

NORTH CAROLINA  
DEPARTMENT OF STATE TREASURER



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

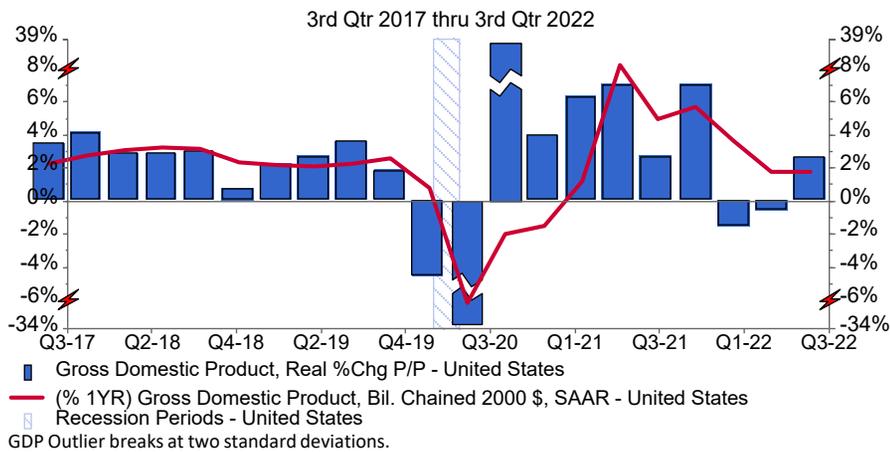
# Performance Review

November 9, 2022



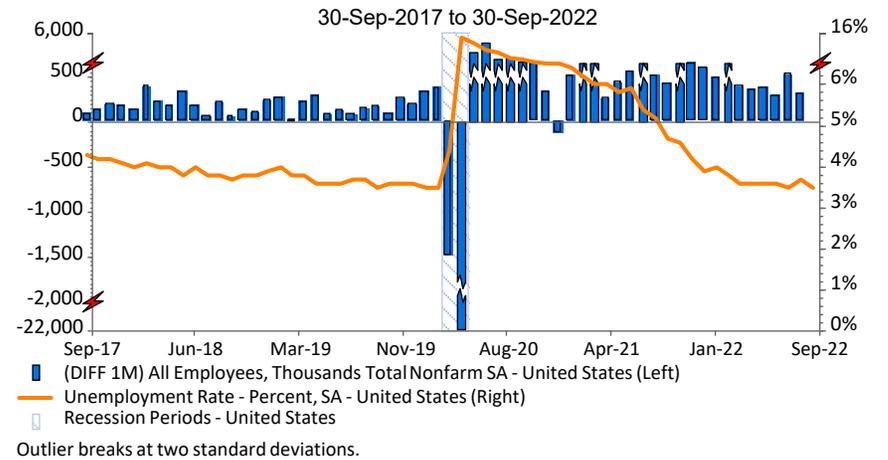
## US Economic Environment

### US Real GDP Growth



©FactSet Research Systems

### US Change in NonFarm Employment & Unemployment Rate



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### US Retail Sales



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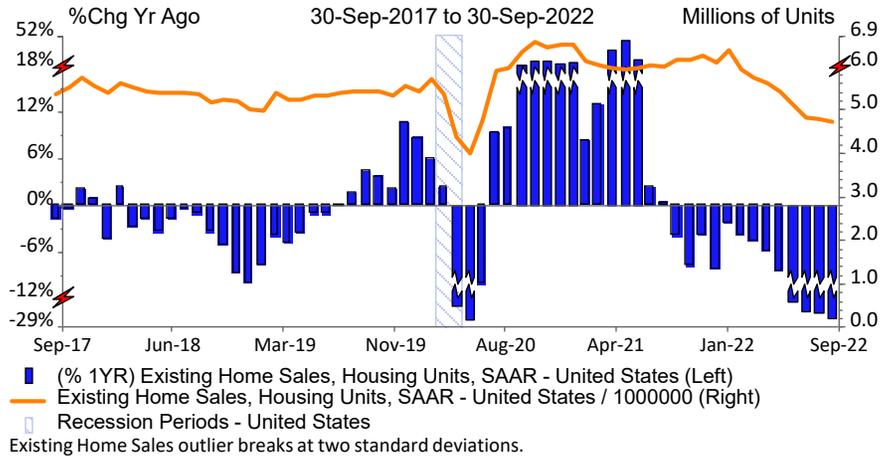
### US Consumer Confidence



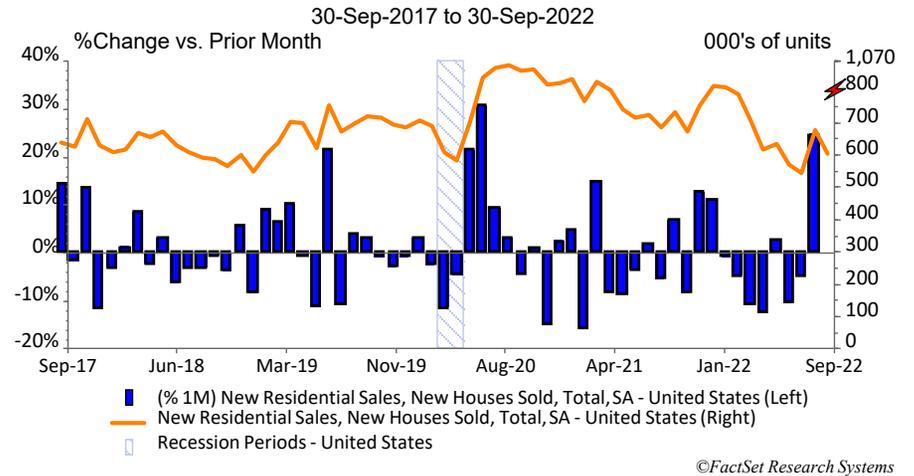
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**US Economic Environment**

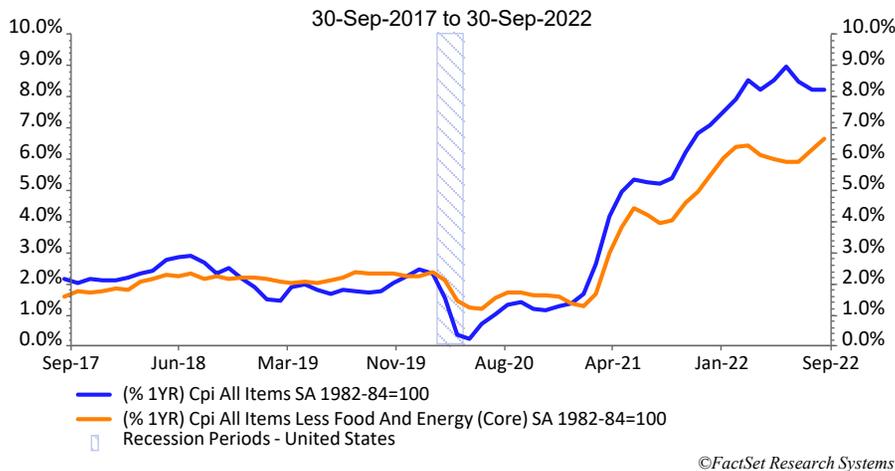
**US Existing Home Sales**



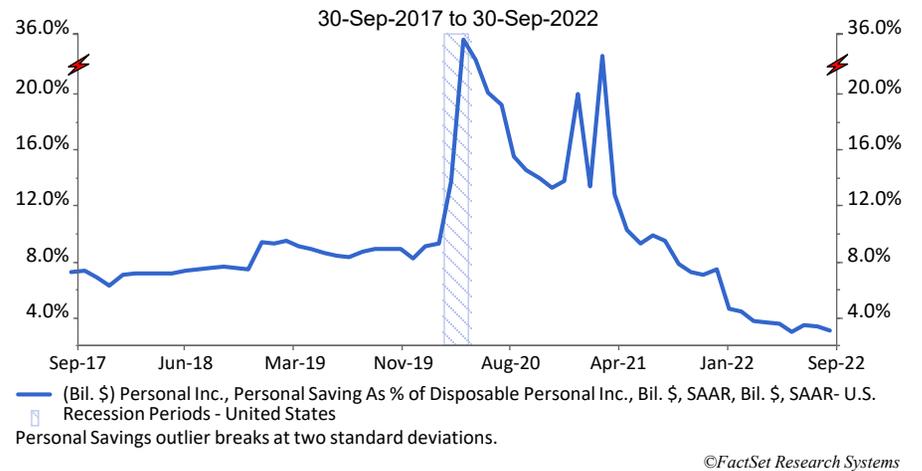
**US New Home Sales**



**US Consumer Price Inflation**



**US Personal Savings Rate**





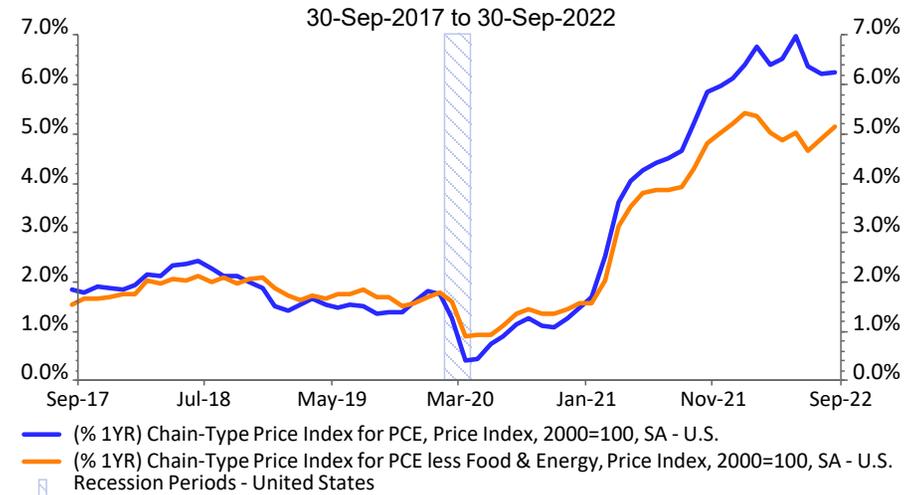
## US and Global Economic Environment

### ISM Report on Business



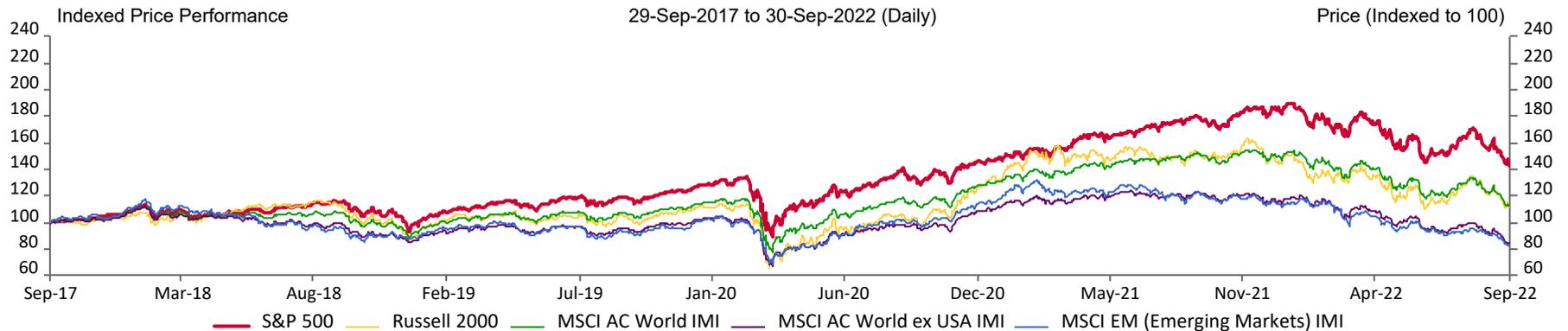
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### US PCE Inflation



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### S&P 500 vs. Peers

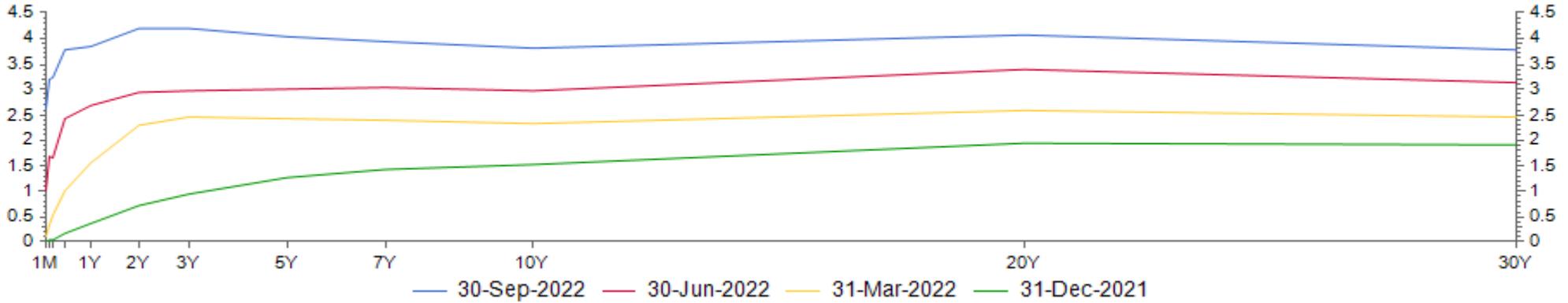


Source: FactSet Prices



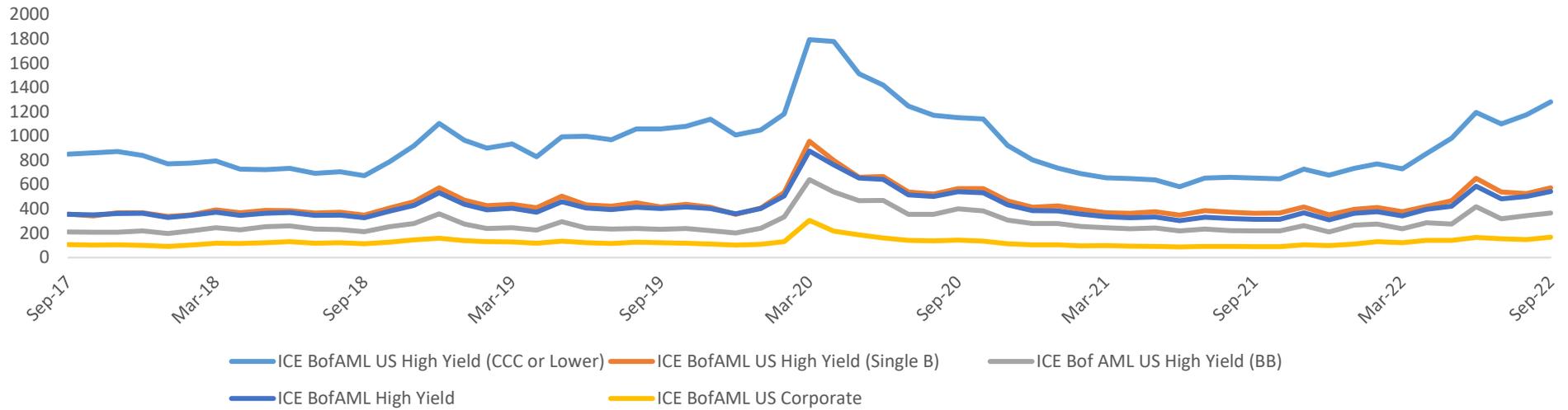
## Market Environment

### United States Treasury Yield Curve



Source: FactSet Interest Rate Database

### Corporate Credit OAS (ICE BofAML Indices)



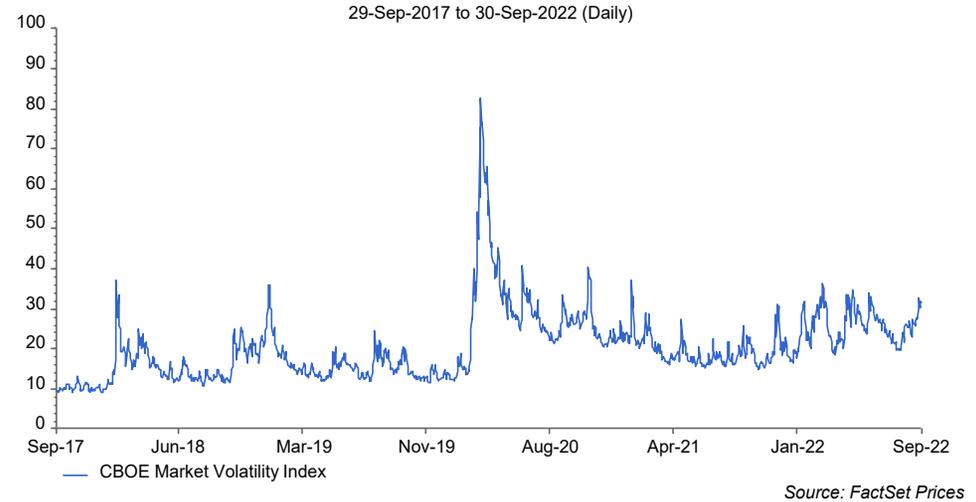


## Market Environment

**Closing Price Fed Nominal Broad Dollar Index**



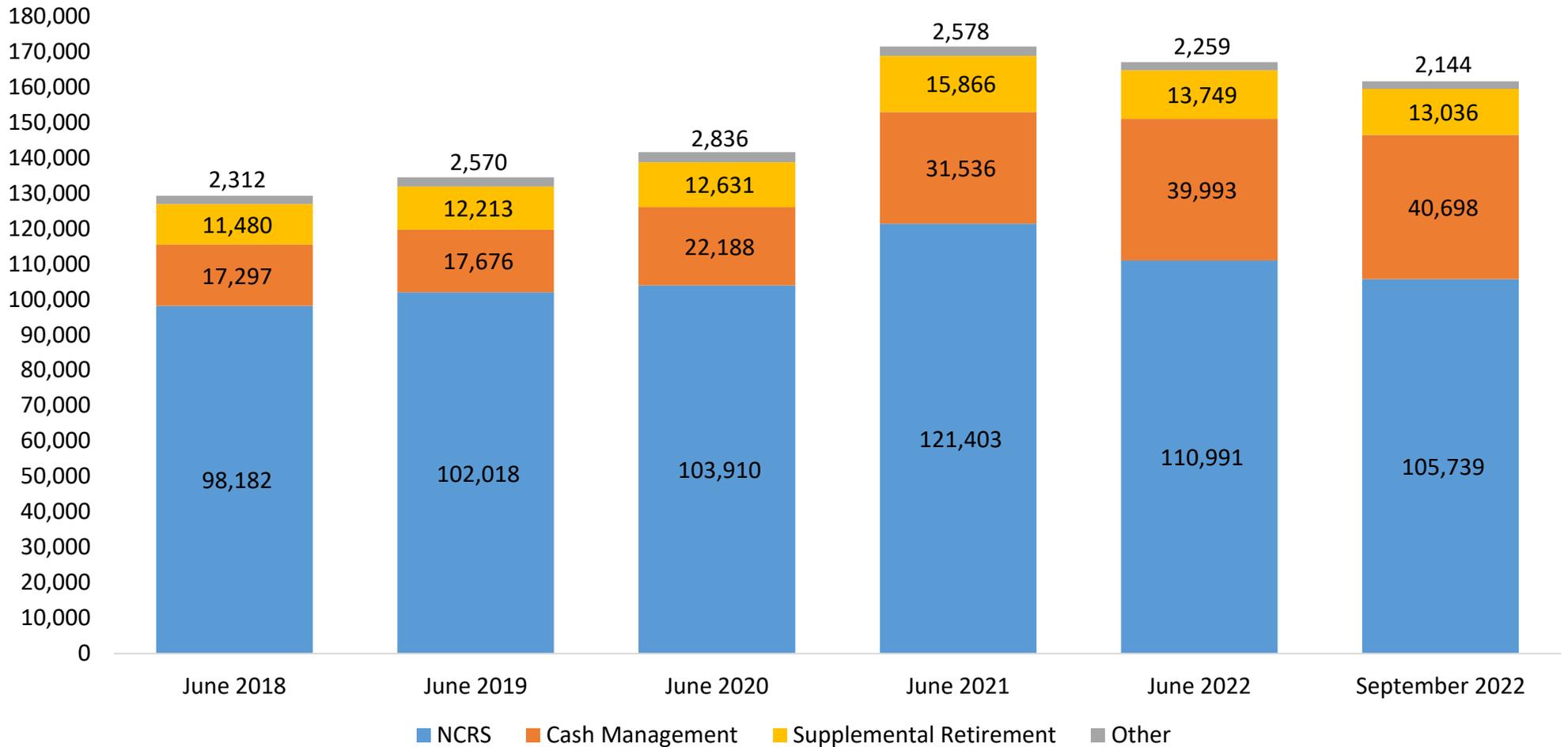
**Closing Price CBOE VIX Index**



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>	09/22	1.8	09/22	3.5	09/22	8.2	<b>Asia/Pacific/Latam</b>						
<b>Europe</b>							China	09/22	3.9			09/22	2.8
Germany	09/22	1.2	09/22	5.5	09/22	10.0	India	06/22	13.5			09/22	6.5
France	09/22	1.0	08/22	7.3	09/22	5.6	Japan	06/22	1.6	09/22	2.6	09/22	3.0
U.K.	06/22	4.4	08/22	3.5	09/22	10.1	Indonesia	06/22	5.4			09/22	6.0
Italy	09/22	2.6	08/22	7.8	09/22	8.9	Brazil	06/22	3.2			09/22	7.2
Spain	09/22	3.8	08/22	12.4	09/22	8.9	Australia	06/22	3.6	09/22	3.5	09/22	7.3

# Assets Under Management (\$MM)

## \$161.6 billion as of September 30, 2022



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 September 30, 2022

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
<b>Growth</b>	<b>48,968</b>	<b>46.31%</b>	<b>55.0%</b>	<b>37.0%</b>	<b>68.0%</b>	<b>-8.69%</b>	<b>(9,189)</b>
Public Equity	33,136	31.34%	38.0%	33.0%	43.0%	-6.66%	(7,045)
Private Equity	6,483	6.13%	7.0%	0.0%	8.8%	-0.87%	(919)
Non Core Real Estate	2,496	2.36%	3.0%	0.0%	8.0%	-0.64%	(677)
Opportunistic Fixed Income	6,853	6.48%	7.0%	0.0%	7.5%	-0.52%	(548)
<b>Rates &amp; Liquidity</b>	<b>42,879</b>	<b>40.55%</b>	<b>33.0%</b>	<b>23.0%</b>	<b>48.0%</b>	<b>7.55%</b>	<b>7,985</b>
IG Fixed Income & Cash	28,469	26.92%	28.0%	23.0%	33.0%	-1.08%	(1,138)
Pension Cash	14,409	13.63%	5.0%	0.0%	10.0%	8.63%	9,122
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>11,745</b>	<b>11.11%</b>	<b>11.0%</b>	<b>4.0%</b>	<b>16.0%</b>	<b>0.11%</b>	<b>114</b>
Inflation Sensitive	5,254	4.97%	6.0%	2.0%	7.5%	-1.03%	(1,090)
Core Real Estate	6,491	6.14%	5.0%	2.0%	10.0%	1.14%	1,204
<b>Multi-Strategy</b>	<b>2,148</b>	<b>2.03%</b>	<b>1.0%</b>	<b>0.0%</b>	<b>4.0%</b>	<b>1.03%</b>	<b>1,090</b>
<b>Grand Total</b>	<b>105,739</b>	<b>100.00%</b>					



# NCRS Asset Allocation (Preliminary)

As of October 31, 2022

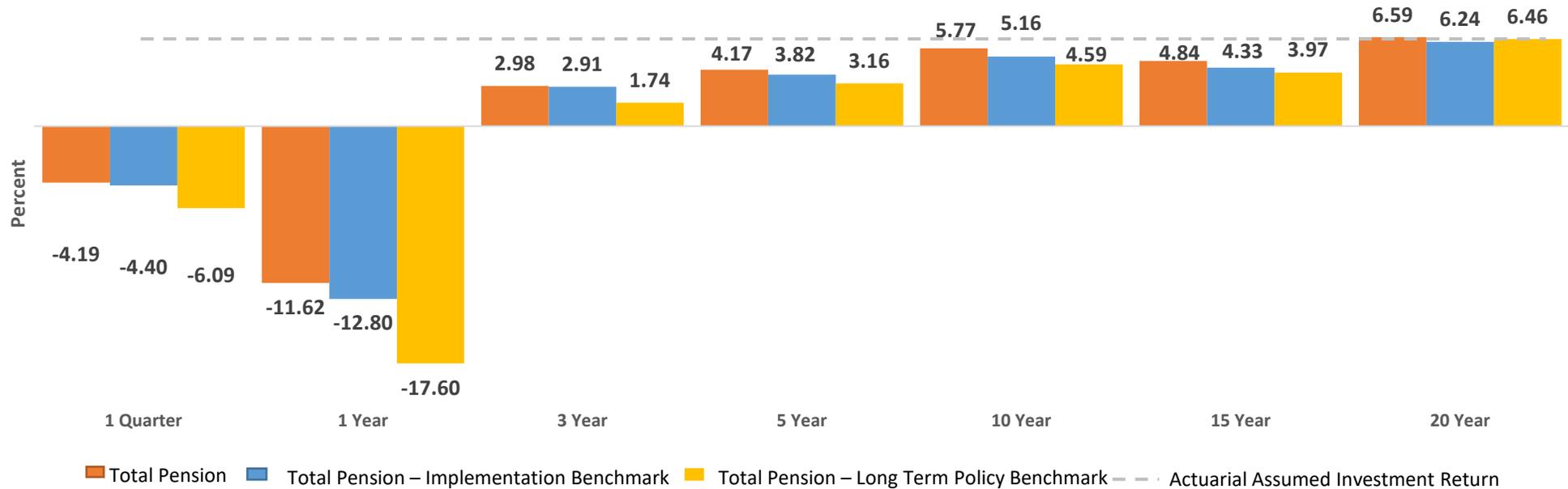
	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
<b>Growth</b>	<b>50,939</b>	<b>47.69%</b>	<b>55.0%</b>	<b>37.0%</b>	<b>68.0%</b>	<b>-7.31%</b>	<b>(7,805)</b>
Public Equity	35,127	32.89%	38.0%	33.0%	43.0%	-5.11%	(5,461)
Private Equity	6,414	6.01%	7.0%	0.0%	8.8%	-0.99%	(1,062)
Non Core Real Estate	2,495	2.34%	3.0%	0.0%	8.0%	-0.66%	(709)
Opportunistic Fixed Income	6,904	6.46%	7.0%	0.0%	7.5%	-0.54%	(573)
<b>Rates &amp; Liquidity</b>	<b>41,980</b>	<b>39.30%</b>	<b>33.0%</b>	<b>23.0%</b>	<b>48.0%</b>	<b>6.30%</b>	<b>6,734</b>
IG Fixed Income & Cash	28,102	26.31%	28.0%	23.0%	33.0%	-1.69%	(1,805)
Pension Cash	13,879	12.99%	5.0%	0.0%	15.0%	7.99%	8,538
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>11,741</b>	<b>10.99%</b>	<b>11.0%</b>	<b>4.0%</b>	<b>16.0%</b>	<b>-0.01%</b>	<b>(8)</b>
Inflation Sensitive	5,237	4.90%	6.0%	2.0%	7.5%	-1.10%	(1,171)
Core Real Estate	6,504	6.09%	5.0%	2.0%	10.0%	1.09%	1,163
<b>Multi-Strategy</b>	<b>2,148</b>	<b>2.01%</b>	<b>1.0%</b>	<b>0.0%</b>	<b>4.0%</b>	<b>1.01%</b>	<b>1,079</b>
<b>Grand Total</b>	<b>106,808</b>	<b>100.00%</b>					



# NCRS Total Net Portfolio Return vs. Benchmarks

## As of September 30, 2022

### Annualized Returns



Notes:

Actuarial Assumed Investment Return was lowered from 7.0% to 6.5% as of December 31, 2020

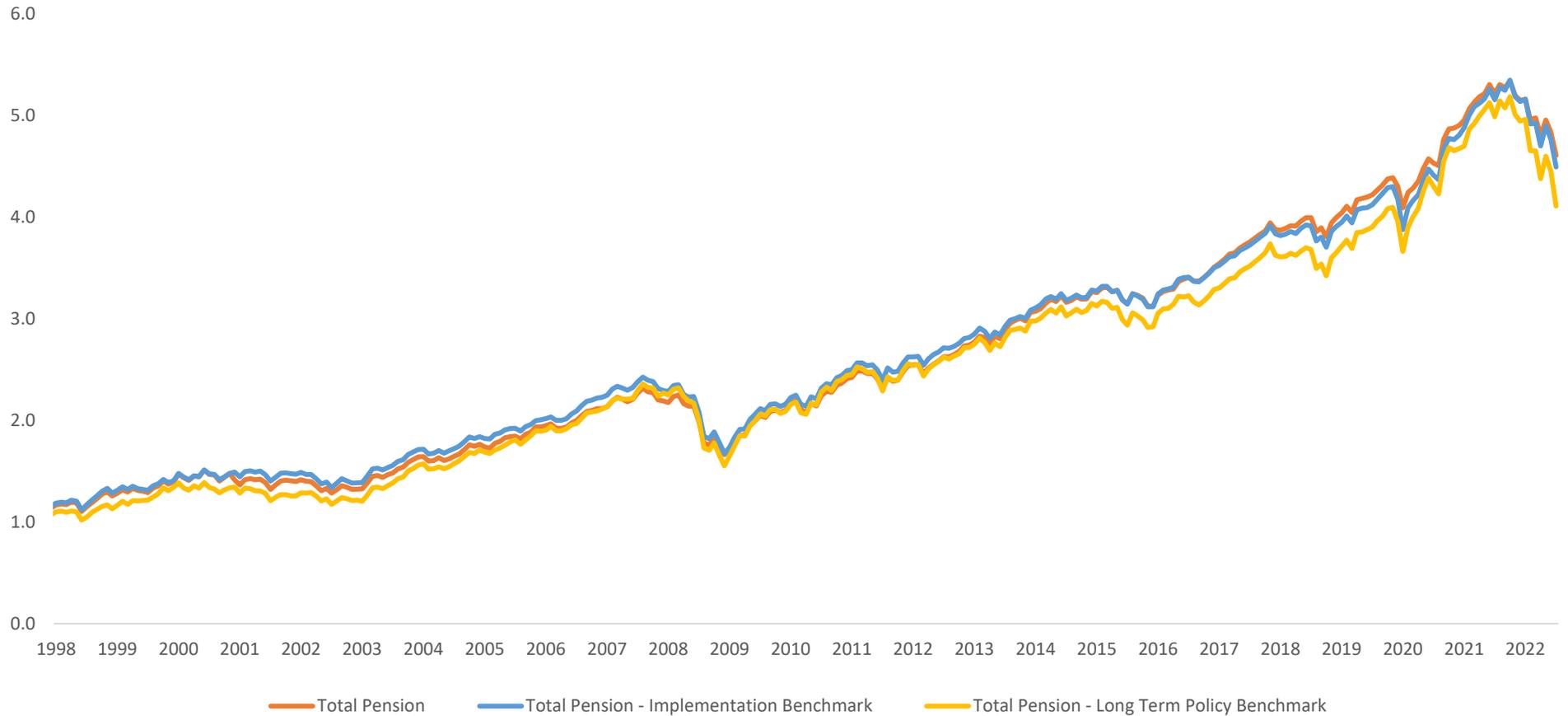
Returns for periods greater than one year are annualized.

*Implementation Benchmark* is a blend of the Asset Class Benchmarks at policy weights. It is currently weighted as follows: 55% Growth Benchmark; 33% Rates & Liquidity Benchmark; 11% Inflation Sensitive & Diversifiers Benchmark; and 1% Multi-Strategy Benchmark.

*Long-Term Policy Benchmark* is comprised of 56% MSCI ACWI IMI Net, 28% BOAML 5+ Years U.S. Treasury Index, 6.5% Bloomberg Commodity Index, 5% BOAML 3 Month Treasury Bill Index, and 4.5% BOAML 1-3 Years U.S. Inflation-Linked Treasury Index.



# Growth of a Dollar Through September 30, 2022



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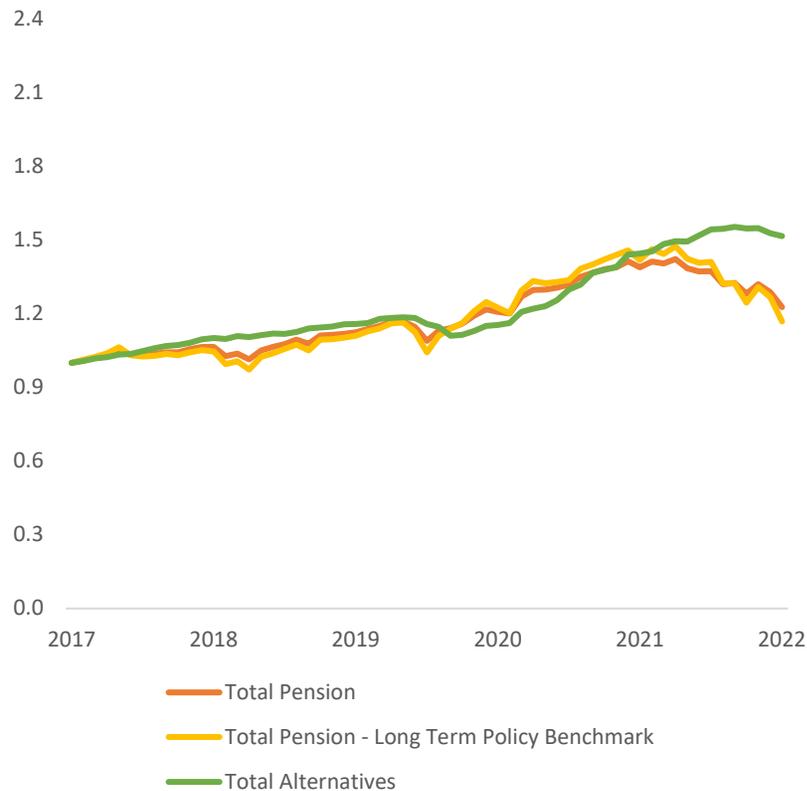
Notes:

*Long-Term Policy Benchmark* is comprised of 56% MSCI ACWI IMI Net, 28% BOAML 5+ Years U.S. Treasury Index, 6.5% Bloomberg Commodity Index, 5% BOAML 3 Month Treasury Bill Index, and 4.5% BOAML 1-3 Years U.S. Inflation-Linked Treasury Index.



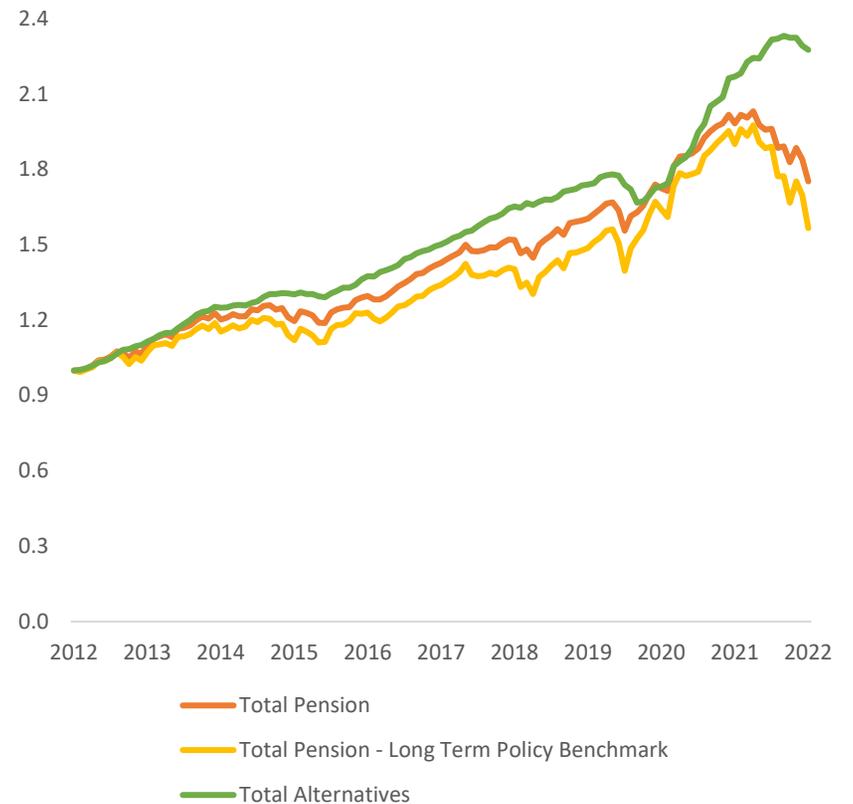
# Growth of a Dollar

5 Years Ending September 30, 2022



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10 Years Ending September 30, 2022



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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 September 30, 2022

### Contribution to Total Plan \$ Earnings

Total Pension	(13,195)	
IG Fixed Income	(4,800)	
Cash		86
Public Equity	(10,038)	
<b>Total Alternatives</b>		<b>1,558</b>
Private Equity	(79)	
Non Core Real Estate		472
Opportunistic Fixed Income		89
Inflation Sensitive		548
Core Real Estate		658
Multi-Strategy	(130)	

\*Millions

### Contribution to Total Plan % Returns

Total Pension	(11.62%)	
IG Fixed Income	(4.23%)	
Cash		0.08%
Public Equity	(8.84%)	
<b>Total Alternatives</b>		<b>1.37%</b>
Private Equity	(0.07%)	
Non Core Real Estate		0.42%
Opportunistic Fixed Income		0.08%
Inflation Sensitive		0.48%
Core Real Estate		0.58%
Multi-Strategy	(0.11%)	

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

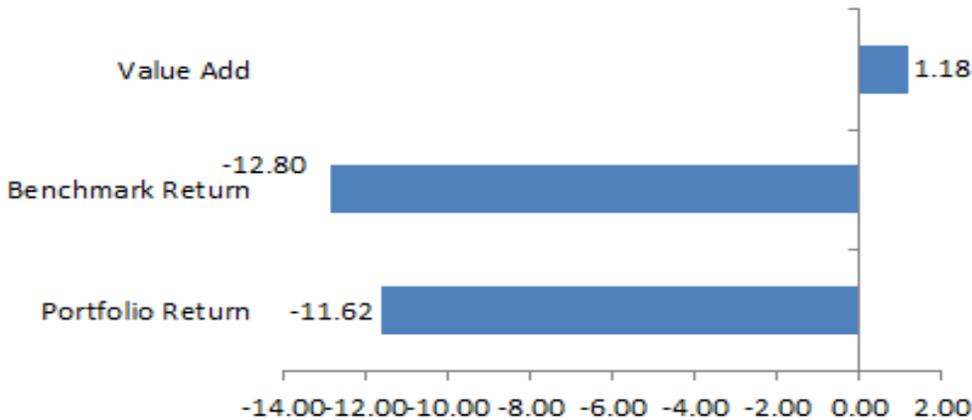
Contribution to Total Plan % Returns = Average Market Value % weight \* % Total Return for each asset class

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.

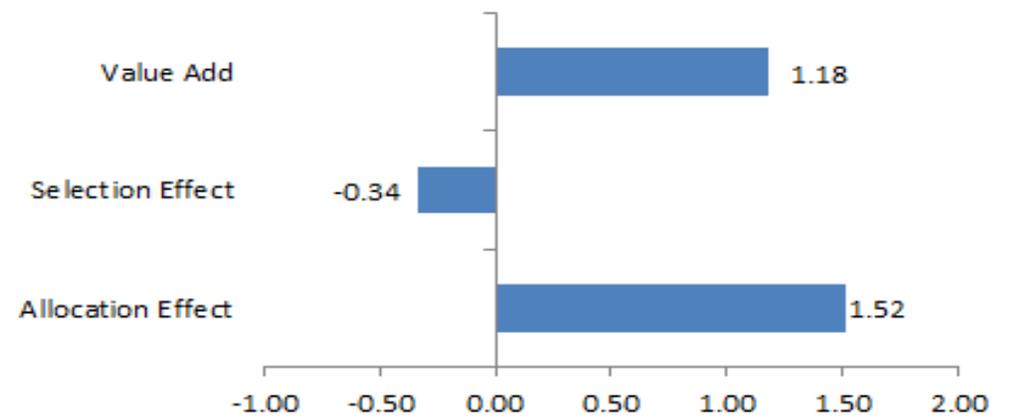
# NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 1 Year Ending September 30, 2022

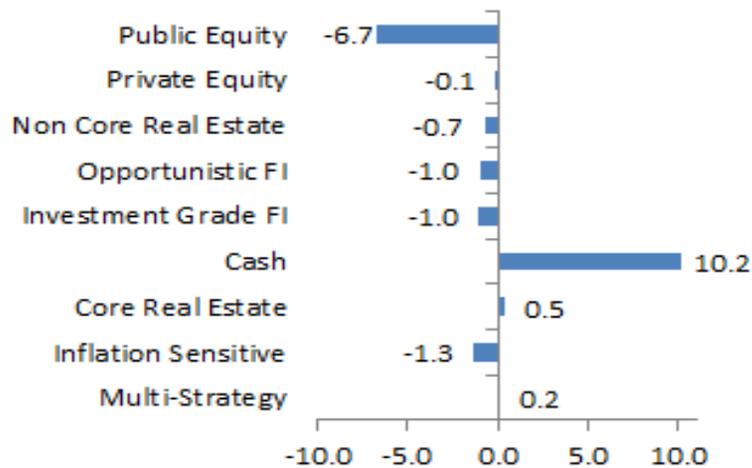
**Total Fund Performance**



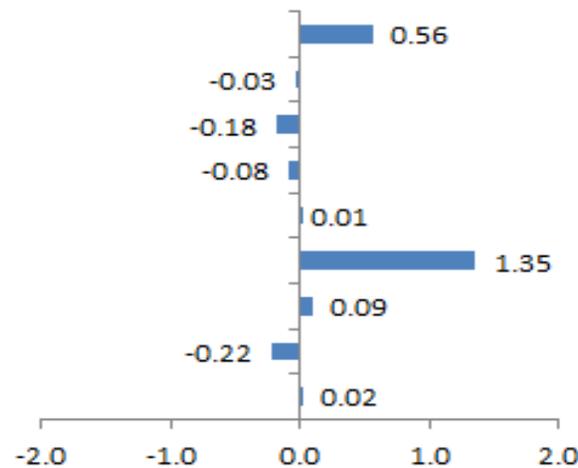
**Attribution**



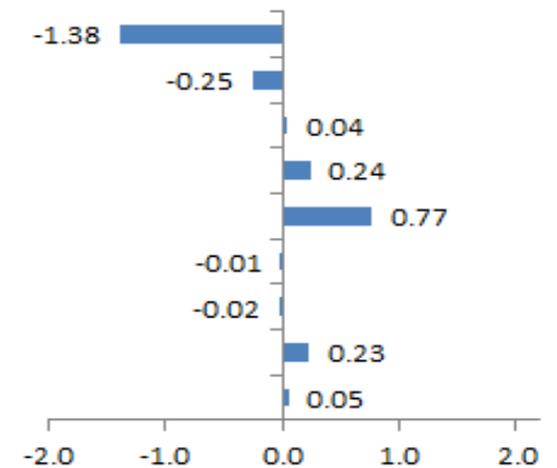
**Avg Active Weight**



**Allocation Effect**

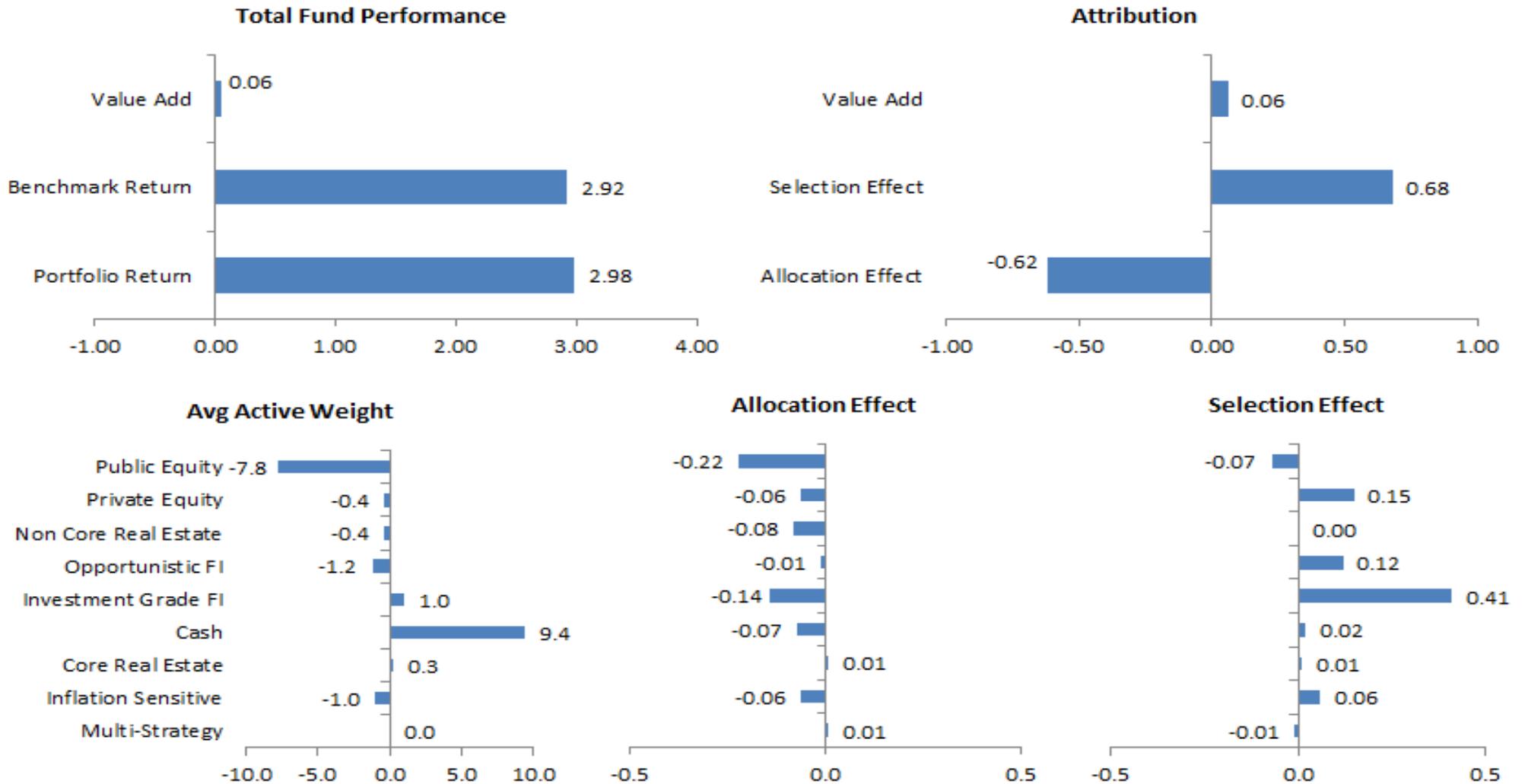


**Selection Effect**



# NCRS Net of Fees Return Attribution

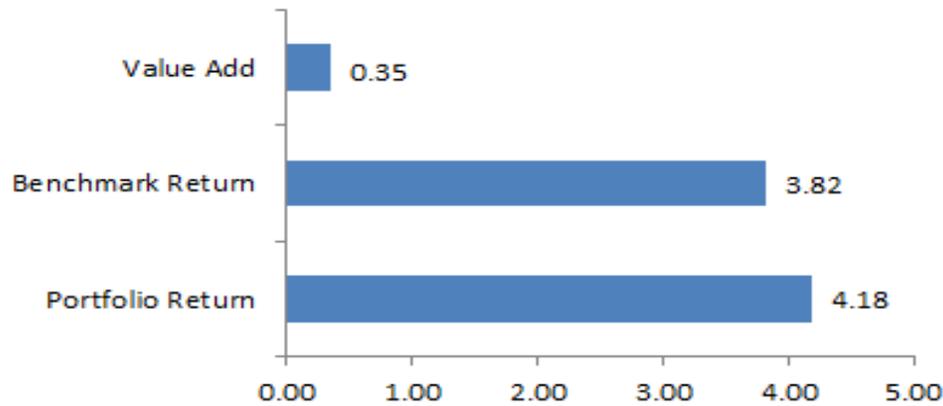
Total Fund vs. Implementation Benchmark: 3 Years Ending September 30, 2022



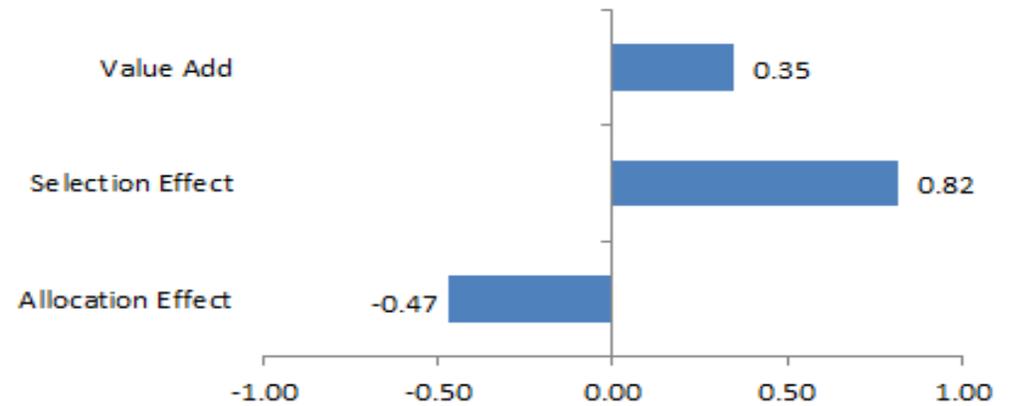
# NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 5 Years Ending September 30, 2022

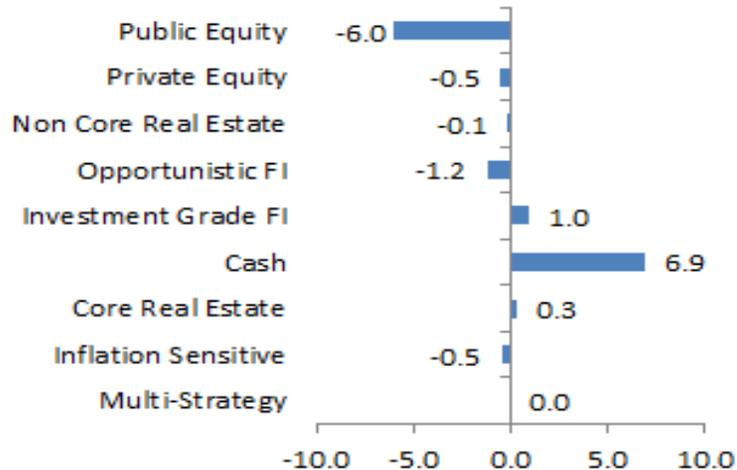
**Total Fund Performance**



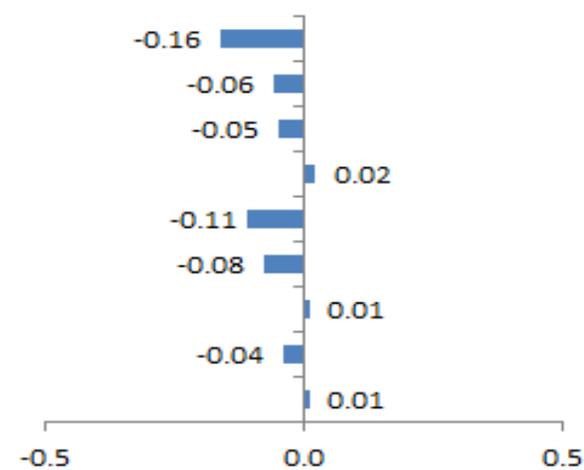
**Attribution**



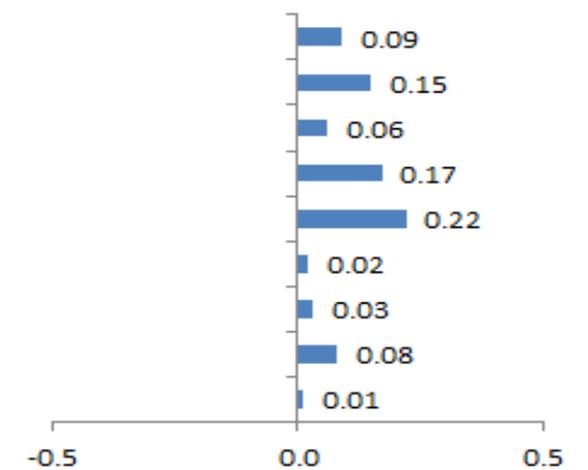
**Avg Active Weight**



**Allocation Effect**



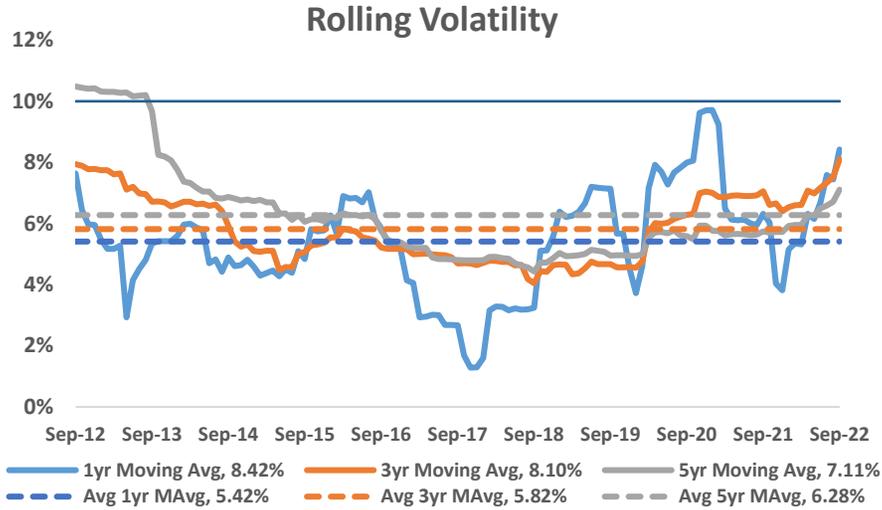
**Selection Effect**



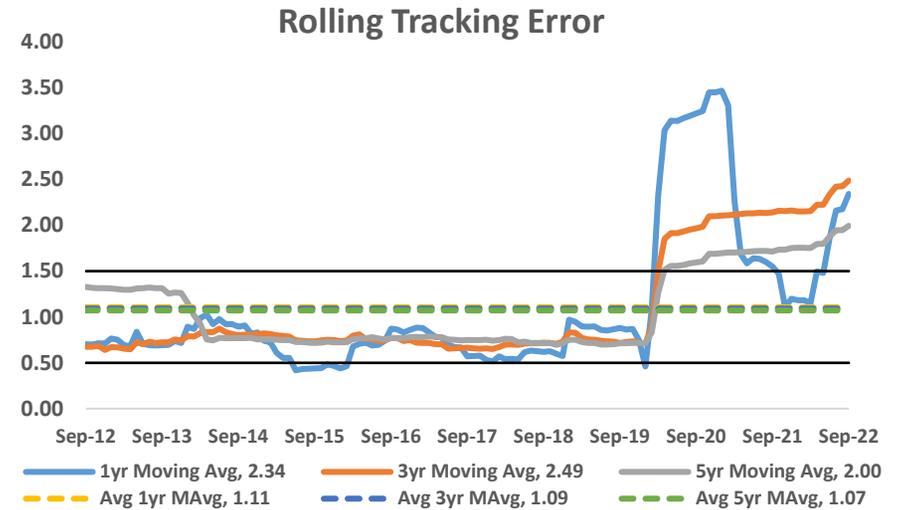


# NCRS Net of Fees Risk Metrics

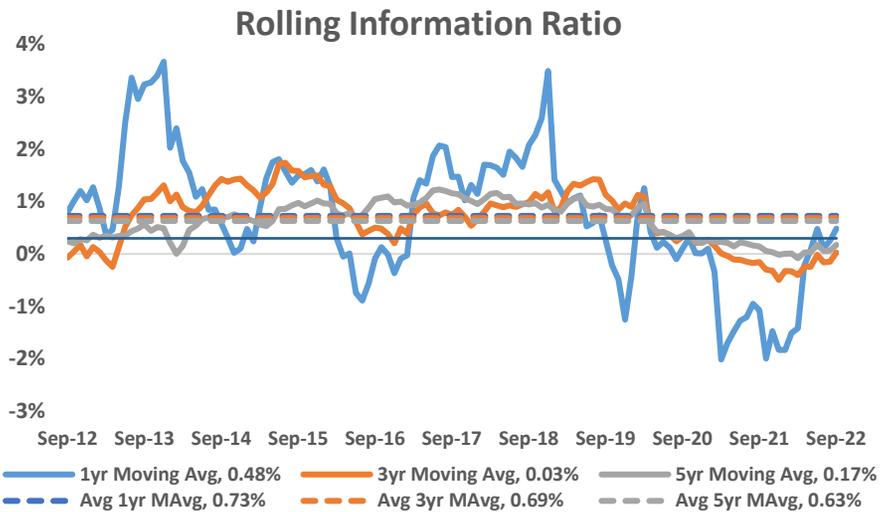
## As of September 30, 2022



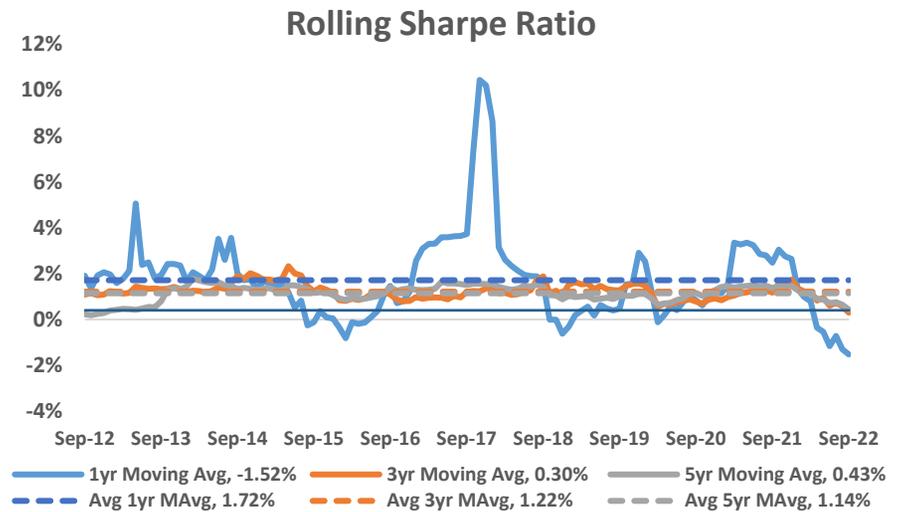
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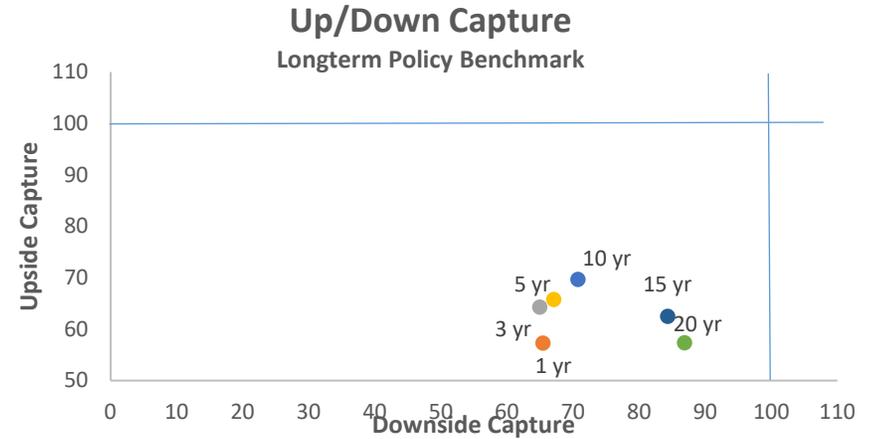
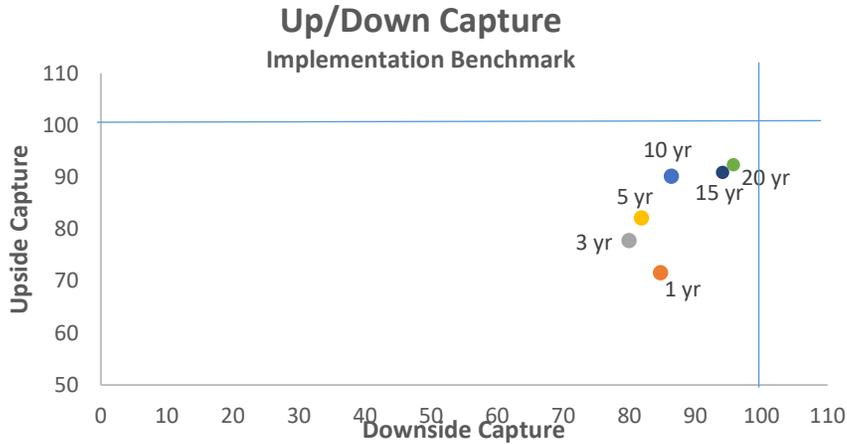
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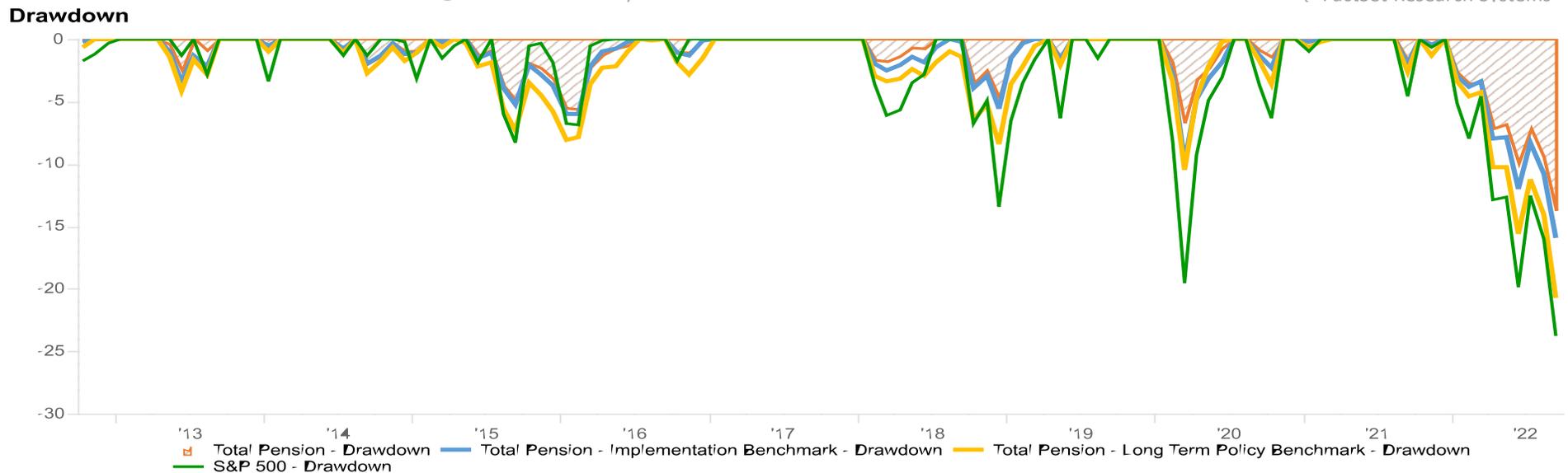
# NCRS Net of Fees Risk Metrics

## As of September 30, 2022



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# NCRS Gross of Fees Return and Risk

BNY Mellon Universe: US Public Funds > \$20B; Data as of September 30, 2022

Returns	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	-4.90	7.48	7.17	8.14	6.04	8.24
<b>Median Percentile</b>	<b>-11.14</b>	<b>6.41</b>	<b>6.42</b>	<b>7.77</b>	<b>5.85</b>	<b>7.82</b>
75th Percentile	-12.04	3.94	5.57	6.82	5.24	7.73
NCRS	<b>-11.29</b>	<b>3.30</b>	<b>4.55</b>	<b>6.27</b>	<b>5.31</b>	<b>6.98</b>
Percentile Rank (1 = highest performance)	63	88	88	82	69	87

Risk	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	11.39	11.29	9.77	7.99	9.91	9.26
<b>Median Percentile</b>	<b>9.74</b>	<b>10.03</b>	<b>8.60</b>	<b>7.12</b>	<b>9.23</b>	<b>8.55</b>
75th Percentile	8.05	8.93	7.88	6.63	8.40	8.05
NCRS	<b>8.05</b>	<b>7.98</b>	<b>7.04</b>	<b>6.01</b>	<b>7.76</b>	<b>7.29</b>
Percentile Rank (1 = highest risk)	75	94	94	88	88	94

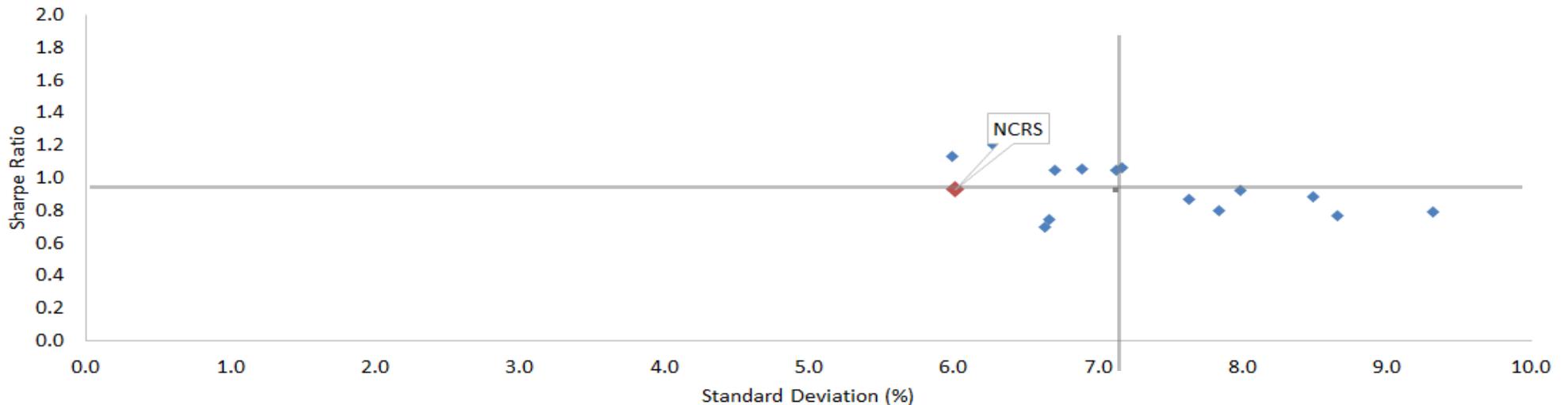
Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.

# NCRS Gross of Fees Sharpe Ratio

BNY Mellon Universe: US Public Funds > \$20B; Data as of September 30, 2022

Sharpe	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	-0.69	0.75	0.78	1.05	0.62	0.84
<b>Median Percentile</b>	<b>-1.11</b>	<b>0.55</b>	<b>0.58</b>	<b>0.93</b>	<b>0.59</b>	<b>0.78</b>
75th Percentile	-1.23	0.38	0.48	0.79	0.50	0.71
<b>NCRS</b>	<b>-1.52</b>	<b>0.37</b>	<b>0.51</b>	<b>0.93</b>	<b>0.62</b>	<b>0.79</b>
Percentile Rank (1 = highest performance)	94	82	69	44	25	40

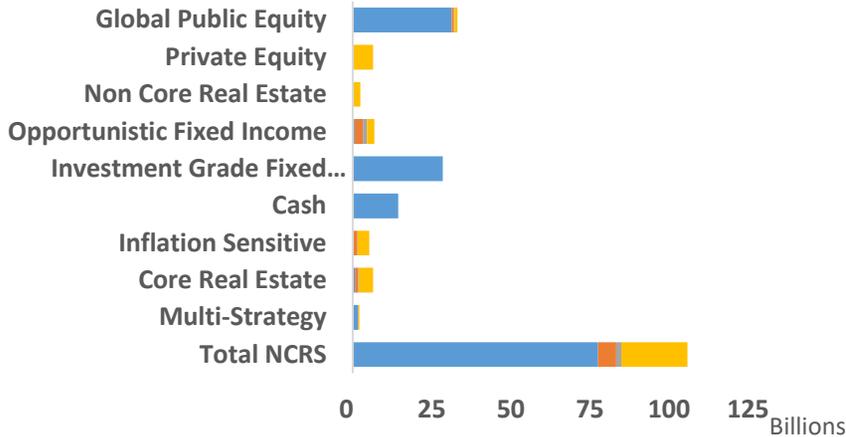
10 Year Plot: Sharpe Ratio vs. Volatility



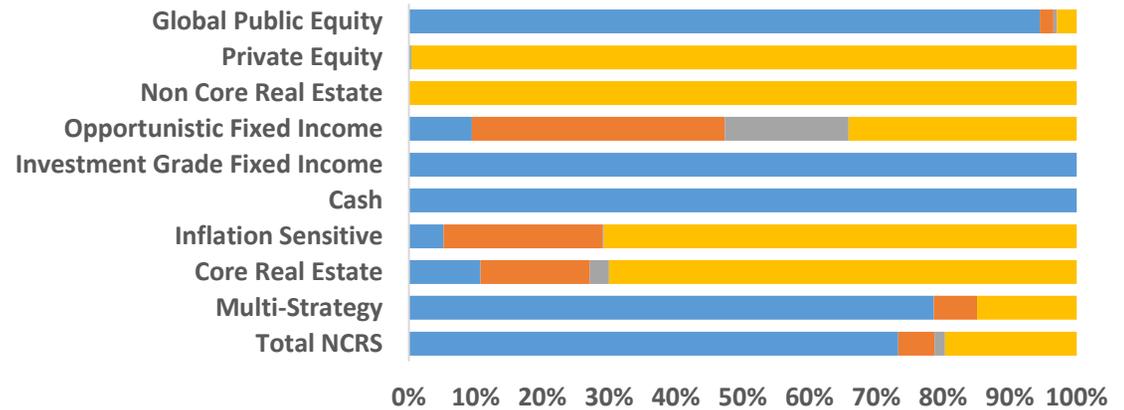
Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.

## NCRS Liquidity Profile As of September 30, 2022

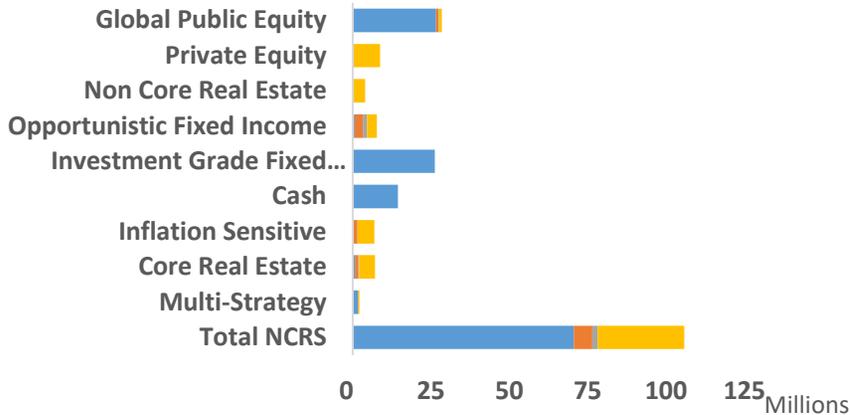
**Liquidity Allocation (\$ Market Value)**



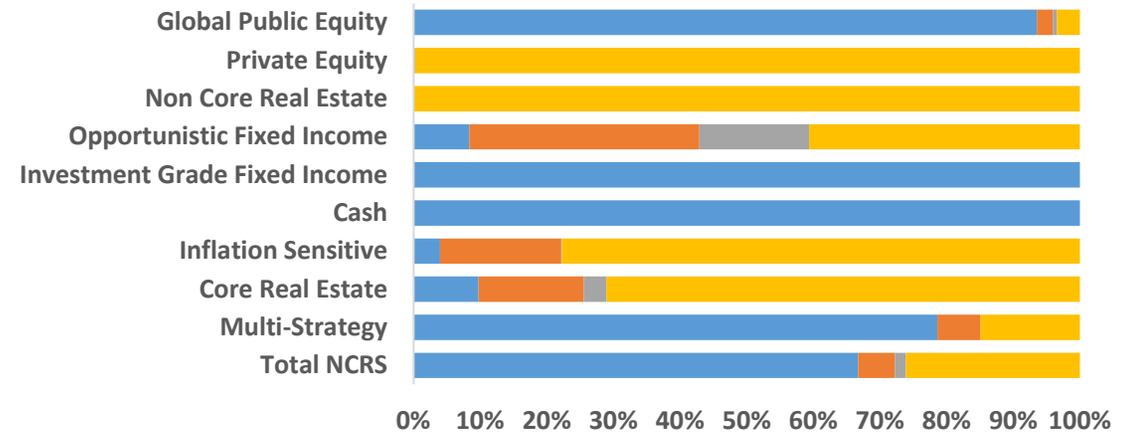
**Liquidity Allocation (% Market Value)**



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



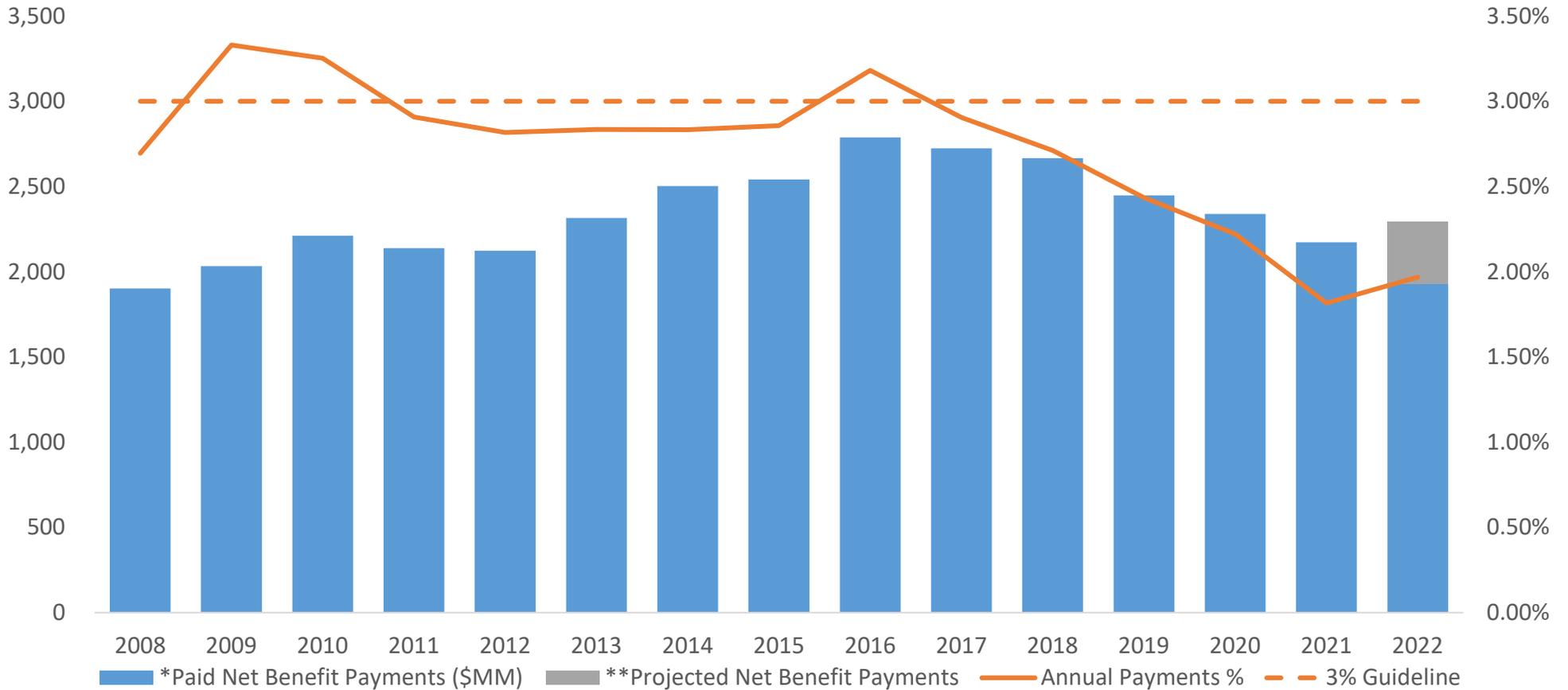
**Liquidity Allocation (% Market Value + Unfunded)**



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



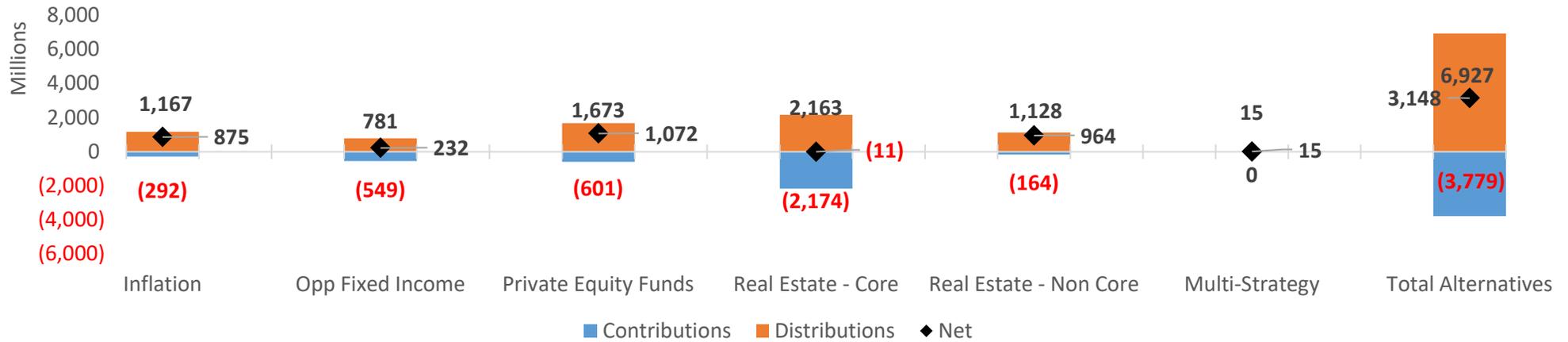
\*Benefit payments exclude transfers from the Retiree Health Premium Fund as of January 1, 2022

\*\*Net benefit payments through October 1, 2022

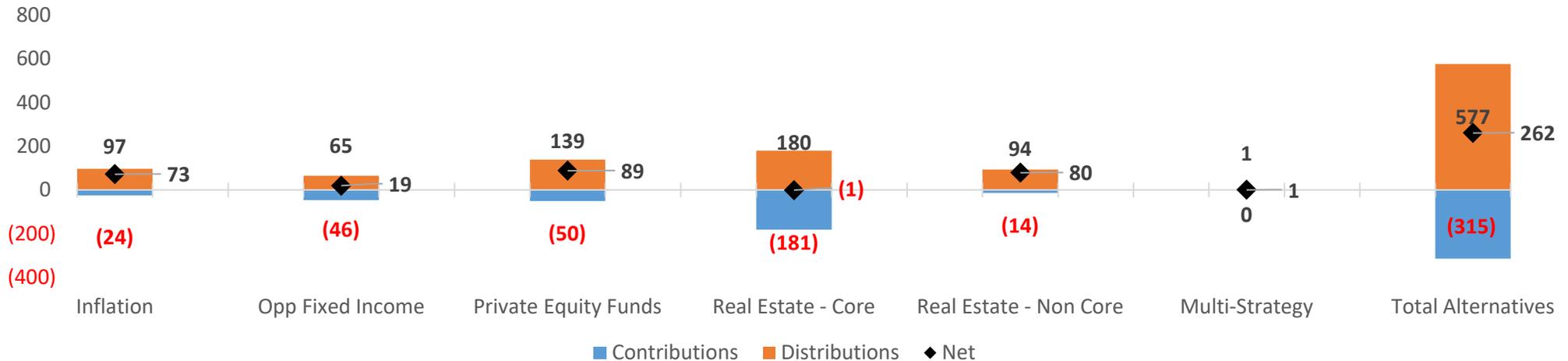
# NCRS Alternatives Liquidity Profile

## Through September 30, 2022

**Prior 12-Months**  
Total Cash Flows by Alternative Asset Class (\$MM)



**Prior 12-Months**  
Average Monthly Cash Flows by Alternative Asset Class (\$MM)

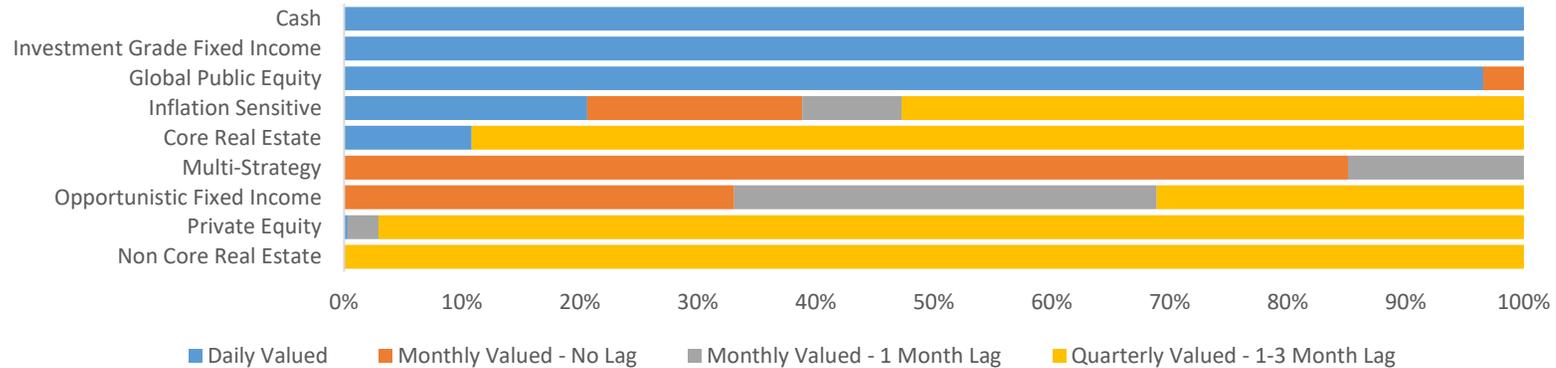




# NCRS Valuation Lag Profile

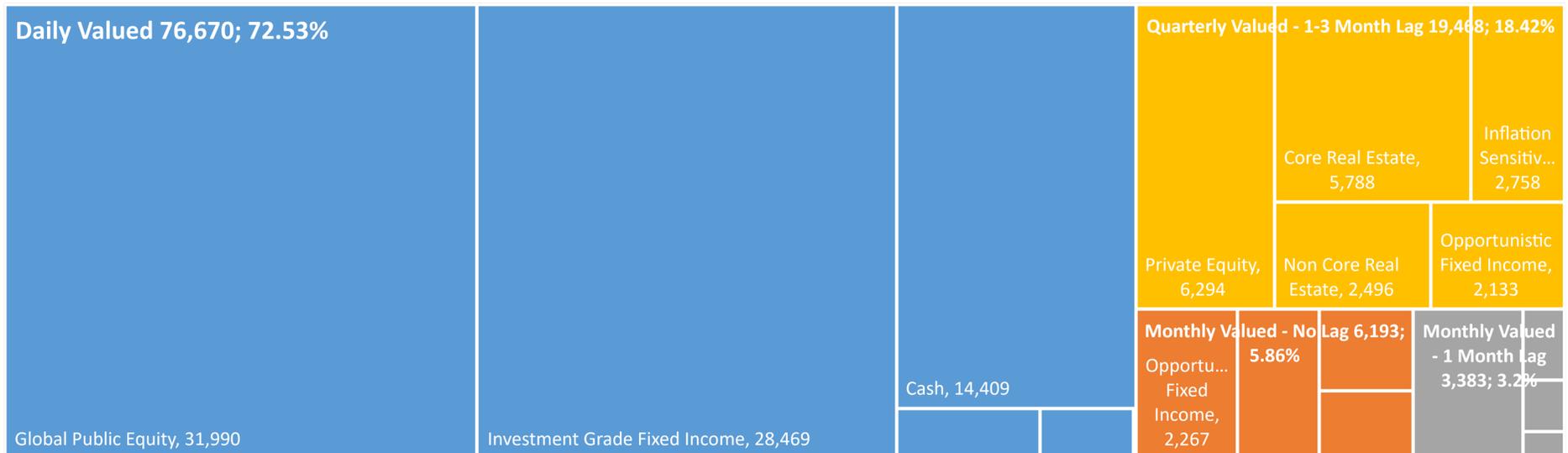
## As of September 30, 2022

### PORTFOLIO VALUATION LAG



### VALUATION LAG BY PORTFOLIO

in Millions





# NCRS Asset Class Net of Fees Performance

## As of September 30, 2022

	Market Value (\$MM)	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
<b>Growth</b>	<b>\$48,968</b>	<b>-17.28</b>	<b>5.96</b>	<b>6.27</b>	<b>8.50</b>	<b>5.16</b>	<b>8.17</b>
Benchmark <sup>1</sup>		-14.98	5.56	5.41	7.42	4.36	7.58
<b>Public Equity</b>	<b>\$33,136</b>	<b>-24.64</b>	<b>3.53</b>	<b>4.31</b>	<b>7.67</b>	<b>4.69</b>	<b>7.81</b>
Benchmark <sup>2</sup>		-21.19	3.57	4.04	7.07	4.10	7.28
<b>Private Equity</b>	<b>\$6,483</b>	<b>-1.05</b>	<b>19.55</b>	<b>17.34</b>	<b>13.57</b>	<b>9.65</b>	<b>9.48</b>
Benchmark <sup>3</sup>		3.51	16.25	14.19	12.28	9.44	11.81
<b>Non-Core Real Estate</b>	<b>\$2,496</b>	<b>15.92</b>	<b>9.14</b>	<b>10.29</b>	<b>12.14</b>	<b>5.15</b>	<b>7.47</b>
Benchmark <sup>4</sup>		13.35	8.86	8.27	8.74	2.58	7.36
<b>Opportunistic Fixed Income</b>	<b>\$6,853</b>	<b>1.20</b>	<b>6.36</b>	<b>5.79</b>	<b>6.15</b>	<b>6.38</b>	<b>-</b>
Benchmark <sup>5</sup>		-3.18	4.20	2.73	2.81	1.16	-
<b>Rates &amp; Liquidity</b>	<b>\$42,879</b>	<b>-9.95</b>	<b>-1.58</b>	<b>0.85</b>	<b>1.60</b>	<b>4.04</b>	<b>4.16</b>
Benchmark <sup>6</sup>		-16.02	-3.84	-0.31	1.05	3.47	3.74
<b>IG Fixed Income</b>	<b>\$28,469</b>	<b>-14.51</b>	<b>-2.90</b>	<b>0.23</b>	<b>1.34</b>	<b>3.86</b>	<b>4.03</b>
Benchmark <sup>7</sup>		-17.27	-4.26	-0.53	0.97	3.42	3.70
<b>Cash</b>	<b>\$14,409</b>	<b>0.57</b>	<b>0.75</b>	<b>1.23</b>	<b>-</b>	<b>-</b>	<b>-</b>
Benchmark <sup>8</sup>		0.66	0.52	1.07	-	-	-
<b>Inflation Sensitive &amp; Diversifiers</b>	<b>\$11,745</b>	<b>9.62</b>	<b>6.61</b>	<b>6.35</b>	<b>5.01</b>	<b>2.46</b>	<b>4.62</b>
Benchmark <sup>9</sup>		7.02	5.88	5.28	4.33	1.38	4.23
<b>Inflation Sensitive</b>	<b>\$5,254</b>	<b>9.41</b>	<b>5.49</b>	<b>5.26</b>	<b>2.42</b>	<b>0.73</b>	<b>3.70</b>
Benchmark <sup>10</sup>		3.84	4.09	3.67	0.85	1.73	4.13
<b>Core Real Estate</b>	<b>\$6,491</b>	<b>9.94</b>	<b>7.82</b>	<b>7.55</b>	<b>8.60</b>	<b>5.29</b>	<b>6.82</b>
Benchmark <sup>11</sup>		10.85	7.95	7.18	8.73	5.31	7.24
<b>Multi-Strategy</b>	<b>\$2,148</b>	<b>-5.46</b>	<b>-0.08</b>	<b>1.44</b>	<b>5.02</b>	<b>4.21</b>	<b>4.98</b>
Benchmark <sup>12</sup>		-8.09	0.10	0.96	4.42	3.47	6.00
<b>Total Pension Plan</b>	<b>\$105,739</b>	<b>-11.62</b>	<b>2.98</b>	<b>4.17</b>	<b>5.77</b>	<b>4.84</b>	<b>6.59</b>
Implementation Benchmark <sup>13</sup>		-12.80	2.92	3.82	5.16	4.33	6.24
Long-Term Policy Benchmark <sup>14</sup>		-17.60	1.74	3.16	4.59	3.97	6.46



# NCRS Calendar Year Asset Class Return Diversification

## As of September 30, 2022

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 YTD
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%	Public Equity 22.23%	Private Equity 48.03%	Non-Core Real Estate 8.94%
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%	Private Equity 18.86%	Opportunistic Fixed Income 17.46%	Inflation Sensitive 7.76%
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%	Total Pension 11.30%	Non-Core Real Estate 16.75%	Core Real Estate 5.45%
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%	IG Fixed Income & Cash 9.34%	Public Equity 14.51%	Pension Cash 0.54%
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%	Opportunistic Fixed Income 2.85%	Core Real Estate 14.51%	Opportunistic Fixed Income (1.34%)
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%	Pension Cash 1.06%	Inflation Sensitive 11.97%	Private Equity (4.49%)
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%	Non-Core Real Estate 0.45%	Total Pension 9.71%	Multi-Strategy (7.72%)
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%	Core Real Estate (0.13%)	Multi-Strategy 7.74%	Total Pension (13.74%)
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 (3.50%)	Pension Cash 0.15%	IG Fixed Income & Cash (14.67%)
	Inflation Sensitive (0.65%)	Inflation Sensitive (9.05%)	Pension Cash 0.98%	Pension Cash 1.12%	Public Equity (9.32%)	Inflation Sensitive 2.09%	Multi-Strategy (4.13%)	IG Fixed Income & Cash (1.84%)	Public Equity (27.79%)



# New, Incremental, & Unfunded Investment Commitments

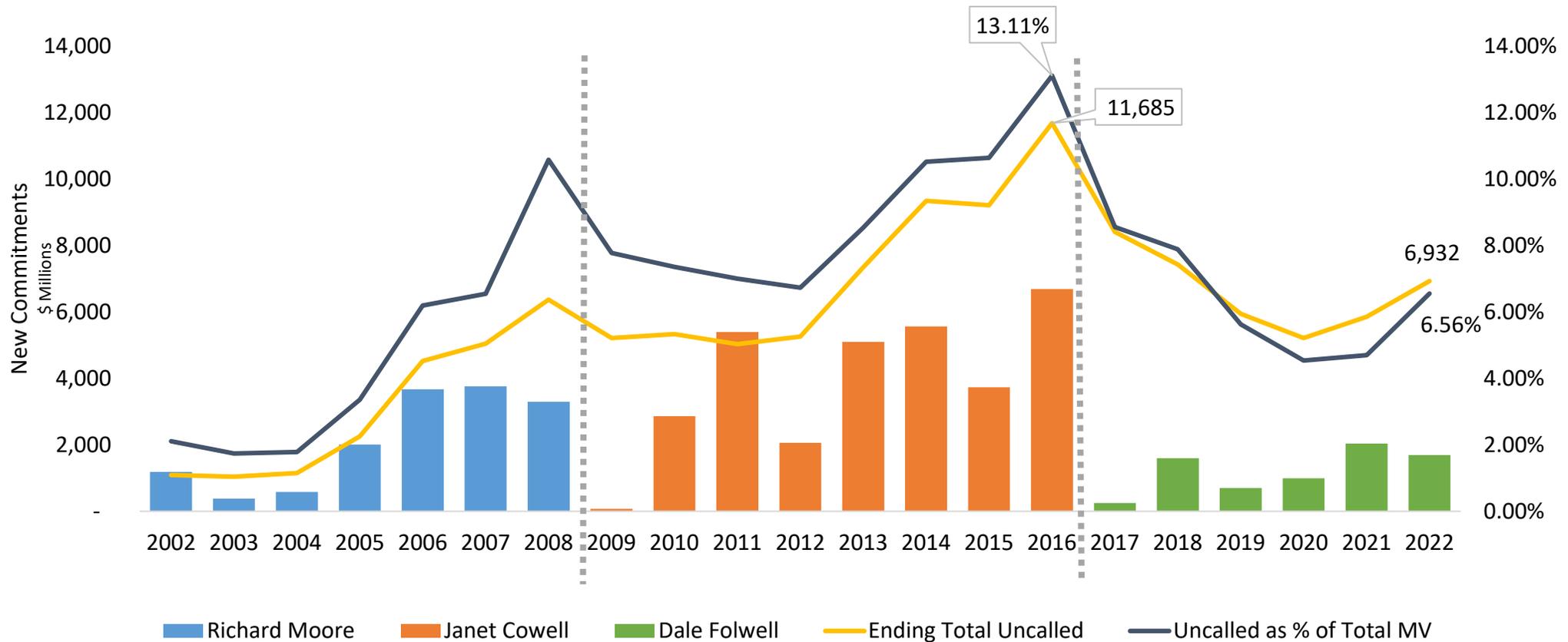
Since August 24<sup>th</sup> IAC Meeting As of September 30, 2022

<u>Fund Name</u>	<u>Firm Name</u>	<u>New or Incremental Commitment (\$MM)</u>	<u>Closing Date</u>
<b>Public Equity</b>			
Internal US Core	Internal	200	10/20
<b>Private Equity</b>			
<b>Non-Core Real Estate</b>			
Prime Storage NC, LP	Prime Group Holdings	300	9/20
<b>Opportunistic Fixed Income</b>			
None			
<b>Inflation Sensitive</b>			
None			
<b>Core Real Estate</b>			
None			
<b>Multi-Strategy</b>			
None			

<u>Asset Class</u>	<u>Unfunded Commitments (\$MM)</u>
Public Equity	0
Private Equity	2,288
Non-Core Real Estate	1,520
Opportunistic Fixed Income	850
Inflation Sensitive	1,630
Core Real Estate	643
Multi Strategy	0
<b>Total</b>	<b>6,931</b>

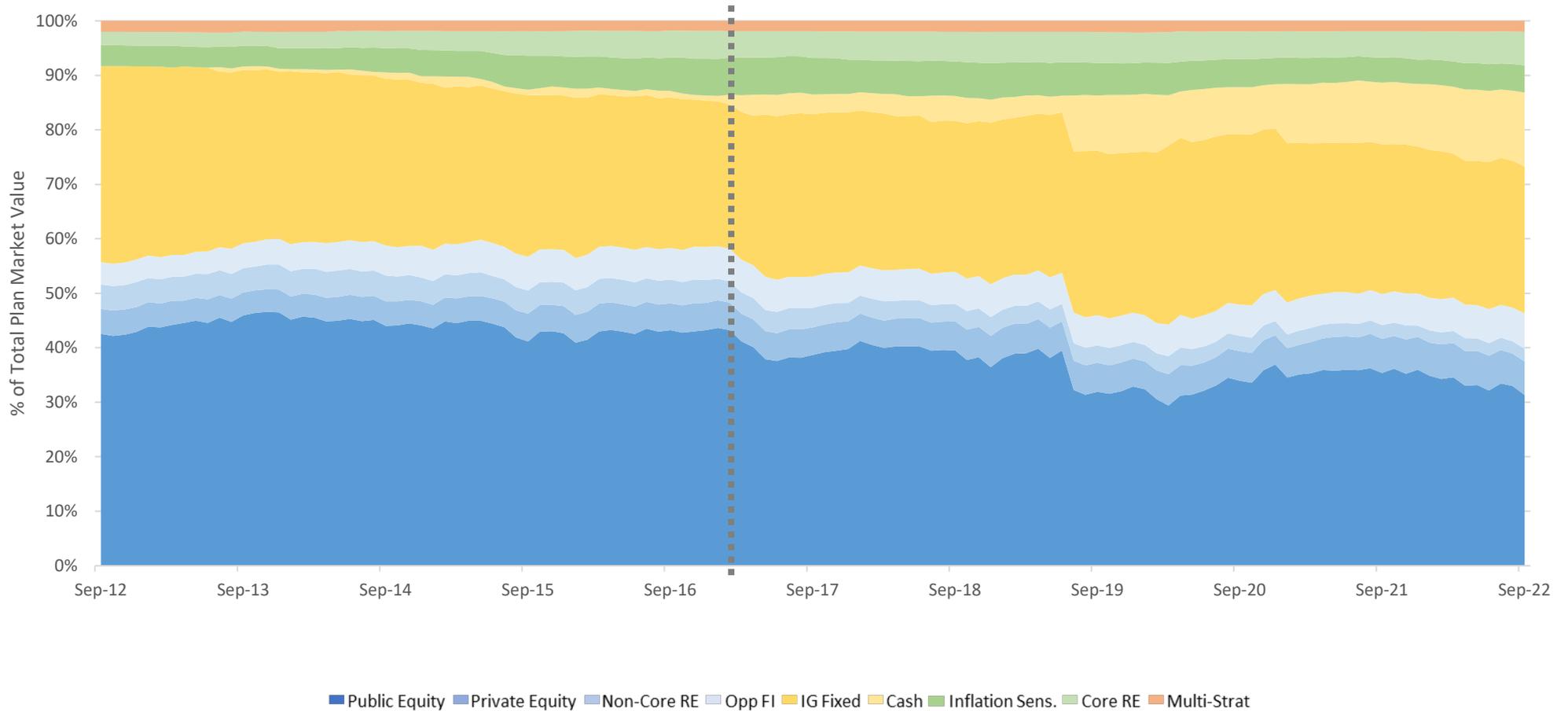
# New and Total Unfunded Private Asset Class Commitments

## By Calendar Year of Closing through September 30<sup>th</sup>





# Asset Allocation History as of September 30, 2022





# Exited Investments

Since August 24<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>		
None		
<b>Multi Strategy</b>		
None		



# Top 20 Investment Managers

## As of September 30, 2022

	Manager	Market Value (\$)	Uncalled (\$)	% MV	% MV Cum.
1	Internal Fixed Income	42,878,768,234	-	40.6%	40.6%
2	Internal Equity	15,114,050,287	-	14.3%	54.8%
3	BlackRock, Inc.	7,415,281,977	-	7.0%	61.9%
4	Rockwood Capital	2,953,670,300	144,491,366	2.8%	64.7%
5	Blackstone Group	2,837,379,167	1,184,551,522	2.7%	67.3%
6	Baillie Gifford	2,562,762,663	-	2.4%	69.8%
7	Wellington Management	2,546,149,196	-	2.4%	72.2%
8	Mondrian Investment Partners Limited	2,221,285,297	-	2.1%	74.3%
9	Walter Scott & Partners	1,916,171,556	-	1.8%	76.1%
10	Gladius Capital Management LP	1,827,503,620	-	1.7%	77.8%
11	Landmark Partners, Inc.	1,818,416,627	2,100,023,807	1.7%	79.5%
12	Angelo, Gordon & Co.	1,713,874,674	31,153,793	1.6%	81.1%
13	ValueAct Capital	1,143,617,745	-	1.1%	82.2%
14	LBA Realty	1,074,179,918	240,594,059	1.0%	83.2%
15	HPS Investment Partners, LLC	1,062,622,955	96,823,519	1.0%	84.3%
16	DoubleLine Capital LP	804,572,979	-	0.8%	85.0%
17	Rockpoint Group, LLC	802,592,300	83,864,970	0.8%	85.8%
18	Campbell Group LLC, The	722,712,447	-	0.7%	86.5%
19	Monarch Alternative Capital	687,300,000	-	0.6%	87.1%
20	Earnest Partners	684,207,961	-	0.6%	87.8%
	82 Remaining Managers*	12,952,321,677	3,050,338,241	12.2%	100.0%
	<b>Total</b>	<b>105,739,441,580</b>	<b>6,931,841,277</b>	<b>100.0%</b>	<b>100.0%</b>

\*Manager count consists of all manager accounts with a market value greater than \$5.0 million and new, not yet funded, accounts.



## Appendix



# NCRS Public Equity Net of Fees Performance

## As of September 30, 2022

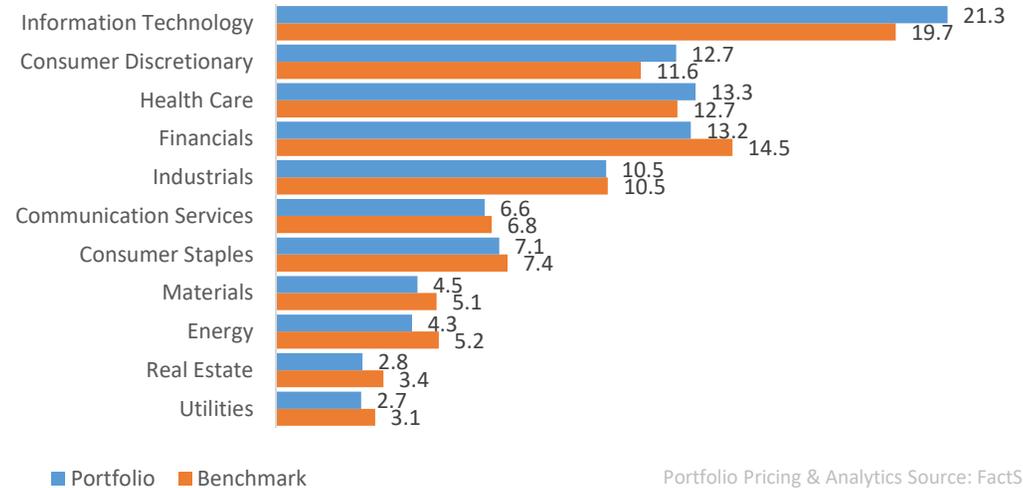
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Public Equity</b>	<b>\$33,136</b>	<b>(7.12)</b>	<b>(24.64)</b>	<b>3.53</b>	<b>4.31</b>	<b>7.67</b>
Benchmark <sup>2</sup>		(6.64)	(21.19)	3.57	4.04	7.07
<b>Domestic Portfolio</b>	<b>\$18,557</b>	<b>(4.48)</b>	<b>(18.91)</b>	<b>7.55</b>	<b>8.84</b>	<b>11.49</b>
Russell 3000		(4.46)	(17.63)	7.70	8.62	11.39
<b>Non-US Portfolio</b>	<b>\$14,576</b>	<b>(10.29)</b>	<b>(30.61)</b>	<b>(0.97)</b>	<b>(0.20)</b>	<b>4.01</b>
Custom Benchmark		(9.69)	(25.72)	(1.27)	(0.78)	3.19

# NCRS Public Equity Portfolio Characteristics

## As of September 30, 2022

Portfolio Characteristics		
	Portfolio	MSCI ACWI IMI
Price/Earnings	15.4	13.8
Dividend Yield	2.1	2.4
Price/Book	2.4	2.2
Market Capitalization	268,861	269,424
Return On Equity	21.1	21.1

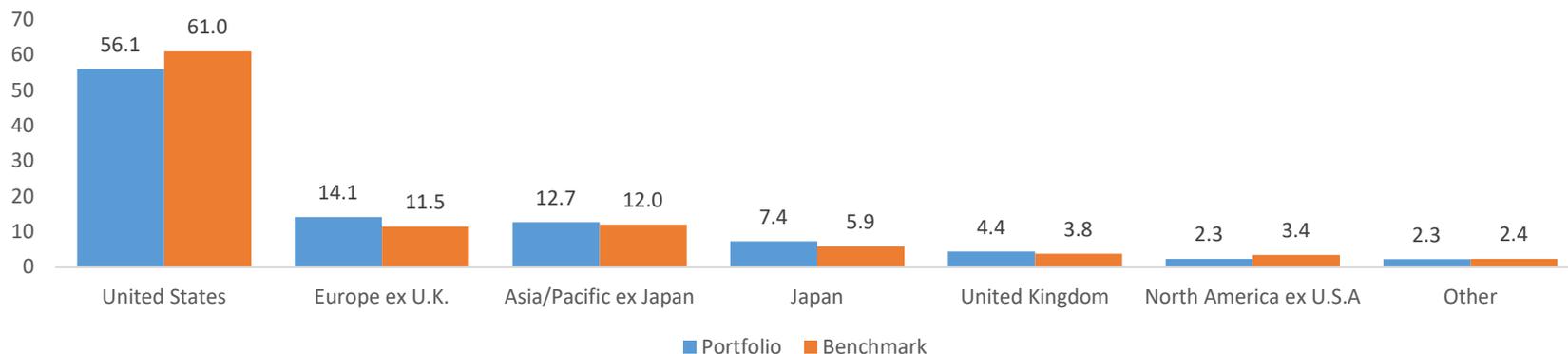
@FactSet Research Systems



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

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

### Total Equity Regional Allocation





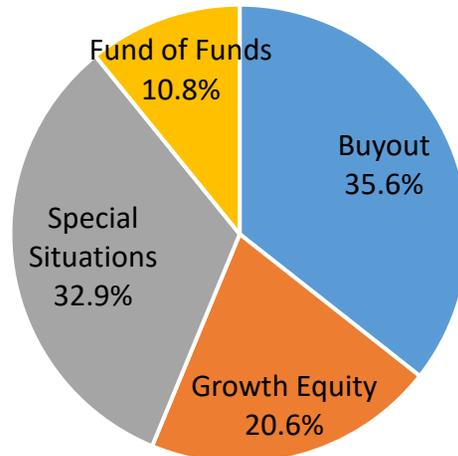
# NCRS Private Equity Portfolio

## As of September 30, 2022

Net of Fees Performance (%)						
	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Private Equity</b>	<b>\$6,483</b>	<b>(6.09)</b>	<b>(1.05)</b>	<b>19.55</b>	<b>17.34</b>	<b>13.57</b>
Benchmark <sup>3</sup>		(3.52)	3.51	16.25	14.19	12.28
<b>Buyout</b>	<b>\$2,302</b>	<b>(3.81)</b>	<b>10.30</b>	<b>21.73</b>	<b>18.22</b>	<b>13.42</b>
<b>Growth</b>	<b>\$1,333</b>	<b>(14.75)</b>	<b>(28.81)</b>	<b>13.56</b>	<b>16.05</b>	<b>14.43</b>
<b>Special Situations</b>	<b>\$2,127</b>	<b>(1.64)</b>	<b>17.52</b>	<b>21.29</b>	<b>16.34</b>	<b>10.71</b>
<b>Fund of Funds</b>	<b>\$701</b>	<b>(7.20)</b>	<b>(3.08)</b>	<b>19.76</b>	<b>17.42</b>	<b>14.91</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>2020</u>	<u>2021</u>	<u>2022</u>	<u>Total</u>
NCRS		12.02	6.83	5.11	3.43	9.51	10.50	8.38	20.10	9.24	14.56	13.11	14.98	20.64	23.80	22.56	25.23	N/A	N/A	-2.07	-79.00	10.42
# of Funds		28	3	11	21	15	17	3	1	6	6	9	4	9	6	7	3	N/A	N/A	4	2	155

Strategy Allocation (Based on Valuation)



\*Private Equity returns include a stock distribution account, in the amount of roughly \$20 million, which does not fall under any specific sub-section.



# NCRS Non-Core Real Estate Portfolio

## As of September 30, 2022

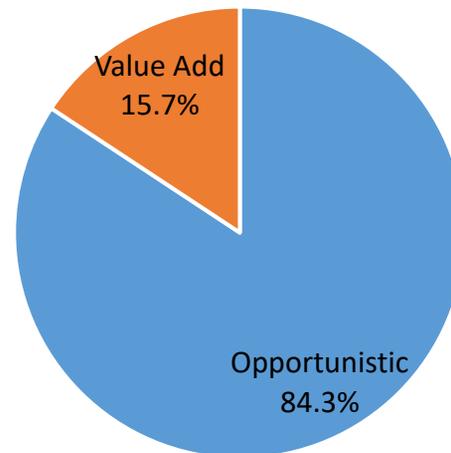
### Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Non-Core Real Estate</b>	<b>\$2,496</b>	<b>(1.62)</b>	<b>15.92</b>	<b>9.14</b>	<b>10.29</b>	<b>12.14</b>
Benchmark <sup>4</sup>		(0.68)	13.35	8.86	8.27	8.74
<b>Opportunistic</b>	<b>\$2,103</b>	<b>(1.70)</b>	<b>17.93</b>	<b>9.75</b>	<b>10.99</b>	<b>12.25</b>
<b>Value Add</b>	<b>\$393</b>	<b>(1.18)</b>	<b>8.46</b>	<b>6.81</b>	<b>8.06</b>	<b>11.43</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>2020</u>	<u>2021</u>	<u>2022</u>	<u>Total</u>
NCRS	8.91	15.69	-1.47	3.12	2.21	15.36	N/A	15.90	17.47	15.83	12.56	4.99	9.18	12.79	N/A	14.10	34.74	N/A	N/A	0.00	6.85
# of Funds	16	3	15	13	8	6	N/A	6	7	5	7	7	6	7	N/A	1	1	N/A	N/A	3	111

### Strategy Allocation (Based on Valuation)





# NCRS Opportunistic Fixed Income Portfolio

## As of September 30, 2022

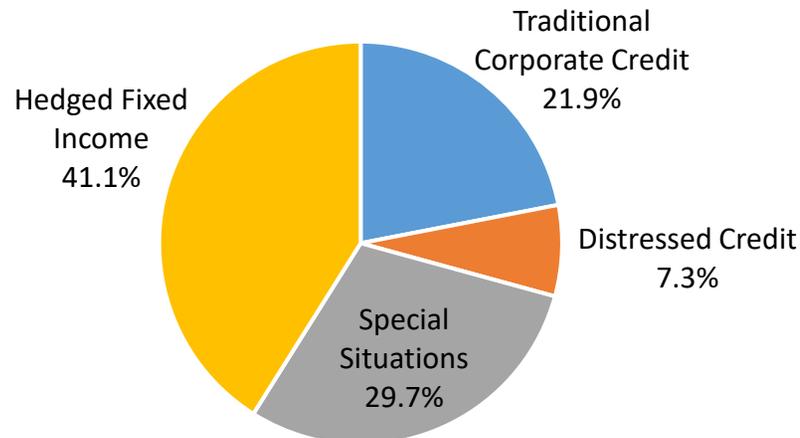
### Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Opportunistic Fixed Income</b>	<b>\$6,853</b>	<b>(1.03)</b>	<b>1.20</b>	<b>6.36</b>	<b>5.79</b>	<b>6.15</b>
Benchmark <sup>b</sup>		2.18	(3.18)	4.20	2.73	2.81
<b>Traditional Corporate Credit</b>	<b>\$1,504</b>	<b>(1.96)</b>	<b>0.06</b>	<b>5.44</b>	<b>5.15</b>	<b>6.06</b>
<b>Distressed Credit</b>	<b>\$500</b>	<b>(2.64)</b>	<b>1.12</b>	<b>11.13</b>	<b>9.25</b>	<b>9.79</b>
<b>Special Situations</b>	<b>\$2,035</b>	<b>(0.20)</b>	<b>5.67</b>	<b>6.32</b>	<b>7.17</b>	<b>11.23</b>
<b>Hedged Fixed Income</b>	<b>\$2,814</b>	<b>(0.87)</b>	<b>(1.14)</b>	<b>6.62</b>	<b>5.05</b>	<b>4.60</b>

### IRR by Vintage Year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NCRS	2.87	N/A	16.91	7.33	22.42	5.18	4.92	3.88	4.94	3.42	8.43	7.18	12.75	N/A	9.26	17.00	11.65	0.43	6.09
# of Funds	1	N/A	1	3	1	4	9	2	7	3	1	8	2	N/A	1	2	1	2	48

### Strategy Allocation (Based on Valuation)





# NCRS Rates & Liquidity Portfolio

## As of September 30, 2022

### Net of Fees Performance (%)

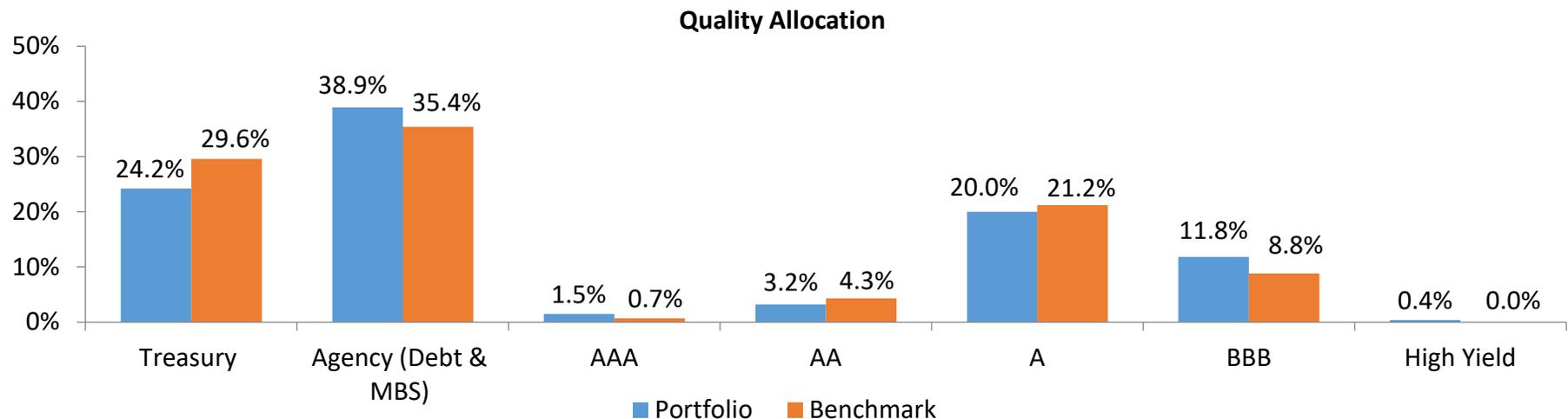
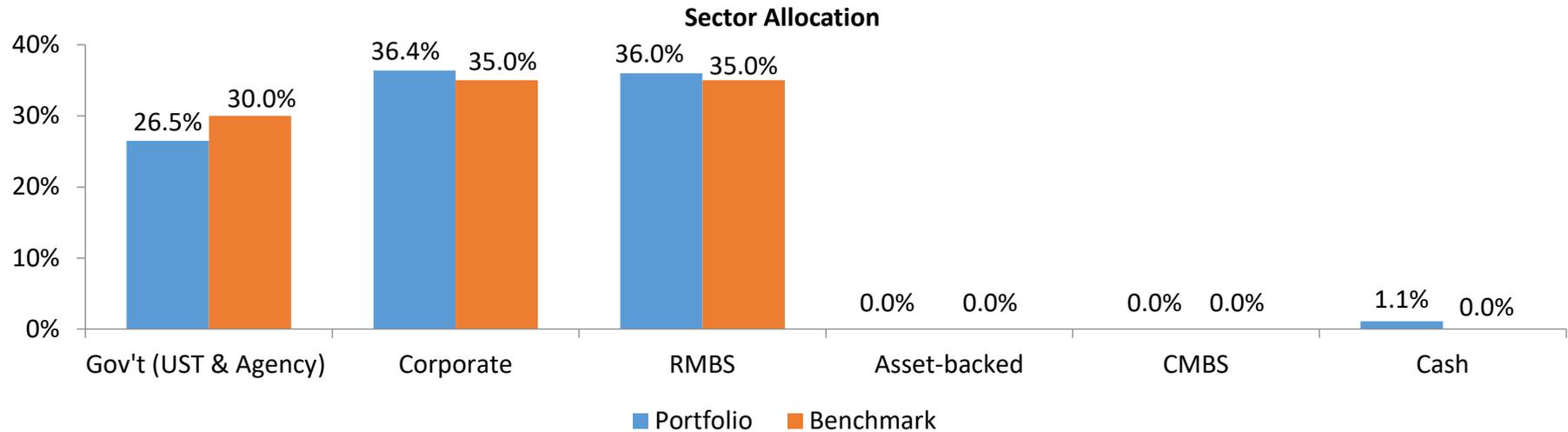
	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Rates &amp; Liquidity</b>	<b>\$42,879</b>	<b>(3.32)</b>	<b>(9.95)</b>	<b>(1.58)</b>	<b>0.85</b>	<b>1.60</b>
Benchmark <sup>6</sup>		(4.95)	(16.02)	(3.84)	(0.31)	1.05
<b>IG Fixed Income</b>	<b>\$28,469</b>	<b>(5.07)</b>	<b>(14.51)</b>	<b>(2.90)</b>	<b>0.23</b>	<b>1.34</b>
<b>Core Fixed Income</b>	<b>\$24,857</b>	<b>(5.80)</b>	<b>(16.32)</b>	<b>(3.45)</b>	<b>0.04</b>	<b>1.31</b>
<b>IG Fixed Income Cash</b>	<b>\$3,613</b>	<b>0.28</b>	<b>0.46</b>	<b>0.76</b>	<b>1.16</b>	<b>-</b>
<b>Pension Cash</b>	<b>\$14,409</b>	<b>0.39</b>	<b>0.57</b>	<b>0.75</b>	<b>1.23</b>	<b>-</b>

### Core Fixed Income Portfolio Characteristics

	<u>Avg. Coupon</u>	<u>Yield to Worst</u>	<u>Effective Duration</u>
Government (Treasury & Agency)	3.6%	4.1%	8.4
Corporate	4.1%	5.7%	8.4
Mortgage	3.0%	4.6%	5.9
<b>Total</b>	<b>3.6%</b>	<b>4.9%</b>	<b>7.5</b>

# NCRS Core Fixed Income Portfolio Characteristics

## As of September 30, 2022





# NCRS Inflation Sensitive Portfolio

## As of September 30, 2022

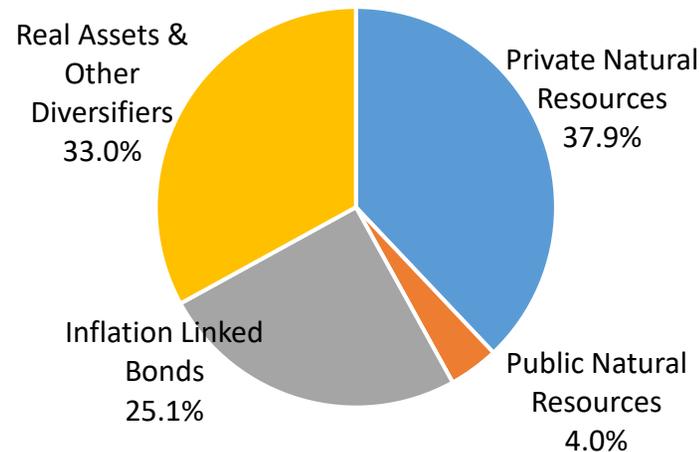
Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Inflation Sensitive</b>	<b>\$5,254</b>	<b>(0.49)</b>	<b>9.41</b>	<b>5.49</b>	<b>5.26</b>	<b>2.42</b>
Benchmark <sup>10</sup>		(1.29)	3.84	4.09	3.67	0.85
<b>Private Natural Resources</b>	<b>\$1,993</b>	<b>(1.86)</b>	<b>13.93</b>	<b>5.23</b>	<b>3.46</b>	<b>3.35</b>
<b>Public Natural Resources</b>	<b>\$211</b>	<b>(5.99)</b>	<b>13.34</b>	<b>14.13</b>	<b>6.51</b>	<b>(1.84)</b>
<b>Inflation Linked Bonds</b>	<b>\$1,316</b>	<b>(0.81)</b>	<b>(4.56)</b>	<b>1.12</b>	<b>2.15</b>	<b>-</b>
<b>Real Assets &amp; Other Diversifiers</b>	<b>\$1,733</b>	<b>1.98</b>	<b>14.80</b>	<b>8.36</b>	<b>9.31</b>	<b>8.51</b>

IRR by Vintage Year

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
NCRS	0.88	-7.73	-5.67	N/A	-5.63	-5.83	5.45	7.14	7.57	8.77	2.50	3.52	26.50	27.43	N/A	50.59	N/A	2.17
# of Funds	3	2	2	N/A	3	9	7	11	12	4	3	1	3	2	N/A	5	N/A	67

Strategy Allocation (Based on Valuation)





# NCRS Core Real Estate Portfolio

## As of September 30, 2022

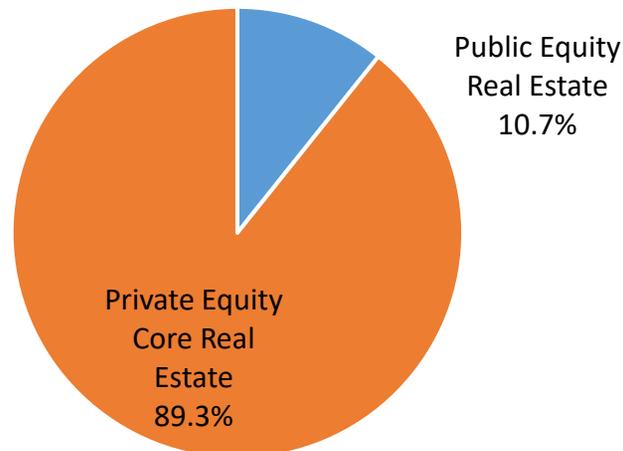
### Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Core Real Estate</b>	<b>\$6,491</b>	<b>(0.21)</b>	<b>9.94</b>	<b>7.82</b>	<b>7.55</b>	<b>8.60</b>
Benchmark <sup>11</sup>		(2.26)	10.85	7.95	7.18	8.73
<b>Public Equity Real Estate</b>	<b>\$697</b>	<b>(12.68)</b>	<b>(26.33)</b>	<b>(5.00)</b>	<b>0.30</b>	<b>4.57</b>
<b>Private Equity Core Real Estate</b>	<b>\$5,793</b>	<b>1.54</b>	<b>16.80</b>	<b>9.87</b>	<b>8.66</b>	<b>9.32</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>2020</u>	<u>2021</u>	<u>2022</u>	<u>Total</u>
NCRS	7.51	9.74	-8.33	4.32	1.39	9.40	N/A	23.62	N/A	N/A	5.06	7.21	7.37	6.89	N/A	15.77	N/A	N/A	22.42	N/A	7.26
# of Funds	5	1	1	2	3	1	N/A	1	N/A	N/A	2	6	2	9	N/A	1	N/A	N/A	3	N/A	37

### Strategy Allocation (Based on Valuation)





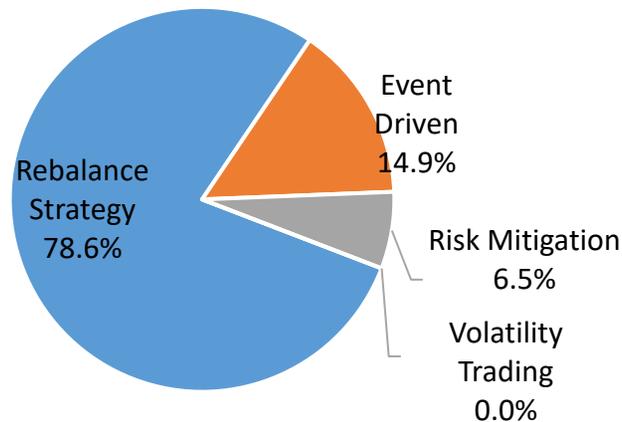
# NCRS Multi-Strategy Portfolio

## As of September 30, 2022

Net of Fees Performance (%)

	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
<b>Multi-Strategy</b>	<b>\$2,148</b>	<b>(1.53)</b>	<b>(5.46)</b>	<b>(0.08)</b>	<b>1.44</b>	<b>5.02</b>
Benchmark <sup>12</sup>		(1.78)	(8.09)	0.10	0.96	4.42
<b>Rebalance Strategy</b>	<b>\$1,689</b>	<b>(1.70)</b>	<b>(6.98)</b>	<b>0.73</b>	<b>2.48</b>	<b>6.16</b>
<b>Event Driven</b>	<b>\$320</b>	<b>(3.09)</b>	<b>(1.26)</b>	<b>6.06</b>	<b>4.47</b>	<b>-</b>
<b>Risk Mitigation</b>	<b>\$139</b>	<b>4.54</b>	<b>4.81</b>	<b>1.24</b>	<b>(1.17)</b>	<b>-</b>
<b>Volatility Trading</b>	<b>-</b>	<b>-</b>	<b>-</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: Effective 7/1/2022 at 45% Buyout, 25% 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% Custom NCREIF ODCE Net Index 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: 55% Growth Benchmark, 33% Rates & Liquidity Benchmark, 11% Inflation Sensitive & Diversifiers Benchmark, and 1% Multi-Strategy Benchmark.
14. The Long-Term Policy Benchmark is comprised of 56% MSCI ACWI IMI Net, 28% BOAML 5+ Years U.S. Treasury Index, 6.5% Bloomberg Commodity Index, 5% BOAML 3 Month Treasury Bill Index, and 4.5% 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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# INVESTMENT MANAGEMENT DIVISION