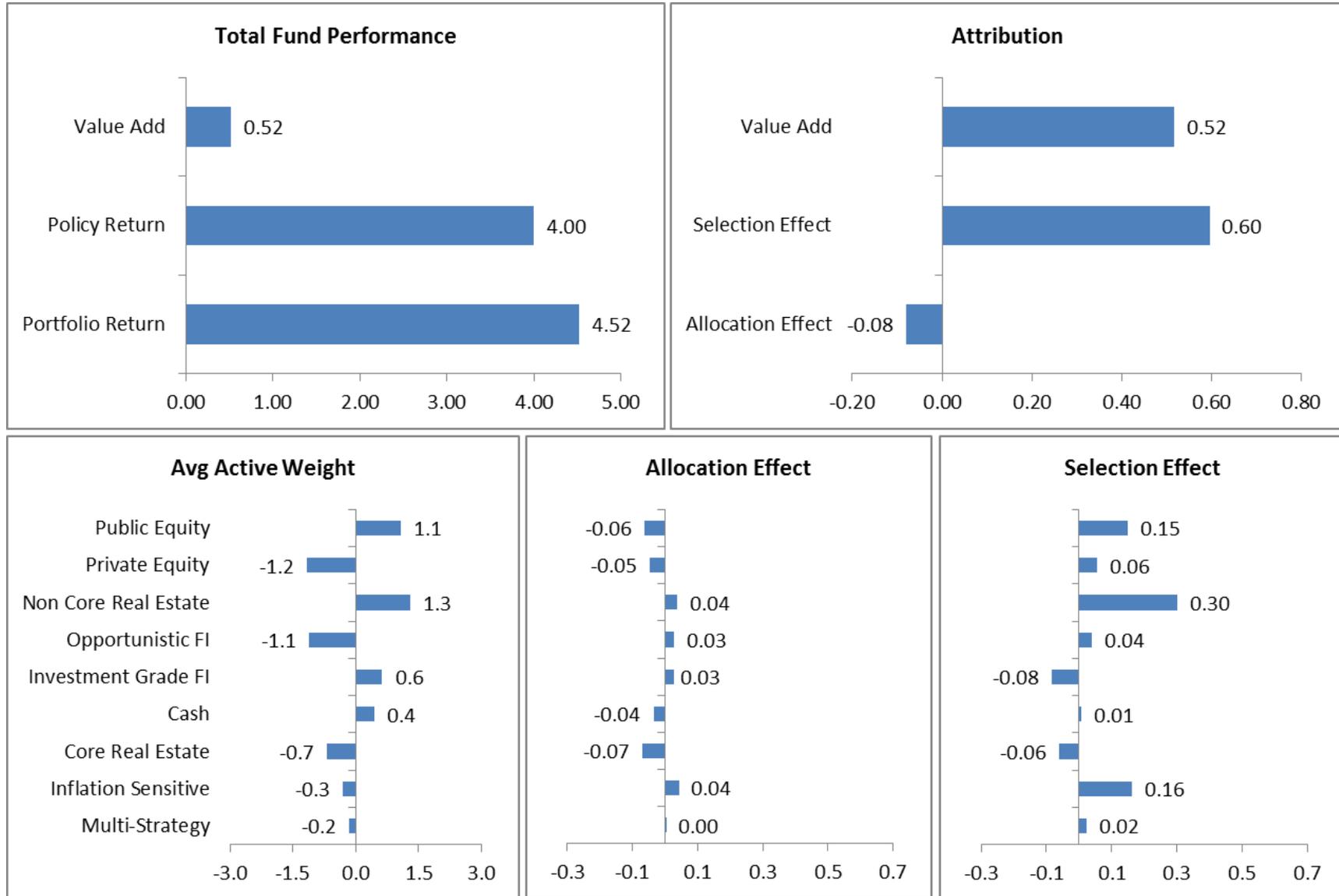
Total Fund vs. Implementation Benchmark: 1 Year Ending June 30, 2017





NCRS Net of Fees Return Attribution

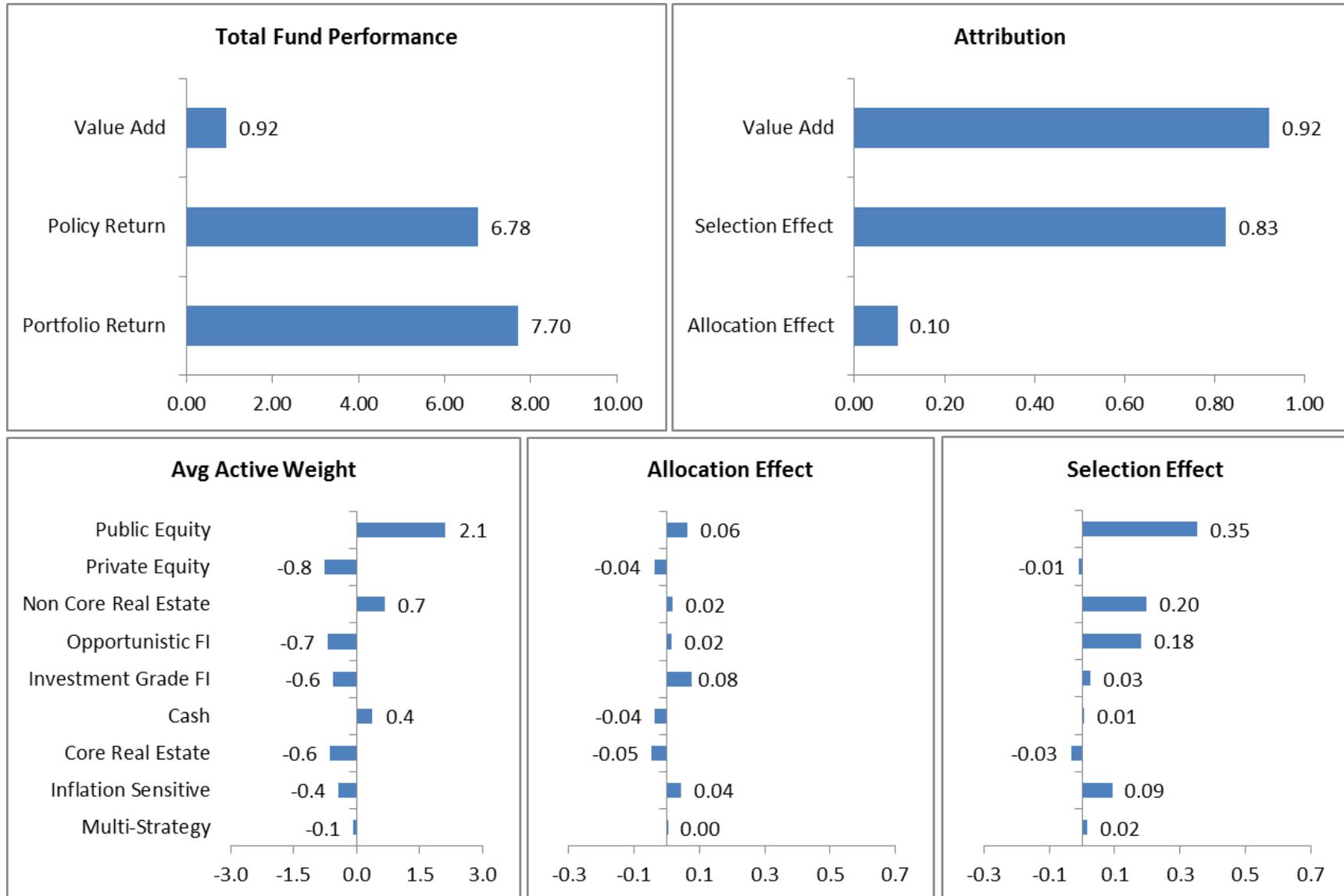
Total Fund vs. Implementation Benchmark: 3 Years Ending June 30, 2017





NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 5 Years Ending June 30, 2017





NCRS Gross of Fees Return and Risk

BNY Mellon Universe: Public Funds > \$20B; Data as of June 30, 2017

<u>Returns</u>	<u>3 Years</u>	<u>5 Years</u>	<u>10 Years</u>	<u>15 Year</u>	<u>20 Year</u>
25th percentile	6.10	9.12	5.46	7.73	7.28
Median	5.34	8.65	5.21	7.39	6.73
75th percentile	4.62	7.59	4.46	7.04	6.55
NCRS	5.16	8.32	5.65	7.21	6.98
Percentile Rank (1 = highest performance)	65	68	21	66	35

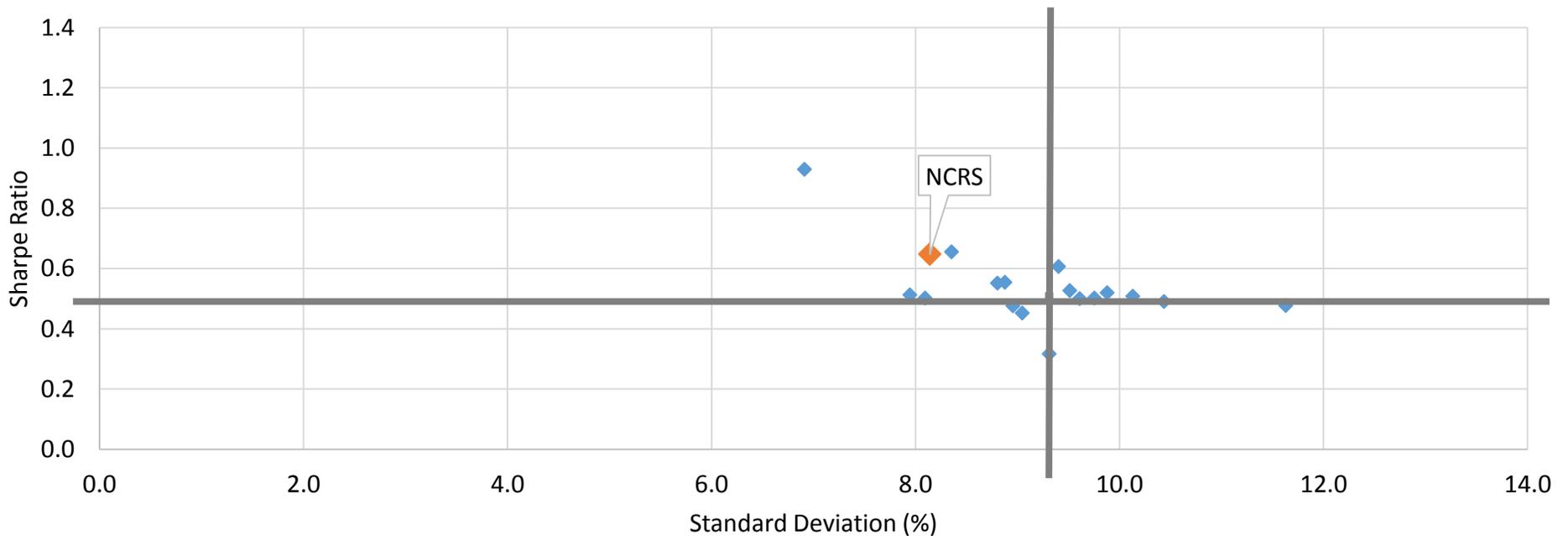
<u>Risk</u>	<u>3 Years</u>	<u>5 Years</u>	<u>10 Years</u>	<u>15 Year</u>	<u>20 Year</u>
25th percentile	5.80	5.53	9.82	9.13	9.59
Median	5.34	5.17	9.31	8.49	8.82
75th percentile	4.79	4.54	8.58	8.10	8.19
NCRS	4.87	4.75	8.14	7.51	8.09
Percentile Rank (99 = lowest risk)	74	68	83	91	81

NCRS Gross of Fees Sharpe Ratio

BNY Mellon Universe: Public Funds > \$20B; Data as of June 30, 2017

Sharpe Ratio	3 Years	5 Years	10 Years	15 Year	20 Year
25th percentile	1.03	1.70	0.55	0.76	0.59
Median	0.93	1.56	0.51	0.73	0.56
75th percentile	0.86	1.43	0.48	0.66	0.49
NCRS	1.01	1.67	0.65	0.80	0.61
Percentile Rank (1 = highest performance)	27	27	12	15	20

10 Year Plot: Sharpe Ratio vs. Volatility

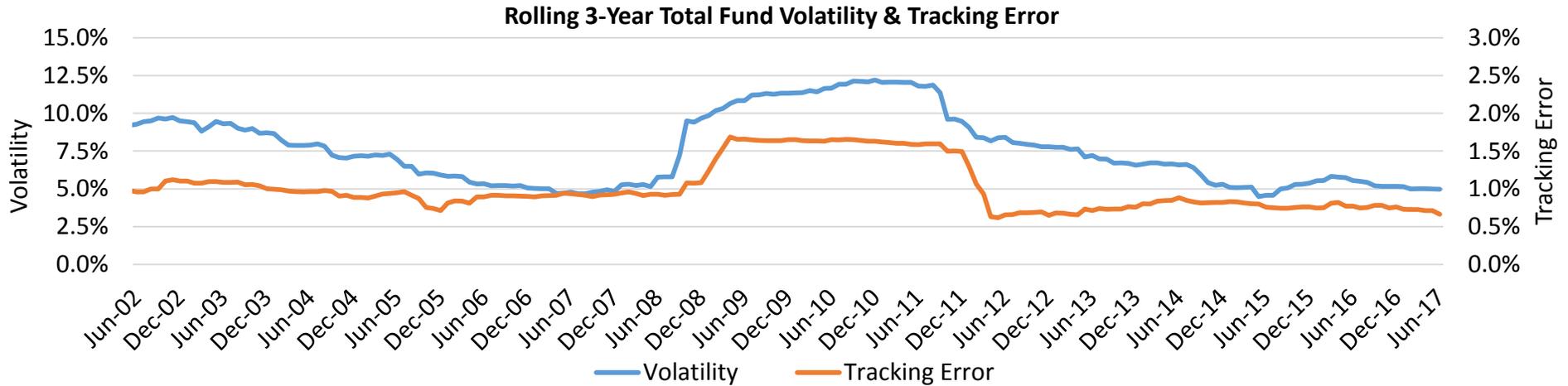


Note: Data shown is gross of fees with the exception of incentive payments which have been deducted from NAV when applicable.



NCRS Net of Fees Risk and Return Metrics

As of June 30, 2017

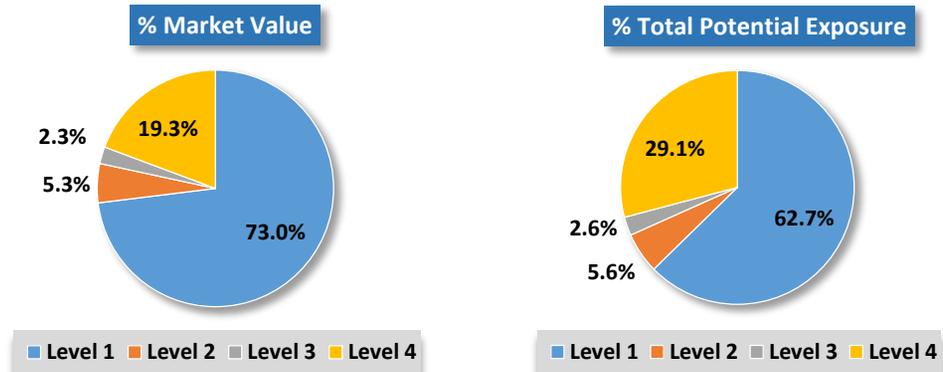


Program	POSITION		36-MONTH					60-MONTH				
	\$ Bil	% Wgt	Return	St. Dev	Active Return	TE	IR	Return	St. Dev	Active Return	TE	IR
Total NCRS	94.1	100.0	4.5	5.0	0.5	0.7	0.8	7.7	4.8	0.9	0.8	1.2
Growth	49.4	52.5	5.5	8.0	0.9	0.8	1.1	11.0	7.6	1.3	0.9	1.5
Public Equity	35.3	37.6	5.0	10.5	0.4	0.6	0.6	11.4	9.9	0.8	0.7	1.2
Private Equity	4.8	5.1	7.8	3.1	1.3	2.3	0.5	9.4	3.1	-0.3	3.5	-0.1
Non-Core Real Estate	3.7	3.9	14.3	3.1	7.5	4.1	1.8	13.7	3.2	4.8	3.8	1.3
Opportunistic Fixed Income	5.5	5.9	2.0	3.3	0.6	3.9	0.2	7.1	3.3	4.0	3.6	1.1
Rates & Liquidity	31.9	33.9	2.8	3.3	-0.3	0.6	-0.5	2.7	3.7	0.0	0.6	0.0
IG Fixed Income & Cash	28.2	30.0	3.0	3.5	-0.2	0.6	-0.4	2.8	3.8	0.1	0.6	0.1
Pension Cash	3.7	3.9	0.8	0.1	0.5	0.1	6.1	--	--	--	--	--
Inflation Sensitive & Diversifiers	11.0	11.7	2.8	2.9	0.4	2.5	0.2	4.2	3.0	0.1	2.4	0.0
Inflation Sensitive	6.5	6.9	-0.9	4.9	2.5	3.3	0.8	0.5	4.8	1.4	2.9	0.5
Core Real Estate	4.5	4.8	8.2	2.5	-1.6	2.1	-0.8	9.7	3.7	-0.9	2.7	-0.3
Multi-Strategy	1.8	1.9	4.2	7.5	1.3	0.9	1.4	9.3	7.1	0.9	1.0	0.9



NCRS Liquidity Profile

As of June 30, 2017



Current Exposure (\$MM Market Value)											
	Global Public Equity	Private Equity	Non Core Real Estate	Opportunistic Fixed Income	Investment Grade Fixed Income	Pension Cash	Inflation Sensitive	Core Real Estate	Multi-Strategy	Total \$	Total %
Level 1	\$33,865	\$21	\$0	\$514	\$28,248	\$3,683	\$260	\$667	\$1,443	\$68,702	73.0%
Level 2	\$879	\$0	\$0	\$1,907	\$0	\$0	\$1,102	\$985	\$148	\$5,021	5.3%
Level 3	\$203	\$0	\$0	\$1,155	\$0	\$0	\$227	\$582	\$1	\$2,168	2.3%
Level 4	\$386	\$4,804	\$3,670	\$1,948	\$0	\$0	\$4,915	\$2,281	\$162	\$18,166	19.3%
Total \$	\$35,332	\$4,825	\$3,670	\$5,524	\$28,248	\$3,683	\$6,504	\$4,516	\$1,754	\$94,057	100.0%
Total %	37.56%	5.13%	3.90%	5.87%	30.03%	3.92%	6.92%	4.80%	1.87%		

Total Potential Exposure (Market Value + Unfunded Commitments)											
	Global Public Equity	Private Equity	Non Core Real Estate	Opportunistic Fixed Income	Investment Grade Fixed Income	Pension Cash	Inflation Sensitive	Core Real Estate	Multi-Strategy	Total	Total %
Level 1	\$26,755	\$21	\$0	\$514	\$25,610	\$3,683	\$260	\$667	\$1,443	\$58,954	62.7%
Level 2	\$879	\$0	\$0	\$2,040	\$0	\$0	\$1,102	\$1,134	\$148	\$5,302	5.6%
Level 3	\$203	\$0	\$0	\$1,270	\$0	\$0	\$227	\$716	\$1	\$2,417	2.6%
Level 4	\$796	\$7,872	\$5,888	\$3,114	\$0	\$0	\$6,472	\$2,867	\$374	\$27,384	29.1%
Total \$	\$28,632	\$7,894	\$5,888	\$6,937	\$25,610	\$3,683	\$8,061	\$5,385	\$1,967	\$94,057	100.0%
Total %	30.44%	8.39%	6.26%	7.38%	27.23%	3.92%	8.57%	5.72%	2.09%		

Note: Level 1 Liquidity = T+3; Level 2 = T+3 to 12 Months; Level 3 = 12 to 24 Months; Level 4 = Greater than 24 Months

NCRS Asset Class Net of Fees Performance

As of June 30, 2017

	Market Value (\$MM)	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Growth	\$49,351	16.77	5.55	10.99	4.38	7.15	6.61
Benchmark ¹		15.61	4.63	9.69	3.64	6.71	5.98
Public Equity	\$35,332	18.99	4.97	11.39	4.51	7.25	6.65
Benchmark ²		18.07	4.62	10.56	3.80	6.65	5.87
Private Equity	\$4,825	9.73	7.85	9.43	6.45	6.22	7.00
Benchmark ³		9.25	6.60	9.71	7.67	10.60	12.62
Non-Core Real Estate	\$3,670	11.21	14.34	13.70	3.03	5.78	8.22
Benchmark ⁴		5.23	6.82	8.92	0.17	6.96	8.02
Opportunistic Fixed Income	\$5,524	11.51	1.98	7.06	6.81	-	-
Benchmark ⁵		11.07	1.33	3.05	0.19	-	-
Rates & Liquidity	\$31,931	-0.37	2.85	2.72	5.91	5.78	6.39
Benchmark ⁶		-0.60	3.12	2.70	5.65	5.56	6.18
IG Fixed Income	\$28,248	-0.29	2.97	2.82	5.96	5.81	6.41
Benchmark ⁷		-0.64	3.22	2.76	5.68	5.58	6.20
Cash	\$3,683	0.97	0.77	-	-	-	-
Benchmark ⁸		0.55	0.24	0.16	-	-	-
Inflation Sensitive & Diversifiers	\$11,020	10.68	2.84	4.19	0.81	4.05	5.33
Benchmark ⁹		4.42	2.45	4.11	-0.17	3.86	5.66
Inflation Sensitive	\$6,504	12.13	-0.94	0.47	-1.38	3.20	3.82
Benchmark ¹⁰		2.62	-3.43	-0.88	0.95	4.25	4.73
Core Real Estate	\$4,516	8.97	8.16	9.68	4.46	6.50	7.23
Benchmark ¹¹		6.57	9.80	10.56	4.68	7.20	8.20
Multi-Strategy	\$1,754	13.20	4.22	9.31	5.17	-	-
Benchmark ¹²		12.39	2.90	8.45	4.45	-	-



New, Incremental, & Unfunded Investment Commitments

Since March 29, 2017, IAC Meeting

<u>Fund Name</u>	<u>Firm Name</u>	<u>New or Incremental Commitment (\$MM)</u>	<u>Closing Date</u>
Public Equity			
None	--	--	--
Private Equity			
None	--	--	--
Non-Core Real Estate			
None	--	--	--
Opportunistic Fixed Income			
None	--	--	--
Inflation Sensitive			
None	--	--	--
Core Real Estate			
None	--	--	--
Multi Strategy			
None	--	--	--

As of June 30, 2017

<u>Fund Name</u>	<u>Unfunded Commitments (\$MM)</u>
Public Equity	410
Private Equity	3,068
Non-Core Real Estate	2,218
Opportunistic Fixed Income	1,413
Inflation Sensitive	1,557
Core Real Estate	869
Multi Strategy	212
Total	9,748



Exited Investments

Fiscal Year 2016-2017

<u>Fund Name</u>	<u>Redemption Amount</u>	<u>Redemption Effective</u>
<u>Public Equity</u>		
Piedmont Strategic Core	~\$345,000,000	01/30/2017
GMO International Active Strategy	~\$520,000,000	01/30/2017
Leading Edge Large Cap Composite	~\$225,000,000	03/09/2017
Longview Global Equity	~\$1,700,000,000	03/20/2017
TimesSquare Focused Growth	~\$230,000,000	03/20/2017
Numeric Emerging Growth	~\$380,000,000	03/20/2017
Brandes Global Equity	~\$1,062,000,000	04/17/2017
Sands Large Cap Growth Equity	~\$598,000,000	05/04/2017
Hotchkis Large Cap Fundamental Value	~\$952,000,000	05/04/2017
Wellington Large Cap Value	~\$788,000,000	05/04/2017
FIS International Composite	~\$200,000,000	06/13/2017
Wasatch Emerging Markets Small Cap	~\$200,000,000	06/13/2017
<u>Core Real Estate</u>		
UBS Trumbull Property Income Fund	~169,000,000	07/15/2016
Prudential Property Investment Separate Account	~\$161,000,000	04/17/2017
UBS Trumbull Property Fund	~\$321,000,000	07/17/2017



Appendix



NCRS Public Equity Net of Fees Performance

As of June 30, 2017

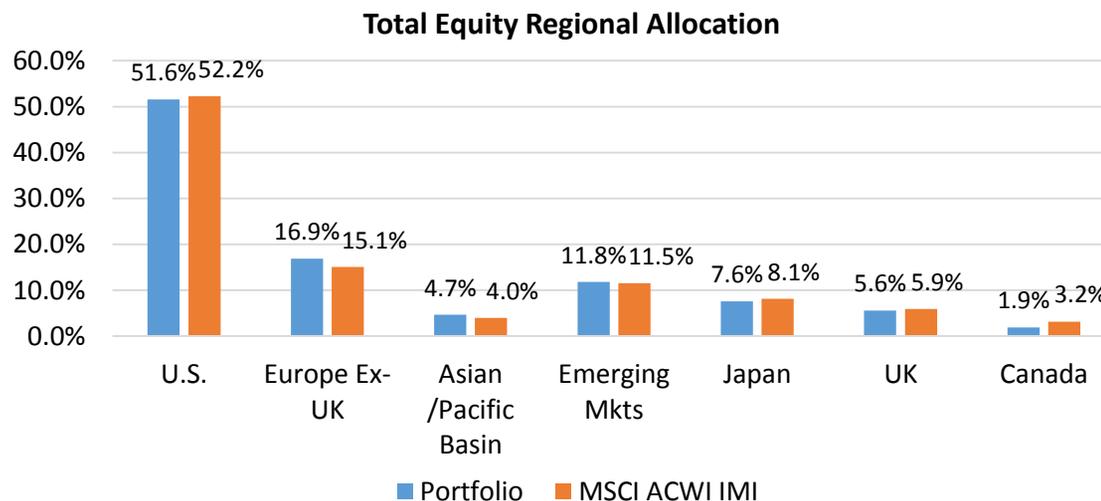
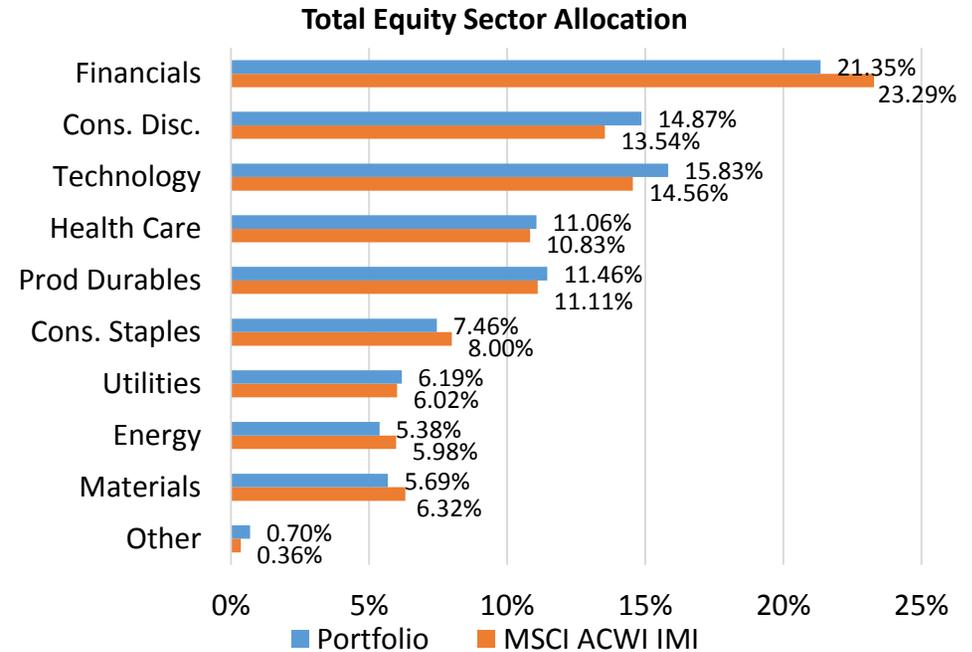
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Public Equity*	\$35,332	4.46	18.99	4.97	11.39	4.51
Benchmark ²		4.03	18.07	4.62	10.56	3.80
Domestic Portfolio	\$15,514	3.09	18.72	8.47	14.56	7.30
Russell 3000		3.02	18.51	9.10	14.59	7.26
Non-US Portfolio	\$16,714	6.75	21.70	1.94	8.51	1.48
Custom Benchmark		5.85	20.43	1.14	7.58	0.59
Equity Hedge	\$3,060	1.49	7.75	5.15	5.55	-
MSCI ACWI (beta adjusted)		-	-	-	-	-

*Public Equity returns also include the global portfolio, which has been liquidated, but currently contains a residual amount of roughly \$2 million.

NCRS Public Equity Portfolio Characteristics

As of June 30, 2017

Portfolio Characteristics		
	Portfolio	MSCI ACWI IMI
Price / Earnings	21.8	21.2
Dividend Yield	2.13	2.33
Price / Book	3.14	2.84
Debt / Equity	0.90	0.97
Market Cap (\$B Weighted Median)	37.362	37.824
Return on Equity - 1 Year	15.5	14.8





NCRS Private Equity Portfolio

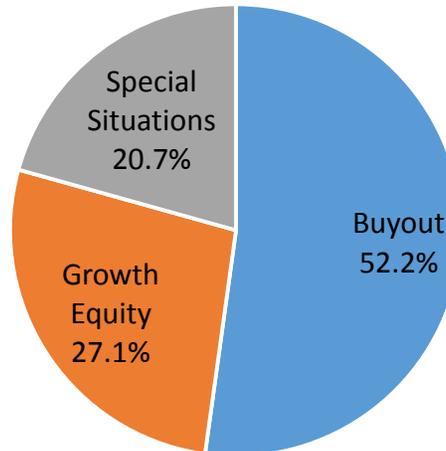
As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Private Equity*	\$4,825	2.81	9.73	7.85	9.43	6.45
Benchmark ³		2.67	9.25	6.60	9.71	7.67
Buyout	\$2,088	3.27	10.35	7.74	8.14	5.78
Growth	\$1,093	2.70	11.64	9.48	12.48	8.38
Special Situations	\$663	3.34	9.59	2.55	5.17	5.08
Fund of Funds	\$960	1.69	7.68	9.88	11.76	6.68

IRR by Vintage Year

	<u>Pre-2004</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Total</u>
NCRS	12.05	7.12	5.38	3.18	8.95	9.30	12.56	19.56	10.99	12.71	8.38	16.50	5.73	-25.87	-2.34	7.64
# of Funds	28	3	11	21	15	17	3	1	6	6	9	4	9	6	7	146

Strategy Allocation (Based on Commitments)



*Private Equity returns include a stock distribution account, in the amount of roughly \$21 million, which does not fall under any specific sub-section. 25

NCRS Non-Core Real Estate Portfolio

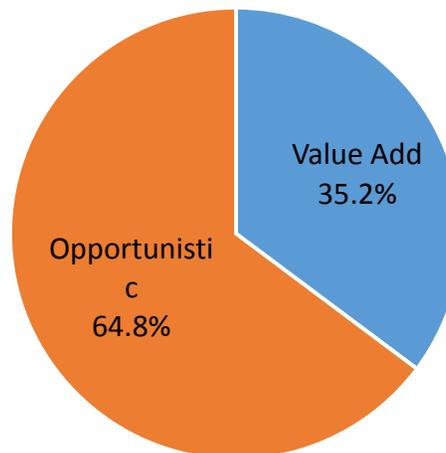
As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Non-Core Real Estate	\$3,670	2.98	11.21	14.34	13.70	3.03
Benchmark ⁴		2.15	5.23	6.82	8.92	0.17
Opportunistic Value Add	\$2,378	2.94	9.62	12.62	12.95	1.07
	\$1,292	3.01	13.91	17.39	14.99	6.33

IRR by Vintage Year

	<u>Pre-2004</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Total</u>
NCRS	9.17	15.72	-1.33	2.57	2.17	16.98	2.21	17.74	17.11	19.51	14.74	6.86	6.27	1.41	3.62	6.20
# of Funds	17	3	15	13	8	6	1	5	7	5	7	7	6	7	1	108

Strategy Allocation (Based on Valuation)





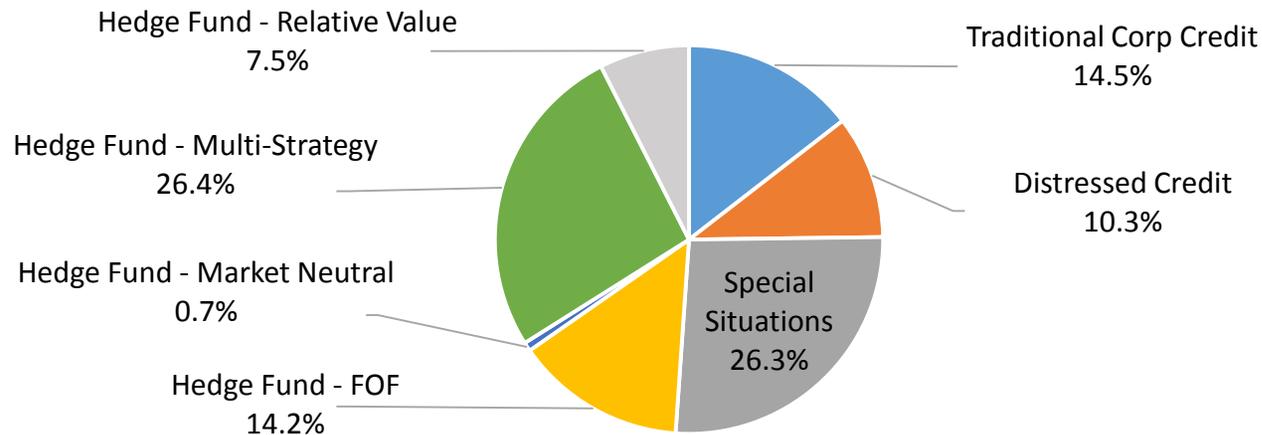
NCRS Opportunistic Fixed Income Portfolio

As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Opportunistic Fixed Income	\$5,524	1.71	11.51	1.98	7.06	6.81
Benchmark ⁵		1.05	11.07	1.33	3.05	0.19
Traditional Corporate Credit	\$803	1.51	14.89	3.06	7.42	-
Distressed Credit	\$567	3.42	15.89	5.80	10.87	7.71
Special Situations	\$1,453	3.13	13.51	9.44	16.61	10.44
Hedged Fixed Income	\$2,701	0.78	9.31	(0.39)	4.68	-

	IRR by Vintage Year													
	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Total</u>
NCRS	2.79	N/A	17.10	8.72	22.42	7.12	4.45	1.88	4.78	3.24	14.75	11.06	0.95	6.19
# of Funds	1	0	1	3	1	4	9	2	7	3	1	8	1	41

Strategy Allocation (Based on Valuation)





NCRS Rates & Liquidity Portfolio

As of June 30, 2017

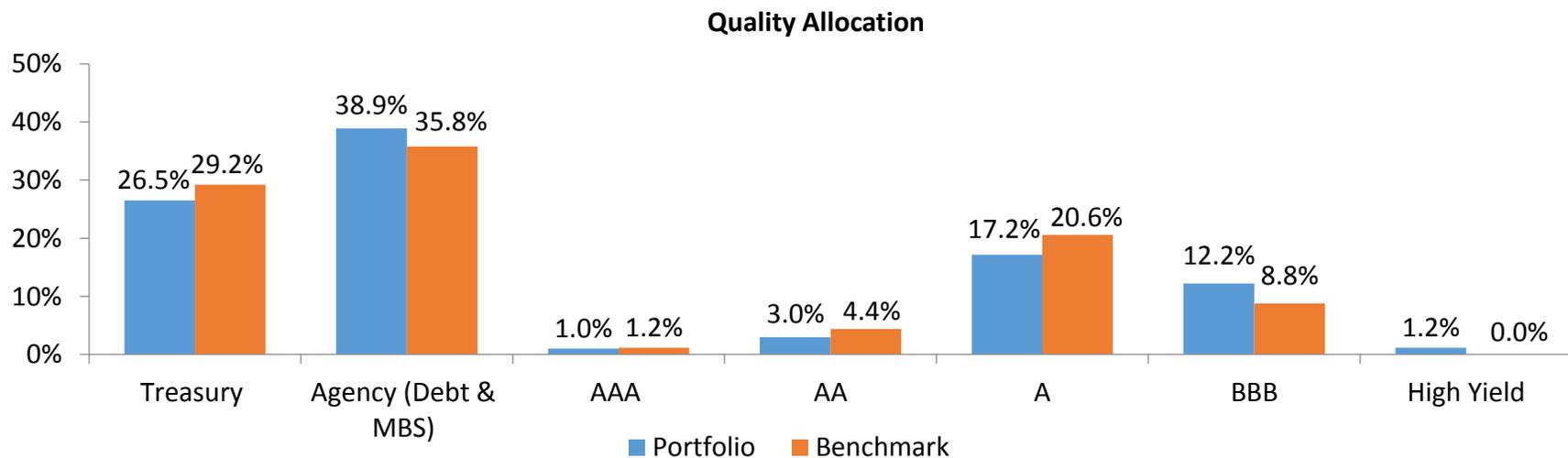
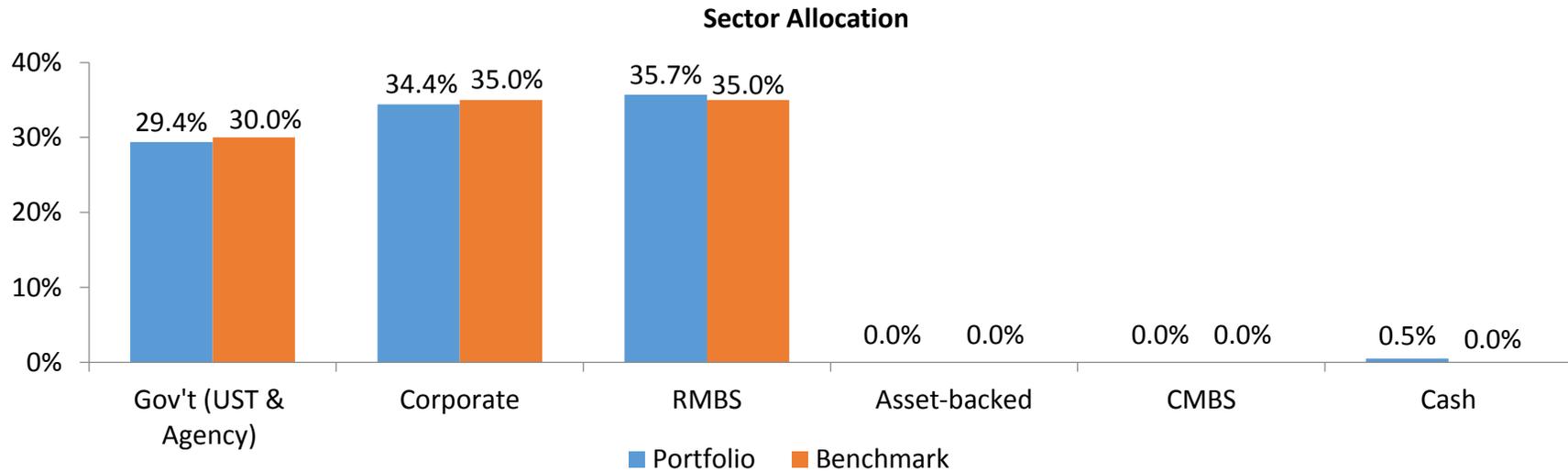
Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Rates & Liquidity	\$31,931	1.52	(0.37)	2.85	2.72	5.91
Benchmark ⁶		1.94	(0.60)	3.12	2.70	5.65
IG Fixed Income & Cash	\$28,248	1.68	(0.29)	2.97	2.82	5.96
Core Fixed Income	\$25,266	1.86	(0.42)	3.23	2.90	6.04
IG Fixed Income Cash	\$2,982	0.27	0.99	0.73	-	-
Pension Cash	\$3,683	0.27	0.97	0.77	-	-

Core Fixed Income Portfolio Characteristics

	<u>Avg. Coupon</u>	<u>Yield to Maturity</u>	<u>Duration (Years)</u>
Government (Treasury & Agency)	4.26%	2.43%	10.1
Corporate	4.64%	3.56%	9.1
Mortgage	3.78%	2.82%	4.4
Total	4.21%	2.96%	7.8

NCRS Core Fixed Income Portfolio Characteristics

As of June 30, 2017





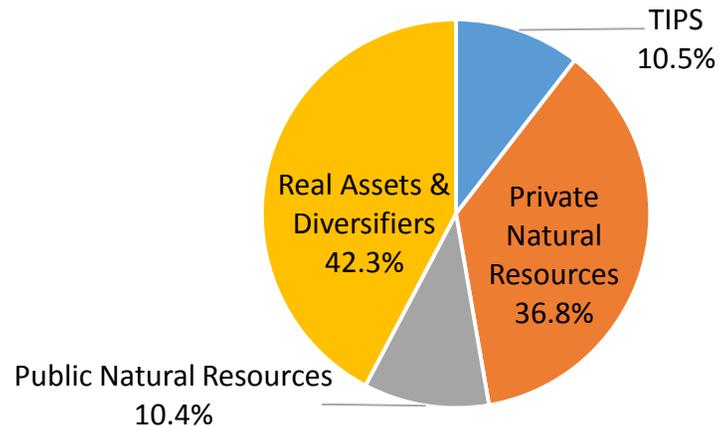
NCRS Inflation Sensitive Portfolio

As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Inflation Sensitive	\$6,504	1.58	12.13	(0.94)	0.47	(1.38)
Benchmark ¹⁰		(0.11)	2.62	(3.43)	(0.88)	0.95
Private Natural Resources	\$2,561	1.83	22.75	1.96	3.03	1.14
Public Natural Resources	\$679	(4.85)	(6.05)	(13.75)	(8.19)	-
TIPS	\$55	(0.74)	0.11	-	-	-
Real Assets & Other Diversifiers	\$2,581	3.29	12.21	7.84	4.42	-

	IRR by Vintage Year												
	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Total</u>
NCRS	-0.23	7.22	2.14	N/A	-8.09	-7.49	7.32	6.27	9.88	3.85	5.03	N/A	-0.44
# of Funds	3	2	2	0	3	9	7	11	12	4	4	0	57

Strategy Allocation (Based on Valuation)





NCRS Core Real Estate Portfolio

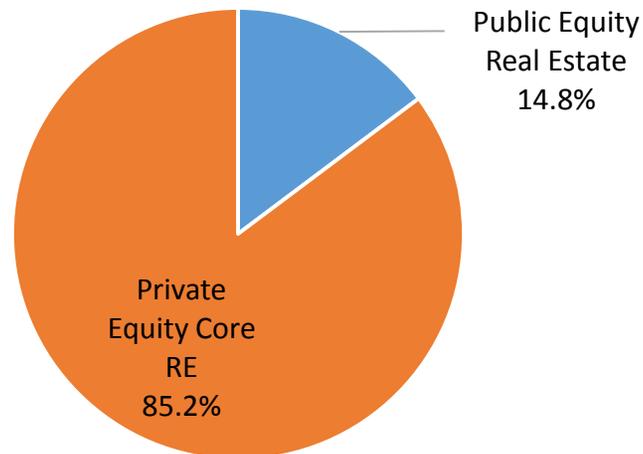
As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Core Real Estate	\$4,516	2.36	8.97	8.16	9.68	4.46
Benchmark ¹¹		1.97	6.57	9.80	10.56	4.68
Public Equity Real Estate	\$667	4.11	3.48	5.41	9.51	3.60
Private Equity Core Real Estate	\$3,849	2.07	9.95	8.73	9.87	5.13

IRR by Vintage Year

	<u>Pre-2004</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>Total</u>
NCRS	7.64	9.76	-10.21	5.62	1.39	9.91	N/A	23.62	N/A	N/A	7.81	7.63	1.41	12.32	-26.48	7.02
# of Funds	5	1	1	2	3	1	0	1	0	0	2	6	1	8	1	32

Strategy Allocation (Based on Valuation)

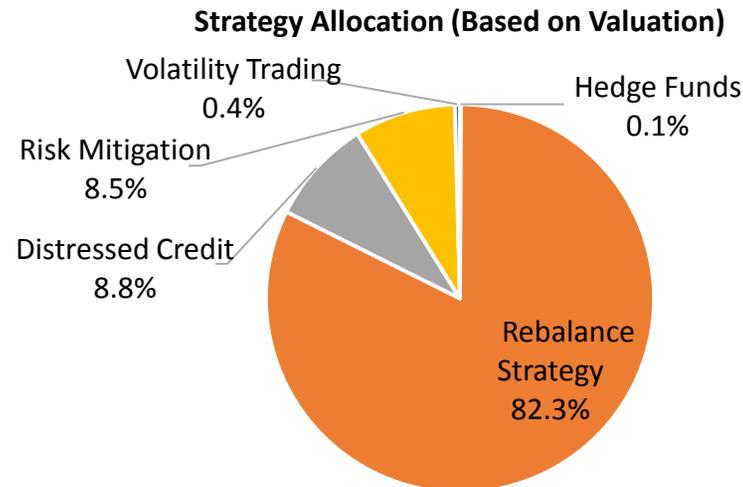




NCRS Multi-Strategy Portfolio

As of June 30, 2017

Net of Fees Performance						
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Multi-Strategy	\$1,754	2.58	13.20	4.22	9.31	5.17
Benchmark ¹²		2.74	12.39	2.90	8.45	4.45
Hedge Funds	\$2	(2.90)	(12.33)	(6.82)	(1.69)	(1.80)
Rebalance Strategy	\$1,443	3.38	14.42	4.87	10.58	-
Distressed Credit	\$154	(0.87)	14.10	-	-	-
Risk Mitigation	\$148	(0.68)	-	-	-	-
Volatility Trading	\$8	(5.03)	-	-	-	-



Notes:

All data presented are based on currently available information at time of publication and may be revised subsequently.

1. The Growth Benchmark is a blend of the Public Equity Benchmark, Private Equity Benchmark, Non-Core Real Estate Benchmark, & Opportunistic FI Benchmark at policy weights.
2. The Public Equity Benchmark is the dynamically weighted combination of the MSCI ACWI IMI Net (Long-Only) and a beta adjusted MSCI ACWI IMI Net (Hedged Equity).
3. The Private Equity Benchmark is comprised of the following Burgiss Group Private iQ indices: 50% Buyout, 20% Venture Capital, and 30% Distressed.
4. The Non-Core Real Estate Benchmark is comprised of the following Burgiss Group Private iQ indices: 80% U.S. Non-Core Real Estate (Opportunistic and Value-Added) and 20% Non-U.S. Non-Core Real Estate (Opportunistic and Value-Added).
5. The Opportunistic Fixed Income Benchmark is a comprised of 50% HFRX Distressed Securities Index, 20% HFRX Relative Value Index, 15% Credit Suisse Leveraged Loan Index, and 15% BOAML High Yield Index*.
6. The Rates & Liquidity Benchmark is a blend of the IG Fixed Income Benchmark and the Cash Benchmark at policy weights.
7. The IG Fixed Income Benchmark is comprised 10% iMoneyNet First Tier Institutional Money Market Funds Net Index and 90% custom BOAML Core Investment Grade Index*. The custom BOAML core index comprised of the following weightings: 30% BOAML 5+ Years Governments, 35% BOAML 5+ Years Investment Grade Corporates, and 35% BOAML Mortgage Master.
8. The Cash Benchmark is the iMoneyNet First Tier Institutional Money Market Funds Net Index.
9. The Inflation Sensitive & Diversifiers Benchmark is a blend of the Inflation Sensitive Benchmark and the Core Real Estate Benchmark at policy weights.
10. The Inflation Sensitive Benchmark is the dynamically weighted combination of the Bank of America Merrill Lynch 1-3 Years U.S. Inflation-Linked Treasury Index (TIPS)*, the Bloomberg Commodities Index (Commodities), and a combination of the benchmarks of investments classified within Private Natural Resources or Other Real Assets and Diversifiers.
11. The Core Real Estate Benchmark is comprised of 80% NCREIF ODCE Net and 20% FTSE EPRA NAREIT Global Index.
12. The Multi-Strategy Benchmark is comprised of a dynamically weighted combination of the HFRX ED: Multi-Strategy Index, net of fees, and the market value weighted benchmarks for any other total fund strategies within the Portfolio.

*Source: BofA Merrill Lynch , used with permission. See disclaimer on page.



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