

NORTH CAROLINA  
DEPARTMENT OF STATE TREASURER



*Dale R. Folwell, CPA*  
STATE TREASURER OF NORTH CAROLINA  
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INVESTMENT MANAGEMENT DIVISION

# Performance Review

February 19, 2020



# Cost-Efficiencies Initiative Update

- Goal:
  - Obtain \$100 million of incremental cost-efficiencies for the NCRS investment program, consistent with fiduciary requirements and investment objectives
  - The \$100 million goal would be measured on a cumulative basis over a four-year timeframe, beginning January 2017
  - The goal is comprehensive of the Pension and Supplemental Retirement Plans
- Progress to date:

**Fully Executed Activities**

**Realized Savings since Jan 2017 (\$000)**

Investment-related services: renegotiations/restructuring	\$36,819
Investment manager terminations/renegotiations	\$216,854
<b>Sub-Total</b>	<b>\$253,672</b>

**Projected Realized savings through December 2020**

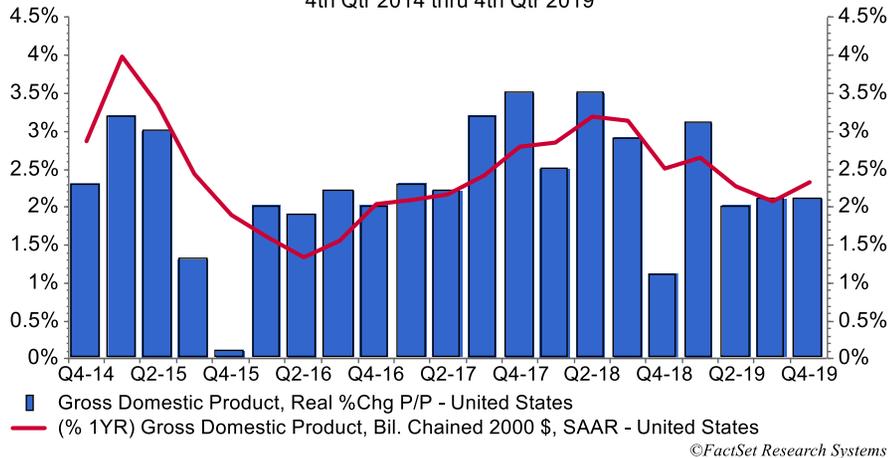
**\$345,504**



## US Economic Environment

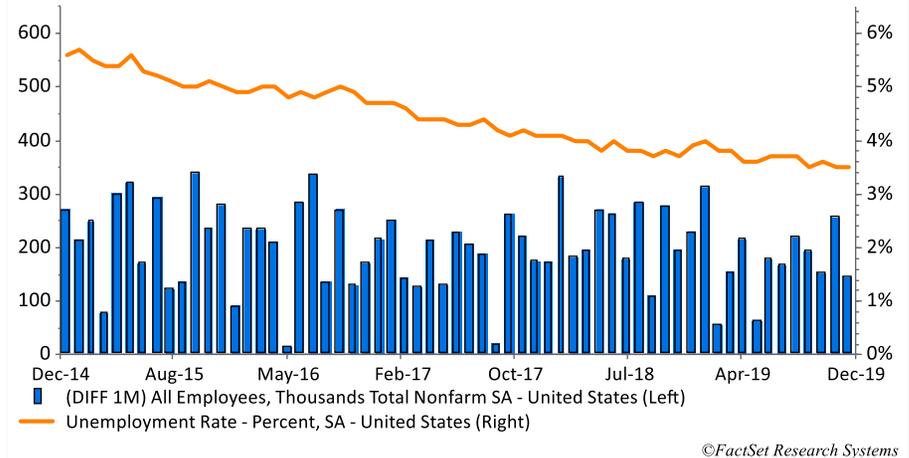
### US Real GDP Growth

4th Qtr 2014 thru 4th Qtr 2019



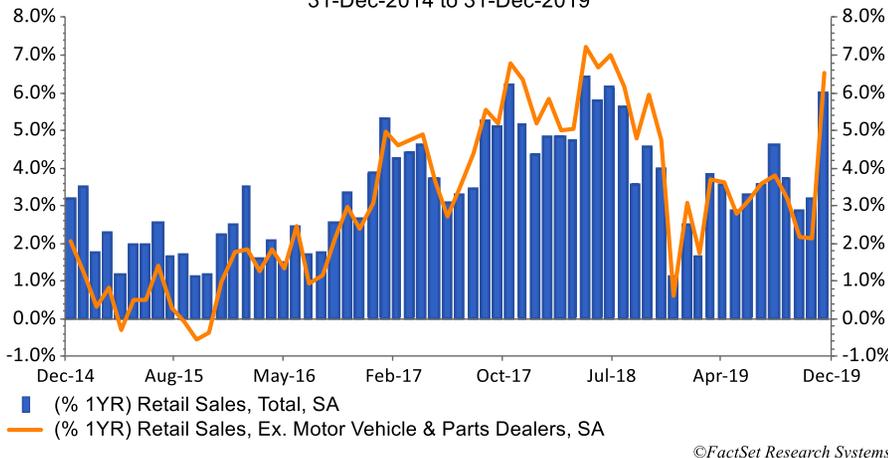
### US Change in NonFarm Employment & Unemployment Rate

31-Dec-2014 to 31-Dec-2019



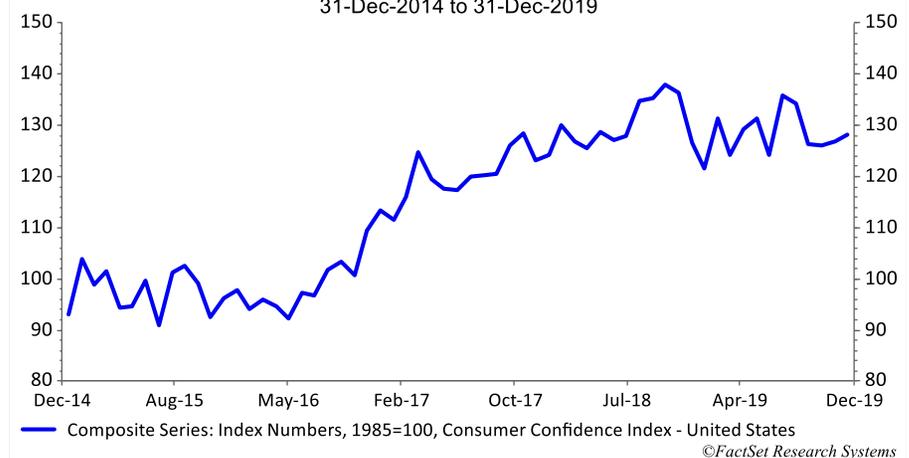
### US Retail Sales

31-Dec-2014 to 31-Dec-2019



### US Consumer Confidence

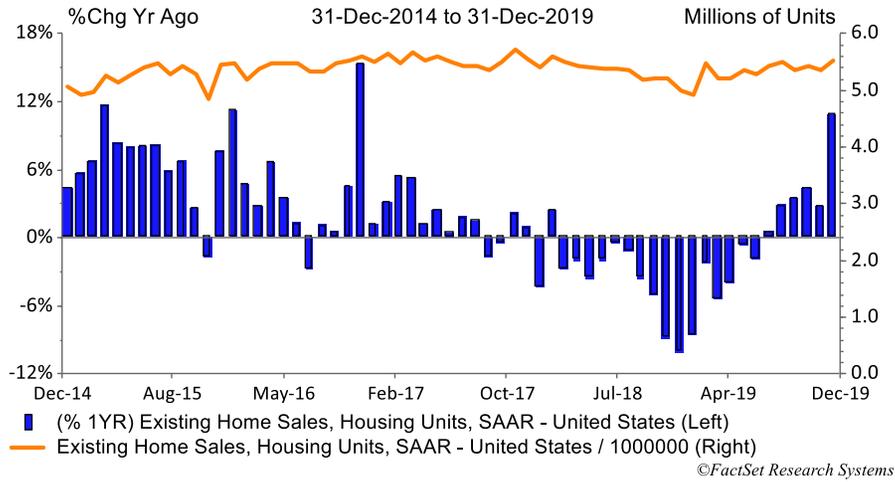
31-Dec-2014 to 31-Dec-2019



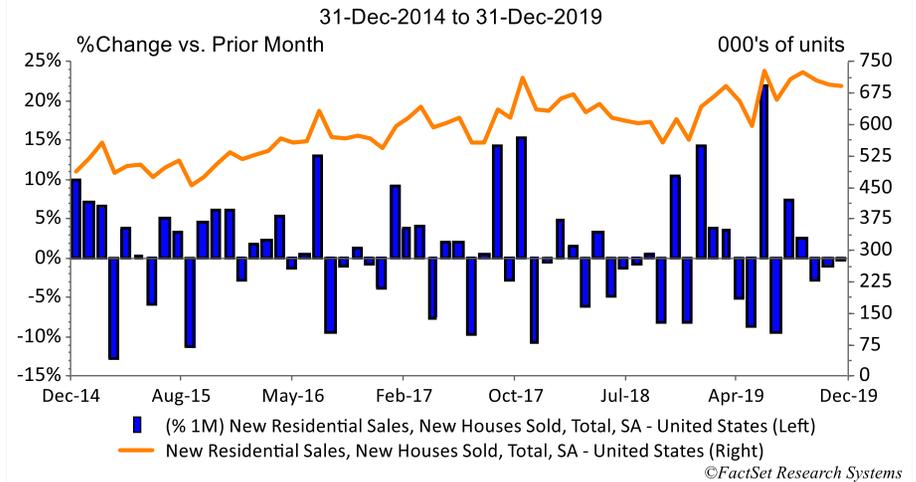


## US Economic Environment

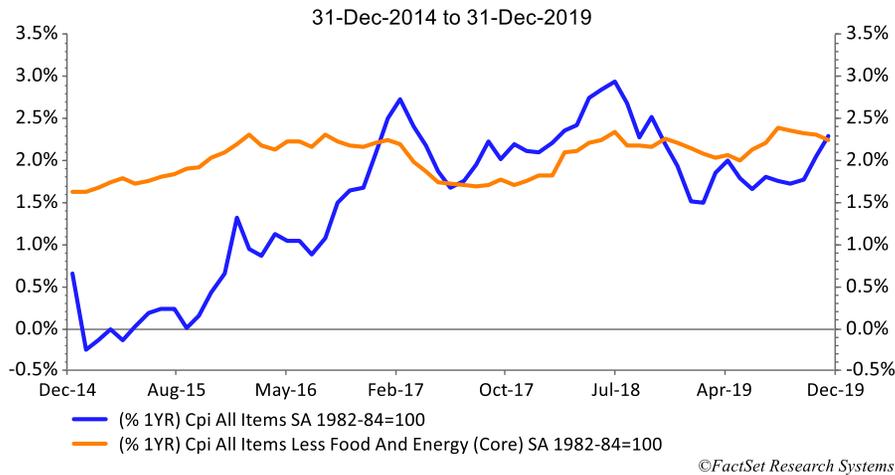
### US Existing Home Sales



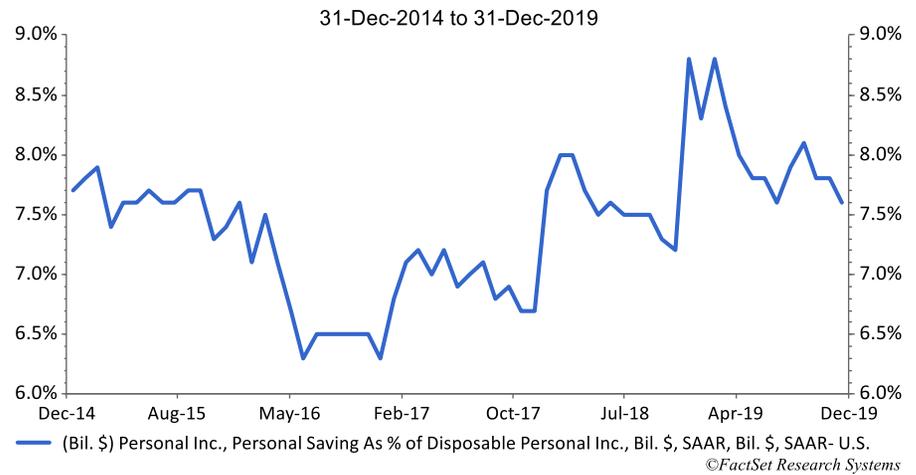
### US New Home Sales



### US Consumer Price Inflation

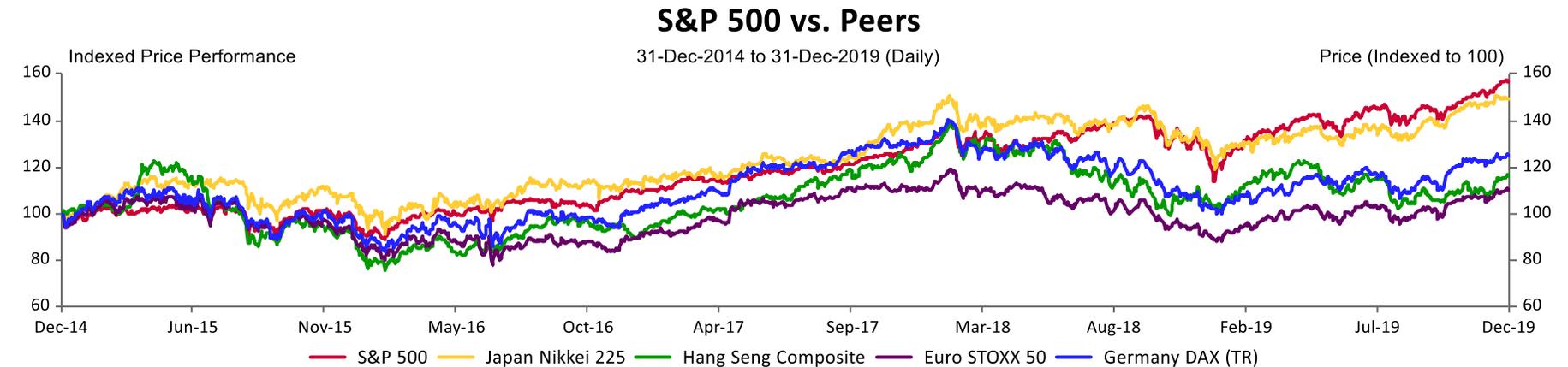
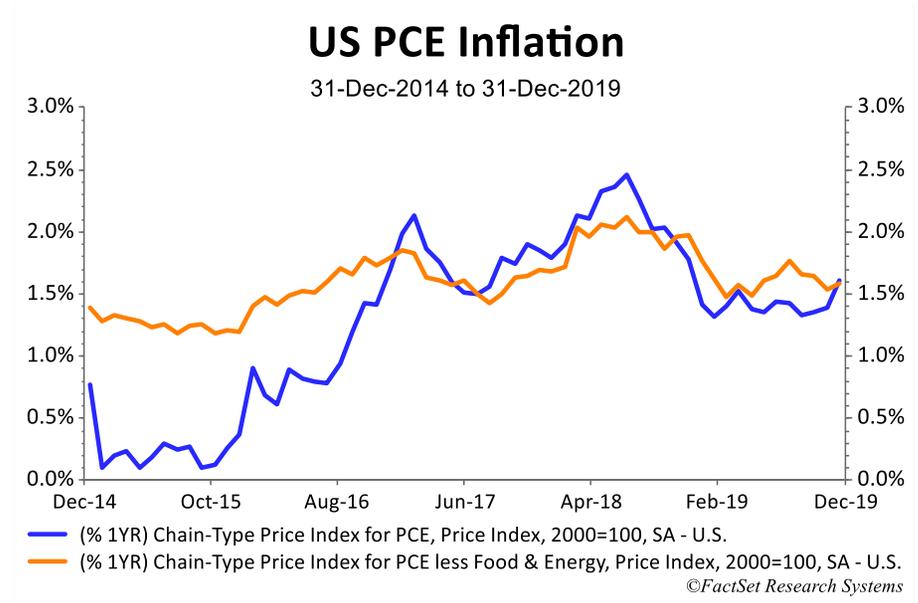
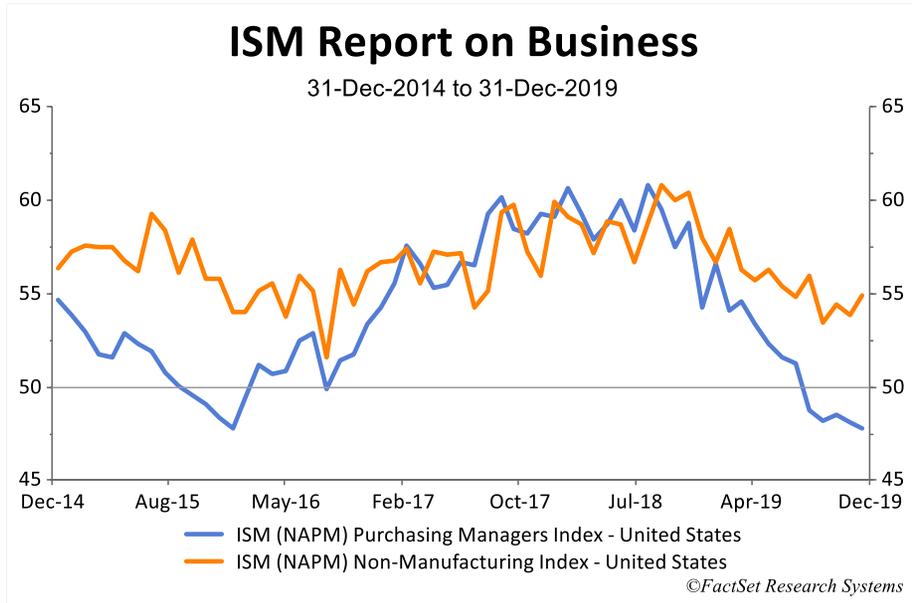


### US Personal Savings Rate





## US and Global Economic Environment

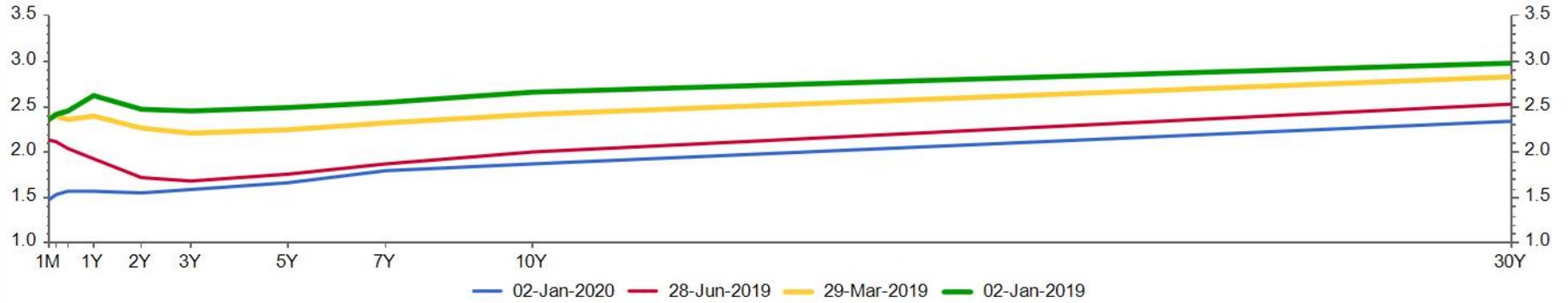


Source: FactSet Prices



## Market Environment

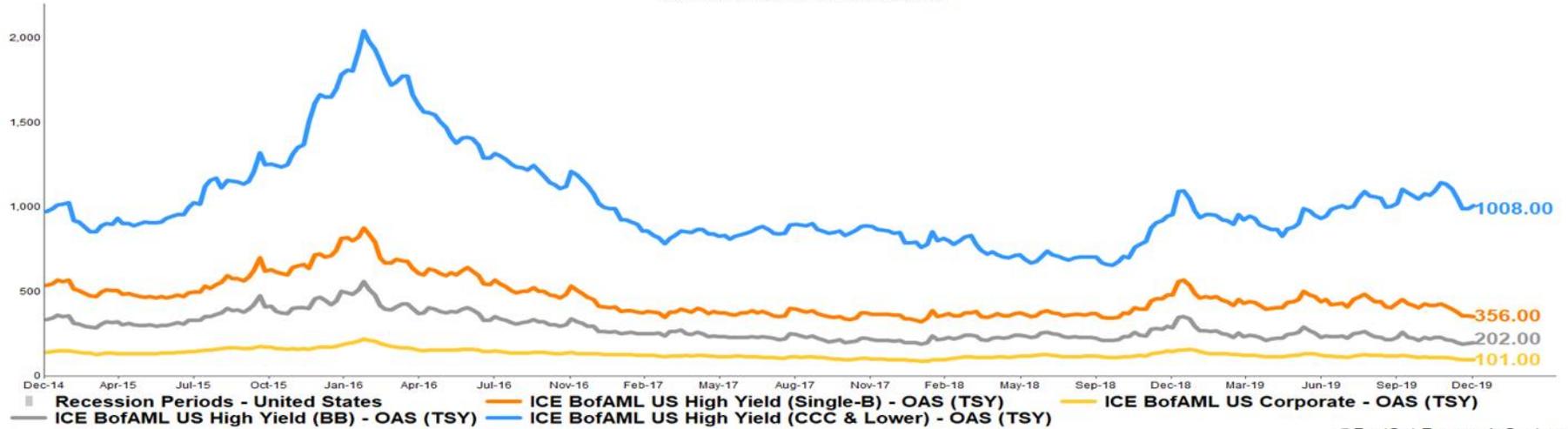
### United States Treasury Yield Curve



Source: FactSet Interest Rate Database

### Corporate Credit OAS (BofAML Indices)

31-Dec-2009 to 31-Dec-2019



©FactSet Research Systems



## Market Environment

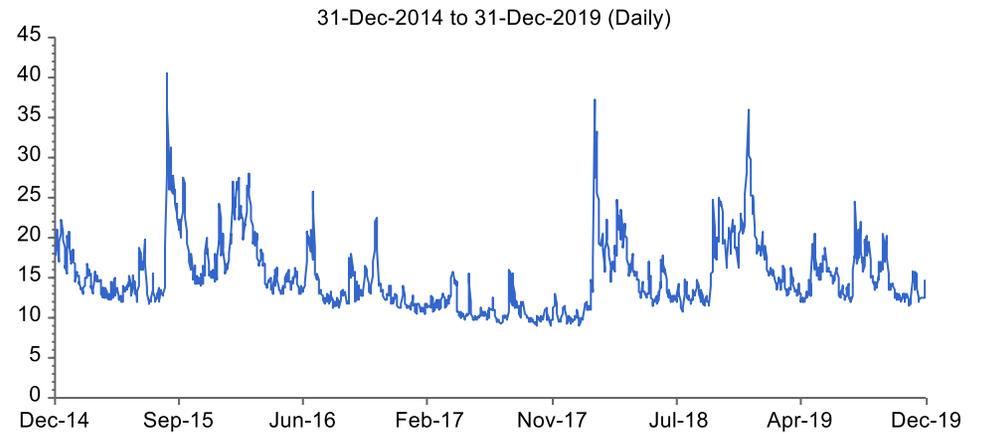
**Closing Price Fed Nominal Broad Dollar Index**



— Federal Reserve nominal broad effective exchange rate index - United States

Source: FactSet Prices

**Closing Price CBOE VIX Index**



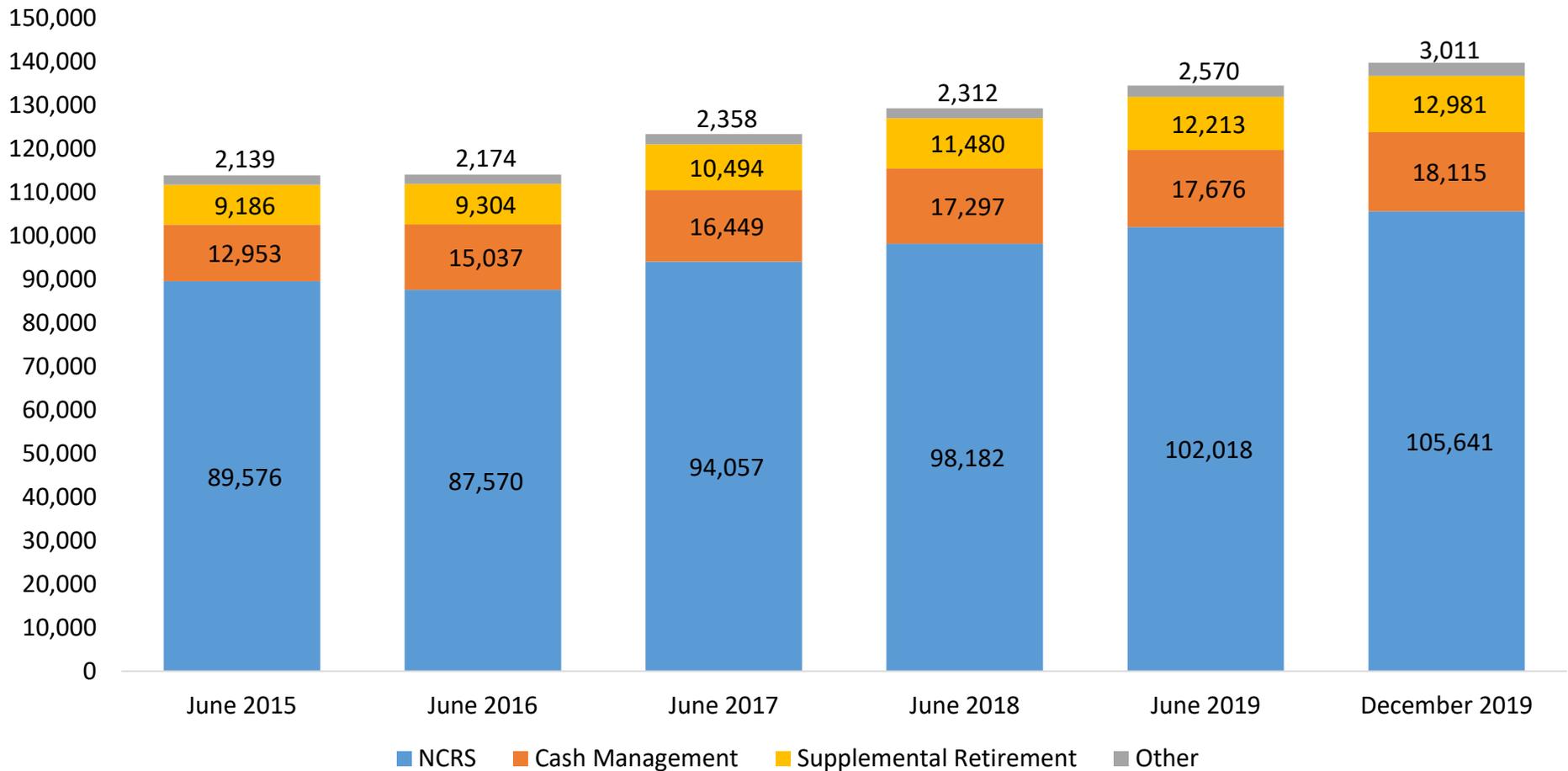
— CBOE Market Volatility Index

Source: FactSet Prices

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
<b>U.S.</b>	12/19	2.3	12/19	3.5	12/19	2.3	<b>Asia/Pacific/Latam</b>						
<b>Europe</b>							China	12/19	6.0			12/19	4.5
Germany	09/19	0.5	12/19	5.0	12/19	1.5	India	09/19	4.5			12/19	9.6
France	12/19	0.8	12/19	8.4	12/19	1.5	Japan	09/19	1.7	12/19	2.2	12/19	0.8
U.K.	09/19	1.1	11/19	3.8	12/19	1.3	Indonesia	12/19	5.0			12/19	2.7
Italy	12/19	0.0	12/19	9.8	12/19	0.5	Brazil	09/19	1.2			12/19	4.3
Spain	12/19	1.8	12/19	13.7	12/19	0.8	Australia	09/19	1.7	12/19	5.1	12/19	1.8

# Assets Under Management (\$MM)

\$139.7 billion as of December 31, 2019



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 December 31, 2019

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
<b>Growth</b>	<b>\$49,088</b>	<b>46.47%</b>	<b>58.00%</b>	<b>37.00%</b>	<b>71.00%</b>	<b>-11.53%</b>	<b>(\$12,184)</b>
Public Equity	34,741	32.89%	42.00%	37.00%	47.00%	-9.11%	(9,628)
Private Equity	5,413	5.12%	6.00%	0.00%	8.75%	-0.88%	(926)
Non Core Real Estate	3,228	3.06%	3.00%	0.00%	8.00%	0.06%	58
Opportunistic Fixed Income	5,707	5.40%	7.00%	0.00%	7.50%	-1.60%	(1,688)
<b>Rates &amp; Liquidity</b>	<b>42,237</b>	<b>39.98%</b>	<b>29.00%</b>	<b>24.00%</b>	<b>42.00%</b>	<b>10.98%</b>	<b>11,601</b>
IG Fixed Income & Cash	31,087	29.43%	28.00%	24.00%	32.00%	1.43%	1,507
Pension Cash	11,150	10.55%	1.00%	0.00%	10.00%	9.55%	10,093
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>12,028</b>	<b>11.39%</b>	<b>11.00%</b>	<b>4.00%</b>	<b>16.00%</b>	<b>0.39%</b>	<b>407</b>
Inflation Sensitive	6,101	5.77%	6.00%	2.00%	7.50%	-0.23%	(238)
Core Real Estate	5,927	5.61%	5.00%	2.00%	10.00%	0.61%	645
<b>Multi-Strategy</b>	<b>2,289</b>	<b>2.17%</b>	<b>2.00%</b>	<b>0.00%</b>	<b>4.00%</b>	<b>0.17%</b>	<b>176</b>
<b>Grand Total</b>	<b>\$105,641</b>	<b>100.00%</b>					



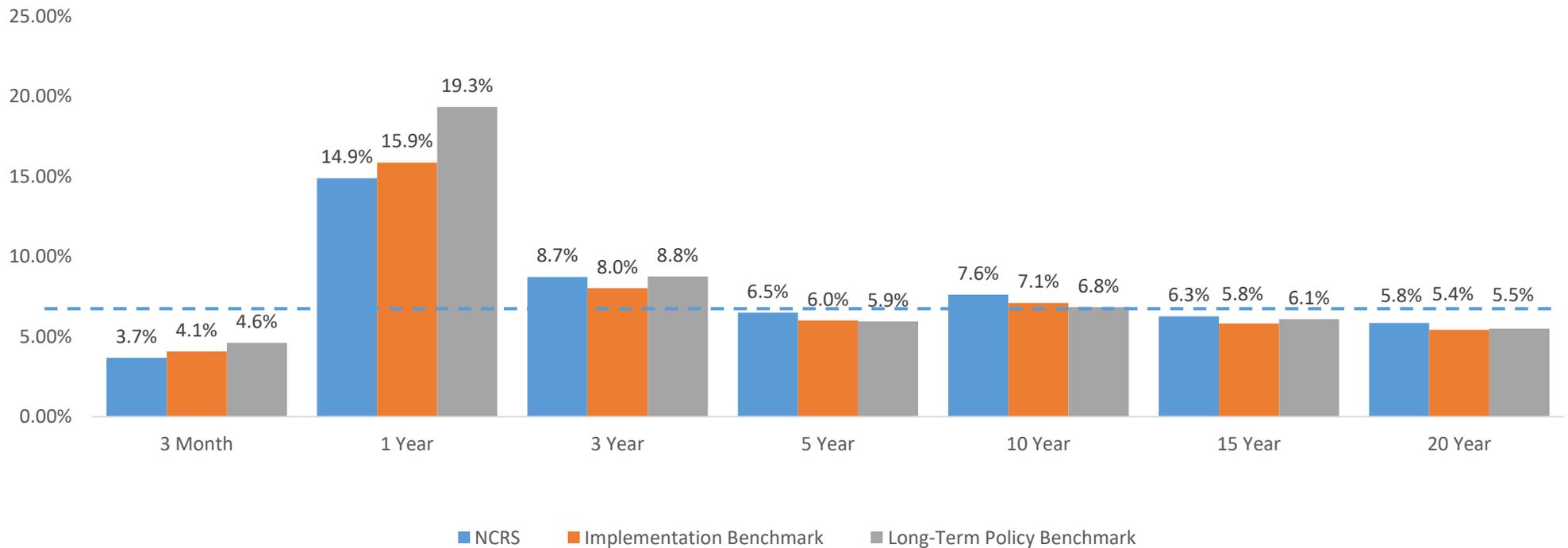
# NCRS Asset Allocation (Unaudited)

As of February 6, 2020

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$000)
				Minimum	Maximum		
<b>Growth</b>	<b>\$49,534</b>	<b>46.58%</b>	<b>58.00%</b>	<b>37.00%</b>	<b>71.00%</b>	<b>-11.42%</b>	<b>(\$12,146)</b>
Public Equity	35,265	33.16%	42.00%	37.00%	47.00%	-8.84%	(9,400)
Private Equity	5,427	5.10%	6.00%	0.00%	8.75%	-0.90%	(954)
Non Core Real Estate	3,178	2.99%	3.00%	0.00%	8.00%	-0.01%	(12)
Opportunistic Fixed Income	5,664	5.33%	7.00%	0.00%	7.50%	-1.67%	(1,780)
<b>Rates &amp; Liquidity</b>	<b>42,604</b>	<b>40.06%</b>	<b>29.00%</b>	<b>24.00%</b>	<b>42.00%</b>	<b>11.06%</b>	<b>11,764</b>
IG Fixed Income & Cash	31,644	29.76%	28.00%	24.00%	32.00%	1.76%	1,867
Pension Cash	10,961	10.31%	1.00%	0.00%	10.00%	9.31%	9,897
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>11,919</b>	<b>11.21%</b>	<b>11.00%</b>	<b>4.00%</b>	<b>16.00%</b>	<b>0.21%</b>	<b>221</b>
Inflation Sensitive	6,116	5.75%	6.00%	2.00%	7.50%	-0.25%	(265)
Core Real Estate	5,803	5.46%	5.00%	2.00%	10.00%	0.46%	486
<b>Multi-Strategy</b>	<b>2,288</b>	<b>2.15%</b>	<b>2.00%</b>	<b>0.00%</b>	<b>4.00%</b>	<b>0.15%</b>	<b>161</b>
<b>Grand Total</b>	<b>\$106,345</b>	<b>100.00%</b>					

# NCRS Total Net Portfolio Return vs. Benchmarks

## As of December 31, 2019



**Notes:**

Actuarial Assumed Investment Return was lowered from 7.2% to 7.0% in April 2018

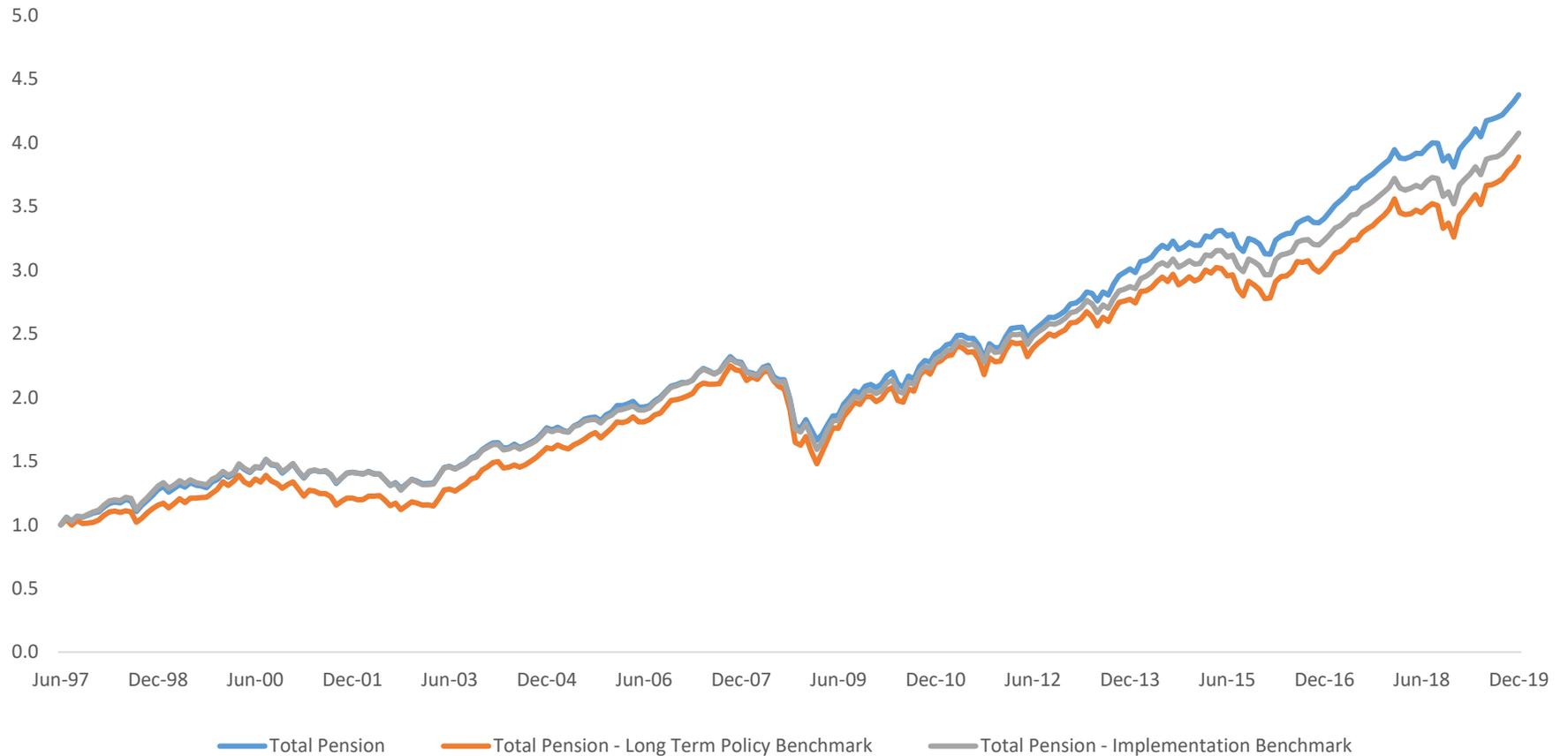
Returns for periods greater than one year are annualized.

*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 December 31, 2019



@FactSet Research Systems

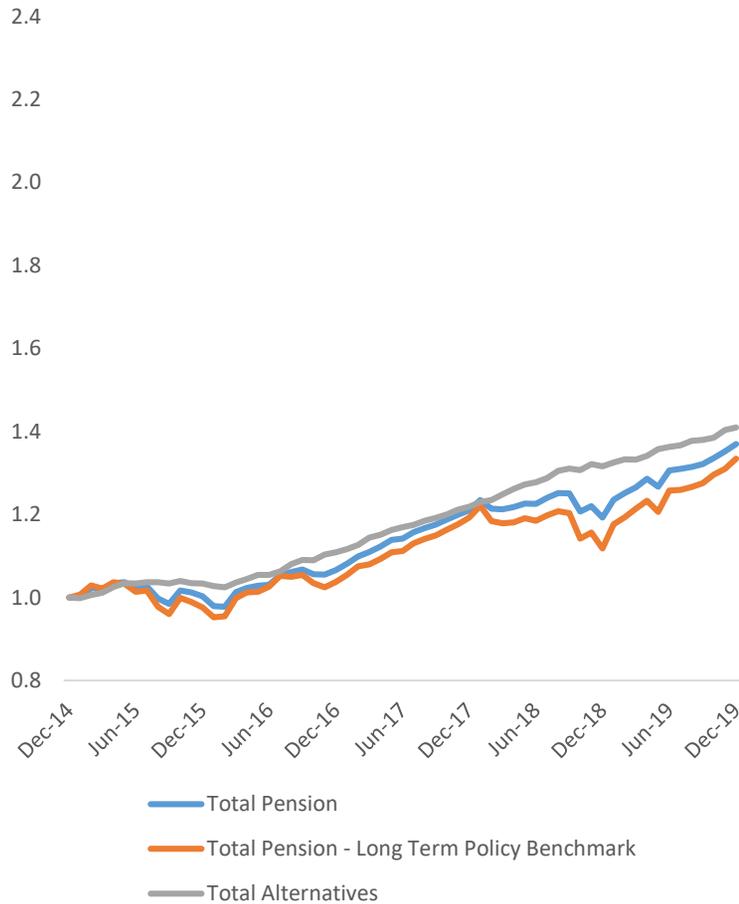
Notes:

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.

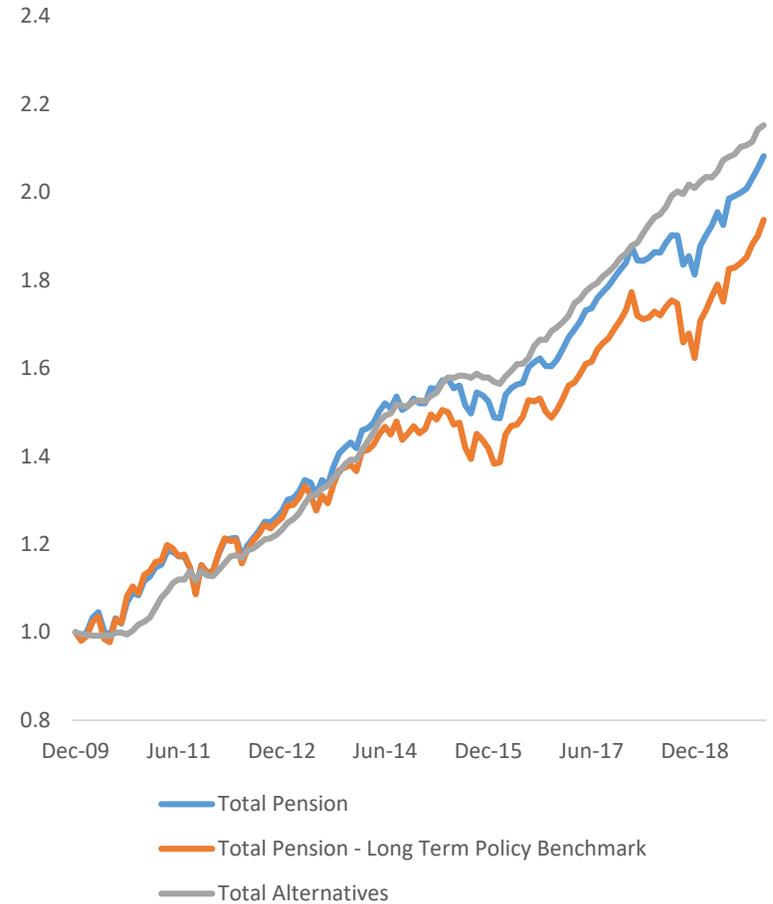


# Growth of a Dollar

5 Years Ending December 31, 2019



10 Years Ending December 31, 2019



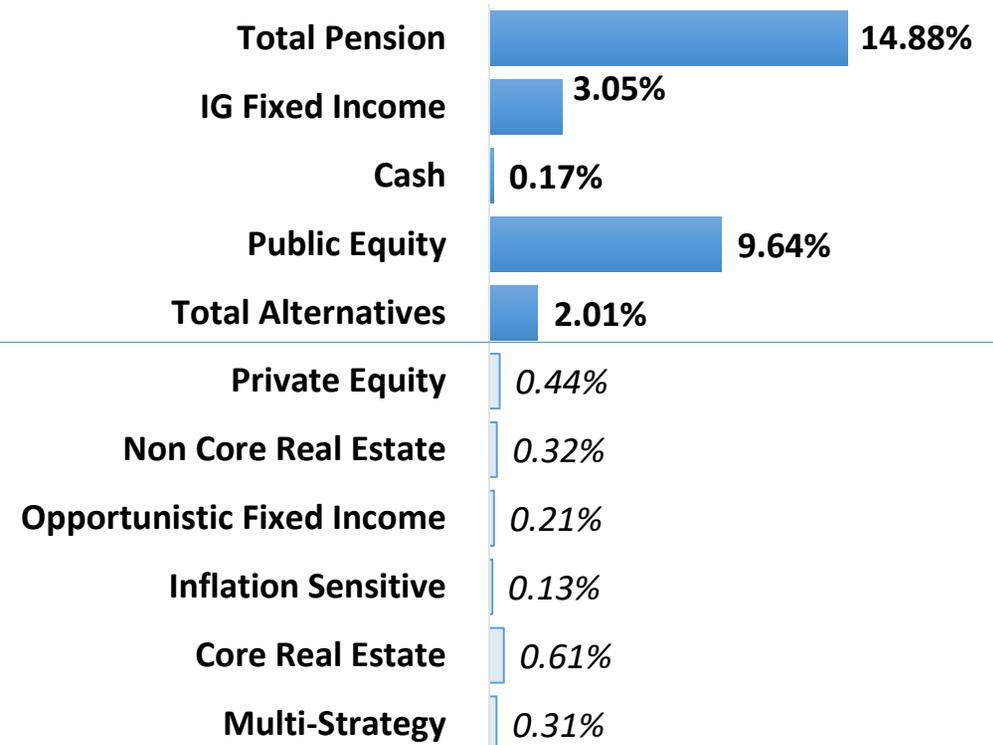
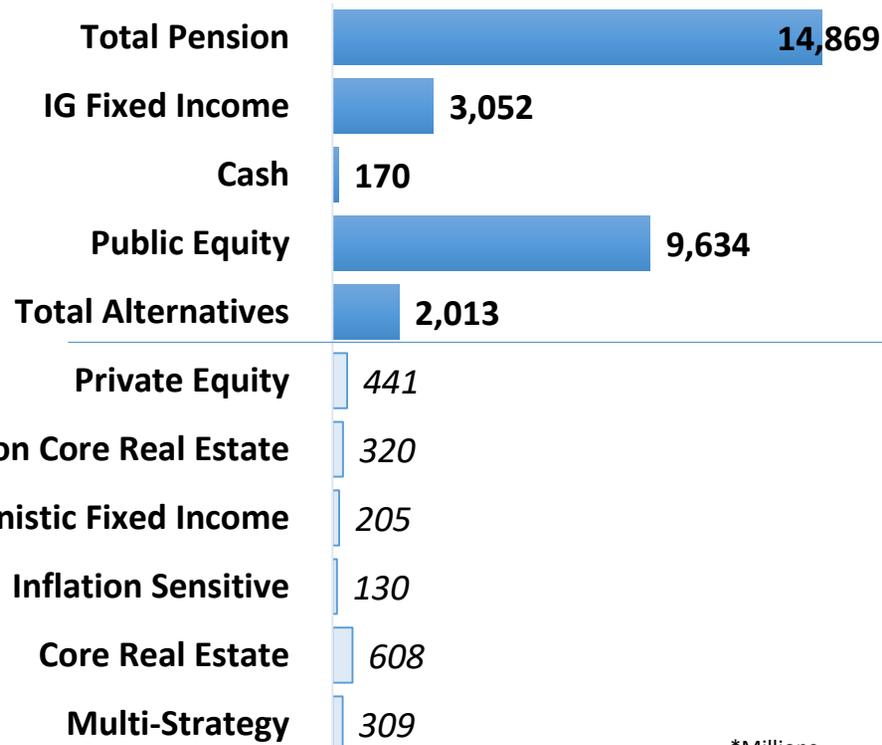
Note: NCRS Alternatives includes the following: Core Real Estate; Inflation Sensitive – Private Natural Resources; Inflation Sensitive – Real Assets and Other Diversifiers; Multi-Strategy Investments; Non Core Real Estate; Opportunistic Fixed Income; Private Equity; Equity Hedge Strategies; and closed-end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

# Estimated Contribution to Total Plan Return – 1 Year

## As of December 31, 2019

### Contribution to Total Plan \$ Earnings

### Contribution to Total Plan % Returns



\*Millions

Notes:

1.) Estimated Contributions are based on average market value and the total return for the period.

Contribution to Total Plan \$ Earnings = Average \$ Market Value \* % Total Return for each asset class

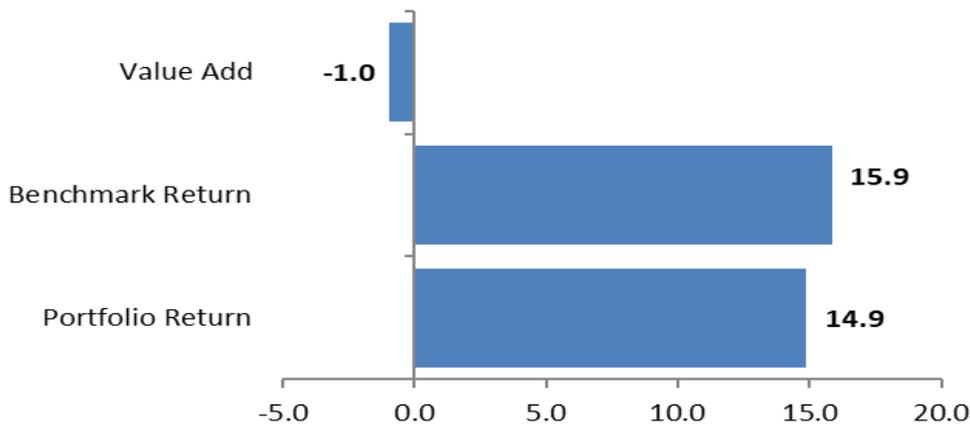
Contribution to Total Plan % Returns = Average Market Value % weight \* % Total Return for each asset class

2.) Alternatives for this analysis include the following: Private Equity, Non Core Real Estate, Opportunistic Fixed Income, Inflation Sensitive, Core Real Estate, and Multi-Strategy investments.

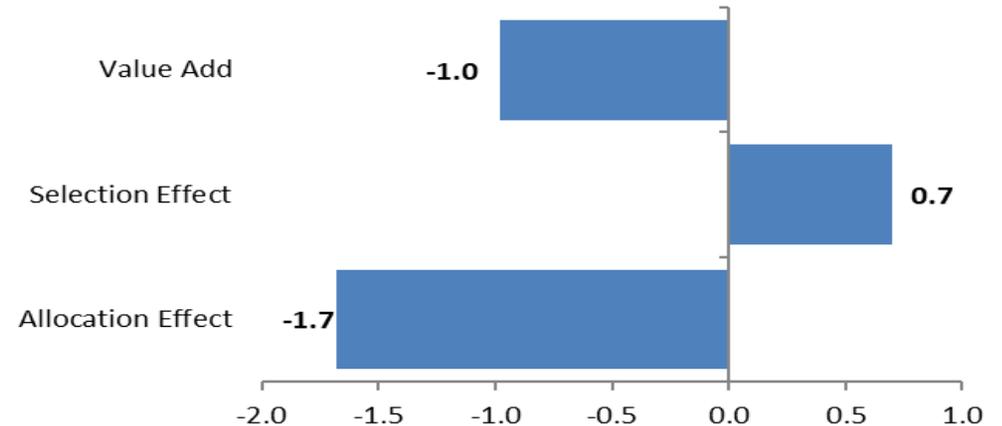
# NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 1 Year Ending December 31, 2019

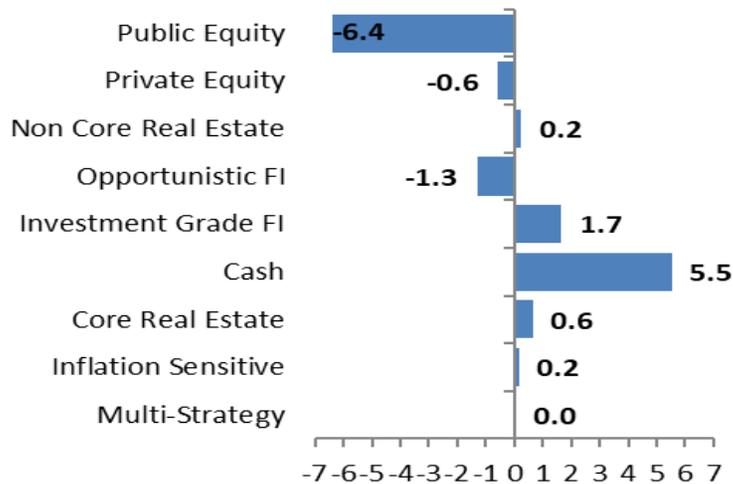
**Total Fund Performance**



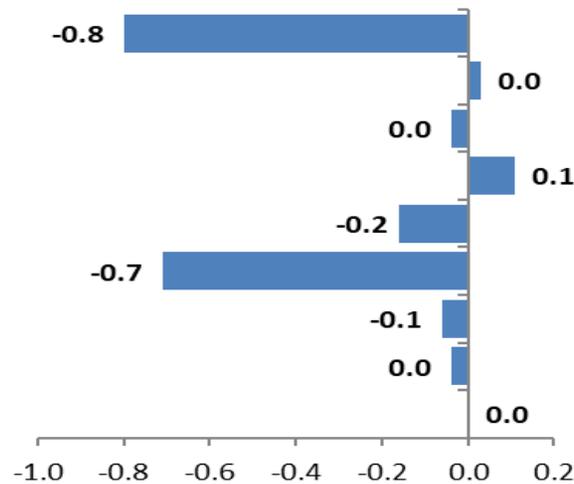
**Attribution**



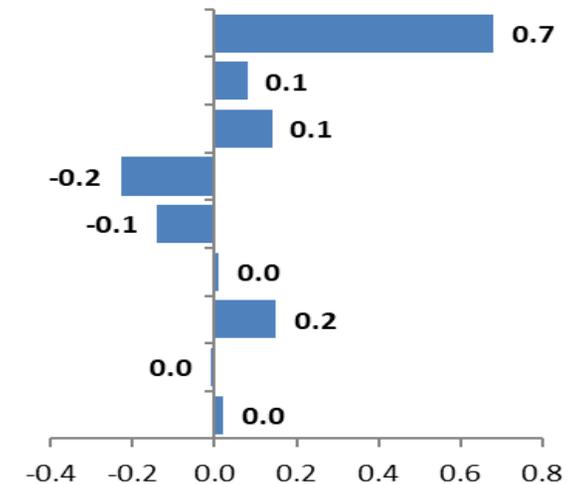
**Avg Active Weight**



**Allocation Effect**



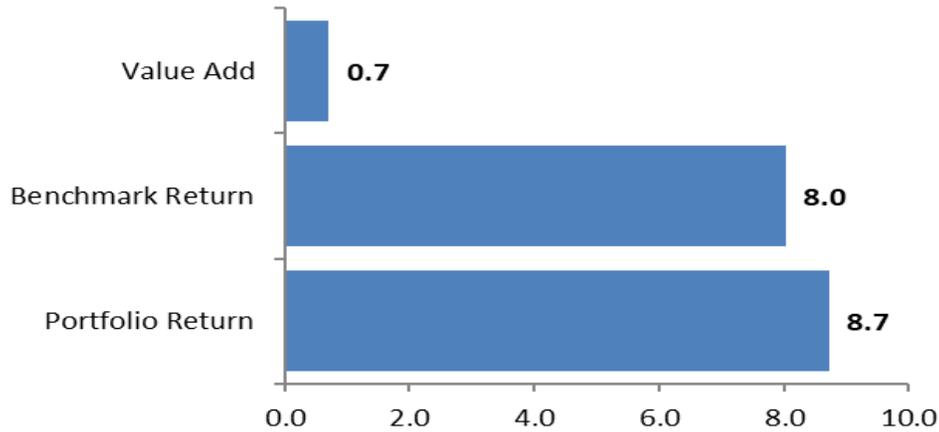
**Selection Effect**



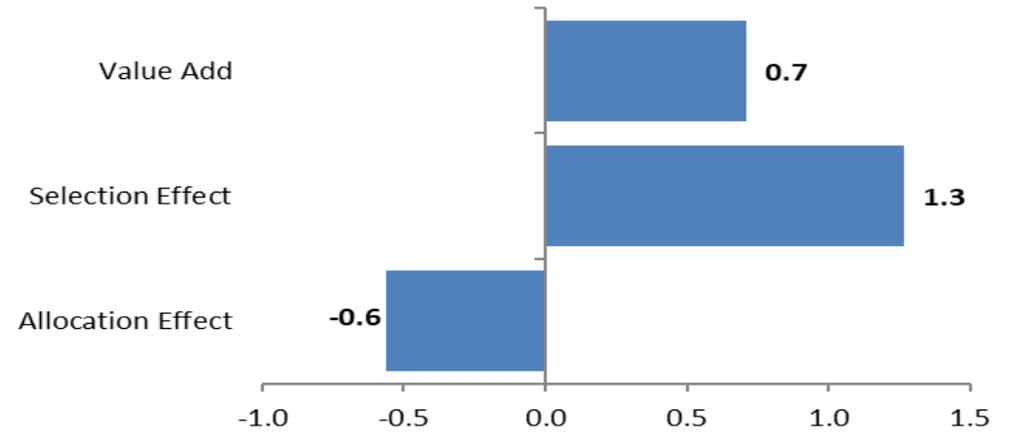
# NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 3 Years Ending December 31, 2019

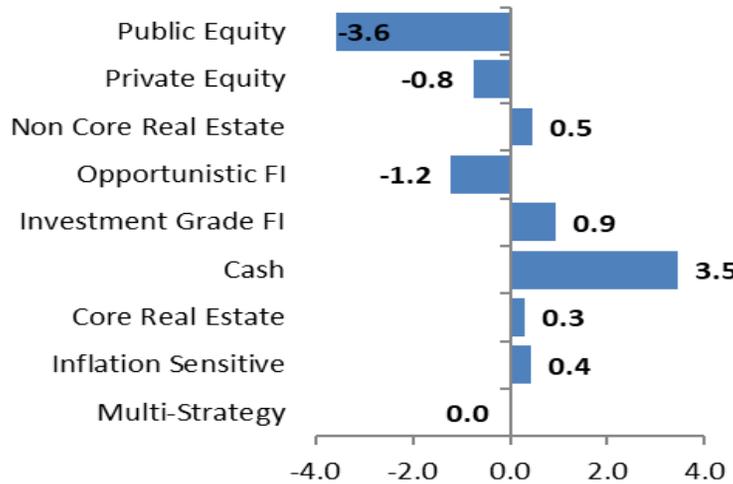
**Total Fund Performance**



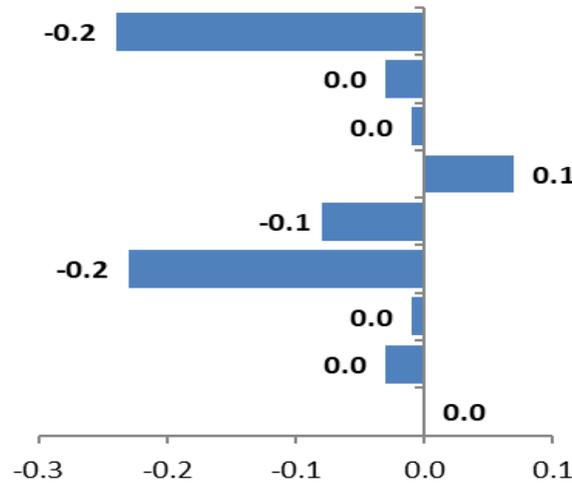
**Attribution**



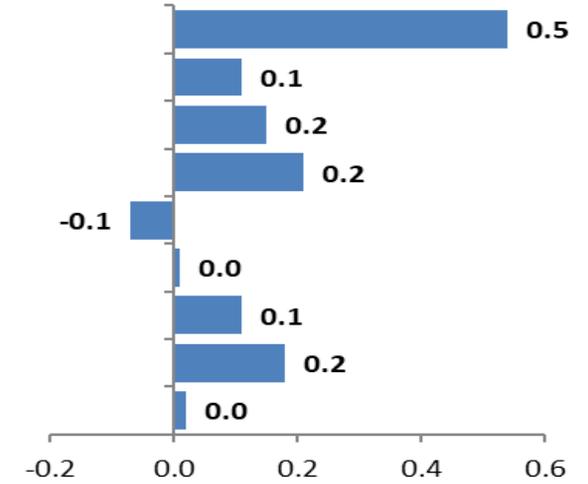
**Avg Active Weight**



**Allocation Effect**



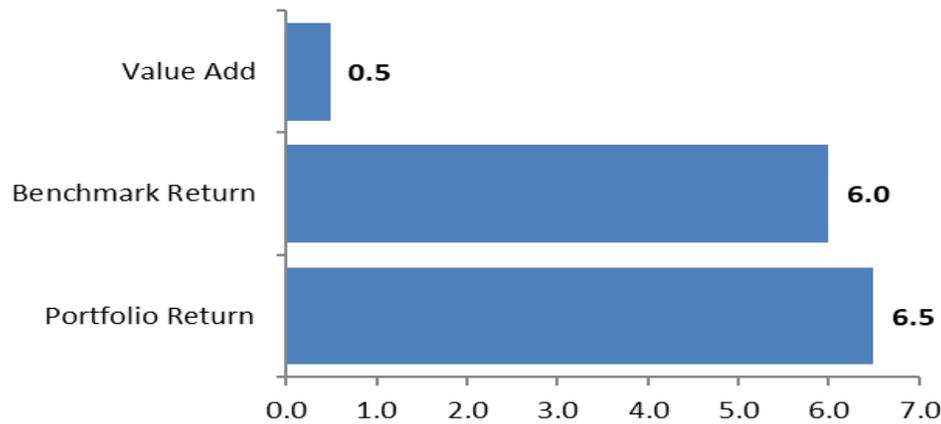
**Selection Effect**



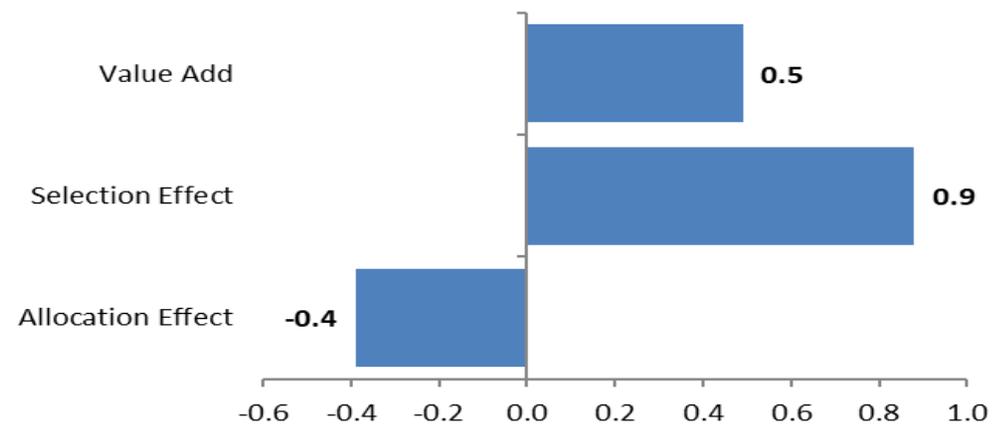
# NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 5 Years Ending December 31, 2019

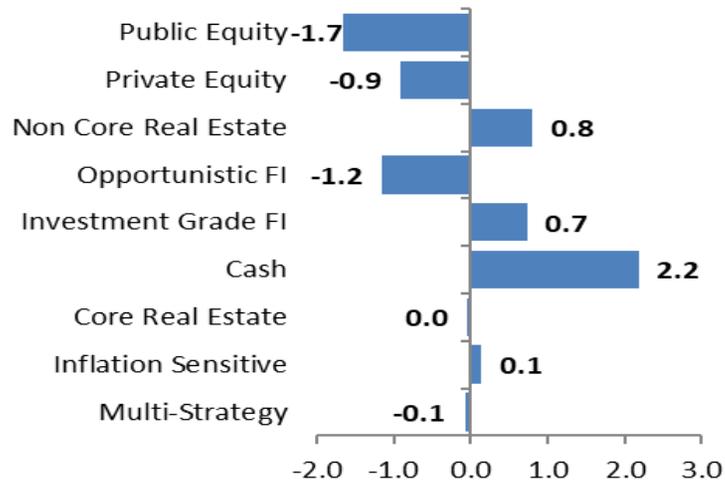
**Total Fund Performance**



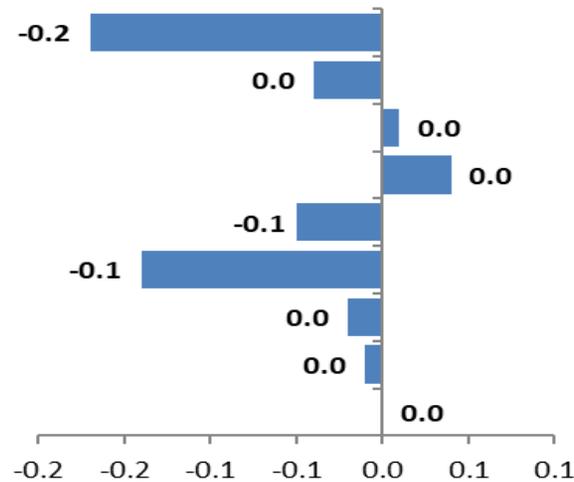
**Attribution**



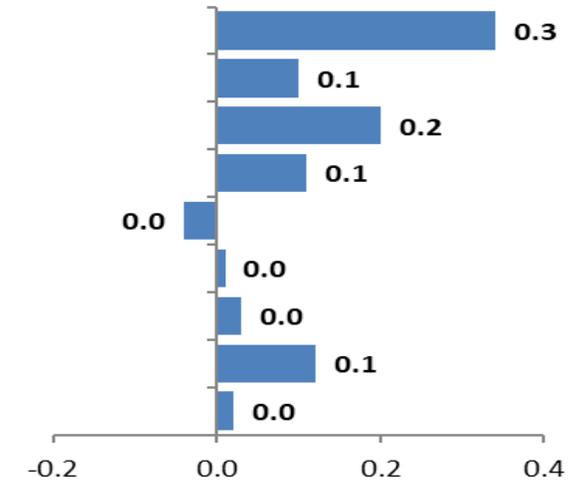
**Avg Active Weight**



**Allocation Effect**



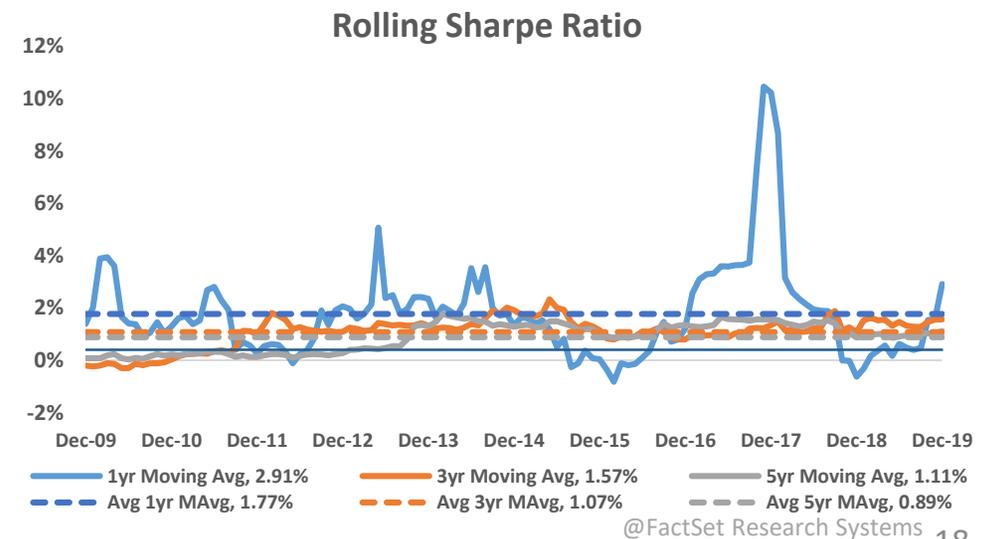
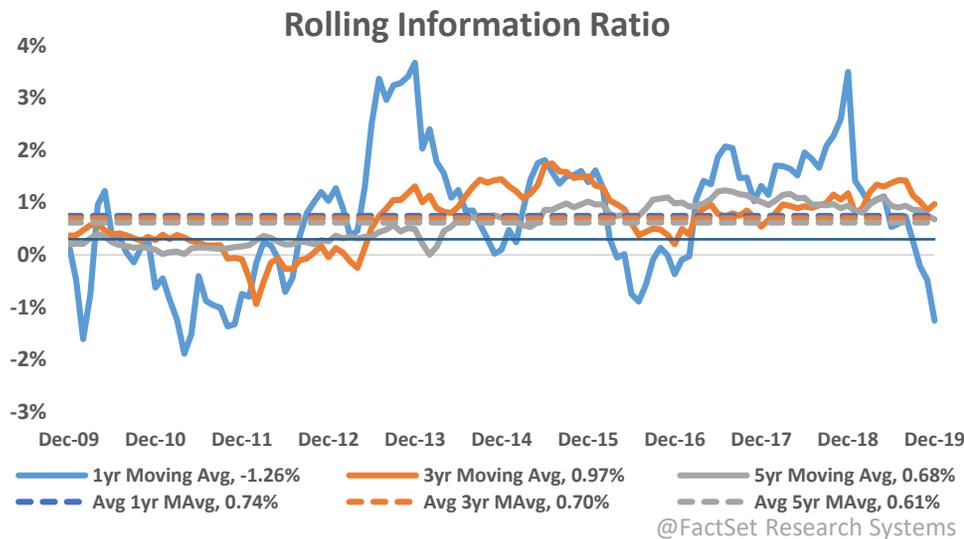
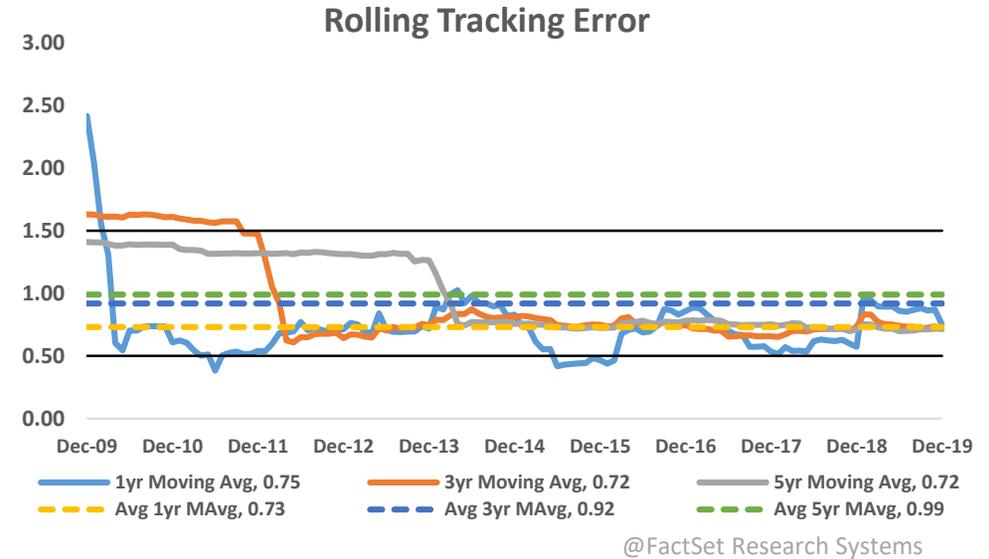
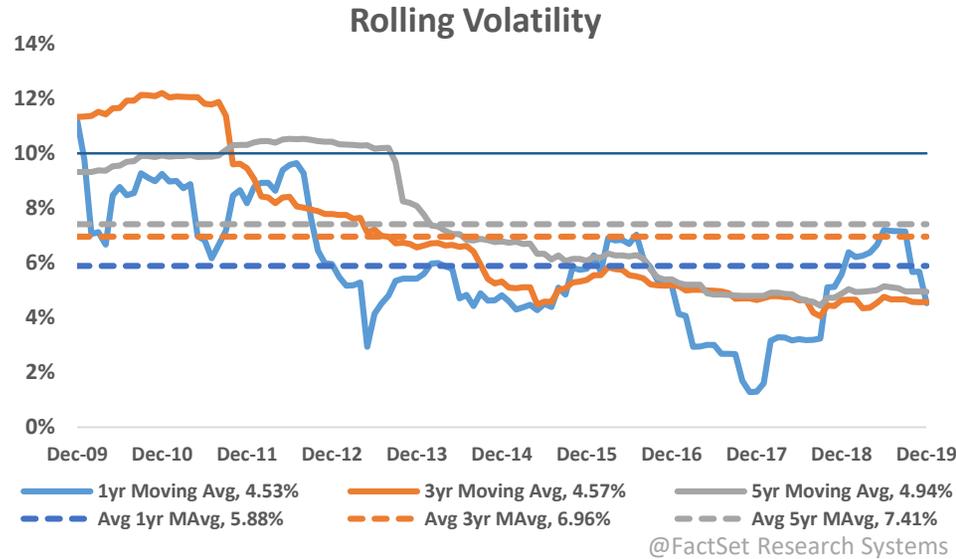
**Selection Effect**





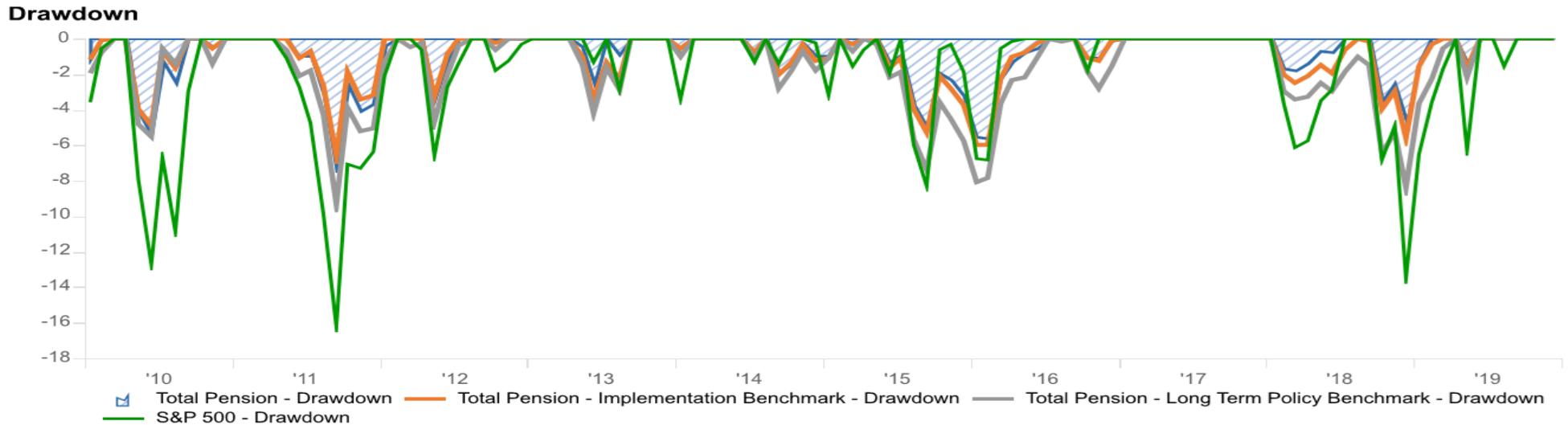
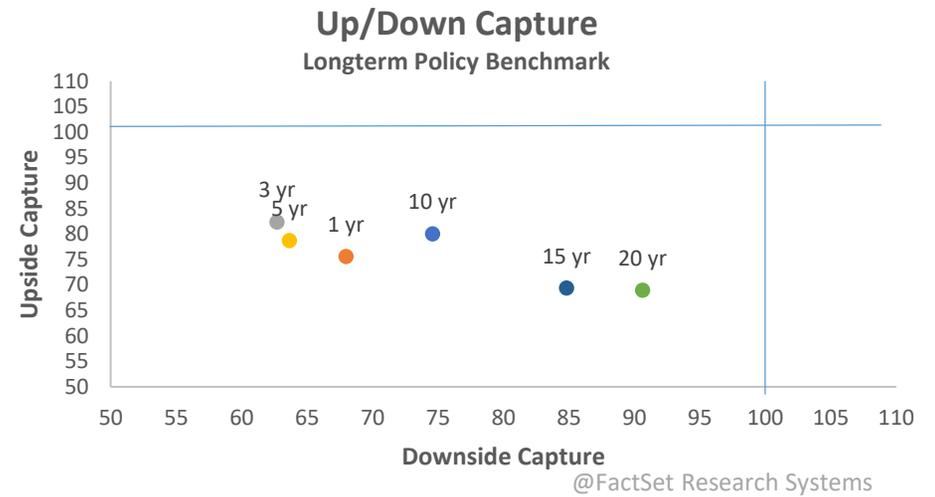
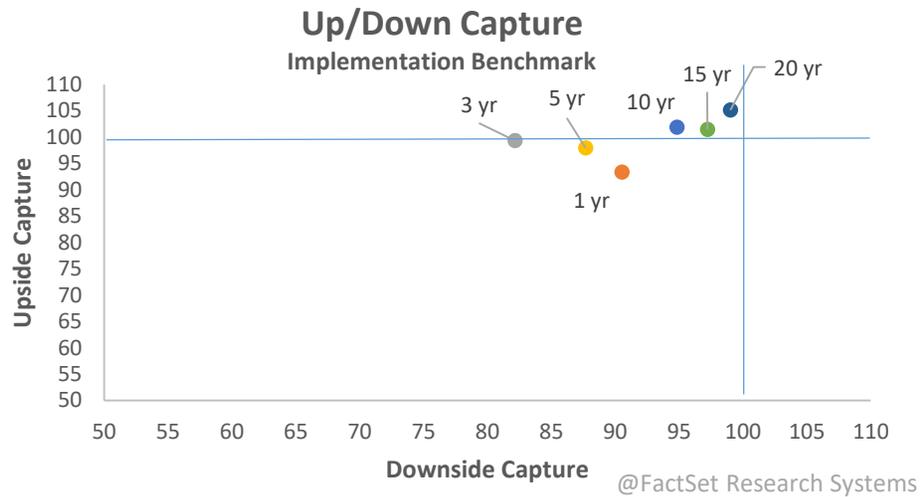
# NCRS Net of Fees Risk Metrics

## As of December 31, 2019



# NCRS Net of Fees Risk Metrics

## As of December 31, 2019





# NCRS Gross of Fees Return and Risk

BNY Mellon Universe: U.S. Public Funds > \$20B; Data as of December 31, 2019

Returns	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	18.94	10.45	7.98	8.98	7.26	6.46
<b>Median Percentile</b>	<b>17.24</b>	<b>9.78</b>	<b>7.56</b>	<b>8.63</b>	<b>7.03</b>	<b>6.20</b>
75th Percentile	15.58	9.37	7.10	8.15	6.70	6.09
<b>NCRS</b>	<b>15.26</b>	<b>9.22</b>	<b>7.08</b>	<b>8.15</b>	<b>6.70</b>	<b>6.19</b>
Percentile Rank (1 = highest performance)	83	83	77	77	75	57

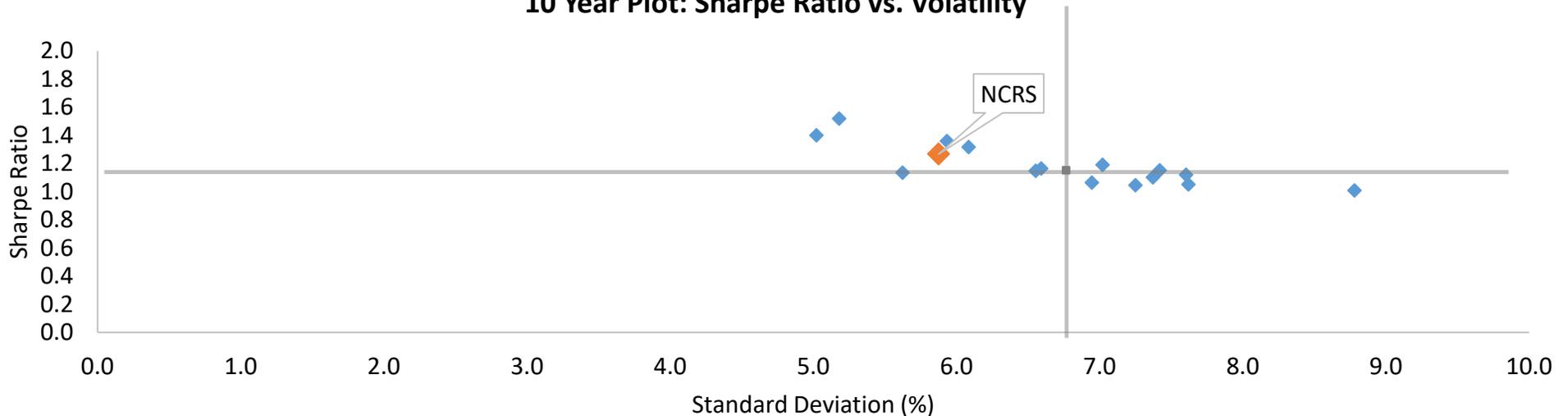
Risk	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	6.43	6.31	6.42	7.41	8.95	9.18
<b>Median Percentile</b>	<b>5.82</b>	<b>5.53</b>	<b>5.76</b>	<b>6.77</b>	<b>8.46</b>	<b>8.53</b>
75th Percentile	4.45	4.67	4.97	5.89	7.83	8.06
<b>NCRS</b>	<b>4.37</b>	<b>4.48</b>	<b>4.86</b>	<b>5.88</b>	<b>7.19</b>	<b>7.54</b>
Percentile Rank (1 = highest risk)	77	83	83	77	94	94

# NCRS Gross of Fees Sharpe Ratio

BNY Mellon Universe: U.S. Public Funds > \$20B; Data as of December 31, 2019

Sharpe	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	2.73	1.60	1.21	1.30	0.75	0.59
<b>Median Percentile</b>	<b>2.44</b>	<b>1.44</b>	<b>1.09</b>	<b>1.15</b>	<b>0.68</b>	<b>0.55</b>
75th Percentile	2.29	1.34	1.02	1.07	0.64	0.50
<b>NCRS</b>	<b>2.78</b>	<b>1.63</b>	<b>1.22</b>	<b>1.27</b>	<b>0.75</b>	<b>0.60</b>
Percentile Rank (1 = highest performance)	18	18	24	30	19	19

10 Year Plot: Sharpe Ratio vs. Volatility

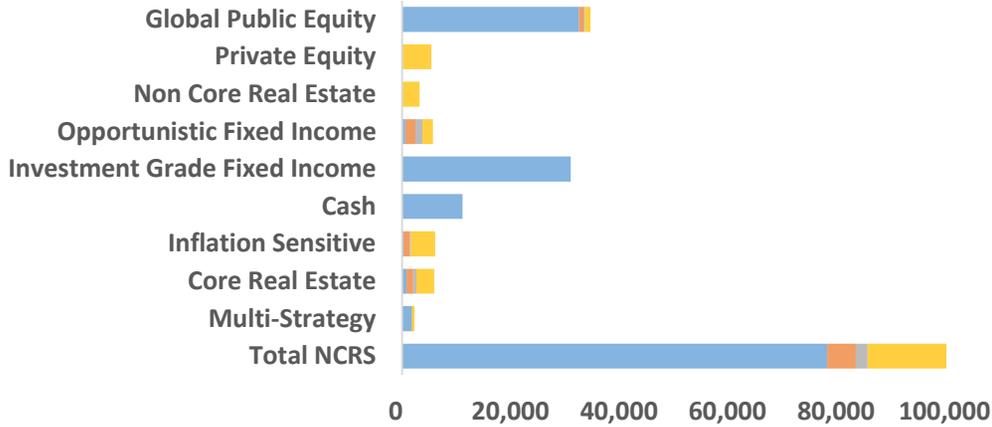


Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.

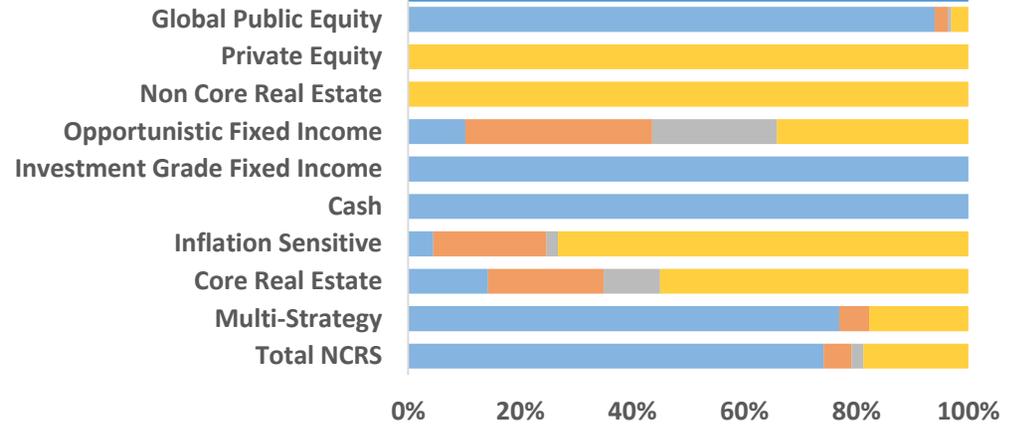
# NCRS Liquidity Profile

## As of December 31, 2019

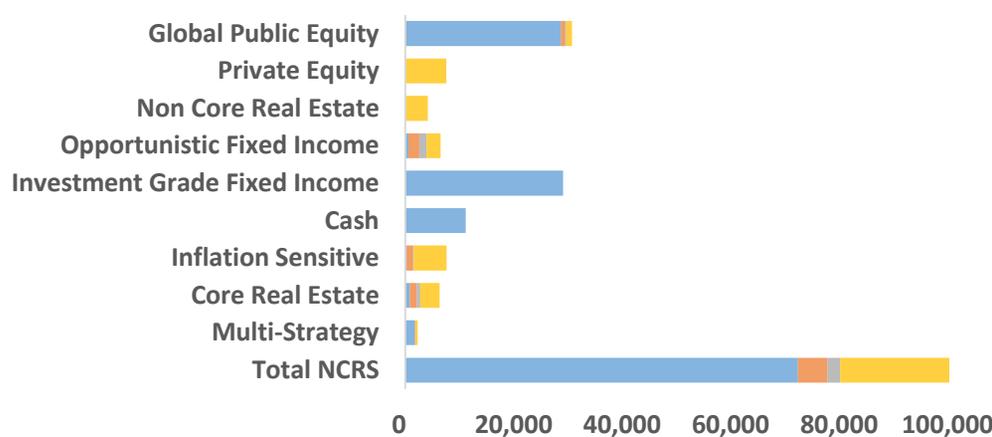
**Liquidity Allocation (\$ Market Value)**



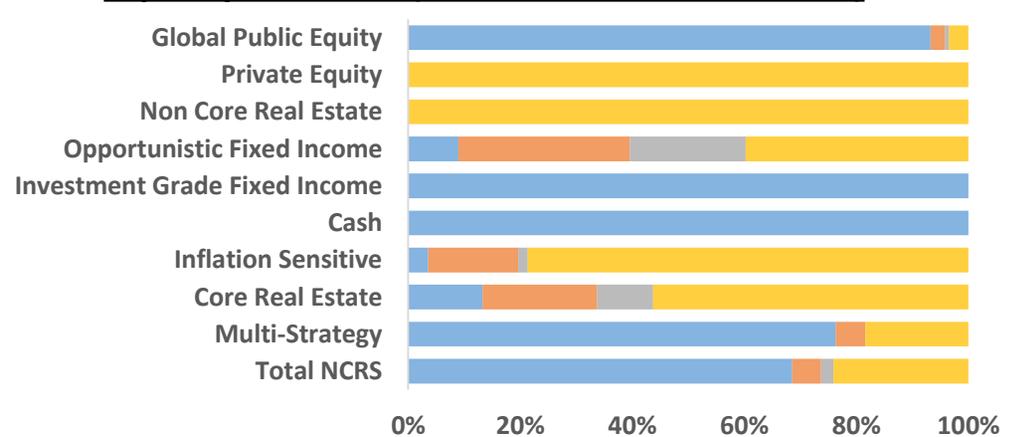
**Liquidity Allocation (% Market Value)**



**Liquidity Allocation (\$ Market Value + Unfunded)**



**Liquidity Allocation (% Market Value + Unfunded)**

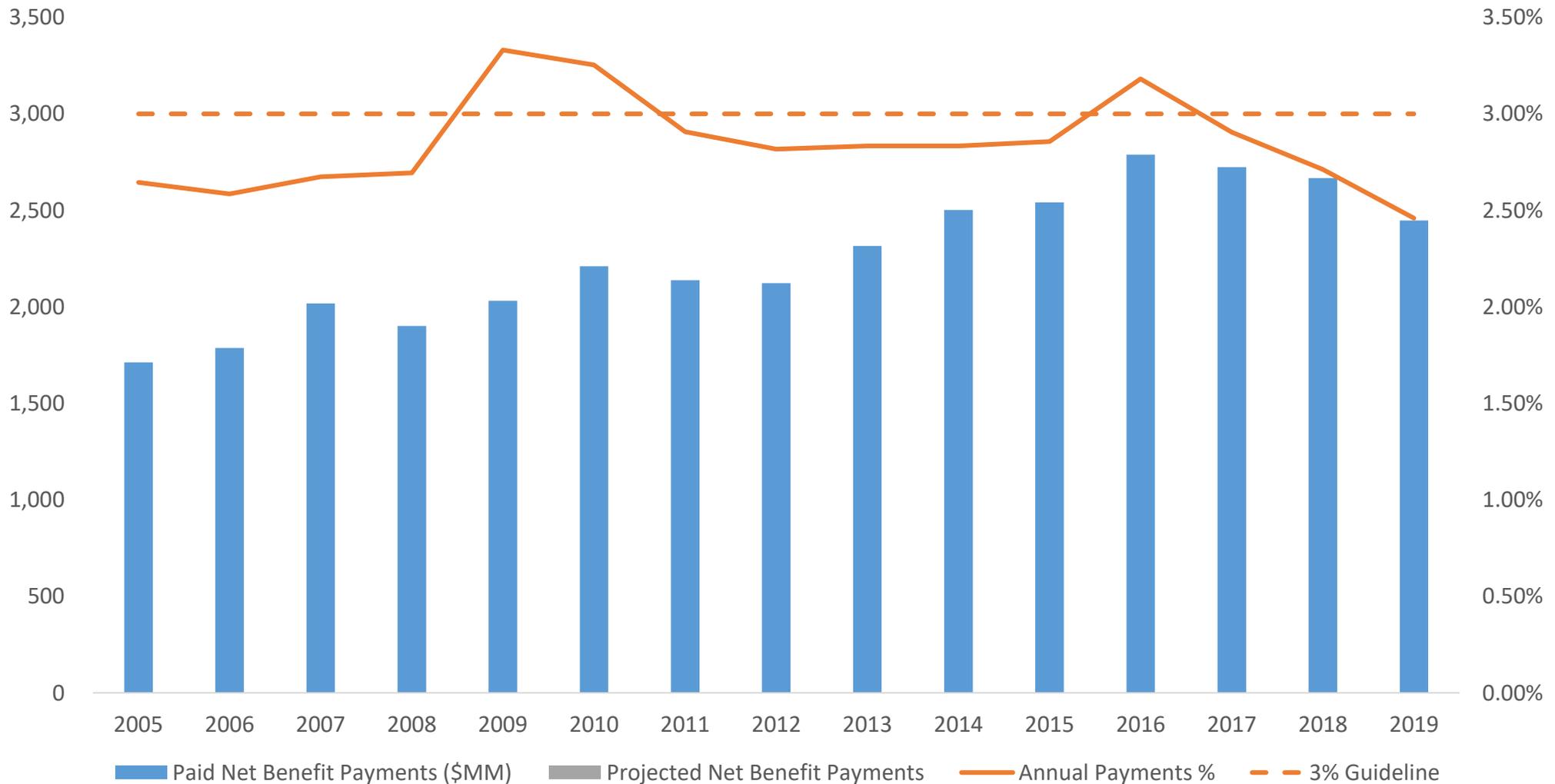


Note: ■ Level 1 Liquidity = T+3; ■ Level 2 = T+3 to 12 Months; ■ Level 3 = 12 to 24 Months; ■ Level 4 = Greater than 24 Months



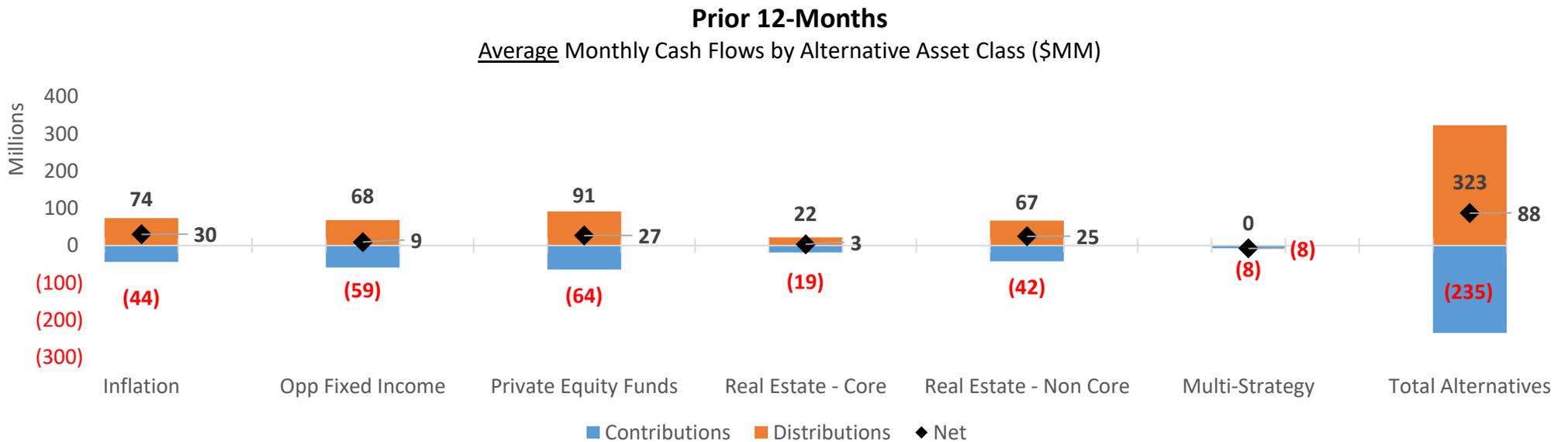
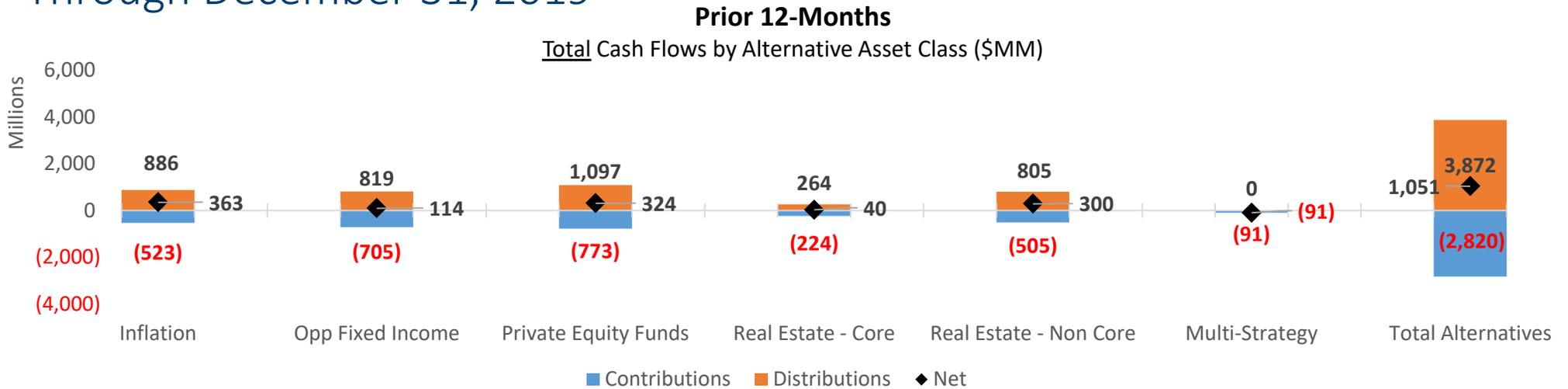
# NCRS Liquidity Profile

## Net benefit payments by calendar year



# NCRS Alternatives Liquidity Profile

## Through December 31, 2019





# NCRS Asset Class Net of Fees Performance

## As of December 31, 2019

	Market Value (\$MM)	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
<b>Growth</b>	<b>\$49,088</b>	<b>21.54</b>	<b>12.04</b>	<b>8.74</b>	<b>9.58</b>	<b>6.76</b>	<b>5.24</b>
Benchmark <sup>1</sup>		20.68	10.23	7.48	8.53	6.16	4.40
<b>Public Equity</b>	<b>\$34,741</b>	<b>27.91</b>	<b>13.01</b>	<b>8.87</b>	<b>9.67</b>	<b>6.90</b>	<b>5.34</b>
Benchmark <sup>2</sup>		26.09	11.63	8.03	8.84	6.24	4.38
<b>Private Equity</b>	<b>\$5,413</b>	<b>8.15</b>	<b>12.73</b>	<b>10.65</b>	<b>10.40</b>	<b>9.04</b>	<b>5.64</b>
Benchmark <sup>3</sup>		6.79	10.56	8.72	11.10	11.15	10.21
<b>Non-Core Real Estate</b>	<b>\$3,228</b>	<b>9.93</b>	<b>11.87</b>	<b>12.43</b>	<b>11.36</b>	<b>7.36</b>	<b>6.76</b>
Benchmark <sup>4</sup>		5.88	7.61	7.02	8.06	6.66	7.34
<b>Opportunistic Fixed Income</b>	<b>\$5,707</b>	<b>3.61</b>	<b>5.44</b>	<b>4.10</b>	<b>7.12</b>	-	-
Benchmark <sup>5</sup>		7.23	1.90	2.32	2.70	-	-
<b>Rates &amp; Liquidity</b>	<b>\$42,237</b>	<b>9.19</b>	<b>4.25</b>	<b>3.23</b>	<b>4.78</b>	<b>5.13</b>	<b>6.17</b>
Benchmark <sup>6</sup>		10.47	4.73	3.50	4.94	5.00	6.03
<b>IG Fixed Income</b>	<b>\$31,087</b>	<b>10.33</b>	<b>4.63</b>	<b>3.47</b>	<b>4.92</b>	<b>5.23</b>	<b>6.24</b>
Benchmark <sup>7</sup>		10.78	4.84	3.59	4.99	5.04	6.06
<b>Cash</b>	<b>\$11,150</b>	<b>2.25</b>	<b>1.75</b>	<b>1.36</b>	-	-	-
Benchmark <sup>8</sup>		2.13	1.60	1.03	-	-	-
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>\$12,028</b>	<b>6.15</b>	<b>7.01</b>	<b>5.15</b>	<b>3.53</b>	<b>3.97</b>	<b>4.57</b>
Benchmark <sup>9</sup>		4.82	4.57	4.14	4.12	3.20	4.48
<b>Inflation Sensitive</b>	<b>\$6,101</b>	<b>2.09</b>	<b>5.47</b>	<b>2.72</b>	<b>-0.73</b>	<b>2.99</b>	<b>3.38</b>
Benchmark <sup>10</sup>		2.09	2.80	1.02	-0.66	3.76	3.82
<b>Core Real Estate</b>	<b>\$5,927</b>	<b>10.71</b>	<b>8.81</b>	<b>8.28</b>	<b>9.30</b>	<b>6.75</b>	<b>6.68</b>
Benchmark <sup>11</sup>		8.14	6.68	7.93	9.70	6.85	7.24
<b>Multi-Strategy</b>	<b>\$2,289</b>	<b>14.82</b>	<b>7.48</b>	<b>5.83</b>	<b>8.08</b>	<b>5.93</b>	-
Benchmark <sup>12</sup>		13.99	6.48	4.59	6.35	7.22	-
<b>Total Pension Plan</b>	<b>\$105,641</b>	<b>14.88</b>	<b>8.72</b>	<b>6.49</b>	<b>7.61</b>	<b>6.26</b>	<b>5.85</b>
Implementation Benchmark <sup>13</sup>		15.85	8.02	6.00	7.09	5.82	5.41
Long-Term Policy Benchmark <sup>14</sup>		19.33	8.75	5.94	6.83	6.08	5.48



# NCRS Calendar Year Asset Class Return Diversification

## As of December 31, 2019

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Public Equity 32.68%	Opportunistic Fixed Income 15.89%	Non-Core Real Estate 17.28%	Public Equity 17.59%	Public Equity 26.27%	Non-Core Real Estate 19.45%	Non-Core Real Estate 14.84%	Non-Core Real Estate 11.73%	Public Equity 24.44%	Private Equity 18.32%	Public Equity 27.91%
Multi-Strategy 16.75%	Public Equity 15.24%	Private Equity 13.87%	Multi-Strategy 14.70%	Multi-Strategy 22.61%	Private Equity 14.02%	Private Equity 9.20%	Public Equity 7.33%	Multi-Strategy 13.58%	Non-Core Real Estate 13.32%	Total Pension 14.88%
Total Pension 15.08%	Total Pension 11.61%	IG Fixed Income & Cash 10.82%	Opportunistic Fixed Income 13.95%	Opportunistic Fixed Income 16.56%	Core Real Estate 10.41%	Core Real Estate 8.28%	Inflation Sensitive 7.19%	Total Pension 13.53%	Inflation Sensitive 6.88%	Multi-Strategy 14.82%
IG Fixed Income & Cash 7.63%	IG Fixed Income & Cash 9.45%	Core Real Estate 7.89%	Core Real Estate 13.67%	Non-Core Real Estate 12.88%	IG Fixed Income & Cash 8.51%	Multi-Strategy 0.85%	Opportunistic Fixed Income 7.09%	Non-Core Real Estate 12.40%	Opportunistic Fixed Income 5.69%	Core Real Estate 10.71%
Opportunistic Fixed Income 6.72%	Core Real Estate 8.48%	Multi-Strategy 6.15%	Total Pension 11.84%	Total Pension 12.28%	Total Pension 6.19%	Pension Cash 0.58%	Core Real Estate 6.68%	Private Equity 11.95%	Core Real Estate 5.67%	IG Fixed Income & Cash 10.33%
Inflation Sensitive -5.77%	Multi-Strategy 6.90%	Opportunistic Fixed Income 2.22%	Non-Core Real Estate 7.78%	Private Equity 11.72%	Public Equity 3.68%	Total Pension 0.29%	Total Pension 6.26%	Core Real Estate 10.12%	Pension Cash 1.88%	Non-Core Real Estate 9.93%
Private Equity -9.39%	Private Equity 5.70%	Total Pension 2.12%	IG Fixed Income & Cash 7.29%	Core Real Estate 11.28%	Opportunistic Fixed Income 3.40%	IG Fixed Income & Cash 0.28%	Private Equity 6.05%	Inflation Sensitive 7.53%	IG Fixed Income & Cash -0.57%	Private Equity 8.15%
Core Real Estate -13.63%	Non-Core Real Estate -4.23%	Inflation Sensitive -5.47%	Private Equity 5.74%	Inflation Sensitive -1.32%	Multi-Strategy 2.69%	Public Equity -1.26%	Multi-Strategy 6.00%	Opportunistic Fixed Income 7.05%	Total Pension -1.47%	Opportunistic Fixed Income 3.61%
Non-Core Real Estate -43.11%	Inflation Sensitive -13.21%	Public Equity -7.20%	Inflation Sensitive 1.06%	IG Fixed Income & Cash -3.49%	Pension Cash 0.45%	Opportunistic Fixed Income -2.61%	IG Fixed Income & Cash 3.24%	IG Fixed Income & Cash 4.42%	Multi-Strategy -4.79%	Pension Cash 2.20%
					Inflation Sensitive -0.65%	Inflation Sensitive -9.05%	Pension Cash 0.98%	Pension Cash 1.12%	Public Equity -9.32%	Inflation Sensitive 2.09%



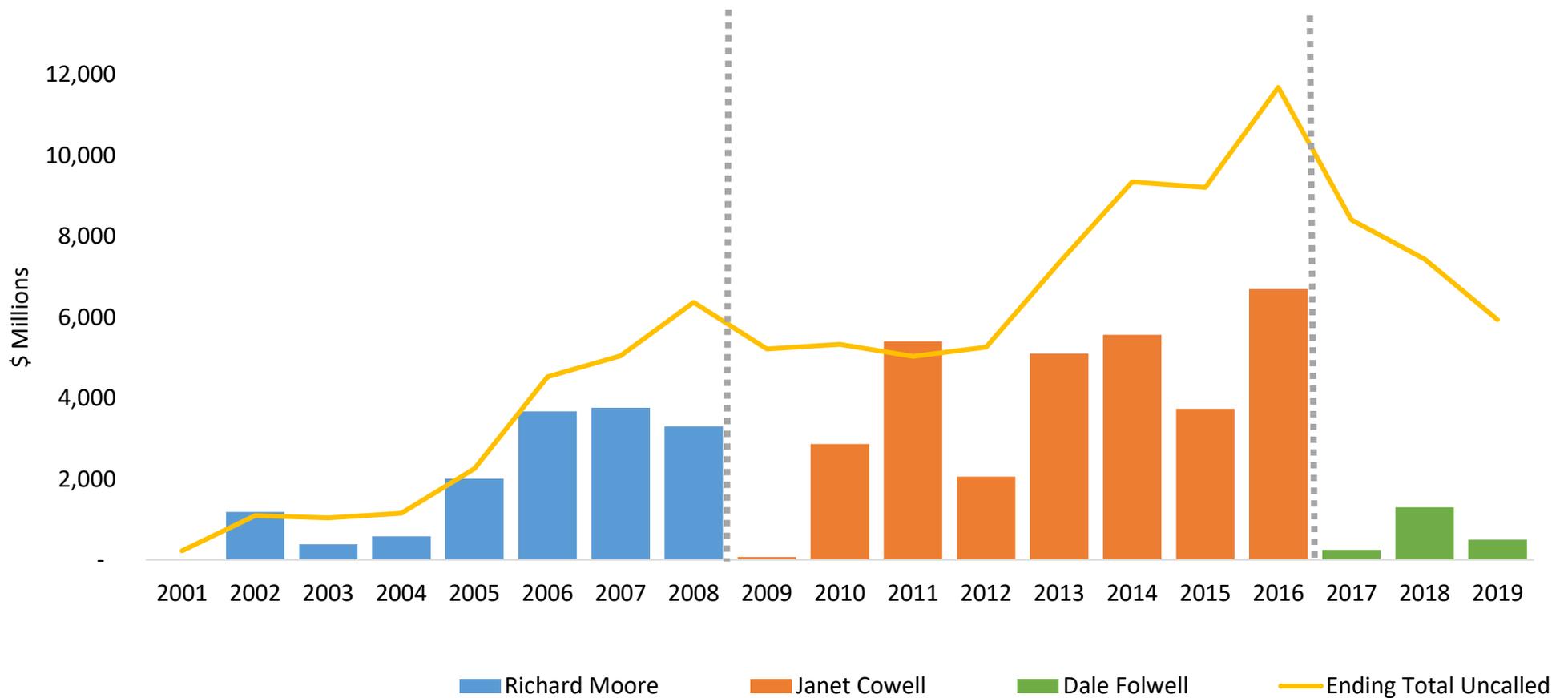
# New, Incremental, & Unfunded Investment Commitments

Since November 20th IAC Meeting As of December 31, 2019

<u>Fund Name</u>	<u>Firm Name</u>	<u>New or Incremental Commitment (\$MM)</u>	<u>Closing Date</u>
<b>Public Equity</b>			
None			
<b>Private Equity</b>			
None			
<b>Non-Core Real Estate</b>			
None			
<b>Opportunistic Fixed Income</b>			
None			
<b>Inflation Sensitive</b>			
None			
<b>Core Real Estate</b>			
BlackRock World REIT	BlackRock	423,449	1/8/2020
<b>Multi-Strategy</b>			
None			

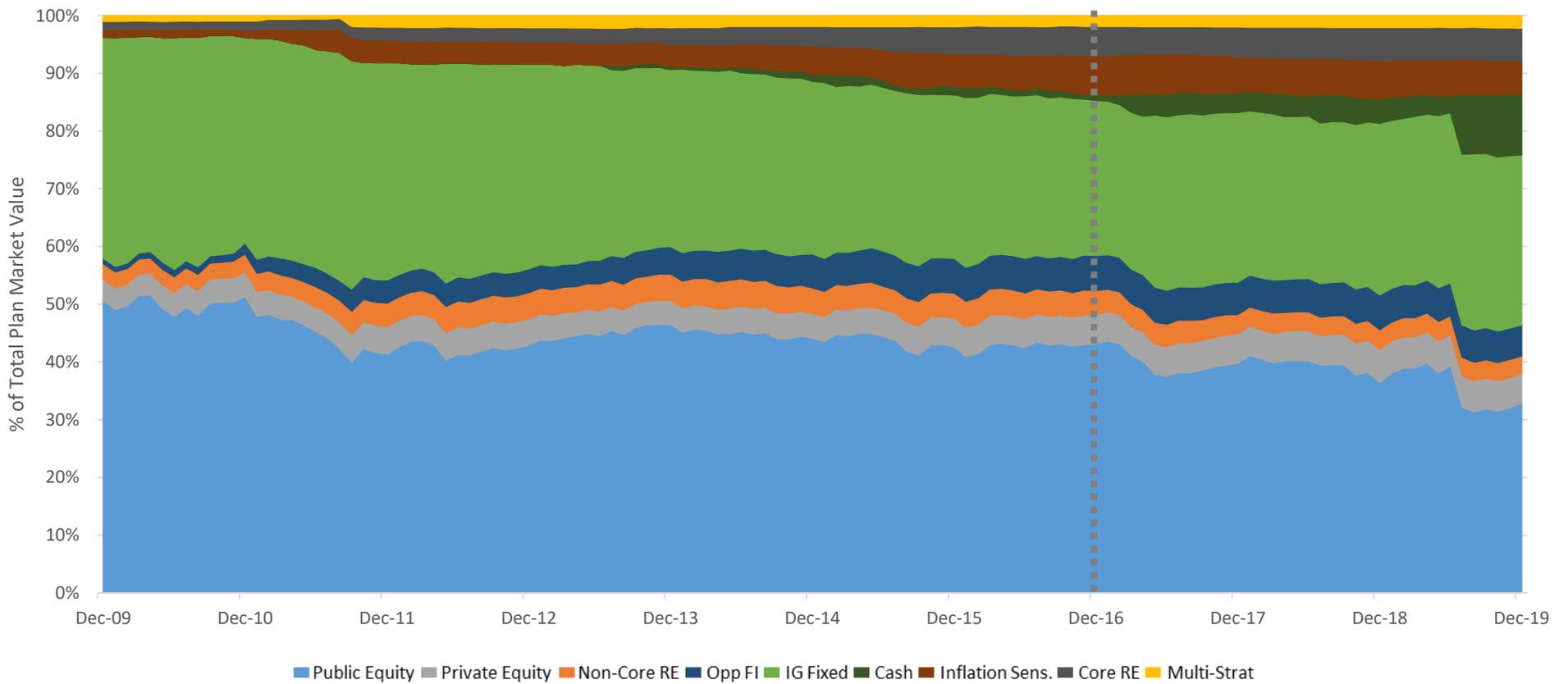
<u>Asset Class</u>	<u>Unfunded Commitments (\$MM)</u>
<b>Public Equity</b>	<b>0</b>
<b>Private Equity</b>	<b>2,180</b>
<b>Non-Core Real Estate</b>	<b>959</b>
<b>Opportunistic Fixed Income</b>	<b>820</b>
<b>Inflation Sensitive</b>	<b>1,553</b>
<b>Core Real Estate</b>	<b>413</b>
<b>Multi Strategy</b>	<b>19</b>
<b>Total</b>	<b>5,944</b>

# New and Total Unfunded Private Asset Class Commitments By Calendar Year of Closing





# Asset Allocation History as of December 31, 2019





# Exited Investments

## Since November 20<sup>th</sup> IAC Meeting

<u>Fund Name</u>	<u>Redemption Amount (\$MM)</u>	<u>Redemption Effective</u>
<b>Public Equity</b>		
None		
<b>Private Equity</b>		
None		
<b>Non-Core Real Estate</b>		
None		
<b>Opportunistic Fixed Income</b>		
None		
<b>Inflation Sensitive</b>		
None		
<b>Core Real Estate</b>		
BlackRock Developed REIT	423,449	1/8/2020
<b>Multi Strategy</b>		
None		



# Top 20 Investment Managers

## As of December 31, 2019

	Manager	Market Value (\$)	Uncalled (\$)	% MV	% MV Cum.
1	Internal Fixed Income	42,236,612,132	-	40.0%	40.0%
2	Internal Equity	12,076,263,194	-	11.4%	51.4%
3	BlackRock, Inc.	10,817,873,121	-	10.2%	61.7%
4	Rockwood Capital	2,774,790,627	190,597,157	2.6%	64.3%
5	Blackstone Group	2,732,935,696	1,242,802,360	2.6%	66.9%
6	Baillie Gifford	2,672,333,448	-	2.5%	69.4%
7	Mondrian Investment Partners Limited	2,669,826,093	-	2.5%	71.9%
8	Wellington Management	2,561,502,984	-	2.4%	74.3%
9	Walter Scott & Partners	2,123,058,489	-	2.0%	76.4%
10	Gladius Capital Management LP	2,020,877,062	3,809,396	1.9%	78.3%
11	Angelo, Gordon & Co.	1,669,821,266	66,716,462	1.6%	79.9%
12	ValueAct Capital	1,060,478,727	-	1.0%	80.9%
13	Landmark Partners, Inc.	928,162,061	1,286,699,813	0.9%	81.7%
14	DoubleLine Capital LP	809,045,695	-	0.8%	82.5%
15	Rockpoint Group, LLC	743,848,411	107,133,816	0.7%	83.2%
16	Campbell Group LLC, The	710,458,606	-	0.7%	83.9%
17	Franklin Templeton Investments	659,521,608	-	0.6%	84.5%
18	Earnest Partners	634,821,931	-	0.6%	85.1%
19	LBA Realty	611,011,007	27,524,752	0.6%	85.7%
20	Monarch Alternative Capital	558,500,000	-	0.5%	86.2%
	102 Remaining Managers*	14,569,709,581	3,018,903,268	13.8%	100.0%
	<b>Total</b>	<b>105,641,451,737</b>	<b>5,944,187,025</b>	<b>100.0%</b>	<b>100.0%</b>

\*Manager count consists of all manager accounts with a market value greater than \$5.1 million and new, not yet funded, accounts.



## Appendix



# NCRS Public Equity Net of Fees Performance

## As of December 31, 2019

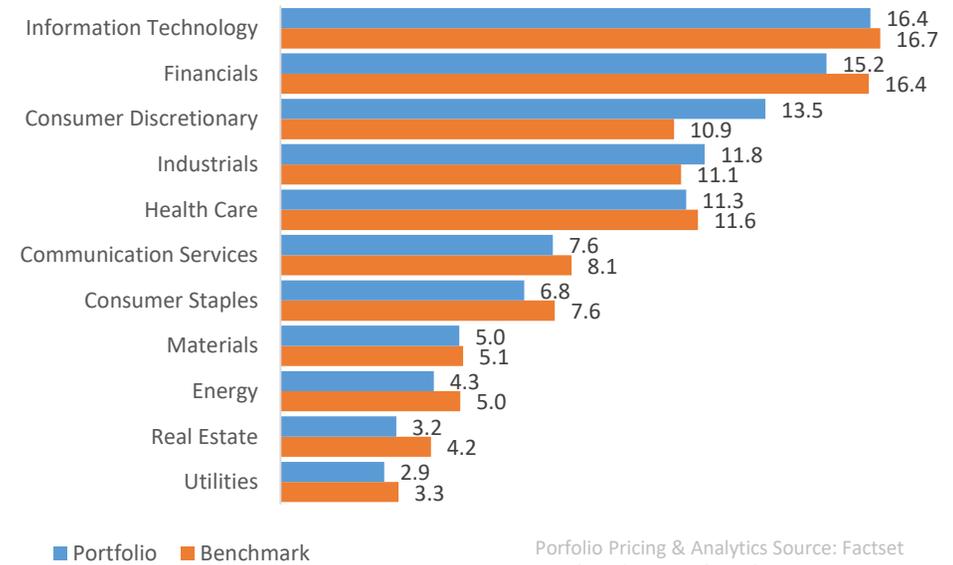
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Public Equity</b>	<b>\$34,741</b>	<b>9.80</b>	<b>27.91</b>	<b>13.01</b>	<b>8.87</b>	<b>9.67</b>
Benchmark <sup>2</sup>		8.97	26.09	11.63	8.03	8.84
<b>Domestic Portfolio</b>	<b>\$15,283</b>	<b>8.96</b>	<b>32.11</b>	<b>15.26</b>	<b>11.34</b>	<b>13.54</b>
Russell 3000		9.10	31.02	14.57	11.24	13.42
<b>Non-US Portfolio</b>	<b>\$19,010</b>	<b>10.47</b>	<b>24.04</b>	<b>12.06</b>	<b>7.09</b>	<b>5.84</b>
Custom Benchmark		9.20	21.63	9.84	5.71	4.94
<b>Equity Hedge</b>	<b>\$447</b>	<b>8.89</b>	<b>12.94</b>	<b>5.27</b>	<b>4.81</b>	<b>-</b>
MSCI ACWI (Beta Adjusted)		3.56	10.06	4.85	3.12	-

# NCRS Public Equity Portfolio Characteristics

## As of December 31, 2019

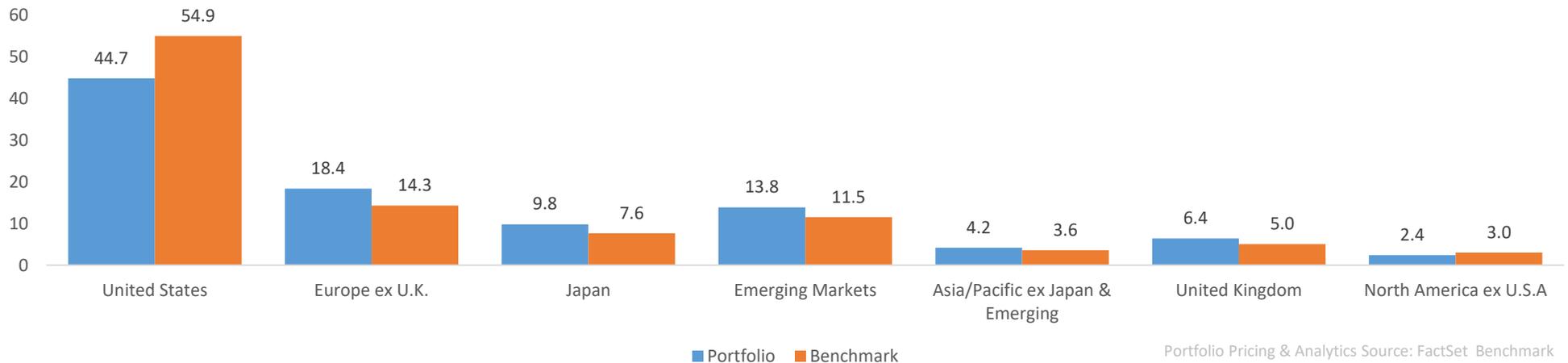
Portfolio Characteristics		
	Portfolio	MSCI ACWI IMI
Price/Earnings	19.0	18.5
Dividend Yield	2.2	2.3
Price/Book	2.3	2.3
Market Capitalization	156,741.0	166,915.6
Return On Equity	17.2	18.5

@FactSet Research Systems



Portfolio Pricing & Analytics Source: Factset  
Benchmark Pricing & Analytics Source: Factset

## Total Equity Regional Allocation



Portfolio Pricing & Analytics Source: FactSet  
Benchmark Pricing & Analytics Source: FactSet



# NCRS Private Equity Portfolio

As of December 31, 2019

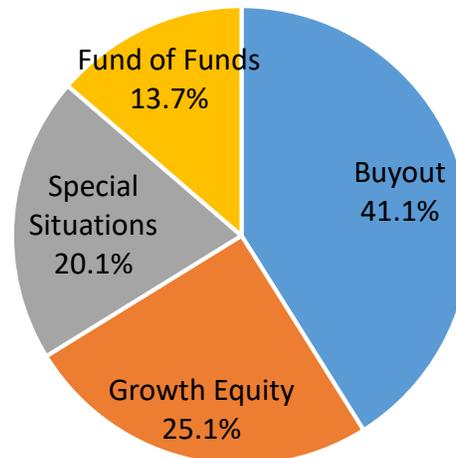
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Private Equity</b>	<b>\$5,413</b>	<b>1.66</b>	<b>8.15</b>	<b>12.73</b>	<b>10.65</b>	<b>10.40</b>
Benchmark <sup>3</sup>		1.02	6.79	10.56	8.72	11.10
<b>Buyout</b>	<b>\$2,221</b>	<b>4.76</b>	<b>13.22</b>	<b>13.78</b>	<b>11.10</b>	<b>9.70</b>
<b>Growth</b>	<b>\$1,359</b>	<b>(3.50)</b>	<b>5.69</b>	<b>13.82</b>	<b>12.86</b>	<b>13.02</b>
<b>Special Situations</b>	<b>\$1,088</b>	<b>2.82</b>	<b>3.51</b>	<b>8.35</b>	<b>6.78</b>	<b>6.72</b>
<b>Fund of Funds</b>	<b>\$740</b>	<b>0.68</b>	<b>5.74</b>	<b>13.14</b>	<b>10.87</b>	<b>12.09</b>

IRR by Vintage Year

	Pre-2004	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NCRS	12.02	6.91	5.34	3.40	9.56	9.23	8.95	20.63	9.93	14.17	12.01	14.04	16.50	16.37	8.37	10.69	0.00	8.62
# of Funds	28	3	11	21	15	17	3	1	6	6	9	4	9	6	7	3	0	149

Strategy Allocation (Based on Valuation)



\*Private Equity returns include a stock distribution account, in the amount of roughly \$6.5 million, which does not fall under any specific sub-section. 35



# NCRS Non-Core Real Estate Portfolio

As of December 31, 2019

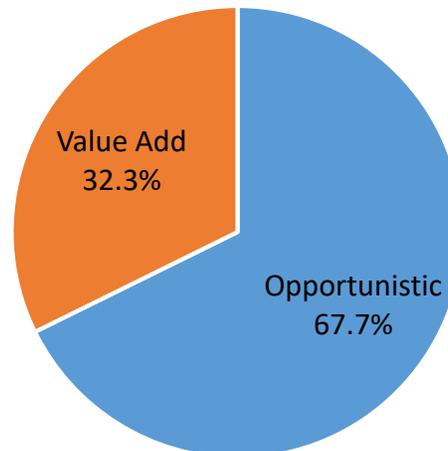
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Non-Core Real Estate</b>	<b>\$3,228</b>	<b>1.74</b>	<b>9.93</b>	<b>11.87</b>	<b>12.43</b>	<b>11.36</b>
Benchmark <sup>4</sup>		1.55	5.88	7.61	7.02	8.06
<b>Opportunistic</b>	<b>\$2,185</b>	<b>1.19</b>	<b>10.33</b>	<b>12.36</b>	<b>12.17</b>	<b>11.35</b>
<b>Value Add</b>	<b>\$1,042</b>	<b>2.93</b>	<b>8.94</b>	<b>10.65</b>	<b>12.74</b>	<b>11.46</b>

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>2018</u>	<u>2019</u>	<u>Total</u>
NCRS	9.14	15.69	-1.42		2.50	16.00	N/A	16.30	18.09	17.90	15.02	7.74	8.89	12.21	N/A	2.39	-0.47	6.80
# of Funds	17	3	15	13	8	6	N/A	6	7	5	7	7	6	7	N/A	1	1	108

Strategy Allocation (Based on Valuation)





# NCRS Opportunistic Fixed Income Portfolio

As of December 31, 2019

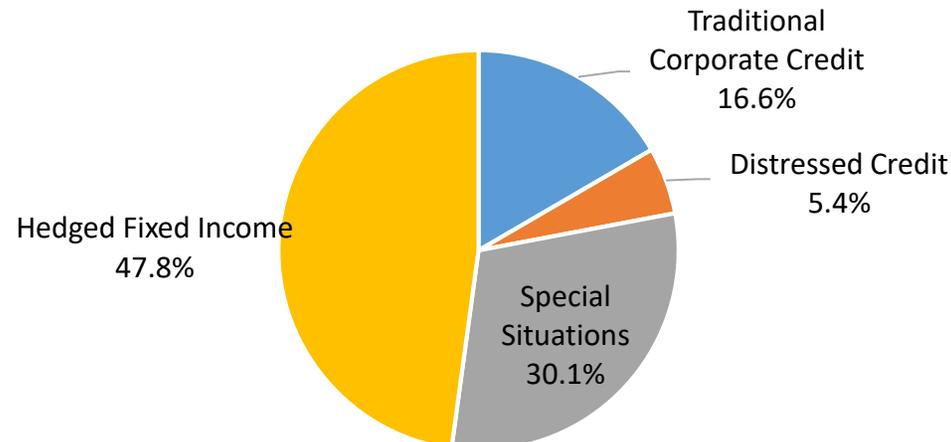
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Opportunistic Fixed Income</b>	<b>\$5,707</b>	<b>0.93</b>	<b>3.61</b>	<b>5.44</b>	<b>4.10</b>	<b>7.12</b>
Benchmark <sup>5</sup>		1.27	7.23	1.90	2.32	2.70
<b>Traditional Corporate Credit</b>	<b>\$948</b>	<b>1.98</b>	<b>2.44</b>	<b>5.83</b>	<b>4.24</b>	<b>8.06</b>
<b>Distressed Credit</b>	<b>\$308</b>	<b>(1.52)</b>	<b>2.41</b>	<b>6.52</b>	<b>6.25</b>	<b>8.81</b>
<b>Special Situations</b>	<b>\$1,720</b>	<b>1.66</b>	<b>6.20</b>	<b>8.88</b>	<b>8.58</b>	<b>14.56</b>
<b>Hedged Fixed Income</b>	<b>\$2,730</b>	<b>0.41</b>	<b>2.49</b>	<b>3.14</b>	<b>1.98</b>	<b>-</b>

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>2018</u>	<u>2019</u>	<u>Total</u>
NCRS	2.87	N/A	16.94	8.05	22.42	5.77	4.32	2.70	4.91	4.40	9.10	8.70	5.97	N/A	1.21	5.80
# of Funds	1	N/A	1	3	1	4	9	2	7	3	1	8	2	N/A	1	42

Strategy Allocation (Based on Valuation)





# NCRS Rates & Liquidity Portfolio

As of December 31, 2019

### Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Rates &amp; Liquidity</b>	<b>\$42,237</b>	<b>0.12</b>	<b>9.19</b>	<b>4.25</b>	<b>3.23</b>	<b>4.78</b>
Benchmark <sup>6</sup>		(0.11)	10.47	4.73	3.50	4.94
<b>IG Fixed Income</b>	<b>\$31,087</b>	<b>(0.02)</b>	<b>10.33</b>	<b>4.63</b>	<b>3.47</b>	<b>4.92</b>
<b>Core Fixed Income</b>	<b>\$27,975</b>	<b>(0.08)</b>	<b>11.34</b>	<b>5.00</b>	<b>3.74</b>	<b>5.10</b>
<b>IG Fixed Income Cash</b>	<b>\$3,112</b>	<b>0.51</b>	<b>2.06</b>	<b>1.61</b>	<b>1.25</b>	<b>-</b>
<b>Pension Cash</b>	<b>\$11,150</b>	<b>0.50</b>	<b>2.25</b>	<b>1.75</b>	<b>1.36</b>	<b>-</b>

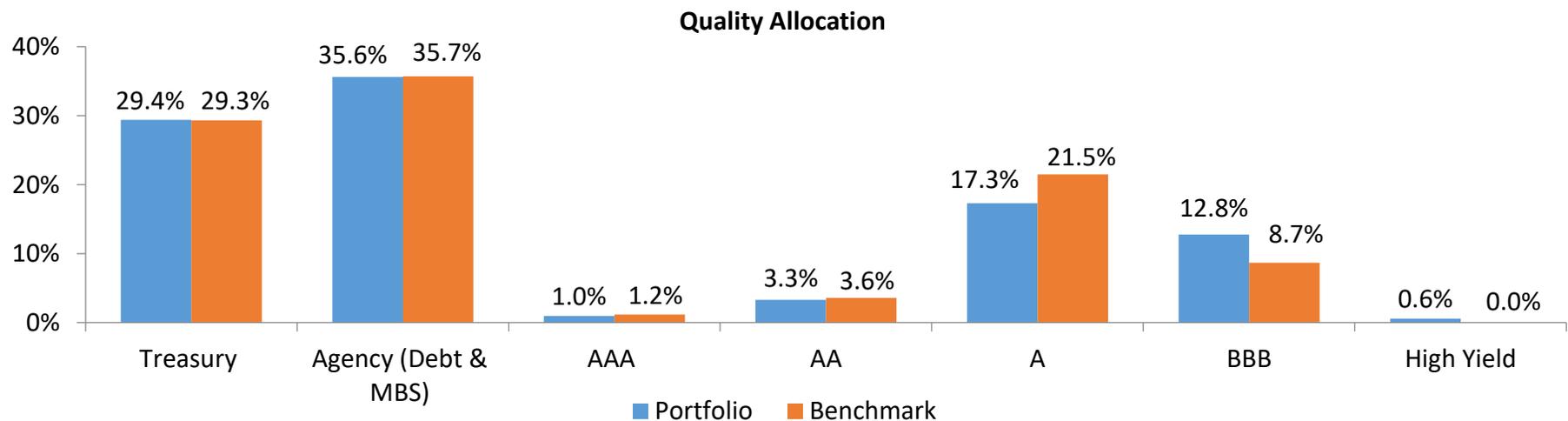
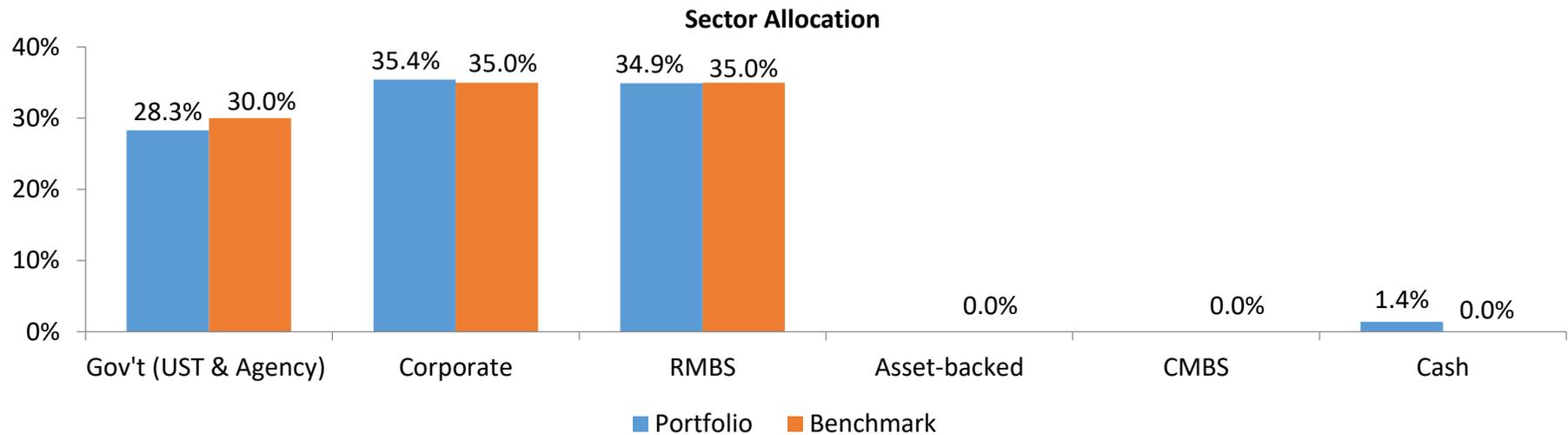
### Core Fixed Income Portfolio Characteristics

	<u>Avg. Coupon</u>	<u>Yield to Worst</u>	<u>Effective Duration</u>
Government (Treasury & Agency)	3.83%	2.07%	11.1
Corporate	4.44%	3.03%	10.0
Mortgage	3.69%	2.68%	3.5
<b>Total</b>	<b>3.99%</b>	<b>2.63%</b>	<b>8.0</b>



# NCRS Core Fixed Income Portfolio Characteristics

## As of December 31, 2019





# NCRS Inflation Sensitive Portfolio

As of December 31, 2019

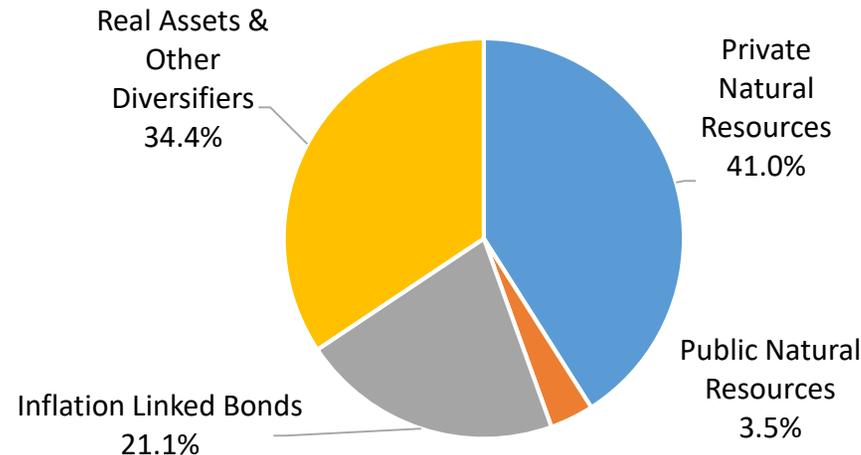
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Inflation Sensitive</b>	<b>\$6,101</b>	<b>0.82</b>	<b>2.09</b>	<b>5.47</b>	<b>2.72</b>	<b>(0.73)</b>
Benchmark <sup>10</sup>		(0.17)	2.09	2.80	1.02	(0.66)
<b>Private Natural Resources</b>	<b>\$2,499</b>	<b>(0.32)</b>	<b>(6.48)</b>	<b>2.95</b>	<b>0.00</b>	<b>0.80</b>
<b>Public Natural Resources</b>	<b>\$216</b>	<b>5.96</b>	<b>10.16</b>	<b>(2.15)</b>	<b>(4.77)</b>	<b>-</b>
<b>Inflation Linked Bonds</b>	<b>\$59</b>	<b>1.24</b>	<b>4.47</b>	<b>1.82</b>	<b>-</b>	<b>-</b>
<b>Real Assets &amp; Other Diversifiers</b>	<b>\$2,096</b>	<b>1.44</b>	<b>9.61</b>	<b>10.10</b>	<b>9.15</b>	<b>-</b>

IRR by Vintage Year

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
NCRS	0.52	-8.19	-5.89	N/A	-9.52	-6.40	7.32	6.91	9.45	5.66	4.47	7.96	38.18	-1.00	1.29
# of Funds	3	2	2	N/A	3	9	7	11	12	4	4	1	3	2	61

Strategy Allocation (Based on Valuation)





# NCRS Core Real Estate Portfolio

As of December 31, 2019

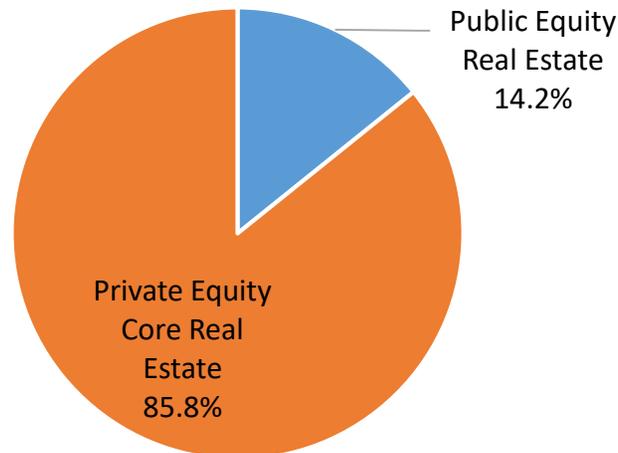
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Core Real Estate</b>	<b>\$5,927</b>	<b>3.95</b>	<b>10.71</b>	<b>8.81</b>	<b>8.28</b>	<b>9.30</b>
Benchmark <sup>11</sup>		1.75	8.14	6.68	7.93	9.70
<b>Public Equity Real Estate</b>	<b>\$844</b>	<b>3.72</b>	<b>24.45</b>	<b>10.66</b>	<b>6.94</b>	<b>9.87</b>
<b>Private Equity Core Real Estate</b>	<b>\$5,084</b>	<b>4.00</b>	<b>8.77</b>	<b>8.53</b>	<b>8.60</b>	<b>9.29</b>

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>2018</u>	<u>2019</u>	<u>Total</u>
NCRS	7.60	9.76	-8.33	4.69	1.39	9.95	N/A	23.62	N/A	N/A	6.78	7.46	9.45	9.95	N/A	7.49	N/A	7.38
# of Funds	5	1	1	2	3	1	N/A	1	N/A	N/A	2	6	2	9	N/A	1	N/A	34

Strategy Allocation (Based on Valuation)





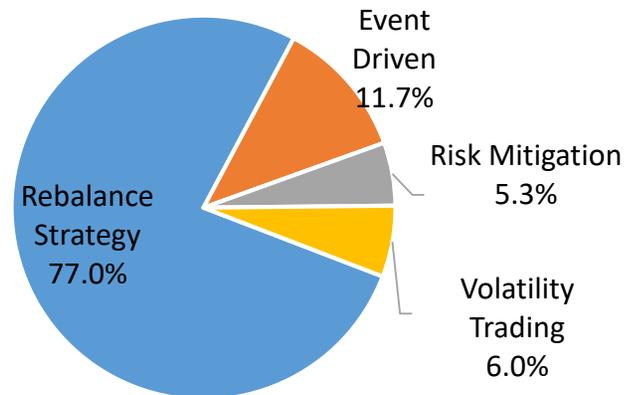
# NCRS Multi-Strategy Portfolio

As of December 31, 2019

Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Multi-Strategy</b>	<b>\$2,289</b>	<b>4.69</b>	<b>14.82</b>	<b>7.48</b>	<b>5.83</b>	<b>8.08</b>
Benchmark <sup>12</sup>		5.03	13.99	6.48	4.59	6.35
<b>Rebalance Strategy</b>	<b>\$1,762</b>	<b>6.62</b>	<b>21.35</b>	<b>9.61</b>	<b>7.39</b>	<b>-</b>
<b>Event Driven</b>	<b>\$268</b>	<b>1.06</b>	<b>(0.14)</b>	<b>4.33</b>	<b>-</b>	<b>-</b>
<b>Risk Mitigation</b>	<b>\$122</b>	<b>(9.01)</b>	<b>(18.95)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Volatility Trading</b>	<b>\$137</b>	<b>0.19</b>	<b>2.38</b>	<b>-</b>	<b>-</b>	<b>-</b>

Strategy Allocation (Based on Valuation)



## 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 a 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 & Cash Benchmark and the Pension Cash Benchmark at policy weights.
7. The IG Fixed Income & Cash 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 Pension 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.
13. The 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.
14. The 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.

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



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NORTH CAROLINA  
DEPARTMENT OF STATE TREASURER



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# INVESTMENT MANAGEMENT DIVISION