

NORTH CAROLINA
DEPARTMENT OF STATE TREASURER



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STATE TREASURER OF NORTH CAROLINA
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INVESTMENT MANAGEMENT DIVISION

Performance Review

November 18, 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)

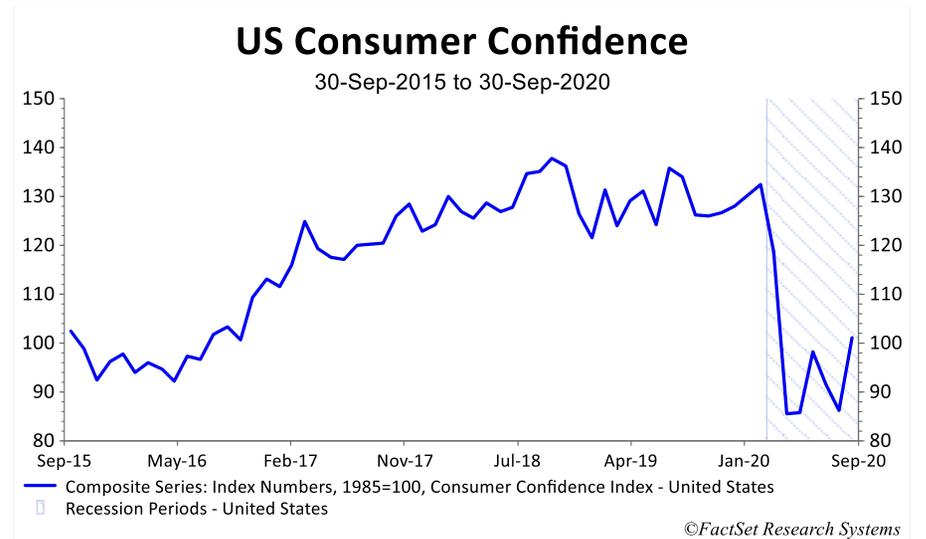
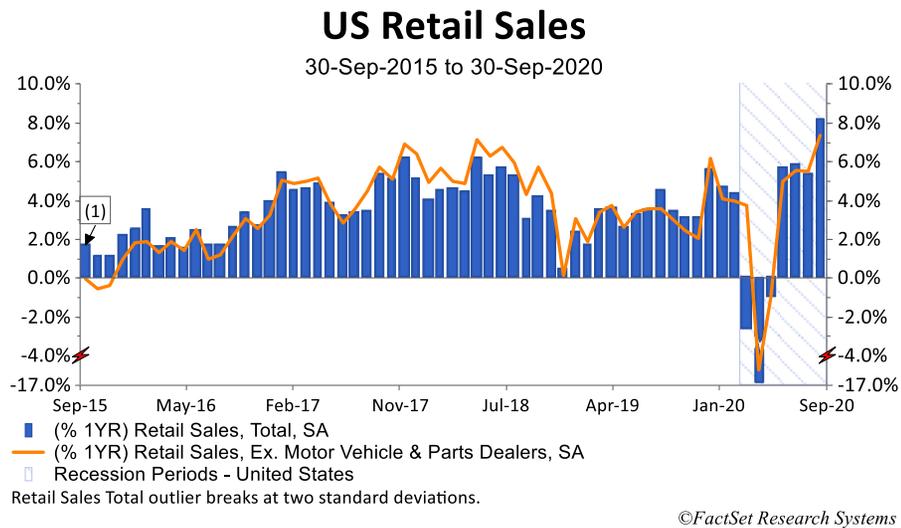
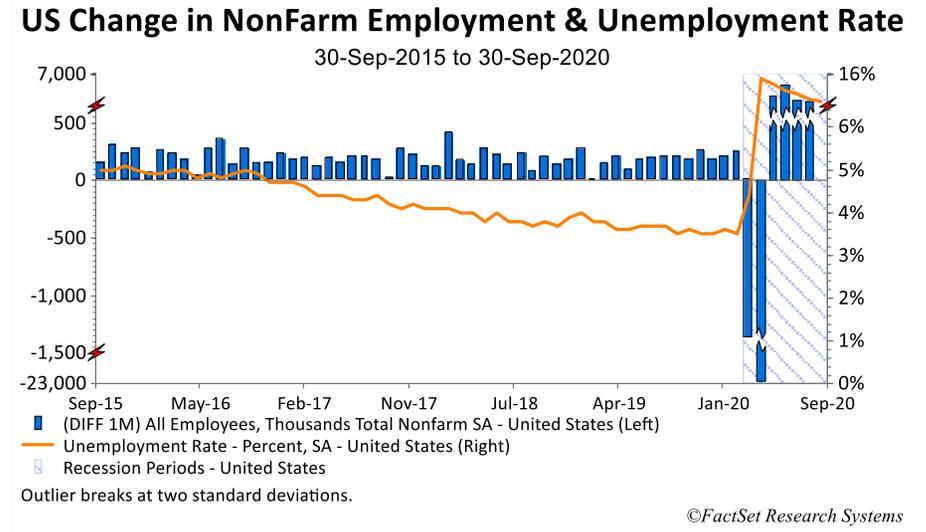
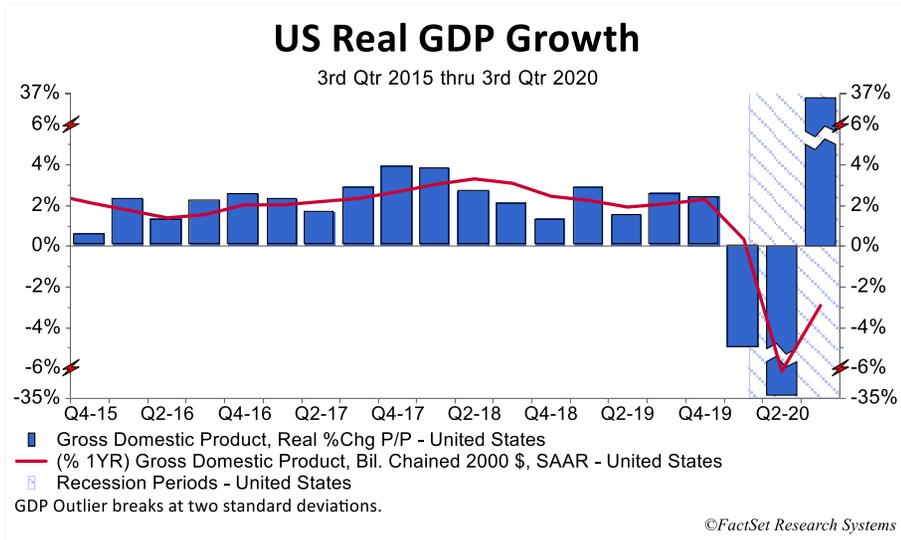
Investment-related services: renegotiations/restructuring	\$47,673
Investment manager terminations/renegotiations	\$293,088
Sub-Total – through November 2020	\$340,761

Projected Realized savings through December 2020

\$350,448



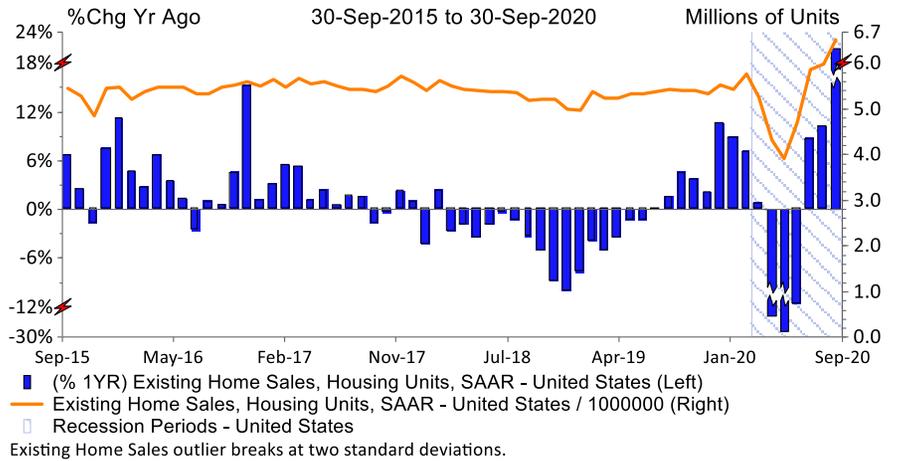
US Economic Environment





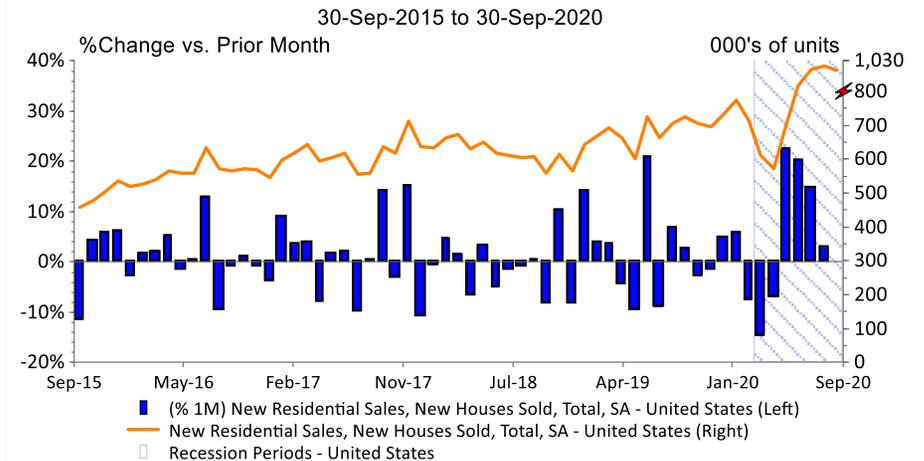
US Economic Environment

US Existing Home Sales



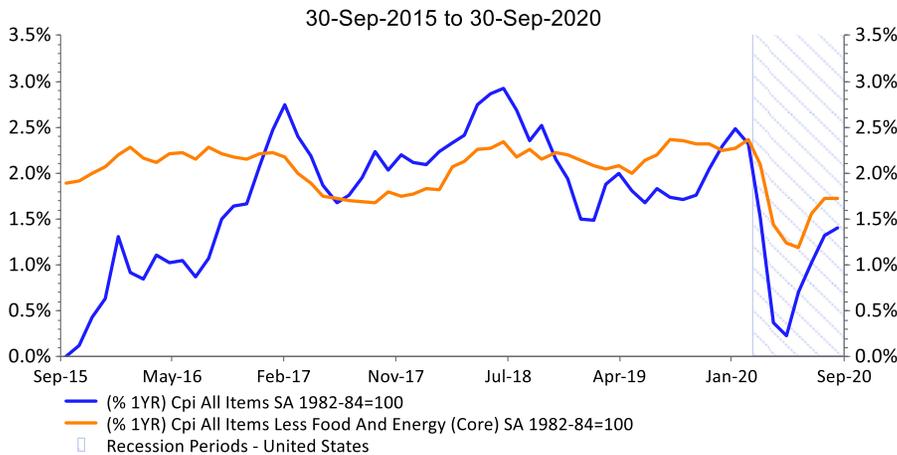
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US New Home Sales



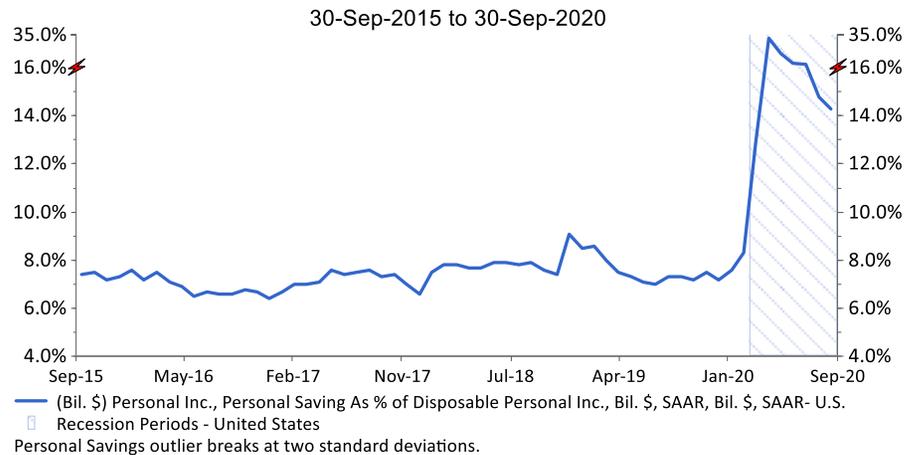
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US Consumer Price Inflation



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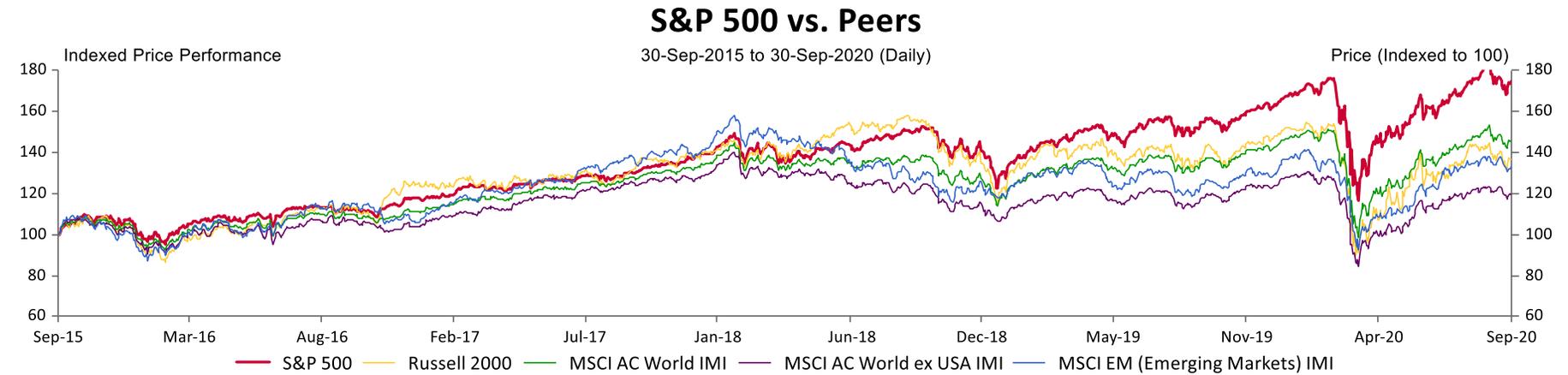
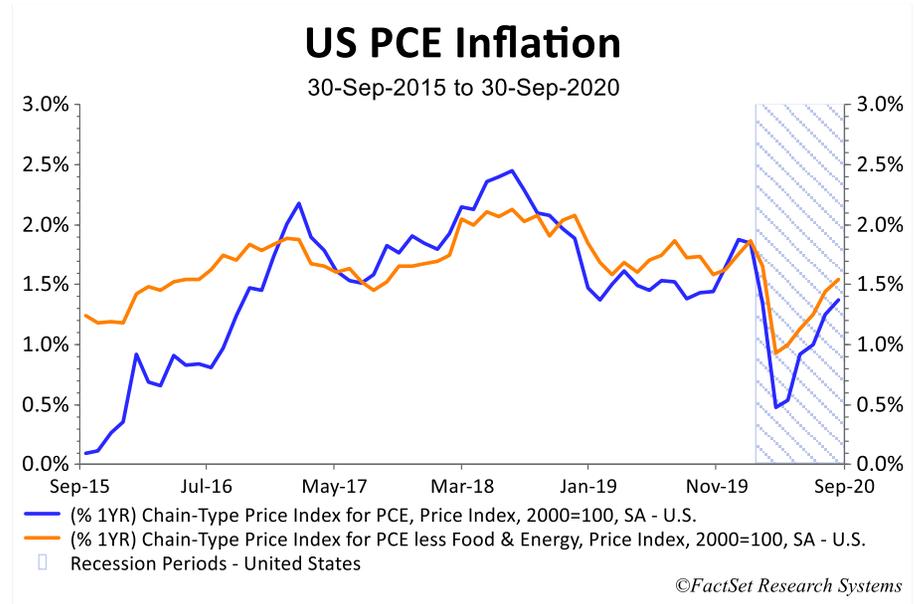
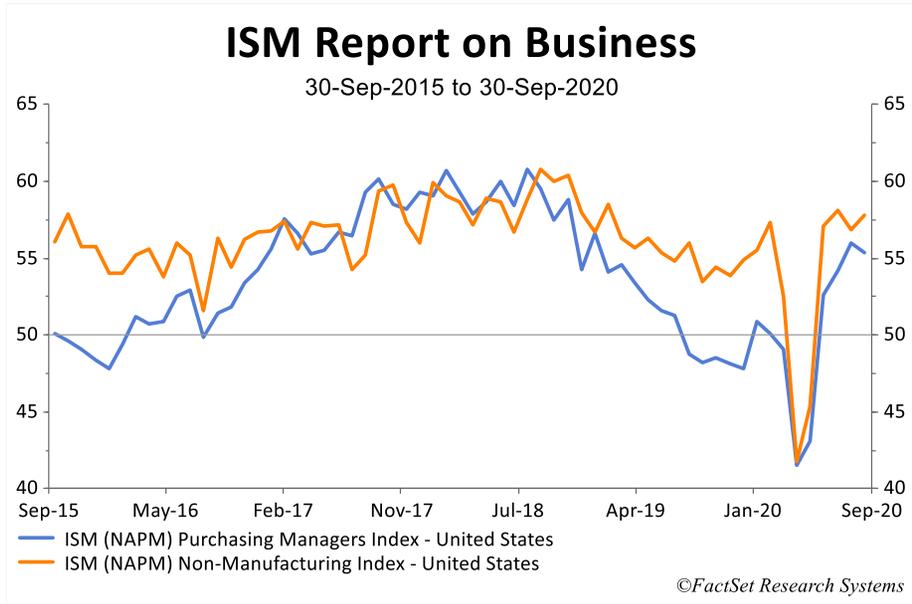
US Personal Savings Rate



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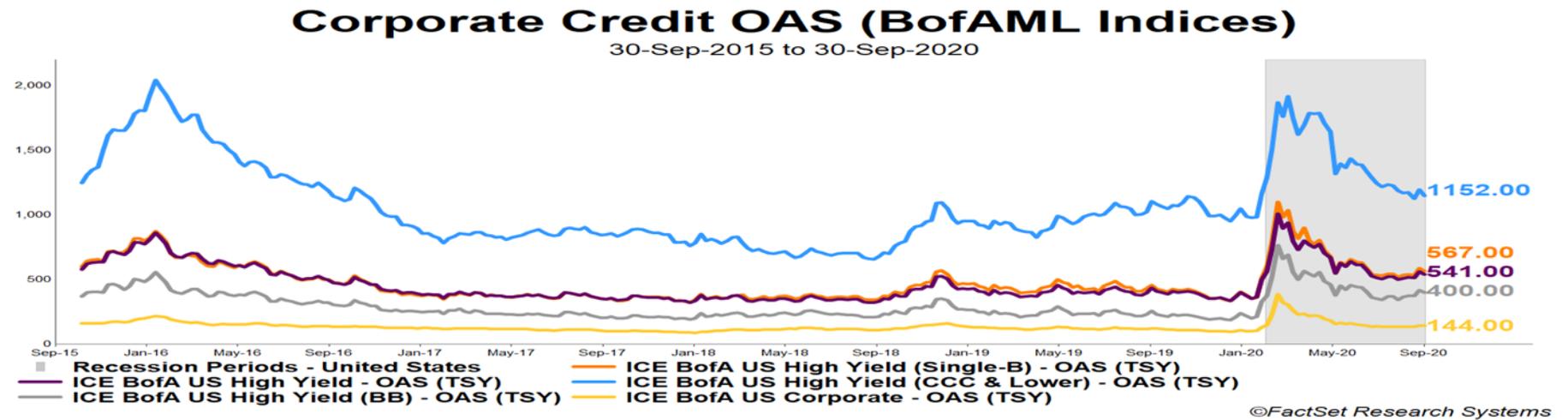
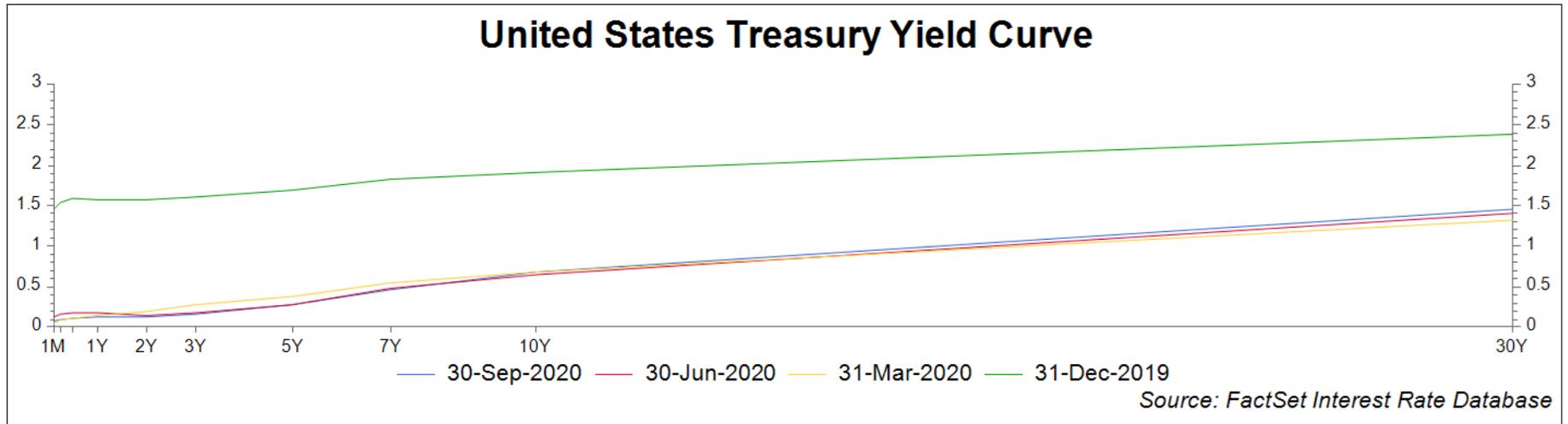
US and Global Economic Environment



Source: FactSet Prices



Market Environment



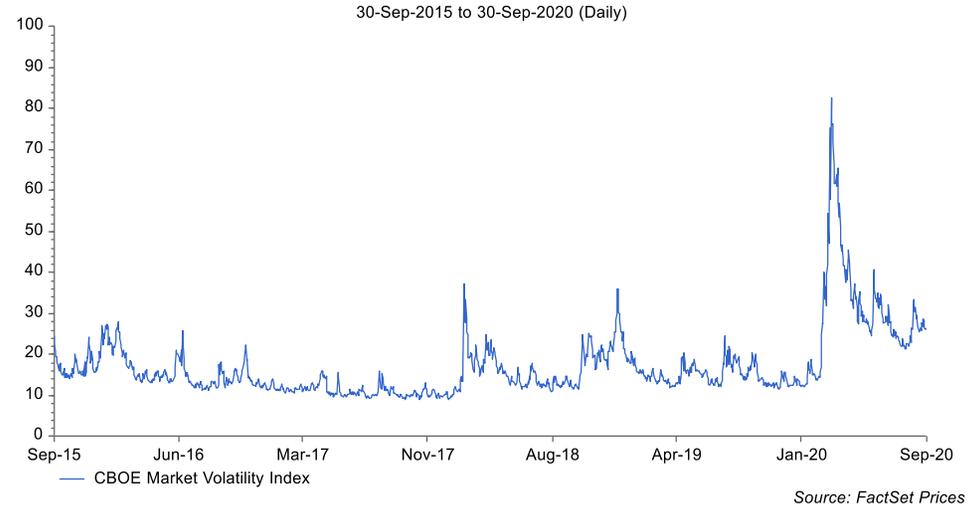


Market Environment

Closing Price Fed Nominal Broad Dollar Index



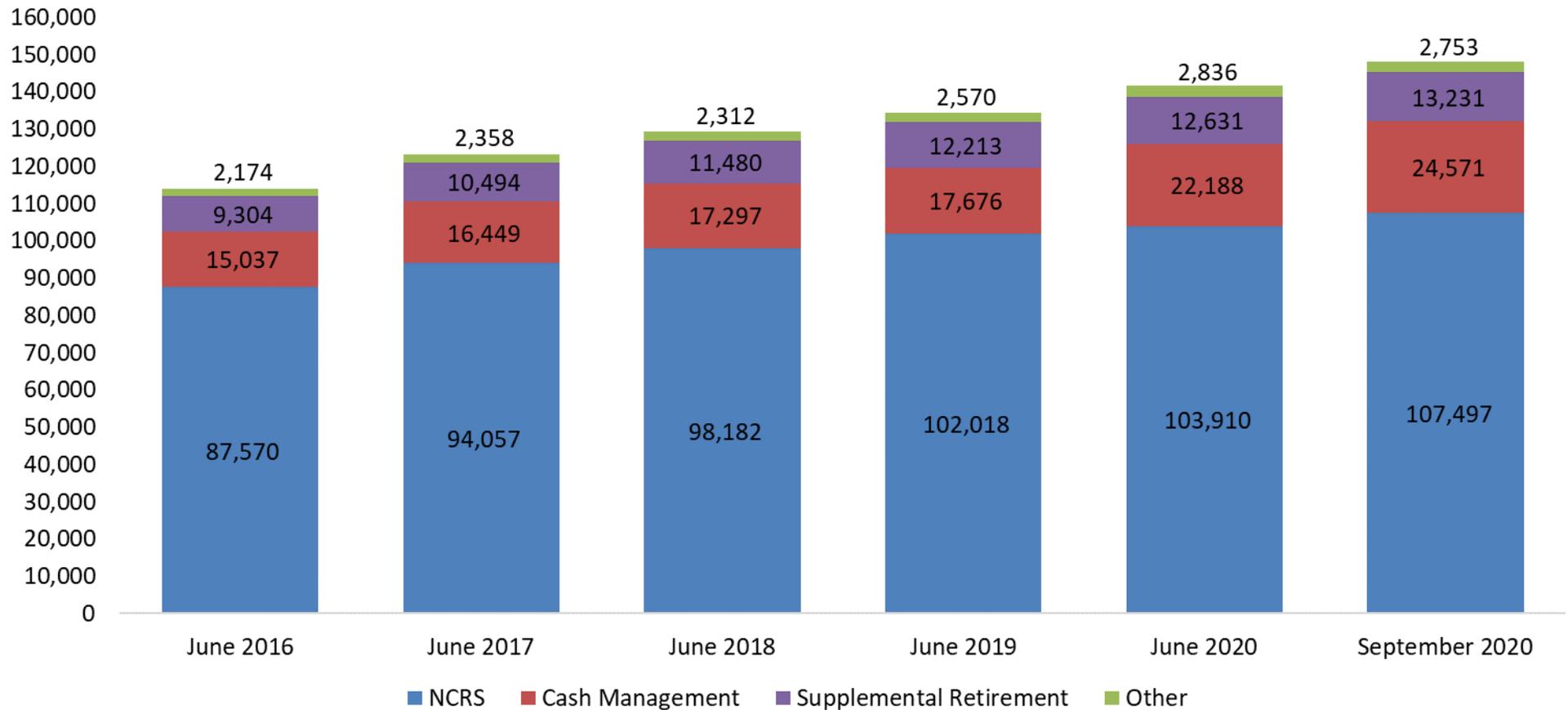
Closing Price CBOE VIX Index



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
U.S.	09/20	-2.9	09/20	7.9	09/20	1.4	Asia/Pacific/Latam						
Europe							China	09/20	4.9			09/20	1.7
Germany	09/20	-4.3	09/20	6.3	09/20	-0.2	India	06/20	-23.9			08/20	5.6
France	09/20	-4.3	09/20	7.9	09/20	0.0	Japan	06/20	-9.9	09/20	3.0	09/20	0.0
U.K.	06/20	-21.5	08/20	4.5	09/20	0.5	Indonesia	06/20	-5.3			09/20	1.4
Italy	09/20	-4.7	09/20	9.6	09/20	-0.6	Brazil	06/20	-11.4			09/20	3.1
Spain	09/20	-8.7	09/20	16.5	09/20	-0.4	Australia	06/20	-6.3	09/20	6.9	09/20	0.7

Assets Under Management (\$MM)

\$148.1 billion as of September 30, 2020



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, 2020

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$MM)
				Minimum	Maximum		
Growth	\$51,508	47.92%	58.00%	37.00%	71.00%	-10.08%	(\$10,840)
Public Equity	36,483	33.94%	42.00%	37.00%	47.00%	-8.06%	(8,666)
Private Equity	5,840	5.43%	6.00%	0.00%	8.75%	-0.57%	(609)
Non Core Real Estate	2,996	2.79%	3.00%	0.00%	8.00%	-0.21%	(229)
Opportunistic Fixed Income	6,189	5.76%	7.00%	0.00%	7.50%	-1.24%	(1,336)
Rates & Liquidity	42,920	39.93%	29.00%	24.00%	42.00%	10.93%	11,746
IG Fixed Income & Cash	33,672	31.32%	28.00%	24.00%	32.00%	3.32%	3,573
Pension Cash	9,249	8.60%	1.00%	0.00%	10.00%	7.60%	8,174
Inflation Sensitive & Diversifiers	10,987	10.22%	11.00%	4.00%	16.00%	-0.78%	(838)
Inflation Sensitive	5,499	5.12%	6.00%	2.00%	7.50%	-0.88%	(951)
Core Real Estate	5,487	5.10%	5.00%	2.00%	10.00%	0.10%	113
Multi-Strategy	2,082	1.94%	2.00%	0.00%	4.00%	-0.06%	(68)
Grand Total	\$107,497	100.00%					



NCRS Asset Allocation (Unaudited)

As of November 6, 2020

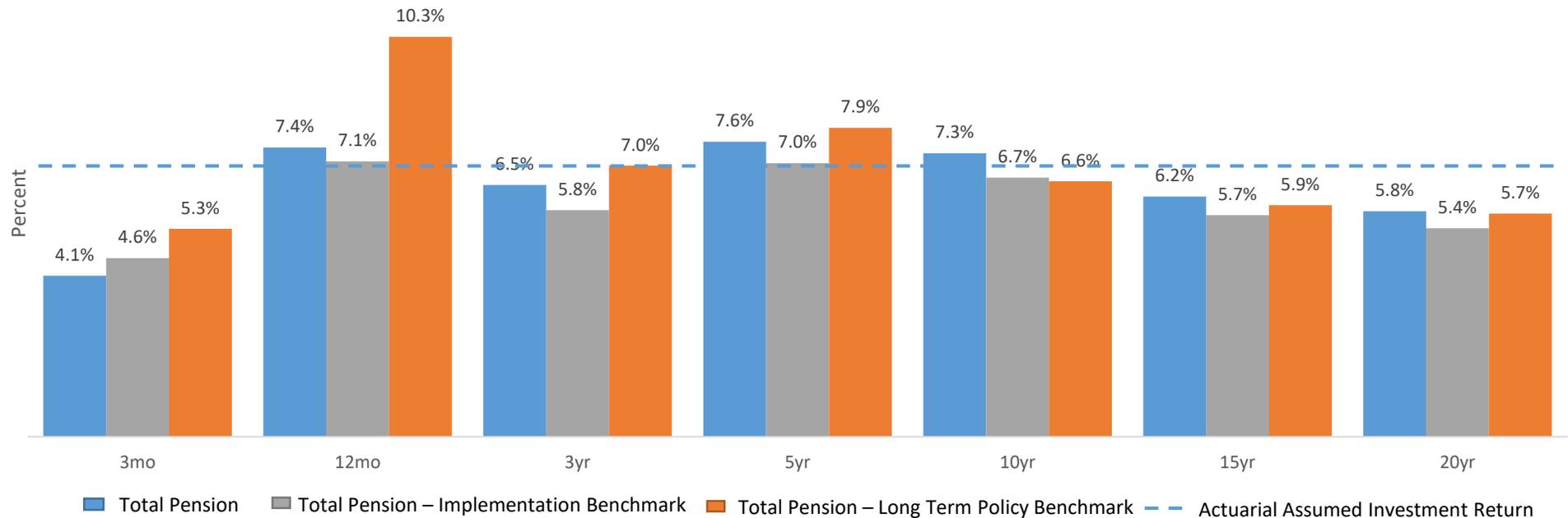
	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$000)
				Minimum	Maximum		
Growth	\$53,422	48.90%	58.00%	37.00%	71.00%	-9.10%	(\$9,943)
Public Equity	38,297	35.05%	42.00%	37.00%	47.00%	-6.95%	(7,588)
Private Equity	5,827	5.33%	6.00%	0.00%	8.75%	-0.67%	(728)
Non Core Real Estate	2,990	2.74%	3.00%	0.00%	8.00%	-0.26%	(287)
Opportunistic Fixed Income	6,308	5.77%	7.00%	0.00%	7.50%	-1.23%	(1,339)
Rates & Liquidity	42,763	39.14%	29.00%	24.00%	42.00%	10.14%	11,081
IG Fixed Income & Cash	33,701	30.85%	28.00%	24.00%	32.00%	2.85%	3,111
Pension Cash	9,062	8.29%	1.00%	0.00%	10.00%	7.29%	7,969
Inflation Sensitive & Diversifiers	10,961	10.03%	11.00%	4.00%	16.00%	-0.97%	(1,056)
Inflation Sensitive	5,473	5.01%	6.00%	2.00%	7.50%	-0.99%	(1,082)
Core Real Estate	5,488	5.02%	5.00%	2.00%	10.00%	0.02%	25
Multi-Strategy	2,103	1.93%	2.00%	0.00%	4.00%	-0.07%	(82)
Grand Total	\$109,249	100.00%					



NCRS Total Net Portfolio Return vs. Benchmarks

As of September 30, 2020

Annualized Returns



Notes:

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

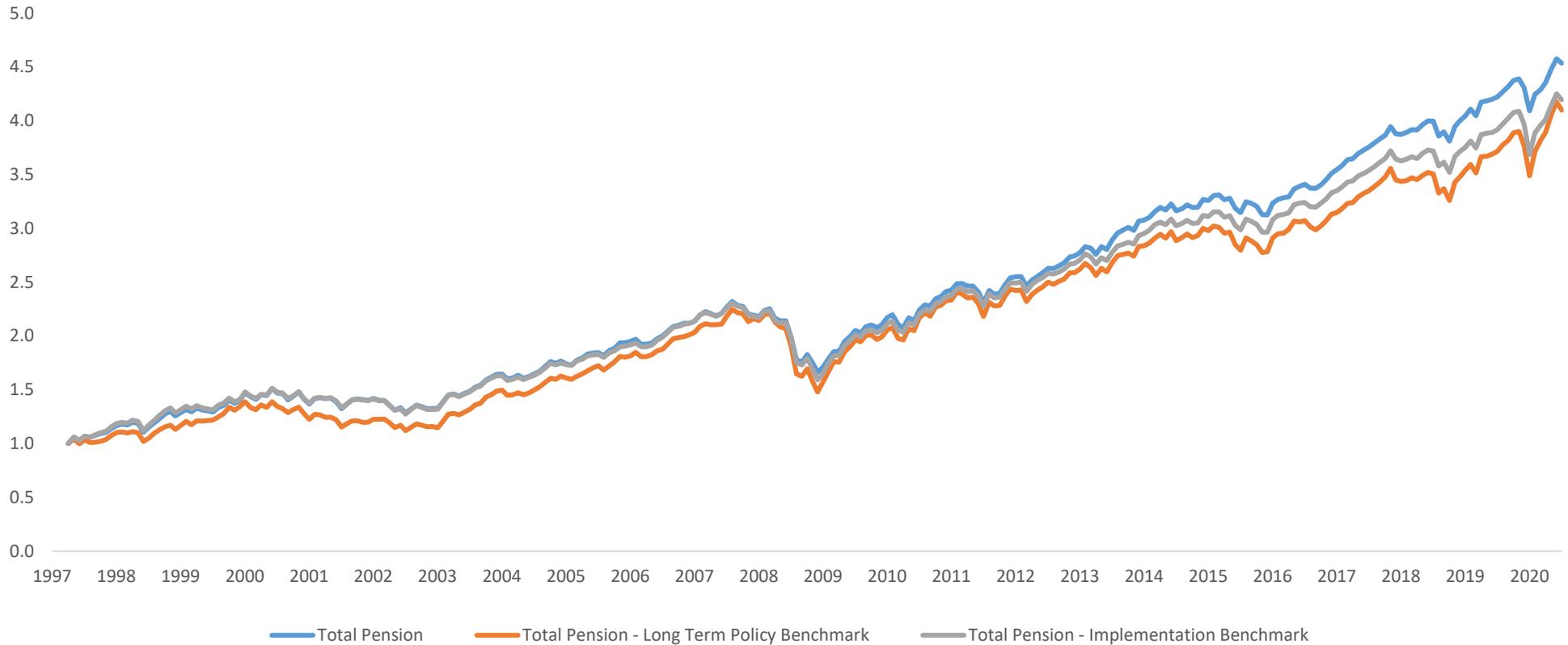
Returns for periods greater than one year are annualized.

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 September 30, 2020



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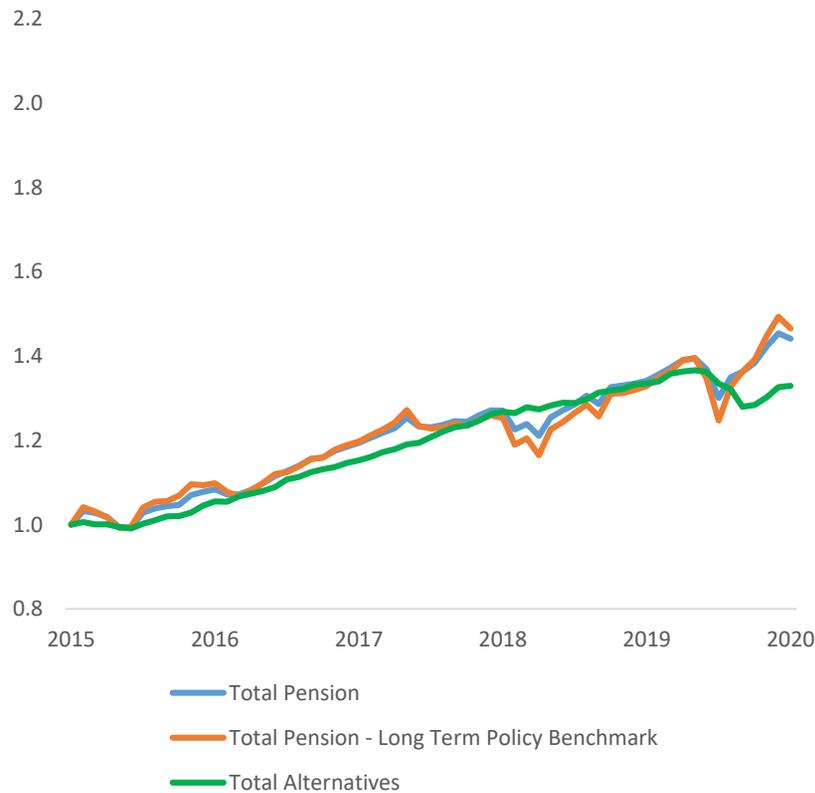
Notes:

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.



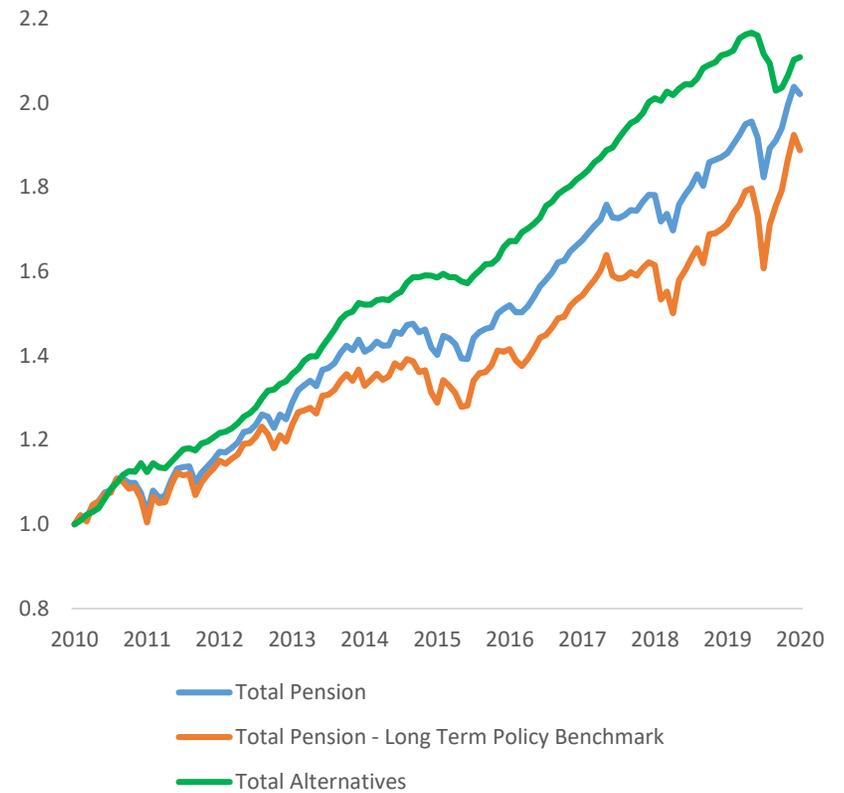
Growth of a Dollar including Alternative Investments

5 Years Ending September 30, 2020



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10 Years Ending September 30, 2020



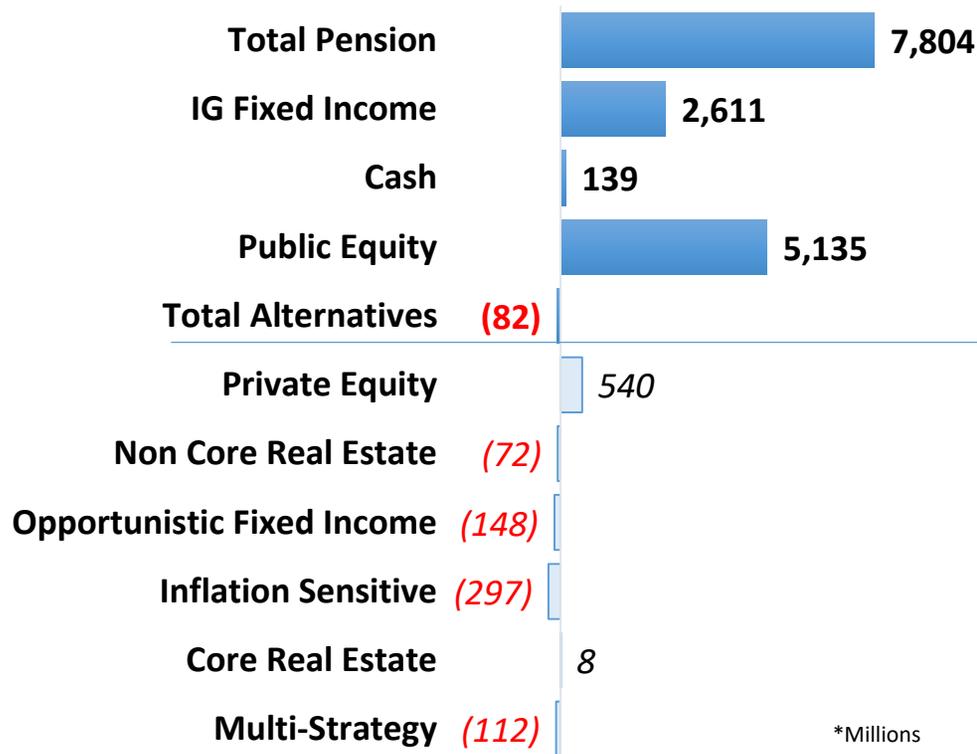
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Note: NCRS Alternatives includes the following: Core Real Estate; Inflation Sensitive – Private Natural Resources; Inflation Sensitive – Real Assets and Other Diversifiers; Multi-Strategy Investments; Non Core Real Estate; Opportunistic Fixed Income;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

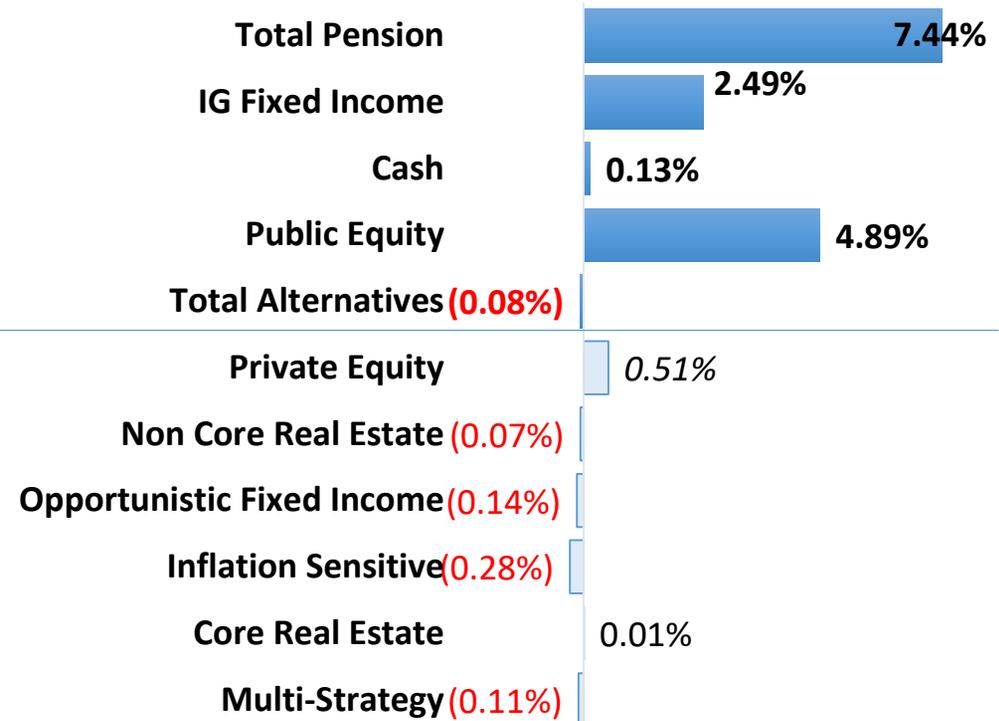
Estimated Contribution to Total Plan Return – 1 Year

As of September 30, 2020

Contribution to Total Plan \$ Earnings*



Contribution to Total Plan % Returns



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

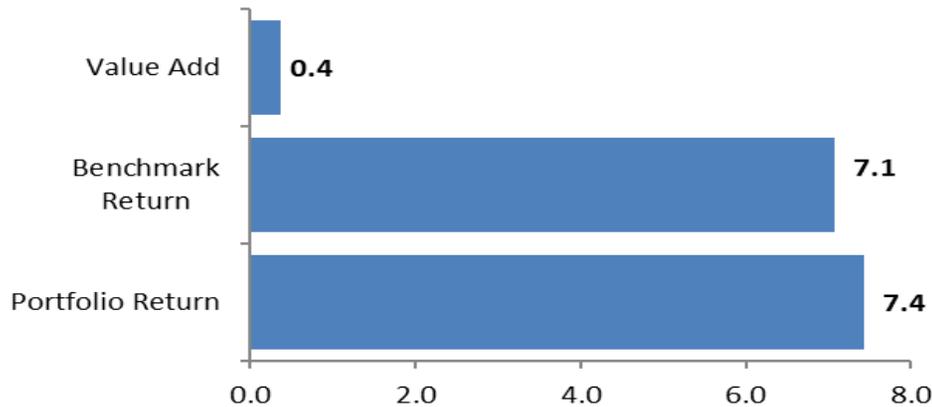
Contribution to Total Plan % Returns = Average Market Value % weight * % Total Return for each asset class

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.

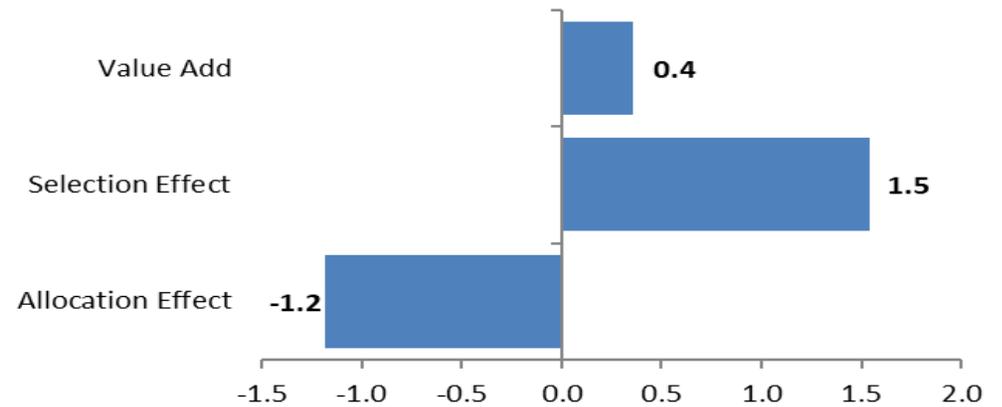
NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 1 Year Ending September 30, 2020

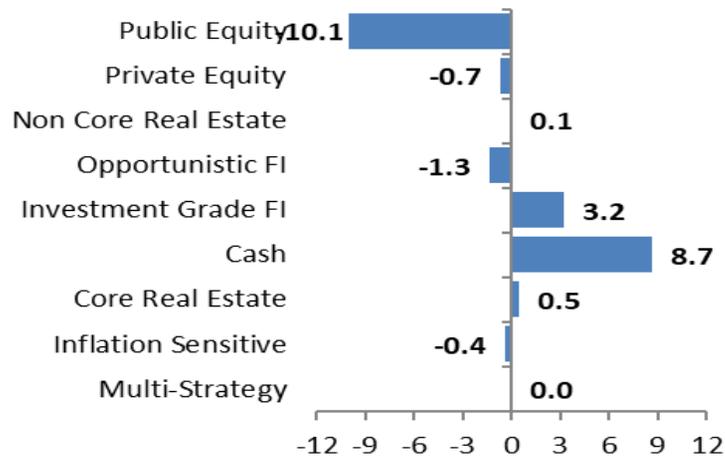
Total Fund Performance



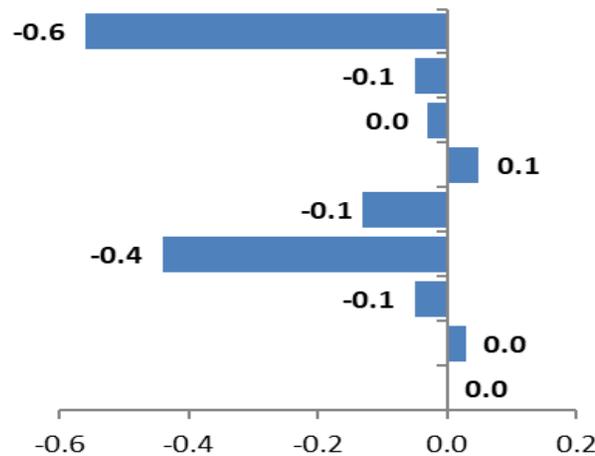
Attribution



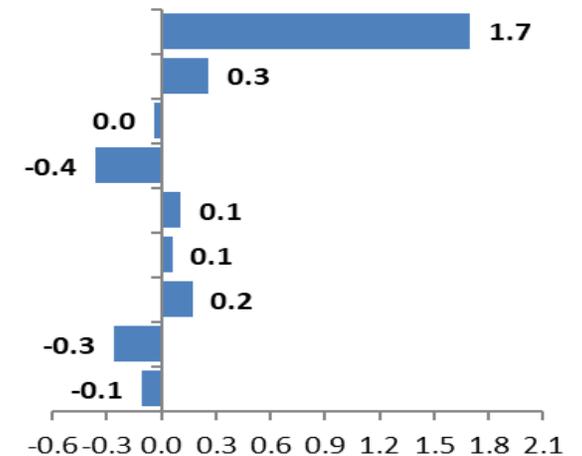
Avg Active Weight



Allocation Effect



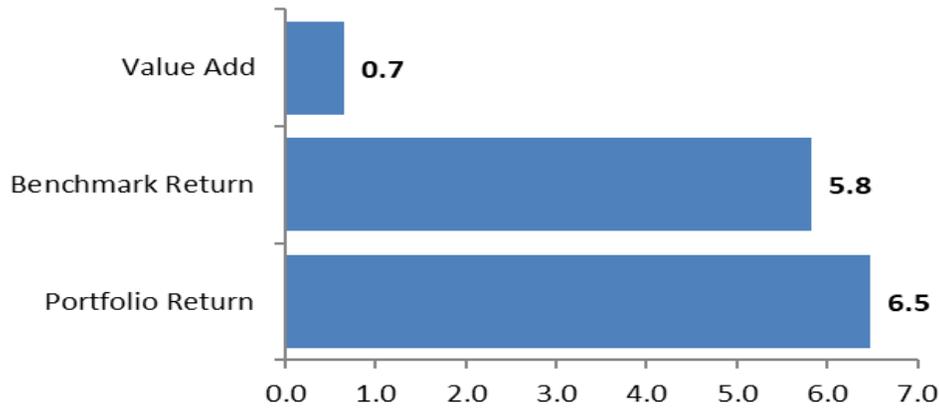
Selection Effect



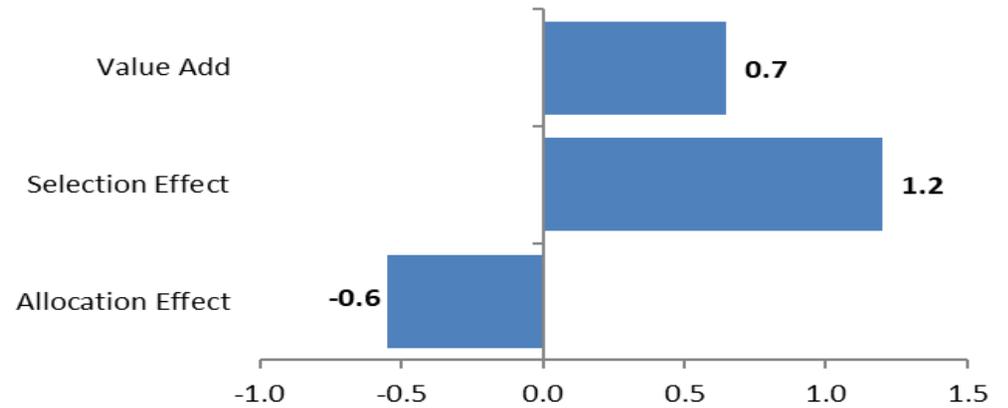
NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 3 Years Ending September 30, 2020

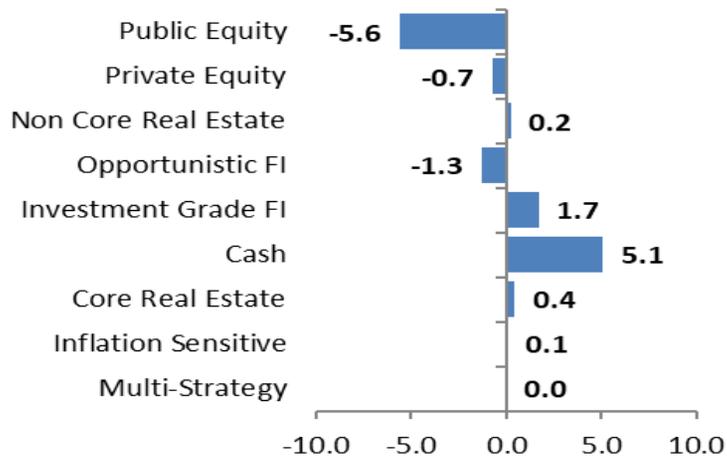
Total Fund Performance



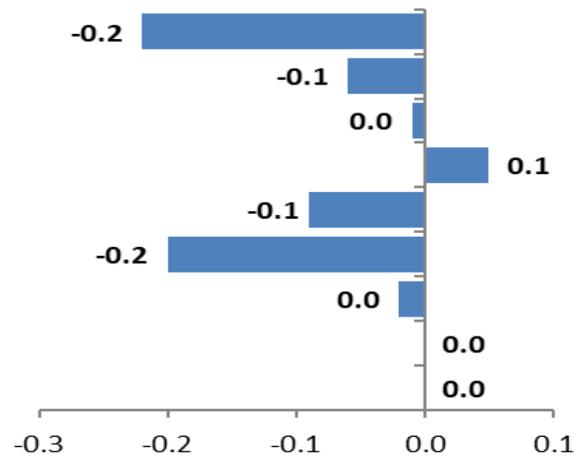
Attribution



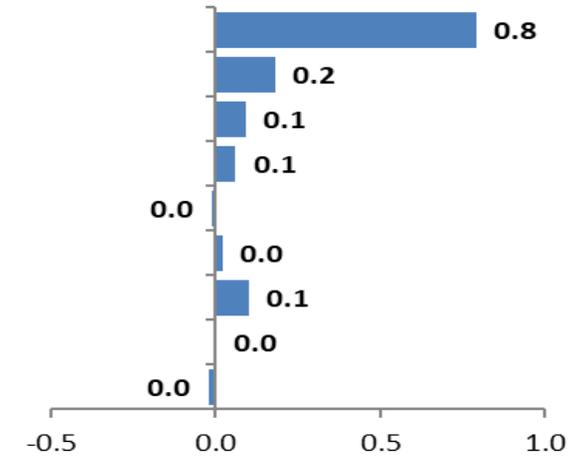
Avg Active Weight



Allocation Effect



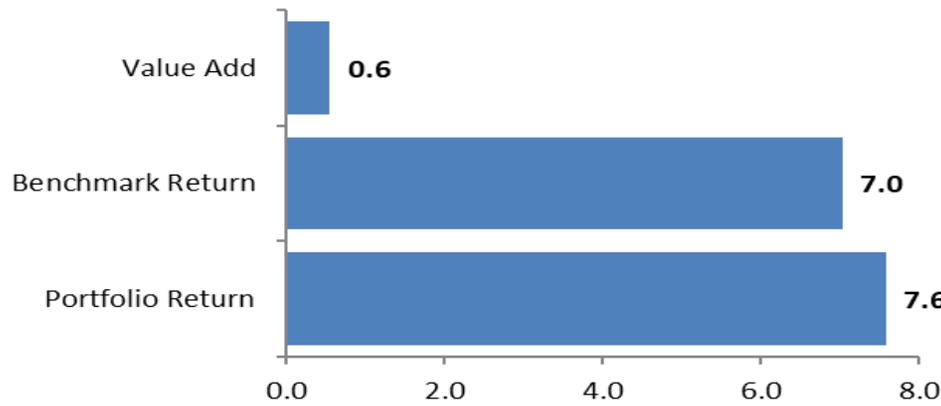
Selection Effect



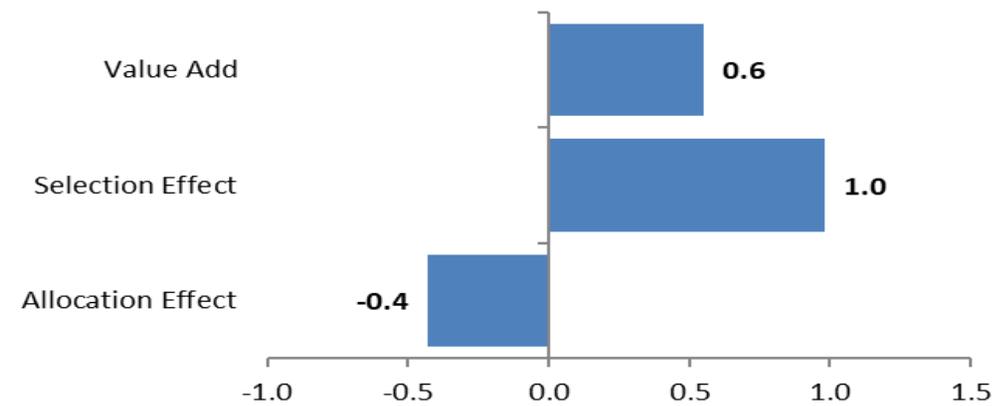
NCRS Net of Fees Return Attribution

Total Fund vs. Implementation Benchmark: 5 Years Ending September 30, 2020

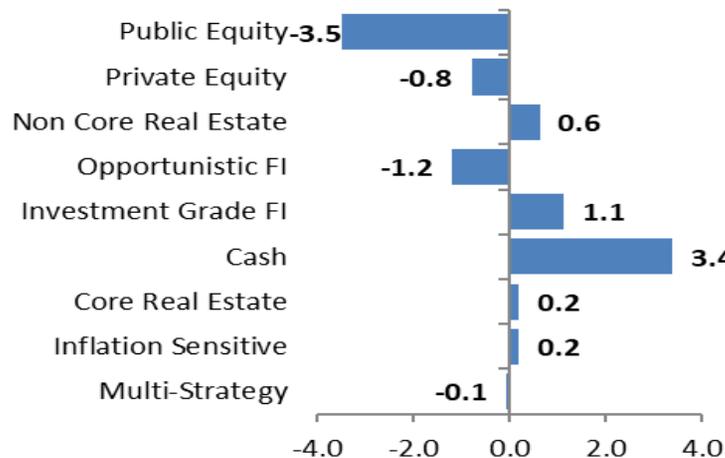
Total Fund Performance



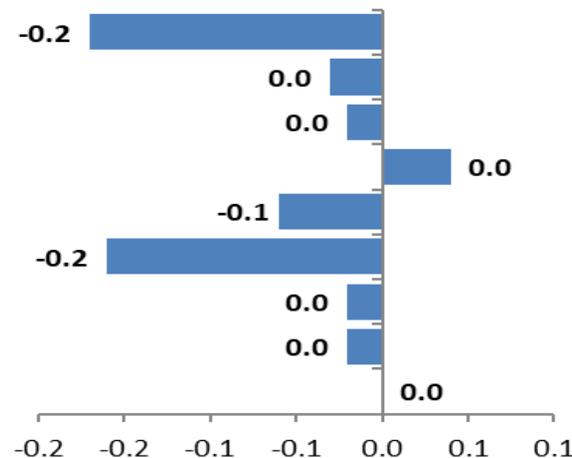
Attribution



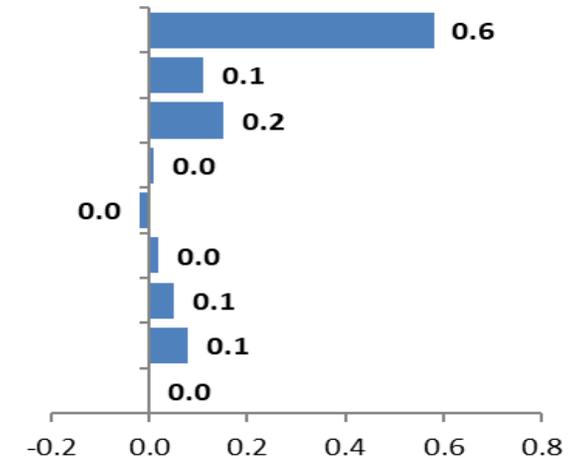
Avg Active Weight



Allocation Effect



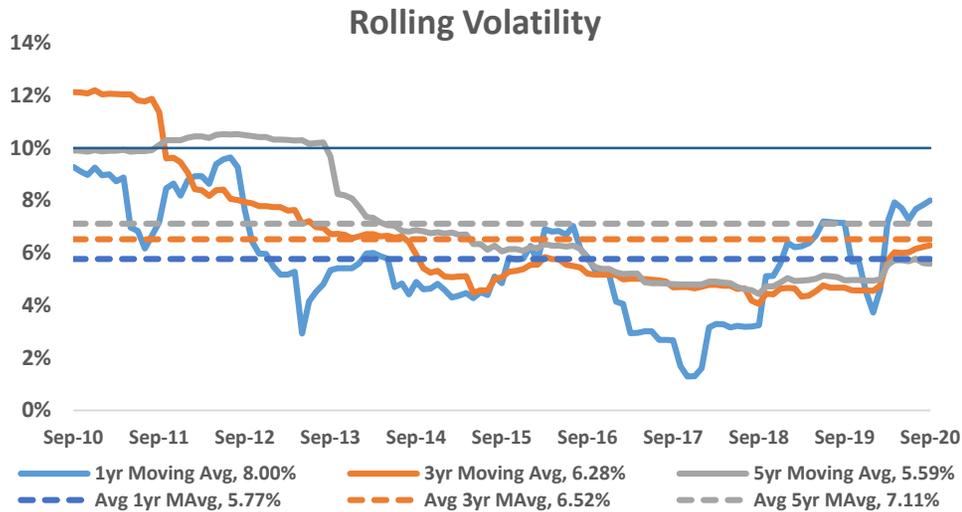
Selection Effect



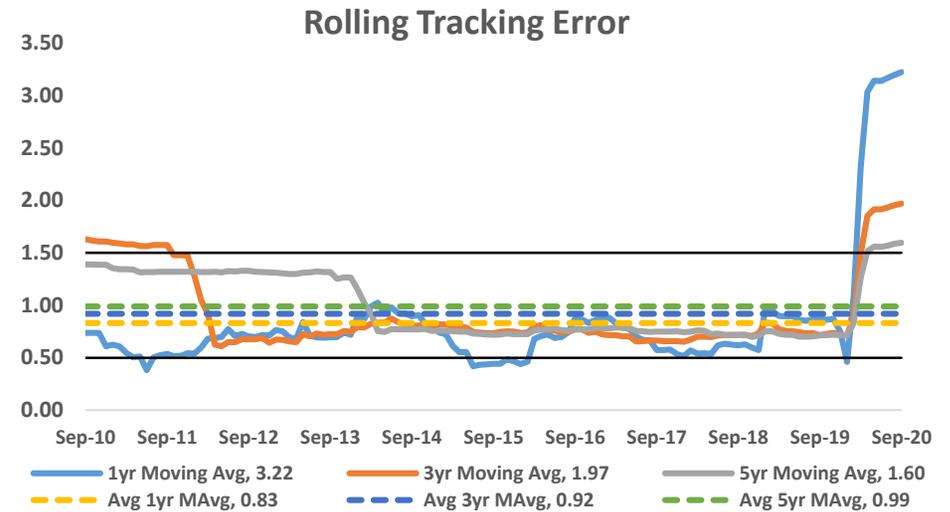


NCRS Net of Fees Risk Metrics

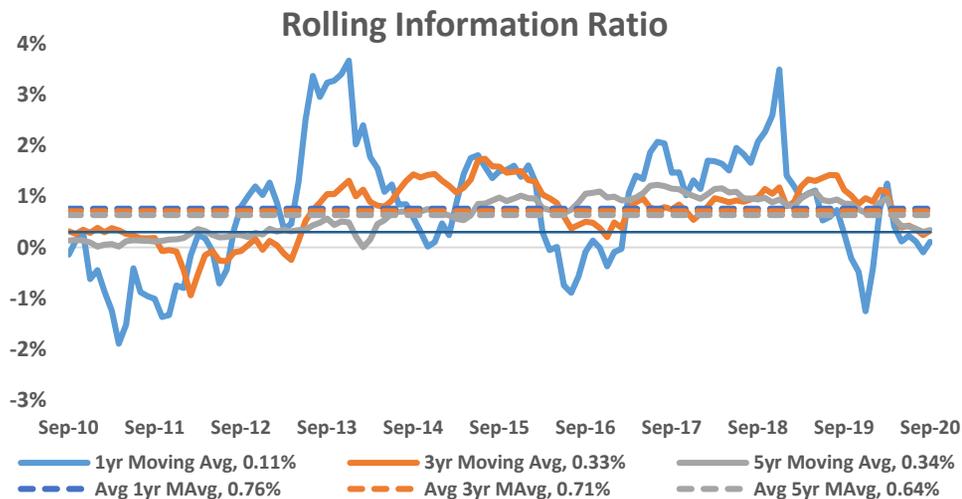
As of September 30, 2020



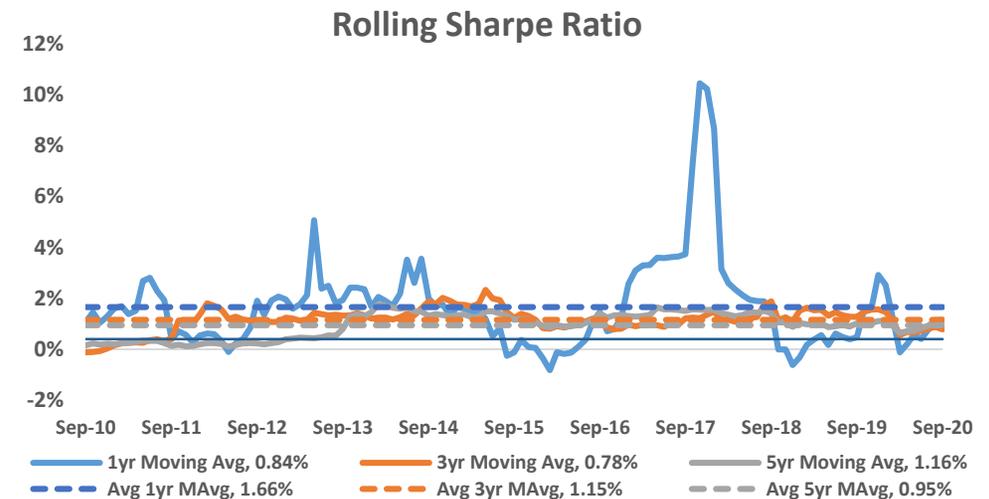
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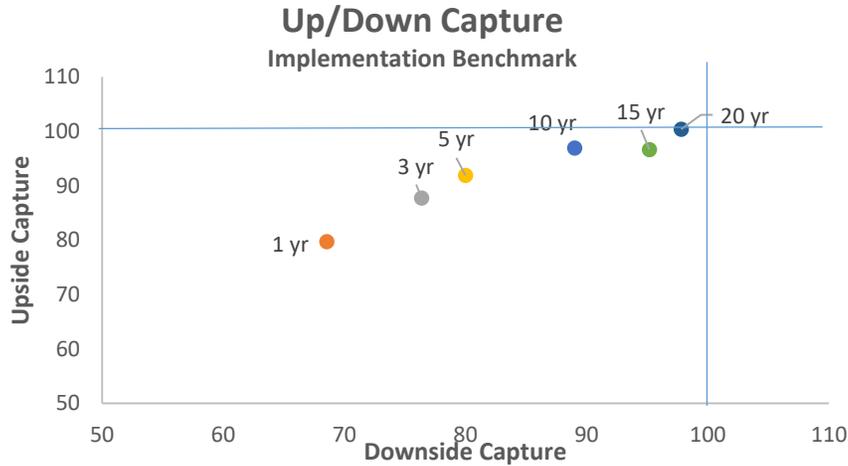


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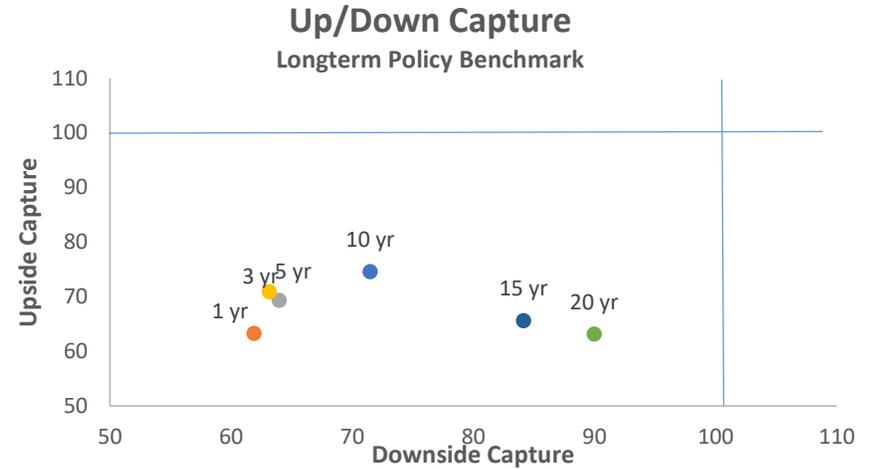


NCRS Net of Fees Risk Metrics

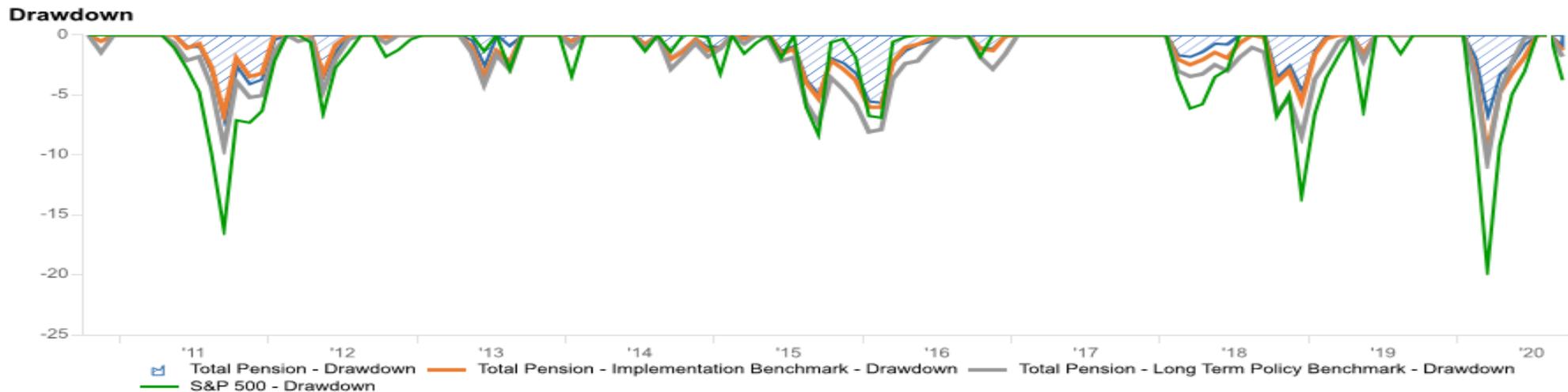
As of September 30, 2020



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NCRS Gross of Fees Return and Risk

BNY Mellon Universe: US Public Funds > \$20B; Data as of September 30, 2020

Returns	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	8.74	7.46	9.02	8.53	7.00	6.47
Median Percentile	7.27	6.67	8.26	7.99	6.67	6.17
75th Percentile	5.99	6.31	7.93	7.54	6.47	6.07
NCRS	7.76	6.89	8.09	7.81	6.63	6.15
Percentile Rank (1 = highest performance)	36	42	59	65	53	63

Risk	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	12.24	9.44	8.13	7.77	9.33	9.42
Median Percentile	11.00	8.41	7.26	6.94	8.92	8.66
75th Percentile	10.01	7.35	6.33	5.91	8.02	8.27
NCRS	7.67	6.18	5.52	5.76	7.38	7.46
Percentile Rank (1 = highest risk)	95	95	95	83	89	94

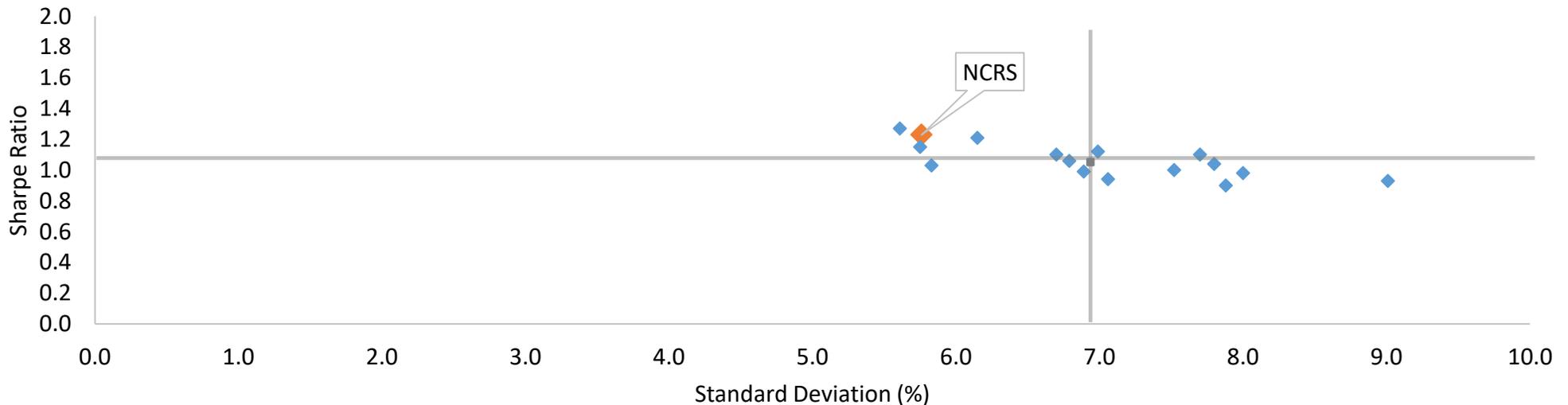
Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.

NCRS Gross of Fees Sharpe Ratio

BNY Mellon Universe: US Public Funds > \$20B; Data as of September 30, 2020

Sharpe	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
25th Percentile	0.69	0.75	1.10	1.15	0.68	0.60
Median Percentile	0.57	0.64	1.01	1.05	0.65	0.55
75th Percentile	0.50	0.54	0.91	0.98	0.60	0.52
NCRS	0.87	0.84	1.23	1.23	0.74	0.63
Percentile Rank (1 = highest performance)	12	6	6	12	12	19

10 Year Plot: Sharpe Ratio vs. Volatility

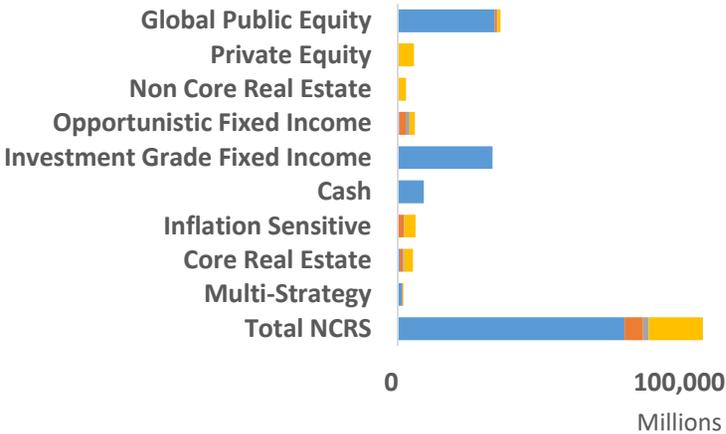


Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.

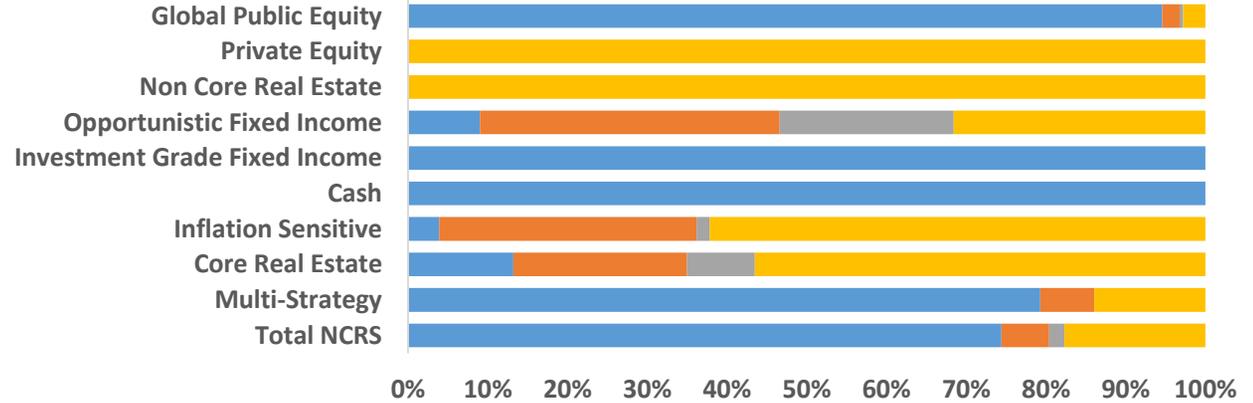
NCRS Liquidity Profile

As of September 30, 2020

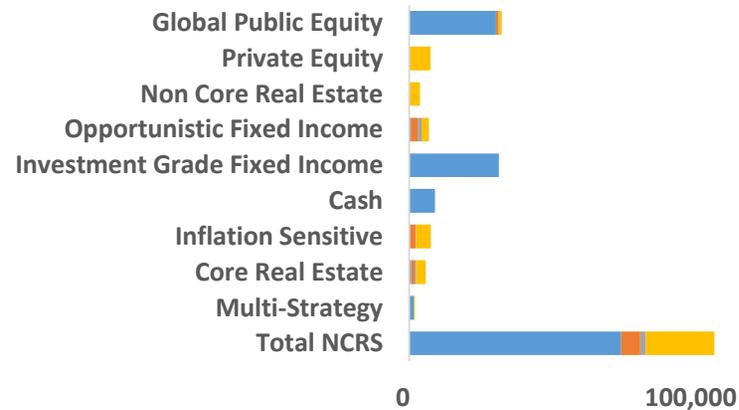
Liquidity Allocation (\$ Market Value)



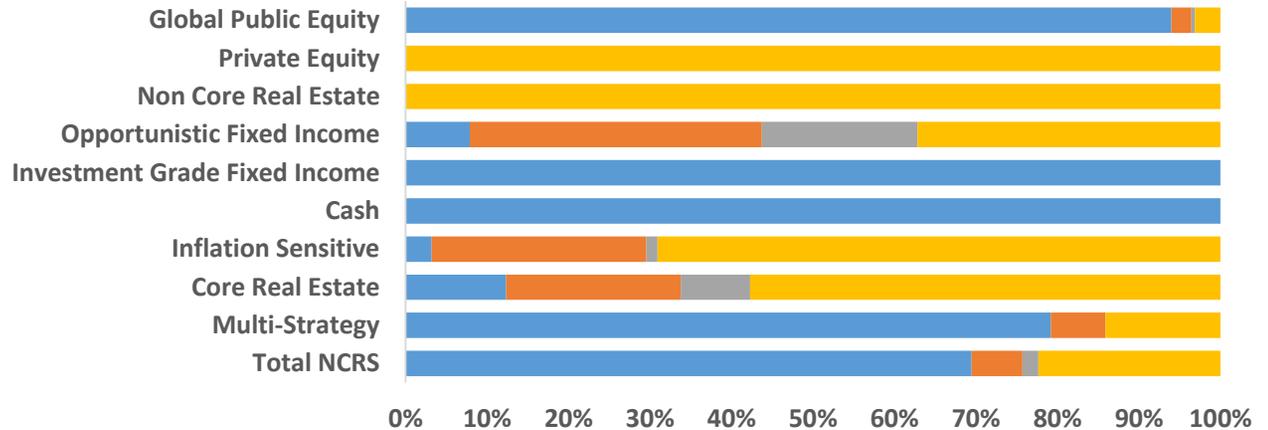
Liquidity Allocation (% Market Value)



Liquidity Allocation (\$ Market Value + Unfunded)



Liquidity Allocation (% Market Value + Unfunded)

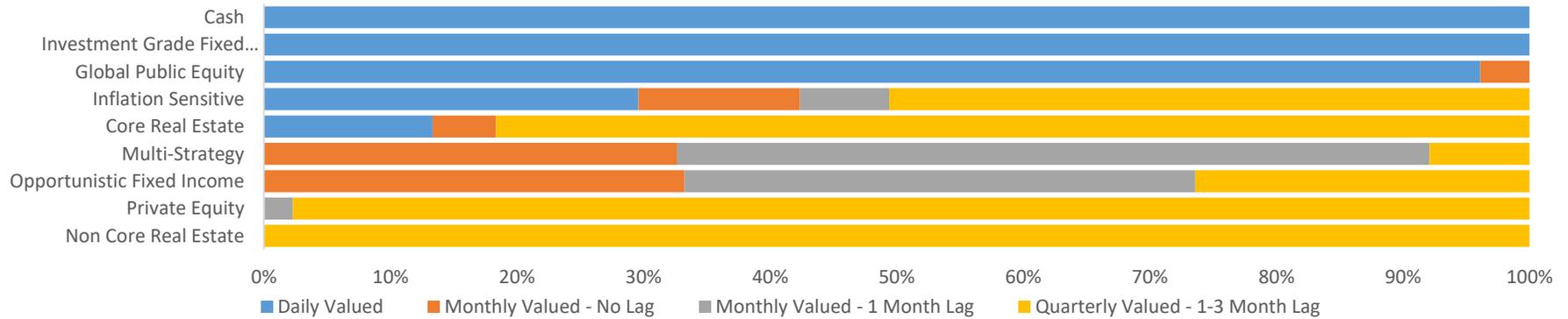


Note: ■ Level 1 Liquidity = T+3; ■ Level 2 = T+3 to 12 Months; ■ Level 3 = 12 to 24 Months; ■ Level 4 = Greater than 24 Months

NCRS Valuation Lag Profile

As of September 30, 2020

PORTFOLIO VALUATION LAG



VALUATION LAG BY PORTFOLIO

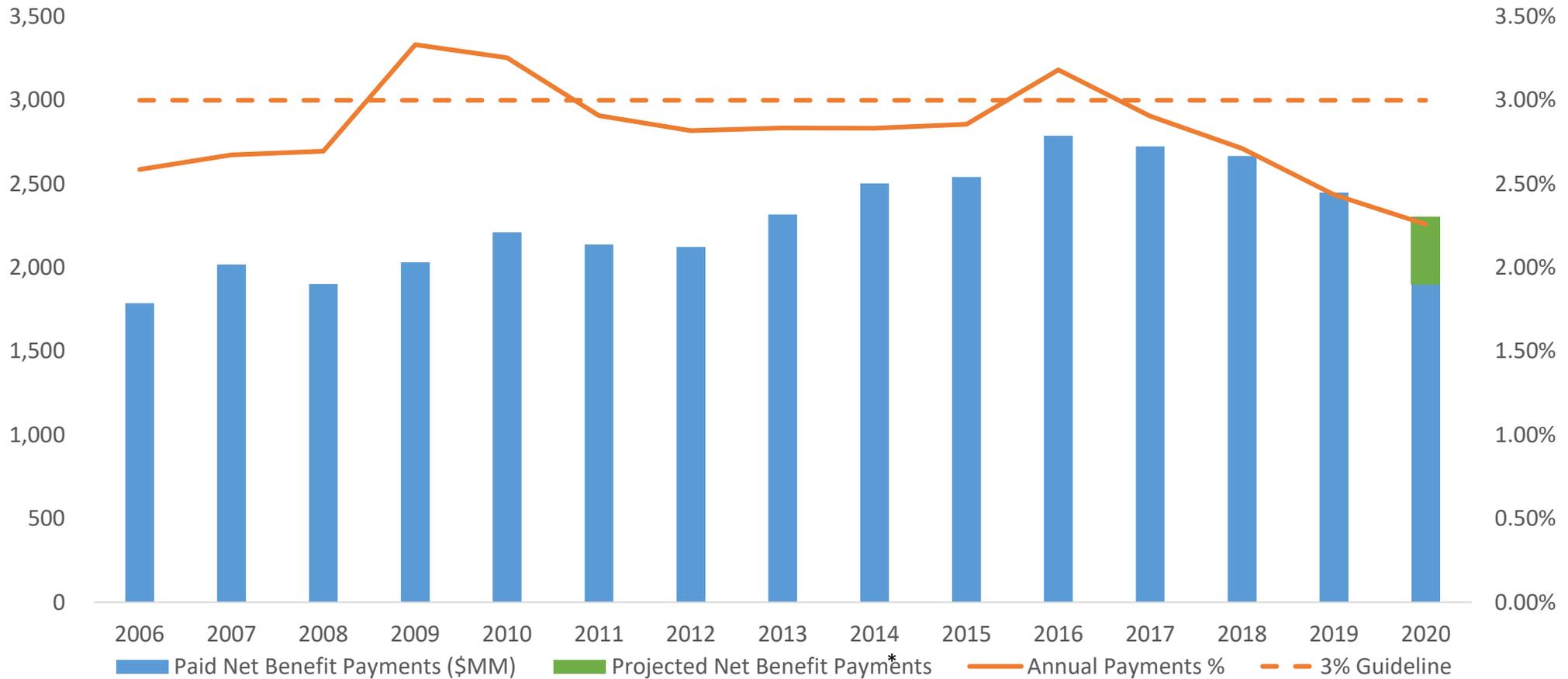
in Millions





NCRS Liquidity Profile

Net benefit payments by calendar year

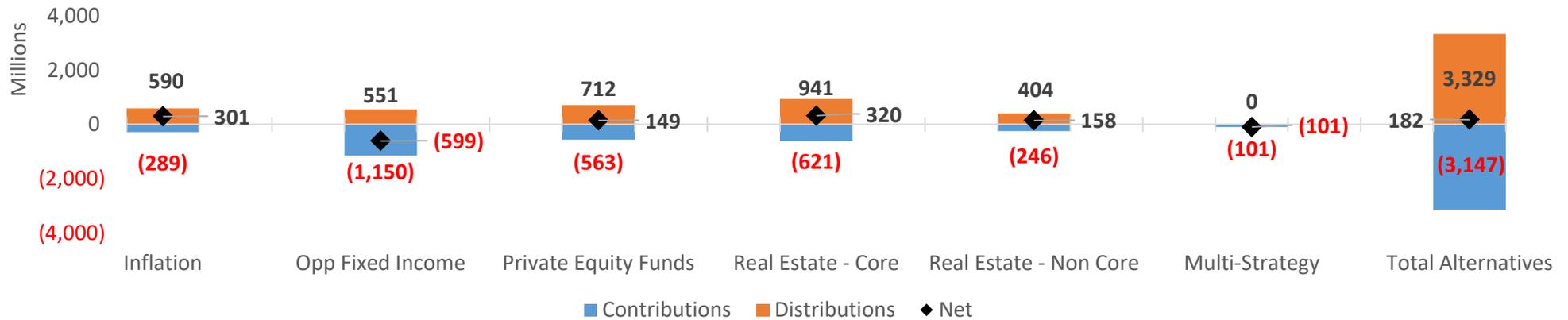


*Net Benefit Payments through October 31, 2020

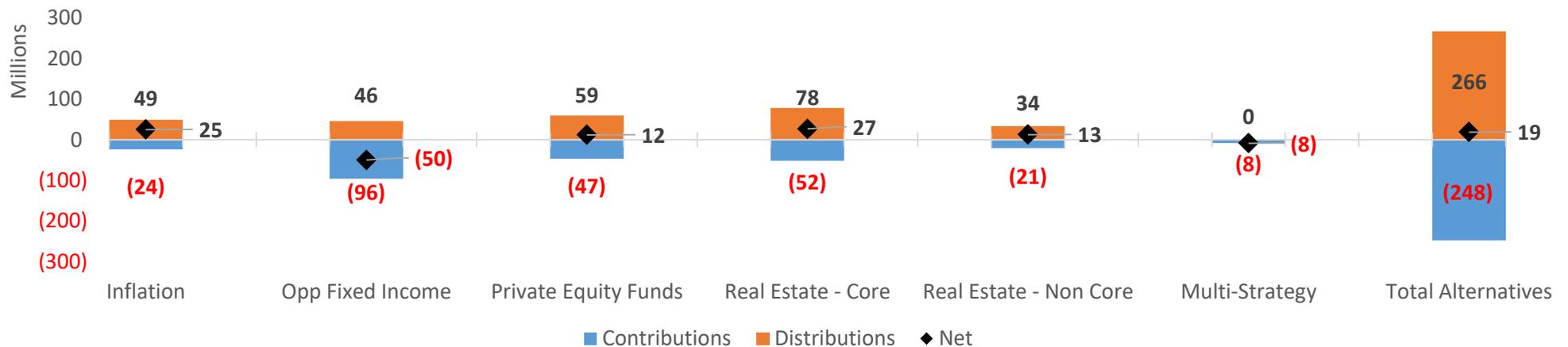
NCRS Alternatives Liquidity Profile

Through September 30, 2020

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



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





NCRS Asset Class Net of Fees Performance

As of September 30, 2020

	Market Value (\$MM)	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Growth	\$51,508	10.90	8.11	10.11	9.50	6.59	5.31
Benchmark ¹		8.14	6.17	8.59	8.26	5.86	4.44
Public Equity	\$36,483	15.23	8.63	11.28	9.69	6.84	5.50
Benchmark ²		9.51	6.31	9.59	8.47	5.95	4.39
Private Equity	\$5,840	9.80	12.65	10.15	10.76	9.02	3.20
Benchmark ³		4.51	8.90	7.90	10.53	10.09	8.35
Non-Core Real Estate	\$2,996	-2.37	7.01	8.82	11.83	6.00	6.15
Benchmark ⁴		-1.12	4.47	4.94	8.53	4.75	6.57
Opportunistic Fixed Income	\$6,189	-2.55	2.39	3.50	5.63	-	-
Benchmark ⁵		2.54	1.23	3.14	2.24	-	-
Rates & Liquidity	\$42,920	6.65	5.28	4.39	4.28	5.38	6.08
Benchmark ⁶		7.73	6.05	4.90	4.53	5.34	6.02
IG Fixed Income	\$33,672	8.30	6.16	4.99	4.60	5.60	6.24
Benchmark ⁷		7.98	6.21	5.04	4.61	5.40	6.06
Cash	\$9,249	1.45	1.79	1.47	-	-	-
Benchmark ⁸		0.90	1.55	1.12	-	-	-
Inflation Sensitive & Diversifiers	\$10,987	-2.66	3.01	4.40	3.63	2.77	3.90
Benchmark ⁹		-1.79	2.30	3.51	3.71	2.18	3.89
Inflation Sensitive	\$5,499	-5.25	1.41	2.81	0.24	1.57	2.79
Benchmark ¹⁰		-1.23	1.59	1.83	-0.58	2.92	3.31
Core Real Estate	\$5,487	0.14	4.75	6.30	8.53	5.61	6.05
Benchmark ¹¹		-2.55	3.09	5.50	8.85	5.67	6.54
Multi-Strategy	\$2,082	-5.51	0.57	4.38	6.57	4.99	-
Benchmark ¹²		-0.55	1.31	4.49	5.62	5.86	-
Total Pension Plan	\$107,497	7.44	6.47	7.58	7.29	6.17	5.80
Implementation Benchmark ¹³		7.08	5.82	7.03	6.66	5.69	5.36
Long-Term Policy Benchmark ¹⁴		10.28	6.97	7.94	6.56	5.95	5.73



NCRS Calendar Year Asset Class Return Diversification

As of September 30, 2020

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
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%	IG Fixed Income & Cash 8.32%
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%	Private Equity 8.00%
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%	Public Equity 4.94%
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%	Total Pension 3.63%
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%	Pension Cash 0.95%
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%	Opportunistic Fixed Income -3.45%
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 -3.67%
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 -4.04%
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 -6.02%
			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 -9.74%



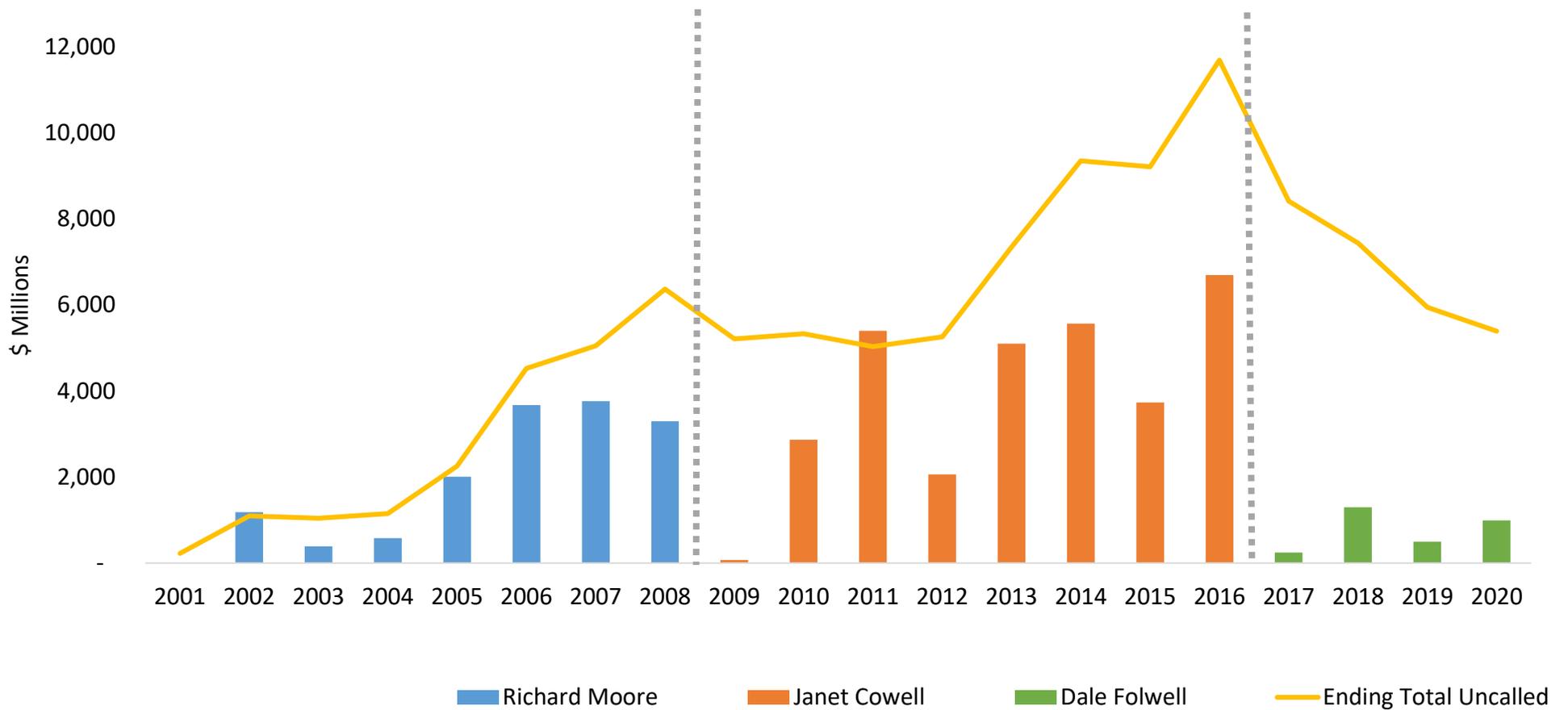
New, Incremental, & Unfunded Investment Commitments

Since August 19th IAC Meeting As of September 30, 2020

<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			

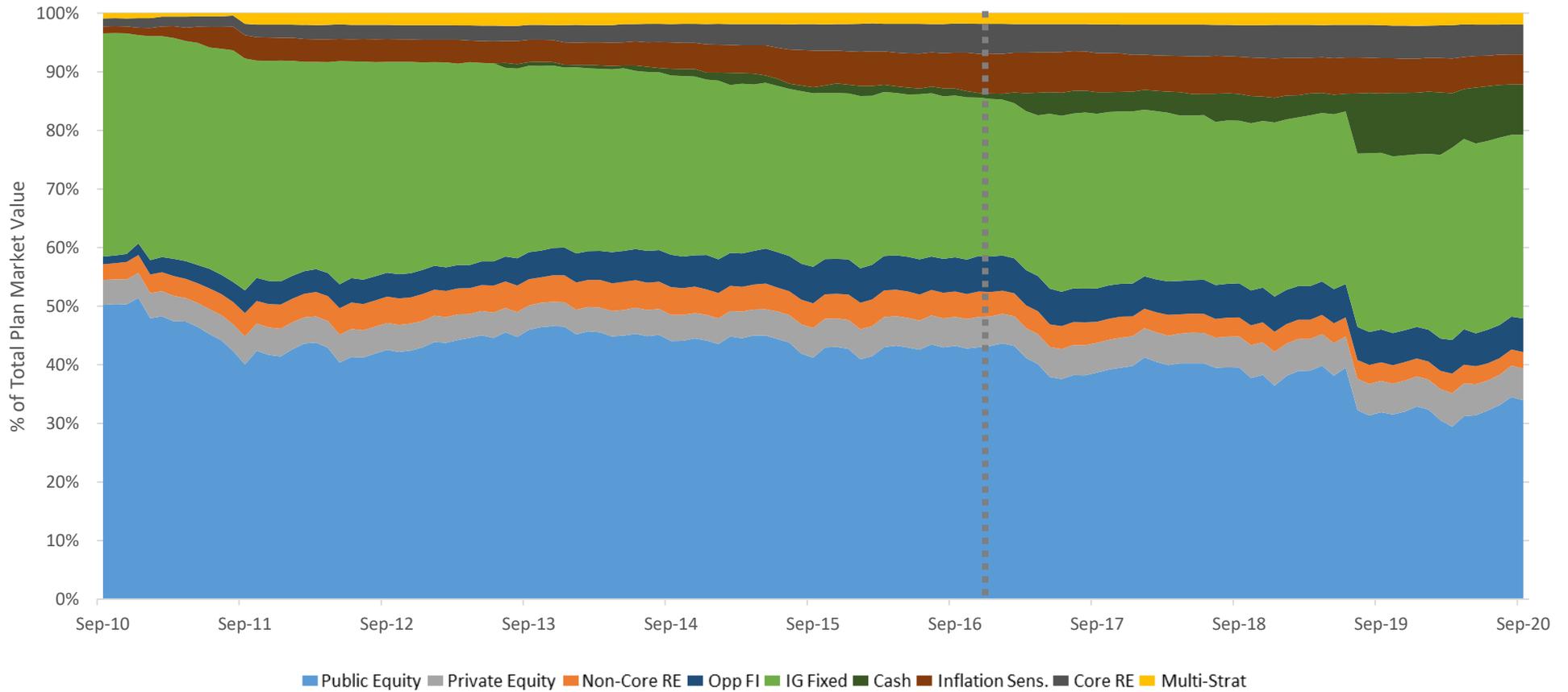
<u>Asset Class</u>	<u>Unfunded Commitments (\$MM)</u>
Public Equity	0
Private Equity	1,814
Non-Core Real Estate	872
Opportunistic Fixed Income	900
Inflation Sensitive	1,416
Core Real Estate	384
Multi Strategy	3
Total	5,389

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





Asset Allocation History as of September 30, 2020





Exited Investments

Since August 19th IAC Meeting

<u>Fund Name</u>	<u>Redemption Amount (\$MM)</u>	<u>Redemption Effective</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		



Top 20 Investment Managers

As of September 30, 2020

	Manager	Market Value (\$)	Uncalled (\$)	% MV	% MV Cum.
1	Internal Fixed Income	42,920,259,589	-	39.9%	39.9%
2	Internal Equity	13,244,473,092	-	12.3%	52.2%
3	BlackRock, Inc.	10,336,232,136	-	9.6%	61.9%
4	Baillie Gifford	3,942,281,958	-	3.7%	65.5%
5	Wellington Management	2,654,431,060	-	2.5%	68.0%
6	Rockwood Capital	2,643,828,942	168,515,769	2.5%	70.5%
7	Blackstone Group	2,495,765,068	1,126,806,338	2.3%	72.8%
8	Mondrian Investment Partners Limited	2,309,272,020	-	2.1%	74.9%
9	Walter Scott & Partners	2,281,482,224	-	2.1%	77.1%
10	Gladius Capital Management LP	1,825,976,727	3,327,917	1.7%	78.8%
11	Angelo, Gordon & Co.	1,677,045,733	52,209,011	1.6%	80.3%
12	ValueAct Capital	1,017,620,642	-	0.9%	81.3%
13	Landmark Partners, Inc.	922,748,506	1,209,347,254	0.9%	82.1%
14	DoubleLine Capital LP	808,902,518	-	0.8%	82.9%
15	HPS Investment Partners, LLC	771,740,063	230,514,981	0.7%	83.6%
16	Campbell Group LLC, The	700,863,720	-	0.7%	84.2%
17	Rockpoint Group, LLC	662,222,634	92,502,955	0.6%	84.9%
18	Brigade Capital Management	660,066,258	-	0.6%	85.5%
19	LBA Realty	642,568,392	9,900,990	0.6%	86.1%
20	Franklin Templeton Investments	634,917,207	-	0.6%	86.7%
	99 Remaining Managers*	14,344,381,156	2,496,323,274	13.3%	100.0%
	Total	107,497,079,645	5,389,448,490	100.0%	100.0%

*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 September 30, 2020

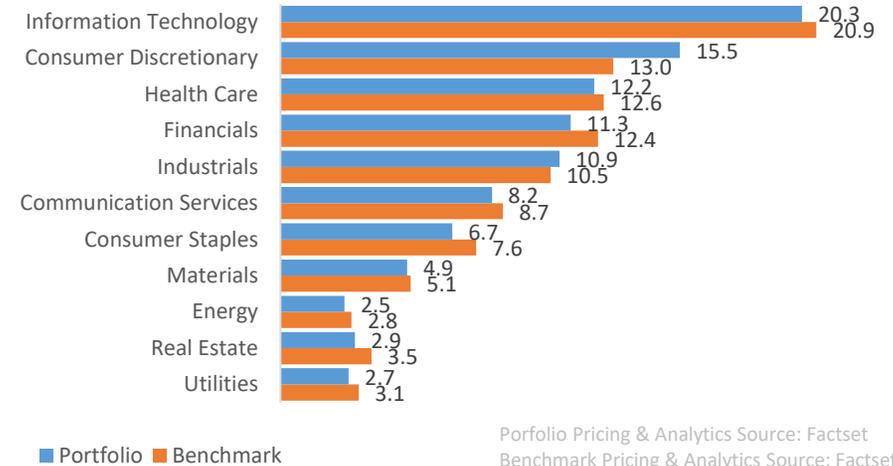
	Market Value (\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Public Equity	\$36,483	9.18	15.23	8.63	11.28	9.69
Benchmark ²		8.05	9.51	6.31	9.59	8.47
Domestic Portfolio	\$16,640	9.18	16.98	12.82	14.12	13.74
Russell 3000		9.21	15.00	11.65	13.69	13.48
Non-US Portfolio	\$19,443	9.35	12.98	4.82	9.36	5.75
Custom Benchmark		6.80	3.51	1.13	6.31	4.17
Equity Hedge	\$399	0.62	(2.59)	(0.87)	2.03	-
MSCI ACWI (Beta Adjusted)		3.25	4.41	2.91	4.16	-

NCRS Public Equity Portfolio Characteristics

As of September 30, 2020

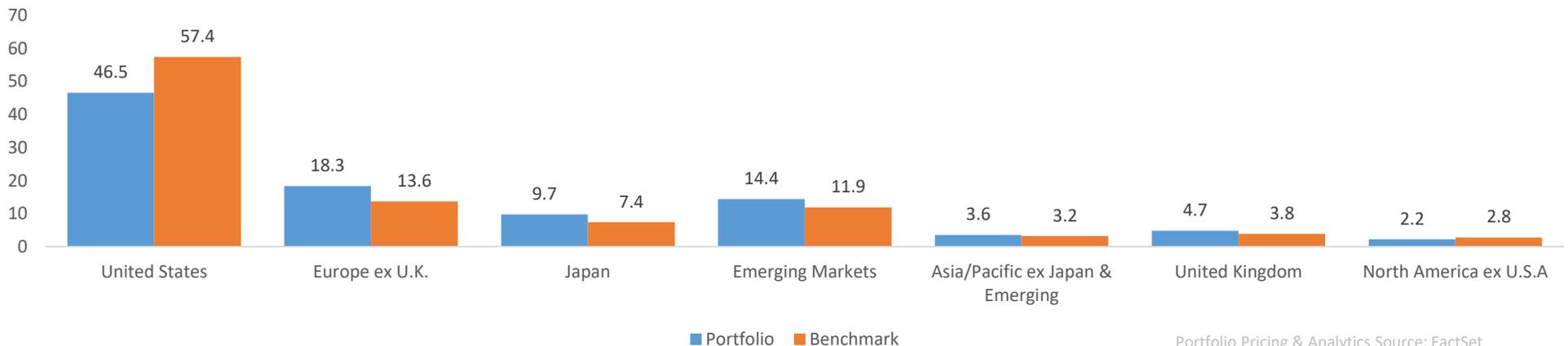
Portfolio Characteristics		
	Portfolio	MSCI ACWI IMI
Price/Earnings	22.9	21.9
Dividend Yield	2.0	2.2
Price/Book	2.3	2.2
Market Capitalization	225,607.0	258,860.0
Return On Equity	16.9	18.7

@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 September 30, 2020

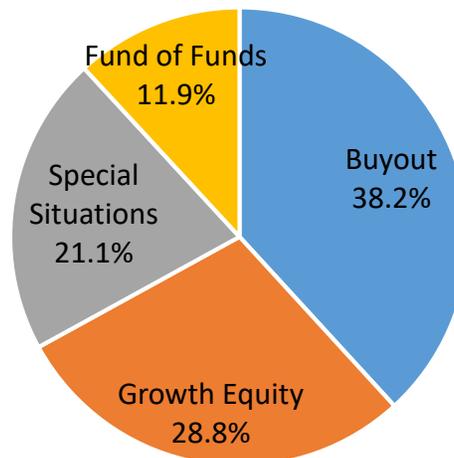
Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Private Equity	\$5,840	10.19	9.80	12.65	10.15	10.76
Benchmark ³		8.81	4.51	8.90	7.90	10.53
Buyout	\$2,230	8.29	6.58	10.90	10.05	9.30
Growth	\$1,683	19.02	23.71	21.15	14.04	15.86
Special Situations	\$1,233	5.14	2.26	6.90	5.88	6.60
Fund of Funds	\$693	5.67	4.07	10.59	9.02	11.51

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>Total</u>
NCRS	12.01	6.81	5.24	3.32	9.38	9.08	7.77	19.90	9.16	12.72	11.36	15.61	15.78	24.44	7.14	6.40	N/A	N/A	8.68
# of Funds	28	3	11	21	15	17	3	1	6	6	9	4	9	6	7	3	N/A	N/A	149

Strategy Allocation (Based on Valuation)



*Private Equity returns include a stock distribution account, in the amount of roughly \$0.7 million, which does not fall under any specific sub-section. 36



NCRS Non-Core Real Estate Portfolio

As of September 30, 2020

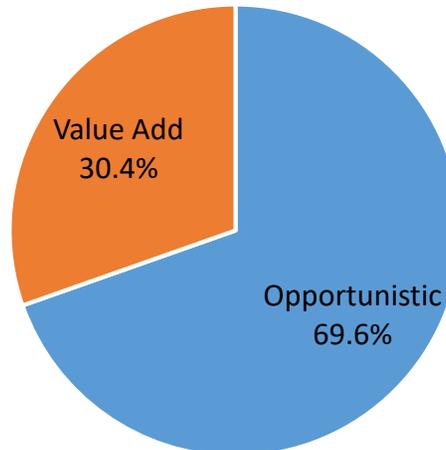
Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Non-Core Real Estate	\$2,996	(1.47)	(2.37)	7.01	8.82	11.83
Benchmark ⁴		(0.11)	(1.12)	4.47	4.94	8.53
Opportunistic	\$2,085	(0.52)	(1.45)	7.87	8.84	11.37
Value Add	\$910	(3.58)	(4.39)	4.95	8.48	12.42

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>Total</u>
NCRS	9.12	15.69	-1.44	2.84	2.22	15.77	N/A	16.04	17.58	16.74	13.67	5.87	5.52	9.59	N/A	9.30	8.03	N/A	6.49
# of Funds	16	3	15	13	8	6	N/A	6	7	5	7	7	6	7	N/A	1	1	N/A	107

Strategy Allocation (Based on Valuation)





NCRS Opportunistic Fixed Income Portfolio

As of September 30, 2020

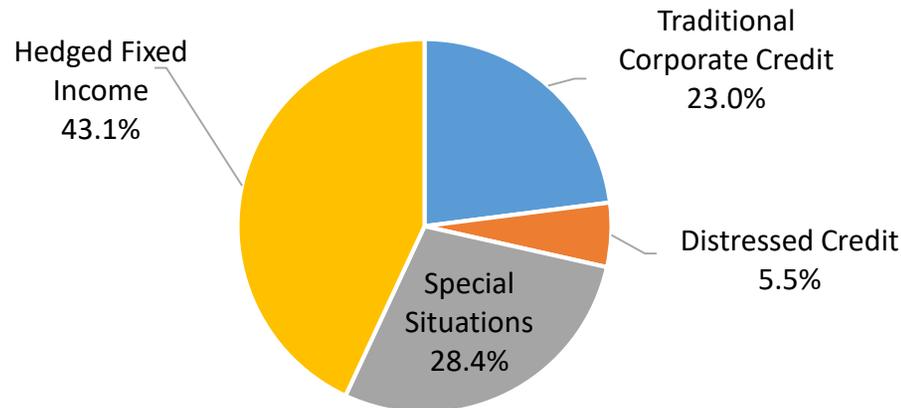
Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Opportunistic Fixed Income	\$6,189	4.80	(2.55)	2.39	3.50	5.63
Benchmark ⁵		3.57	2.54	1.23	3.14	2.24
Traditional Corporate Credit	\$1,422	8.12	4.66	4.69	5.48	7.21
Distressed Credit	\$343	10.40	(0.33)	4.16	6.57	8.30
Special Situations	\$1,760	1.77	(7.56)	2.83	4.85	12.00
Hedged Fixed Income	\$2,664	4.47	(2.10)	1.10	1.82	-

IRR by Vintage Year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
NCRS	2.87	N/A	16.92	7.31	22.42	5.11	3.86	2.57	4.36	2.30	8.06	5.59	13.02	N/A	-2.07	14.69	4.84
# of Funds	1	N/A	1	3	1	4	9	2	7	3	1	8	2	N/A	1	2	42

Strategy Allocation (Based on Valuation)





NCRS Rates & Liquidity Portfolio

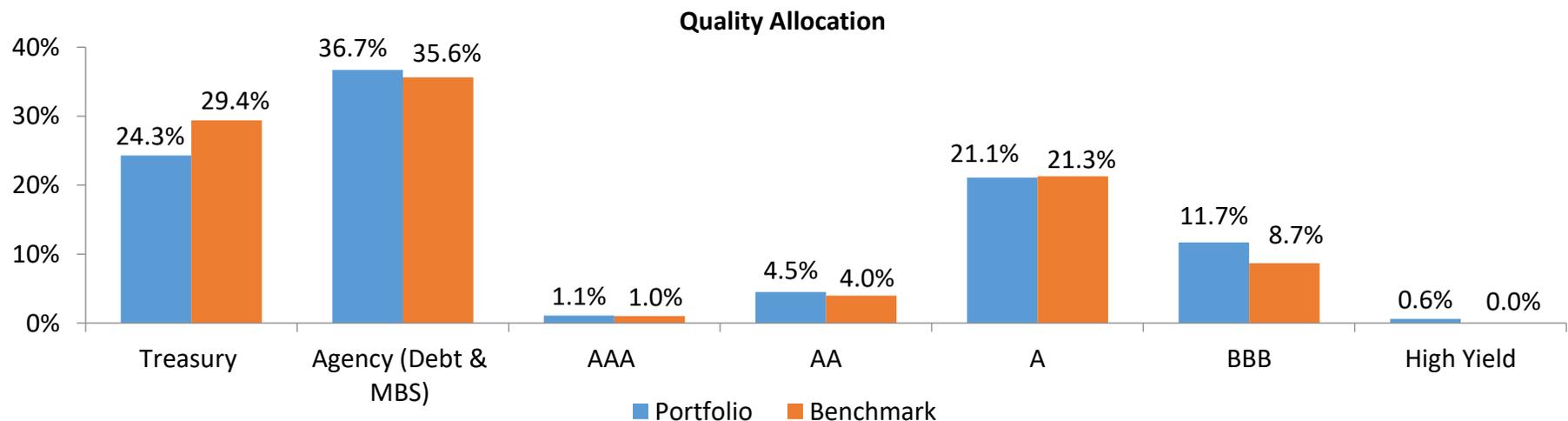
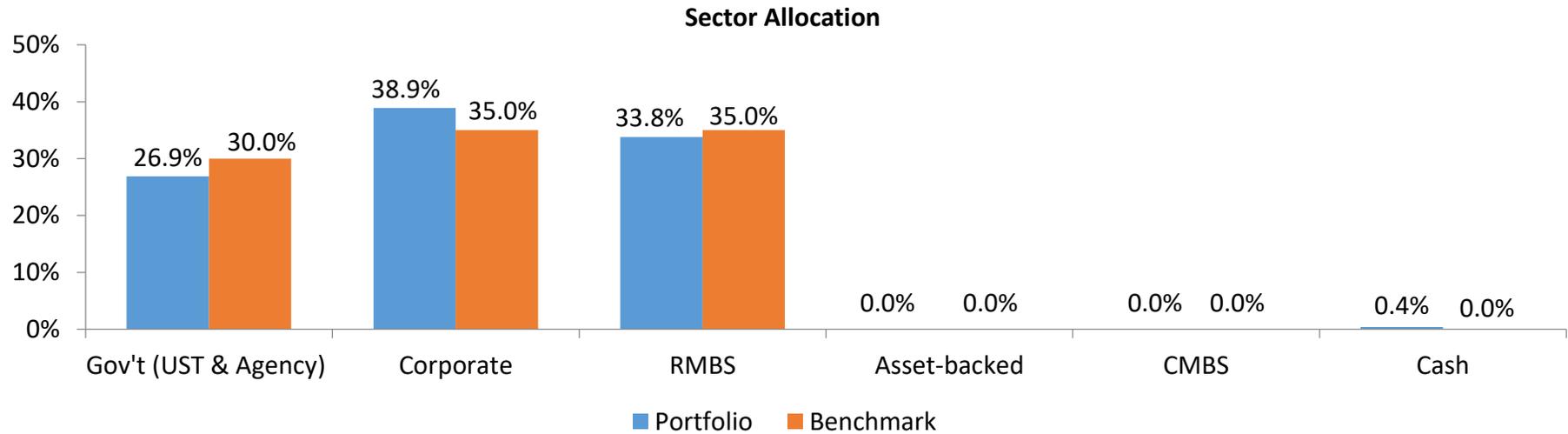
As of September 30, 2020

	(\$MM)	Net of Fees Performance (%)				
		3 Month	1 Year	3 Years	5 Years	10 Years
Rates & Liquidity	\$42,920	0.53	6.65	5.28	4.39	4.28
Benchmark ⁶		0.67	7.73	6.05	4.90	4.53
IG Fixed Income	\$33,672	0.64	8.30	6.16	4.99	4.60
Core Fixed Income	\$31,134	0.66	8.88	6.62	5.38	4.82
IG Fixed Income Cash	\$2,538	0.22	1.58	1.69	1.38	-
Pension Cash	\$9,249	0.19	1.45	1.79	1.47	-

Core Fixed Income Portfolio Characteristics			
	<u>Avg. Coupon</u>	<u>Yield to Worst</u>	<u>Effective Duration</u>
Government (Treasury & Agency)	3.8%	0.9%	11.1
Corporate	4.2%	2.3%	10.1
Mortgage	3.5%	1.6%	2.2
Total	3.9%	1.7%	7.7

NCRS Core Fixed Income Portfolio Characteristics

As of September 30, 2020





NCRS Inflation Sensitive Portfolio

As of September 30, 2020

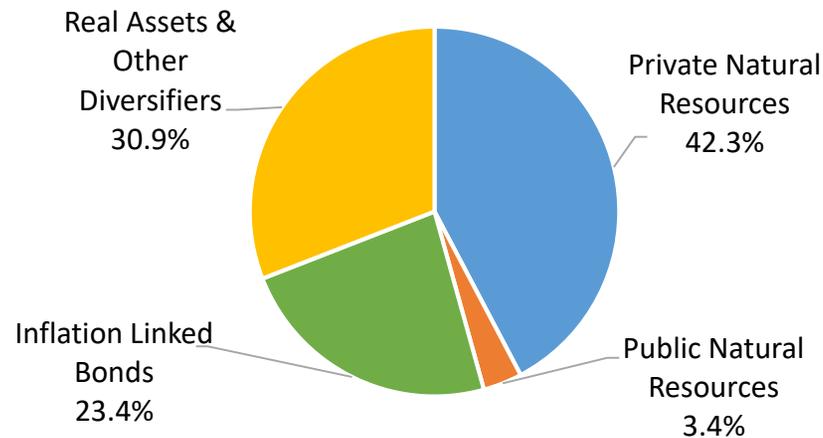
Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Inflation Sensitive	\$5,499	2.69	(5.25)	1.41	2.81	0.24
Benchmark ¹⁰		2.65	(1.23)	1.59	1.83	(0.58)
Private Natural Resources	\$2,325	5.35	(8.71)	(2.44)	(0.15)	1.54
Public Natural Resources	\$188	9.14	(7.90)	(5.30)	(4.31)	-
Inflation Linked Bonds	\$60	1.43	3.84	2.61	2.08	-
Real Assets & Other Diversifiers	\$1,700	(1.80)	(4.85)	5.29	6.97	-

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>2018</u>	<u>2019</u>	<u>2020</u>	<u>Total</u>
NCRS	0.31	-8.19	-6.19	N/A	-10.01	-6.70	5.27	5.47	6.73	3.99	3.34	-0.16	17.23	30.24	N/A	0.55
# of Funds	3	2	2	N/A	3	9	7	11	12	4	4	1	3	2	N/A	61

Strategy Allocation (Based on Valuation)





NCRS Core Real Estate Portfolio

As of September 30, 2020

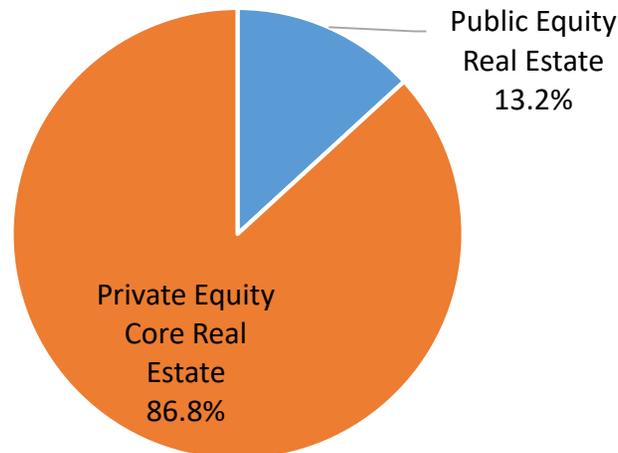
Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Core Real Estate	\$5,487	0.38	0.14	4.75	6.30	8.53
Benchmark ¹¹		0.64	(2.55)	3.09	5.50	8.85
Public Equity Real Estate	\$725	2.20	(10.90)	1.81	4.48	6.76
Private Equity Core Real Estate	\$4,763	0.12	2.03	5.23	6.61	9.25

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>Total</u>
NCRS	7.57	9.76	-8.33	4.48	1.39	9.10	N/A	23.62	N/A	N/A	4.99	6.17	7.47	6.41	N/A	6.39	N/A	N/A	6.90
# 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	34

Strategy Allocation (Based on Valuation)





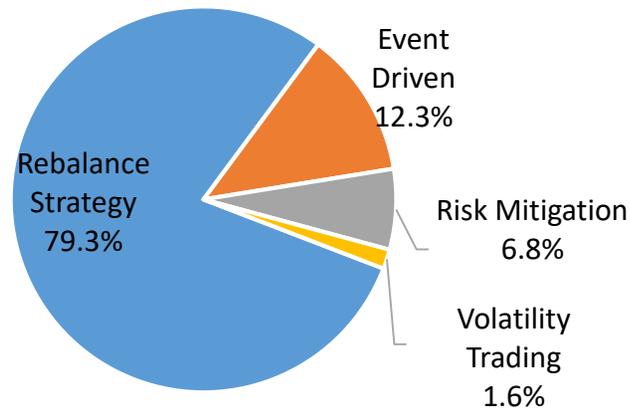
NCRS Multi-Strategy Portfolio

As of September 30, 2020

Net of Fees Performance (%)

	(\$MM)	3 Month	1 Year	3 Years	5 Years	10 Years
Multi-Strategy	\$2,082	2.09	(5.51)	0.57	4.38	6.57
Benchmark ¹²		1.46	(0.55)	1.31	4.49	5.62
Rebalance Strategy	\$1,651	2.85	(0.06)	3.40	6.78	-
Event Driven	\$256	0.53	(8.71)	(1.62)	-	-
Risk Mitigation	\$141	(4.63)	5.11	(1.52)	-	-
Volatility Trading	\$34	7.64	(75.30)	(43.42)	-	-

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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