

NORTH CAROLINA
DEPARTMENT OF STATE TREASURER



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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
Sub-Total	\$253,672

Projected Realized savings through December 2020

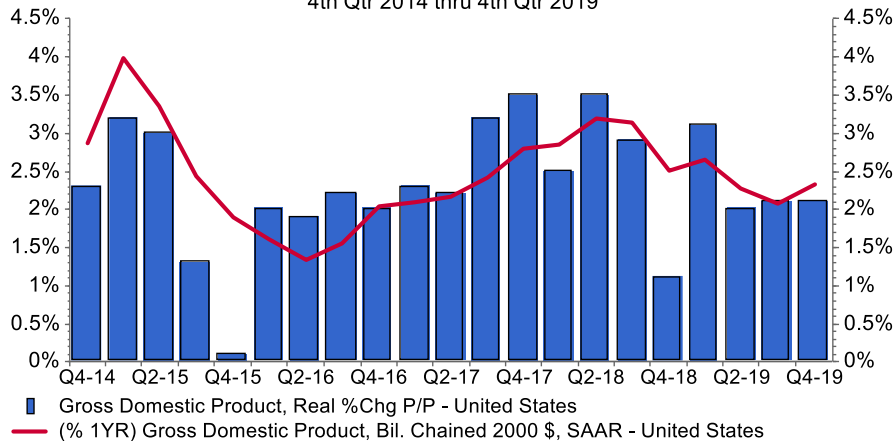
\$345,504



US Economic Environment

US Real GDP Growth

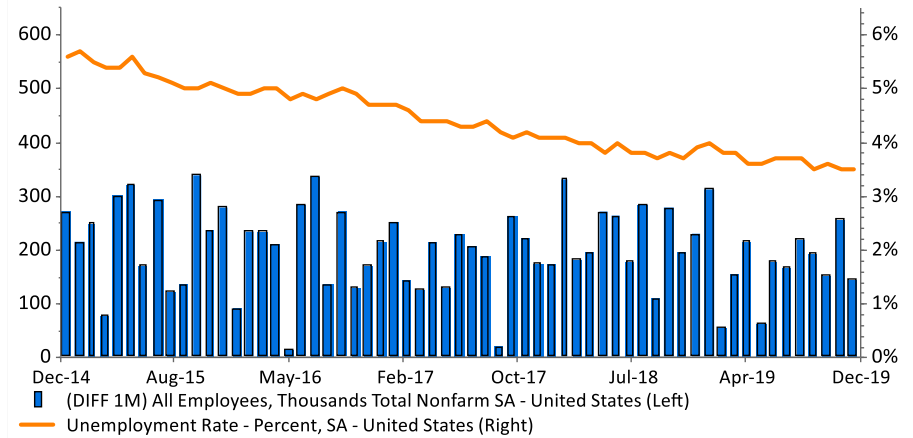
4th Qtr 2014 thru 4th Qtr 2019



©FactSet Research Systems

US Change in NonFarm Employment & Unemployment Rate

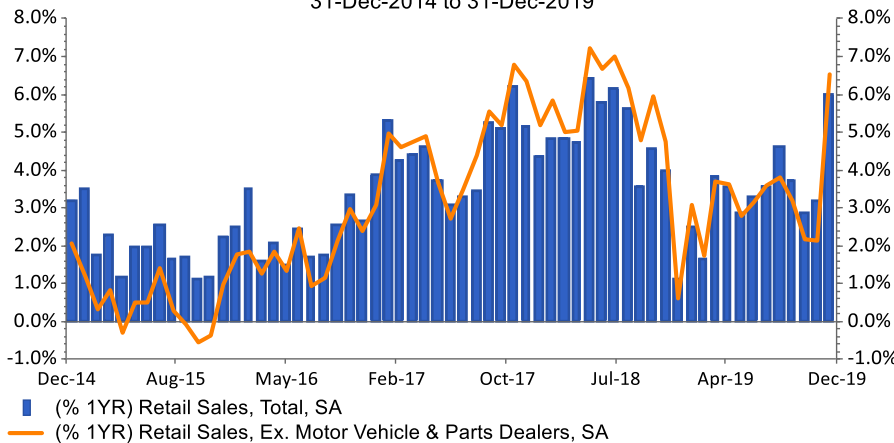
31-Dec-2014 to 31-Dec-2019



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US Retail Sales

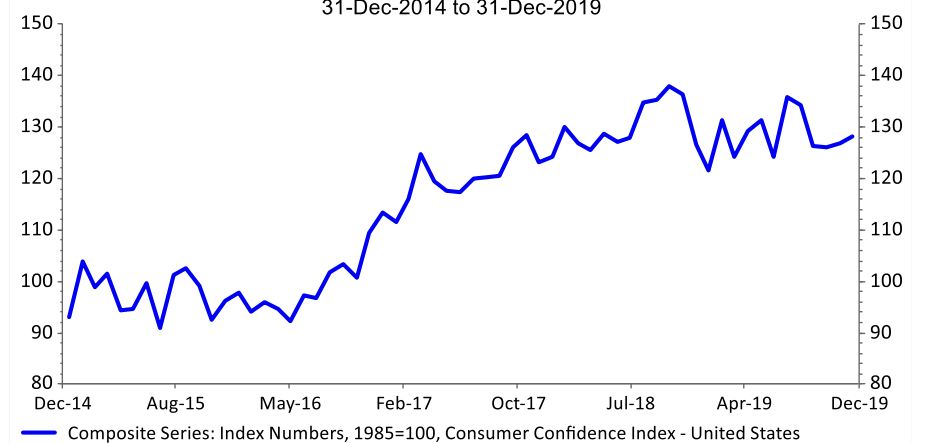
31-Dec-2014 to 31-Dec-2019



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US Consumer Confidence

31-Dec-2014 to 31-Dec-2019

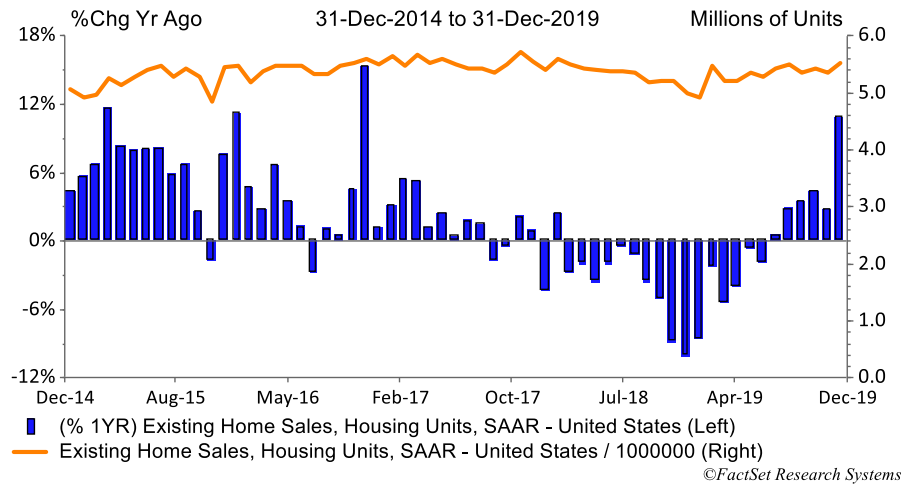


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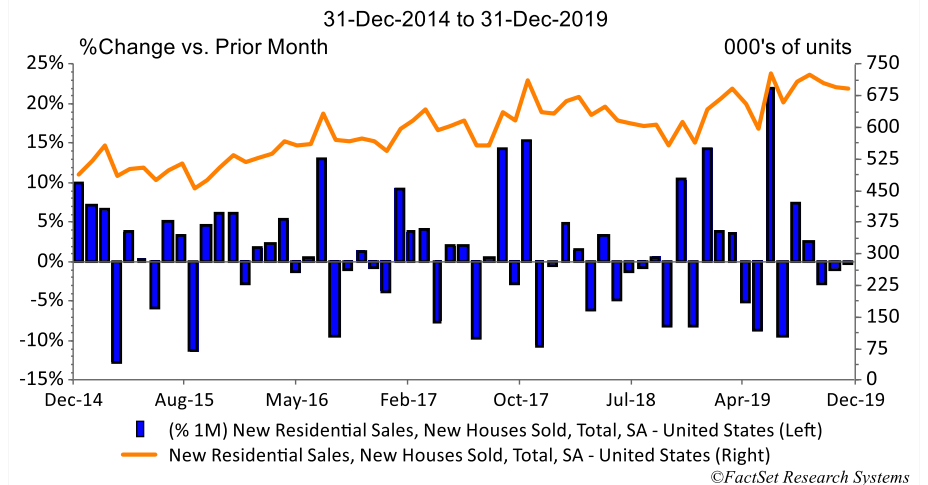


US Economic Environment

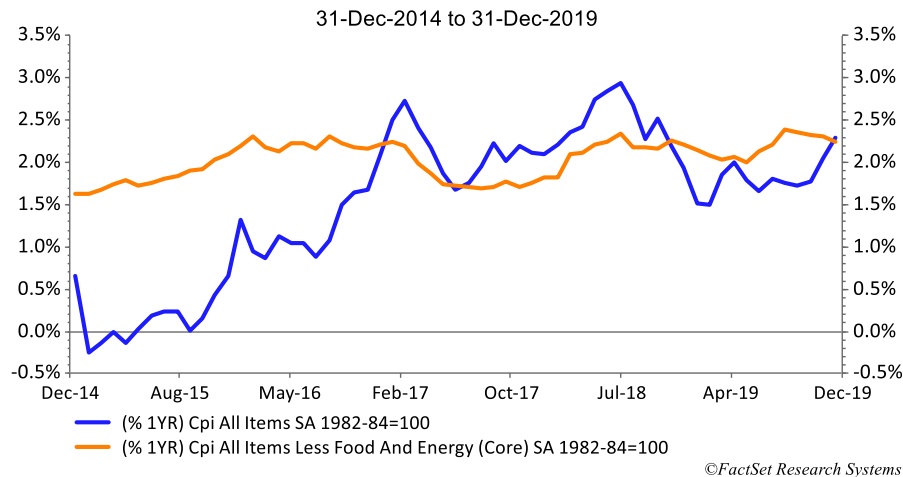
US Existing Home Sales



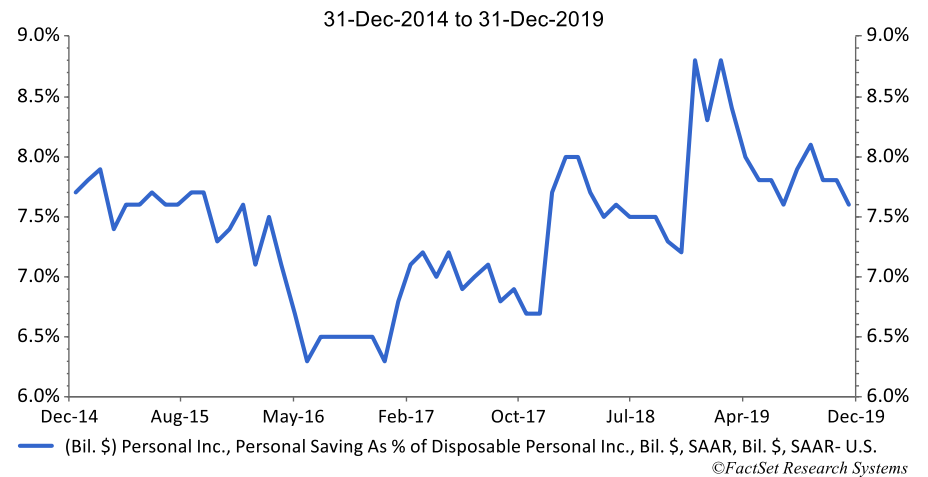
US New Home Sales



US Consumer Price Inflation



US Personal Savings Rate

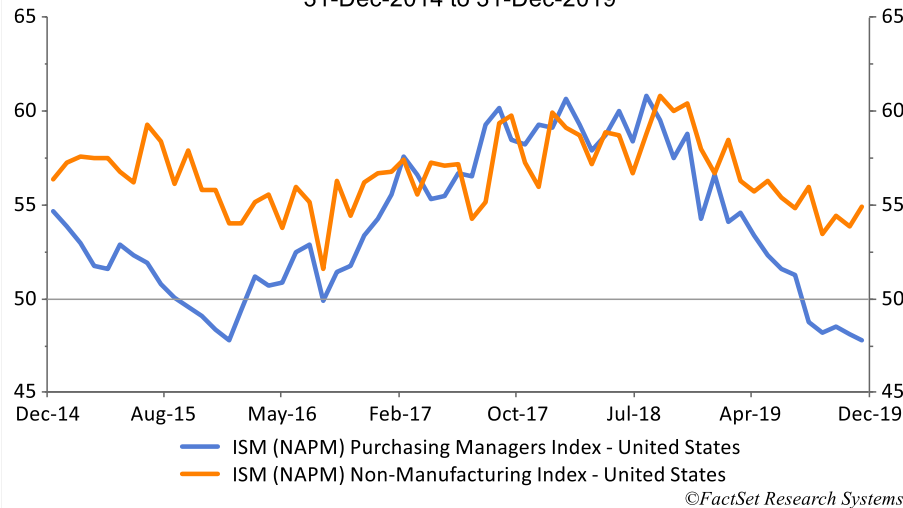




US and Global Economic Environment

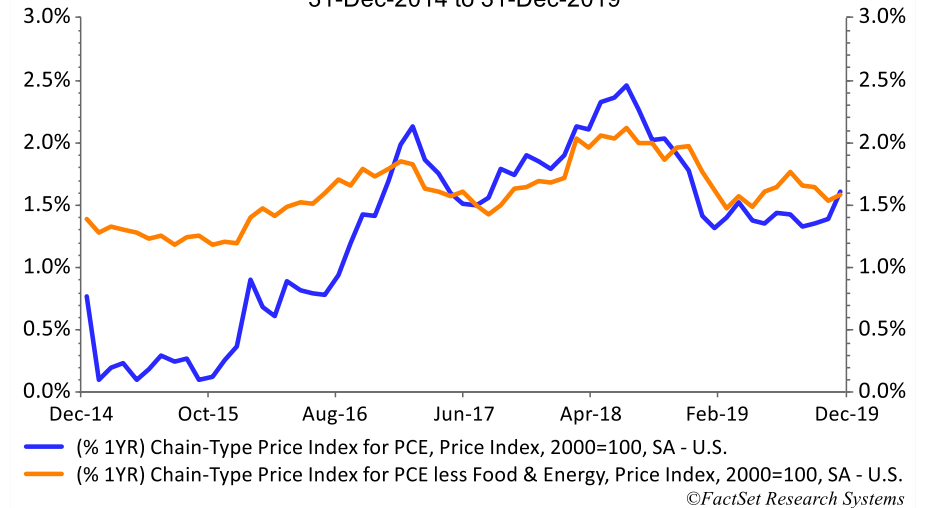
ISM Report on Business

31-Dec-2014 to 31-Dec-2019



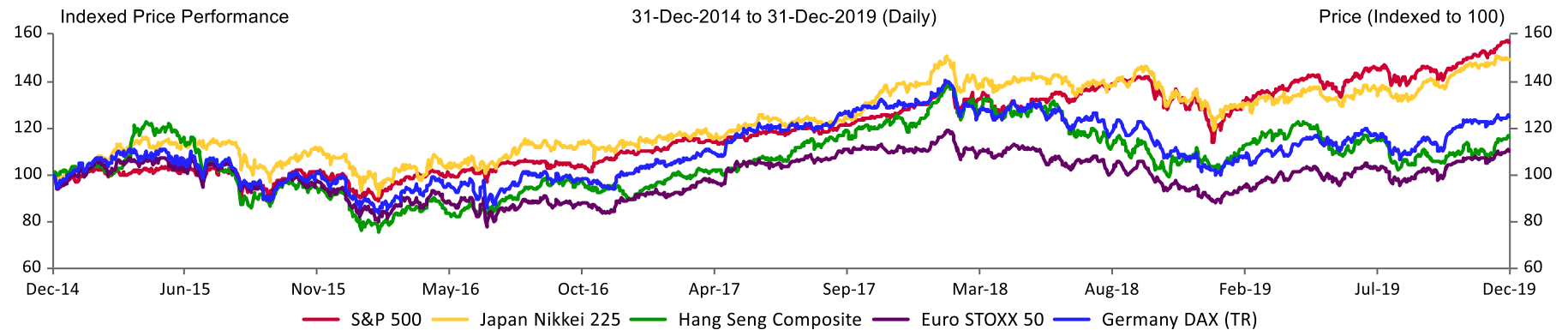
US PCE Inflation

31-Dec-2014 to 31-Dec-2019



S&P 500 vs. Peers

31-Dec-2014 to 31-Dec-2019 (Daily)

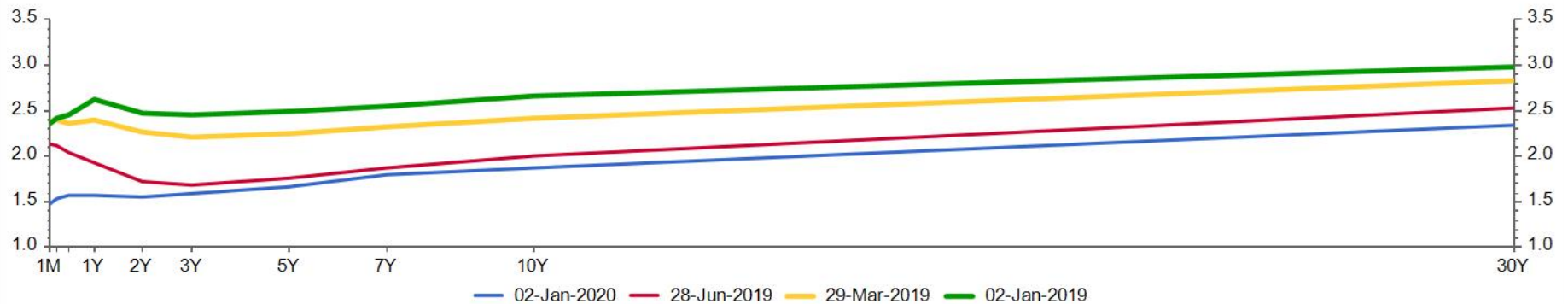


Source: FactSet Prices



Market Environment

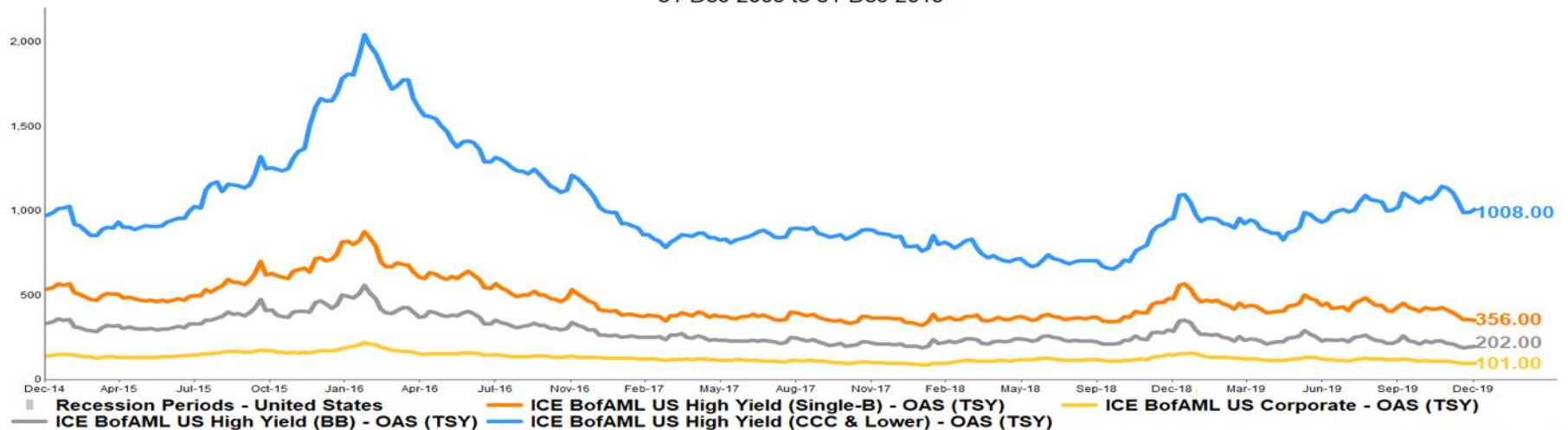
United States Treasury Yield Curve



Source: FactSet Interest Rate Database

Corporate Credit OAS (BofAML Indices)

31-Dec-2009 to 31-Dec-2019

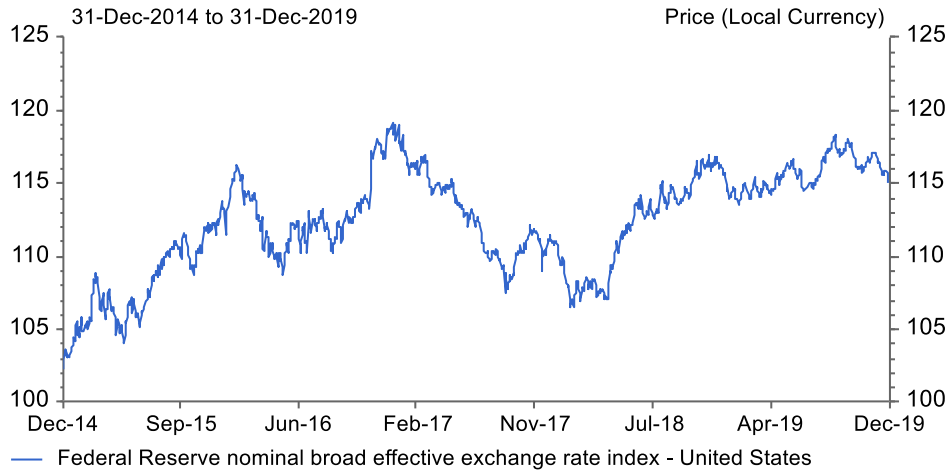


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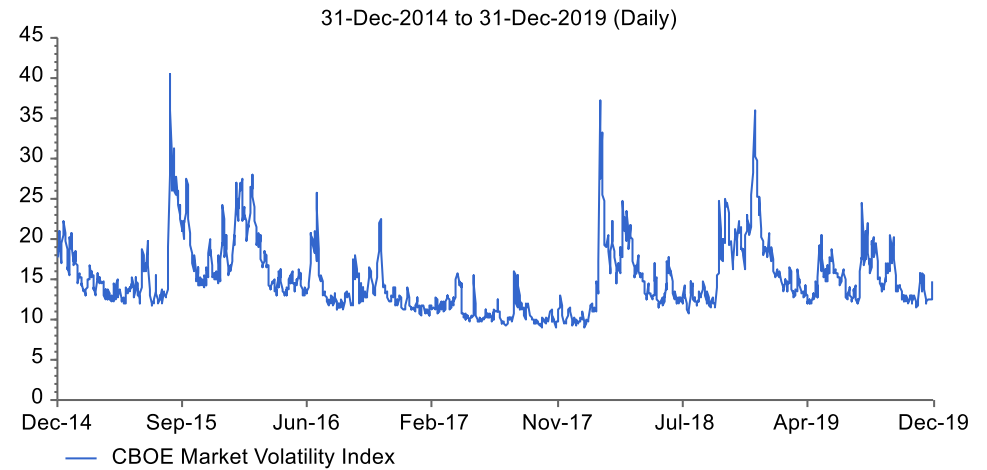
Market Environment

Closing Price Fed Nominal Broad Dollar Index



Source: FactSet Prices

Closing Price CBOE VIX Index



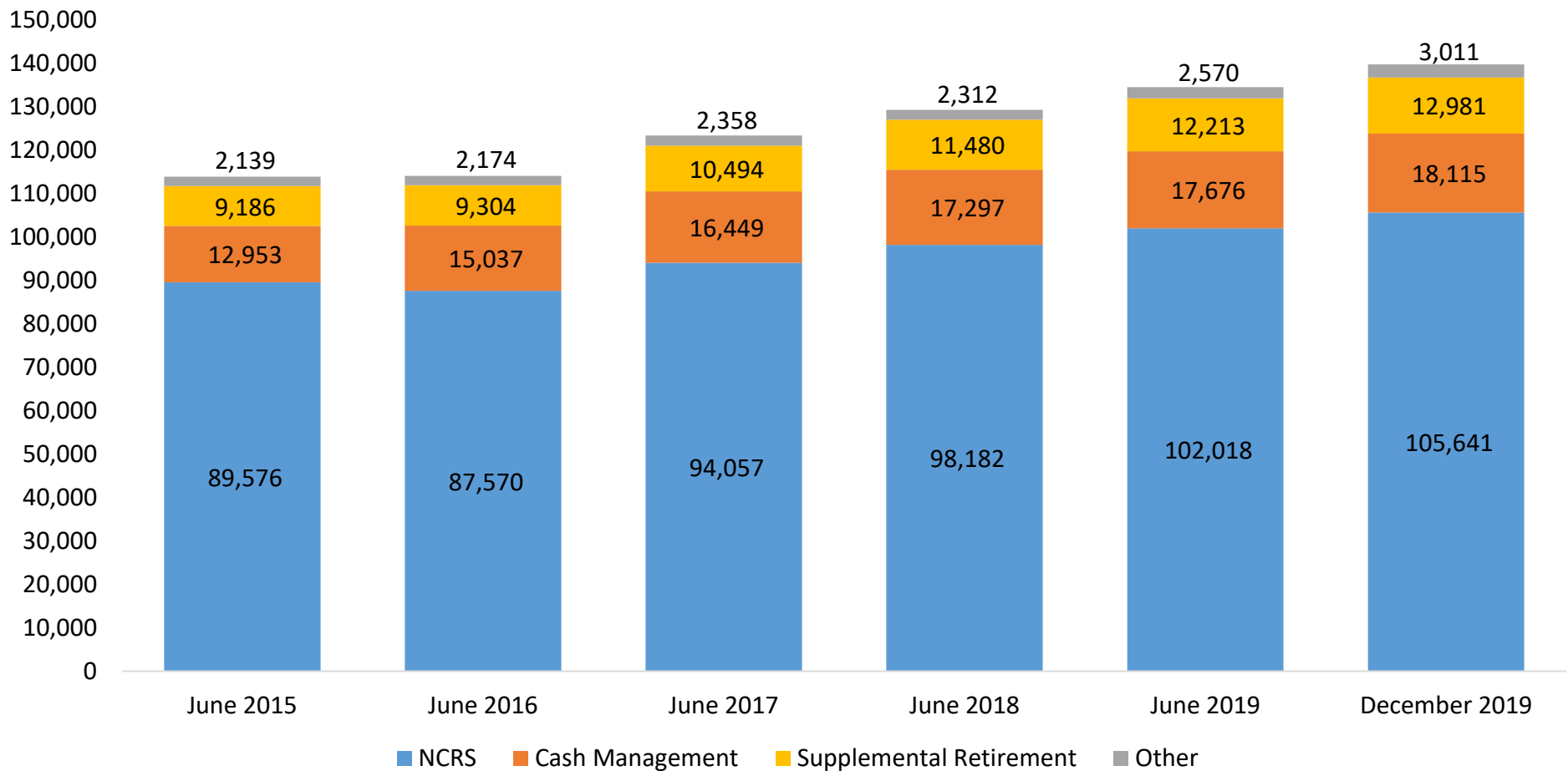
Source: FactSet Prices

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
U.S.	12/19	2.3	12/19	3.5	12/19	2.3	Asia/Pacific/Latam						
Europe							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		
Growth	\$49,088	46.47%	58.00%	37.00%	71.00%	-11.53%	(\$12,184)
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)
Rates & Liquidity	42,237	39.98%	29.00%	24.00%	42.00%	10.98%	11,601
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
Inflation Sensitive & Diversifiers	12,028	11.39%	11.00%	4.00%	16.00%	0.39%	407
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
Multi-Strategy	2,289	2.17%	2.00%	0.00%	4.00%	0.17%	176
Grand Total	\$105,641	100.00%					

NCRS Asset Allocation (Unaudited)

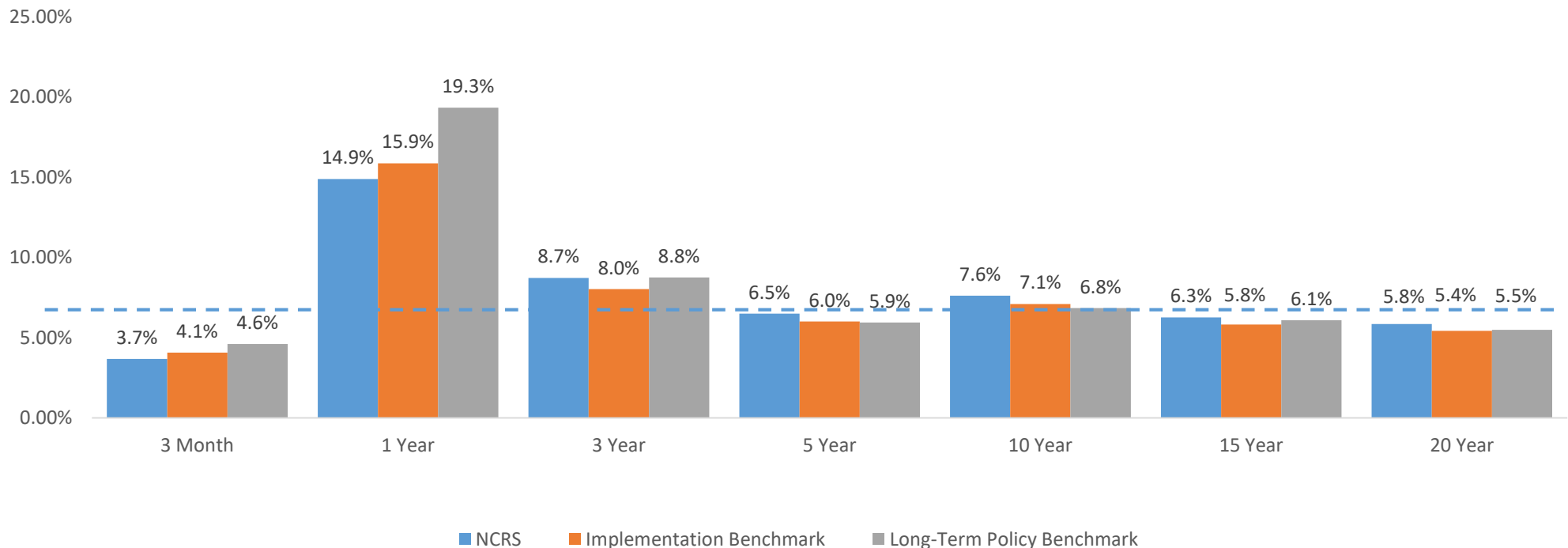
As of February 6, 2020

	Market Value (\$MM)	%	Target	Range		Relative %	Relative \$ (\$000)
				Minimum	Maximum		
Growth	\$49,534	46.58%	58.00%	37.00%	71.00%	-11.42%	(\$12,146)
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)
Rates & Liquidity	42,604	40.06%	29.00%	24.00%	42.00%	11.06%	11,764
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
Inflation Sensitive & Diversifiers	11,919	11.21%	11.00%	4.00%	16.00%	0.21%	221
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
Multi-Strategy	2,288	2.15%	2.00%	0.00%	4.00%	0.15%	161
Grand Total	\$106,345	100.00%					



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

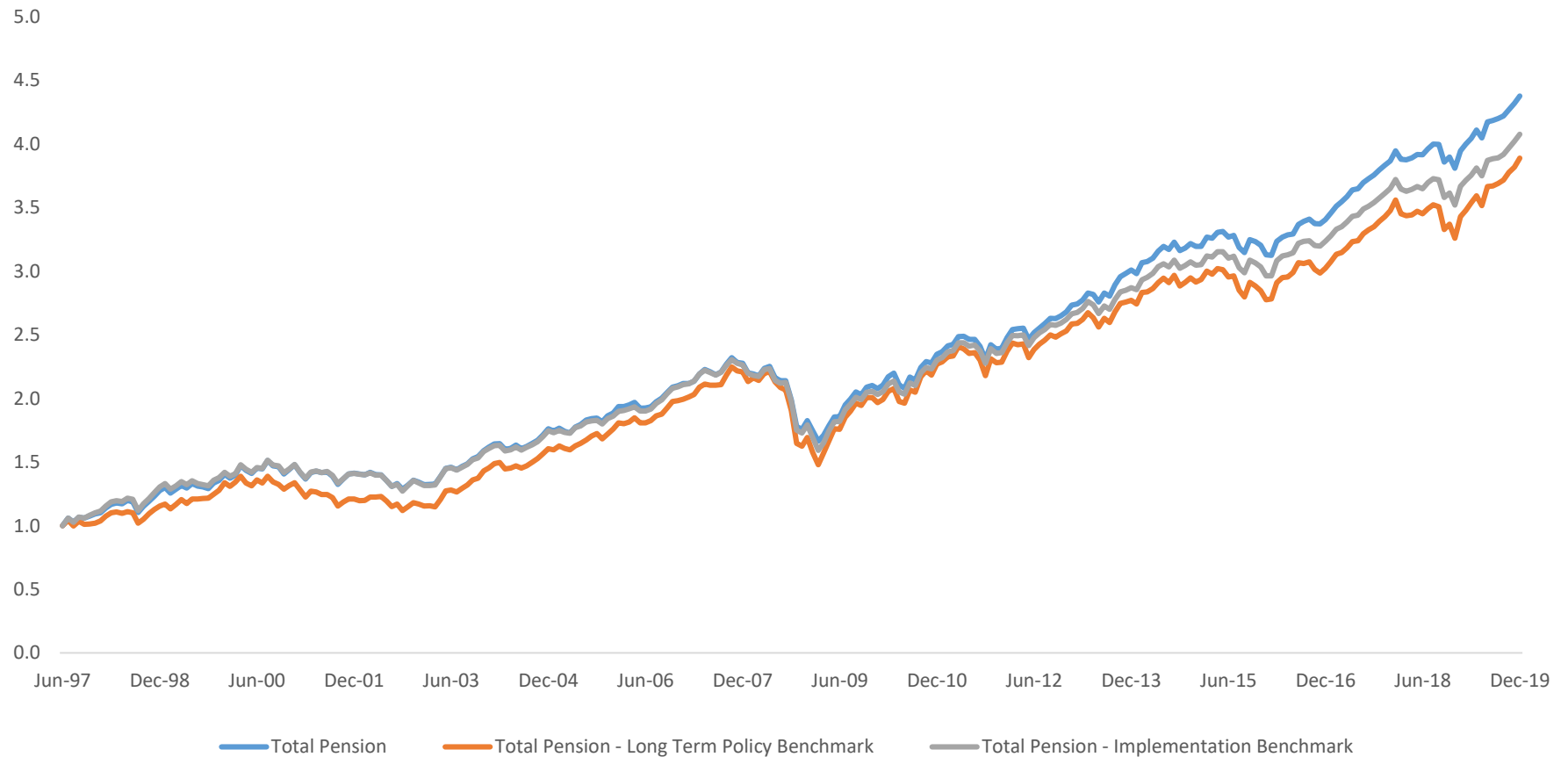
Returns for periods greater than one year are annualized.

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



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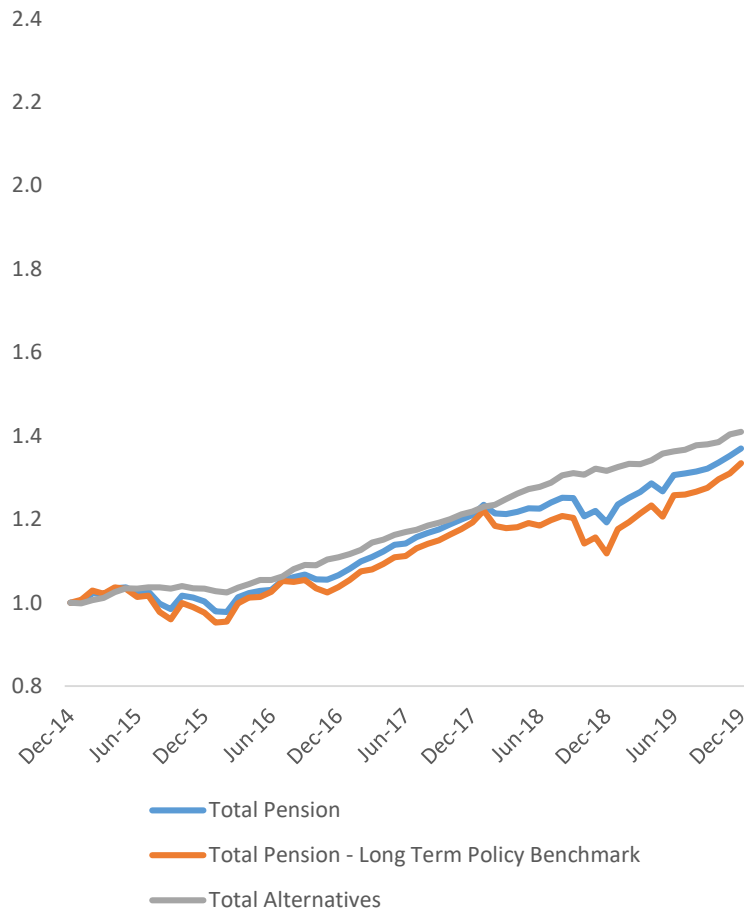
Notes:

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.

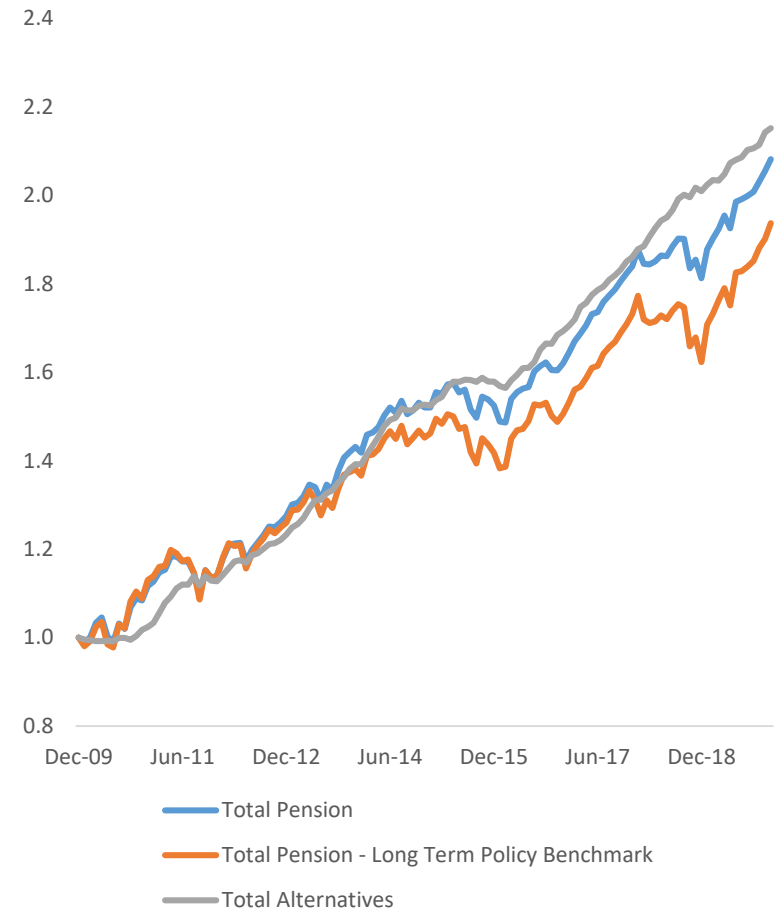


Growth of a Dollar

5 Years Ending December 31, 2019



10 Years Ending December 31, 2019



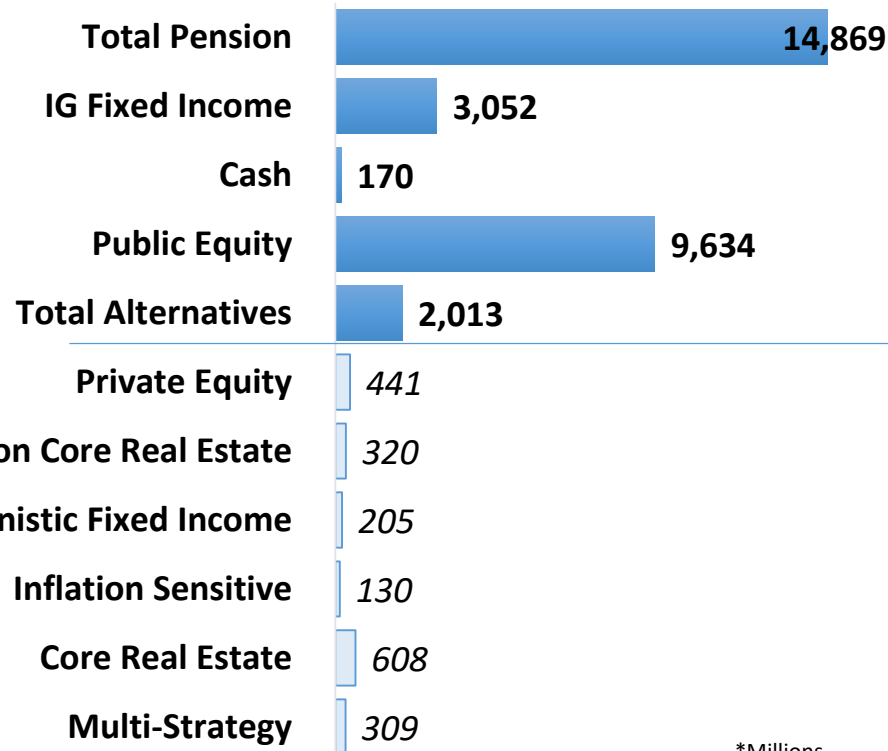
Note: NCRS Alternatives includes the following: Core Real Estate; Inflation Sensitive – Private Natural Resources; Inflation Sensitive – Real Assets and Other Diversifiers; Multi-Strategy Investments; Non Core Real Estate; Opportunistic Fixed Income; Private Equity; Equity Hedge Strategies; and closed-end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



Estimated Contribution to Total Plan Return – 1 Year

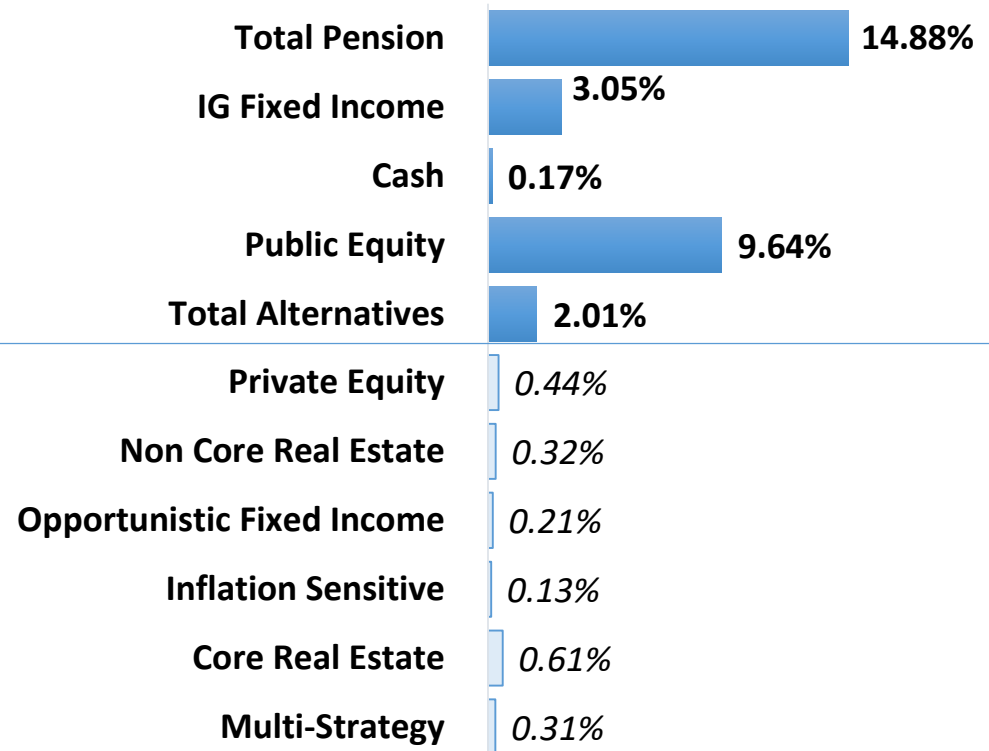
As of December 31, 2019

Contribution to Total Plan \$ Earnings



*Millions

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

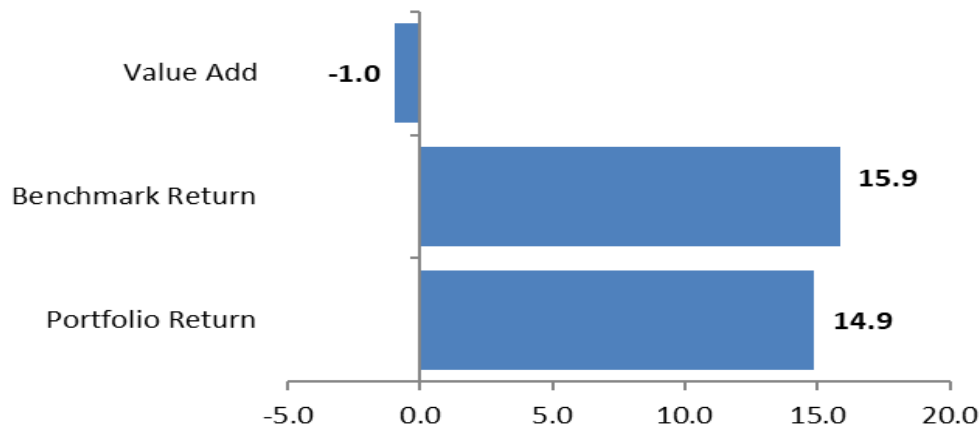
2.) Alternatives for this analysis include the following: Private Equity, Non Core Real Estate, Opportunistic Fixed Income, Inflation Sensitive, Core Real Estate, and Multi-Strategy investments.



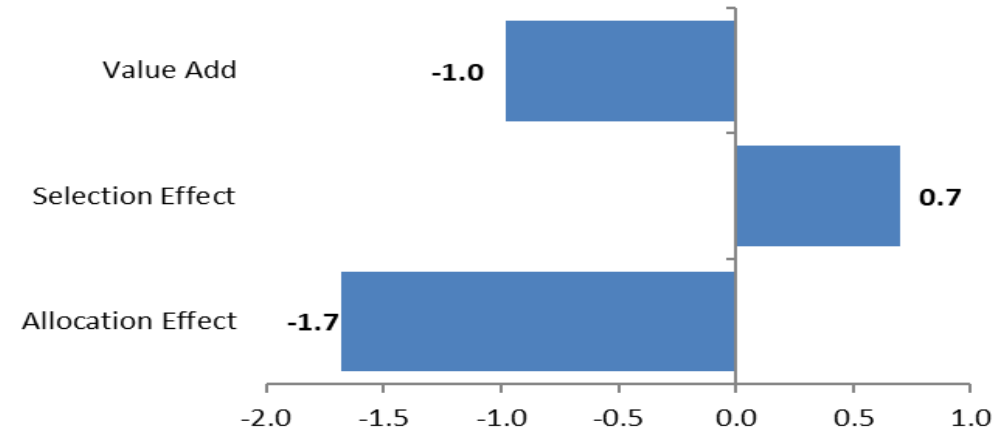
NCRS Net of Fees Return Attribution

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

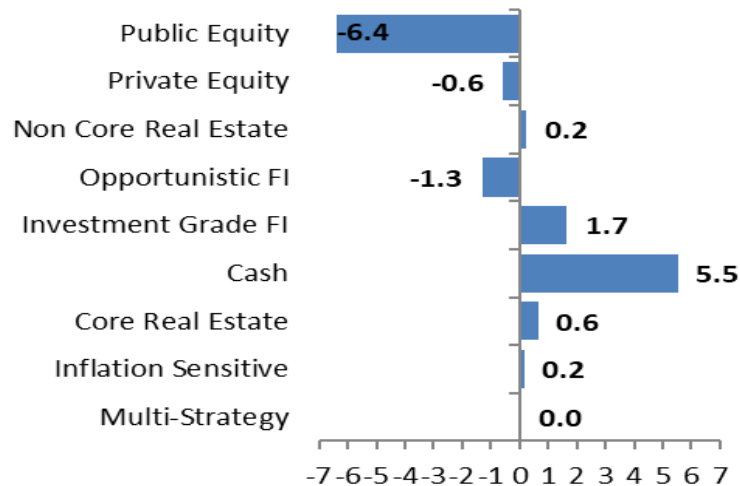
Total Fund Performance



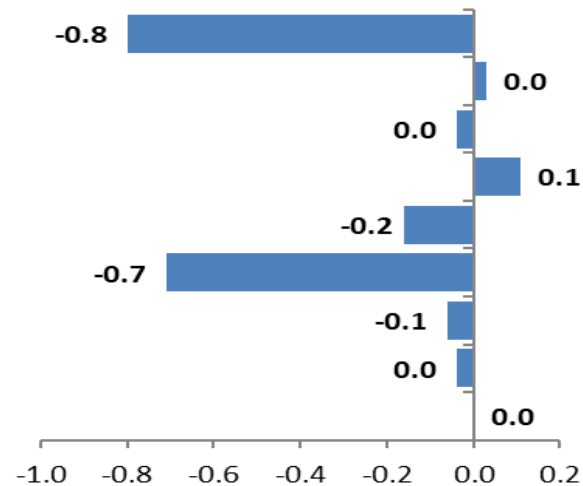
Attribution



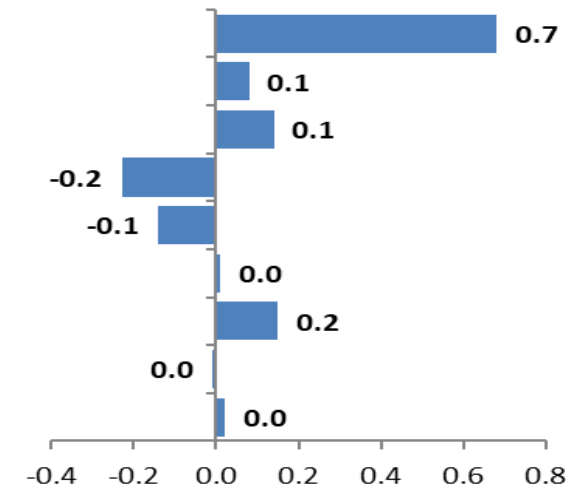
Avg Active Weight



Allocation Effect



Selection Effect

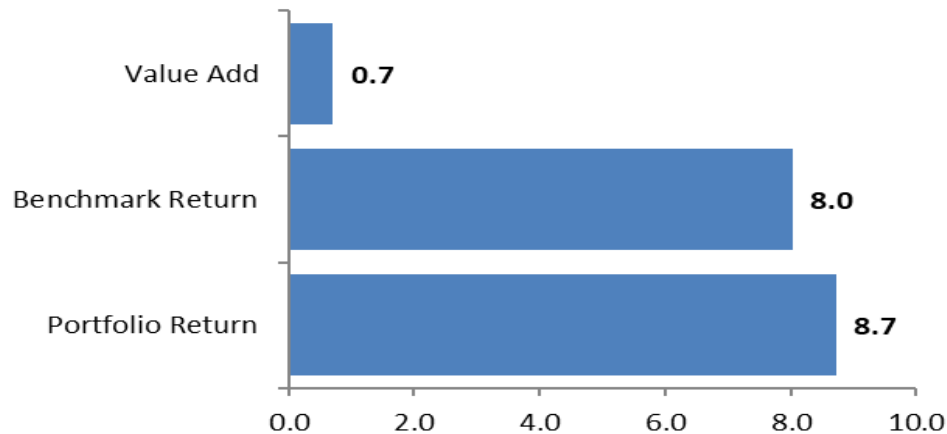




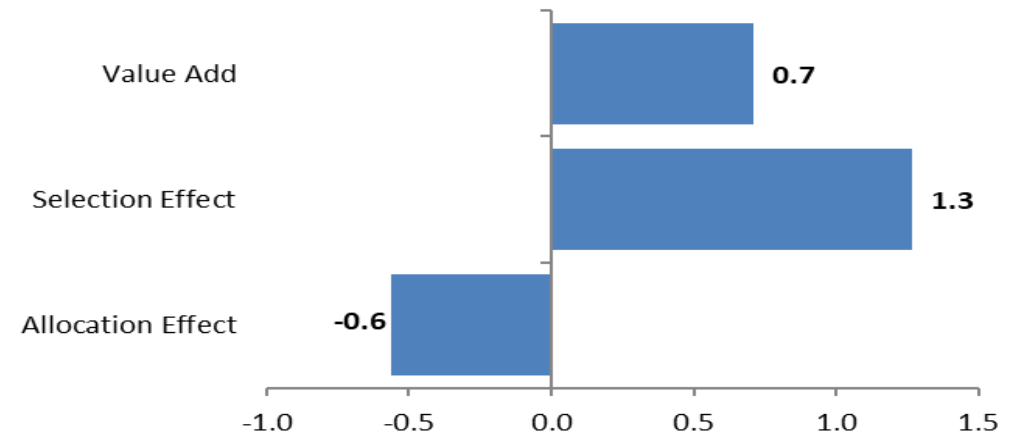
NCRS Net of Fees Return Attribution

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

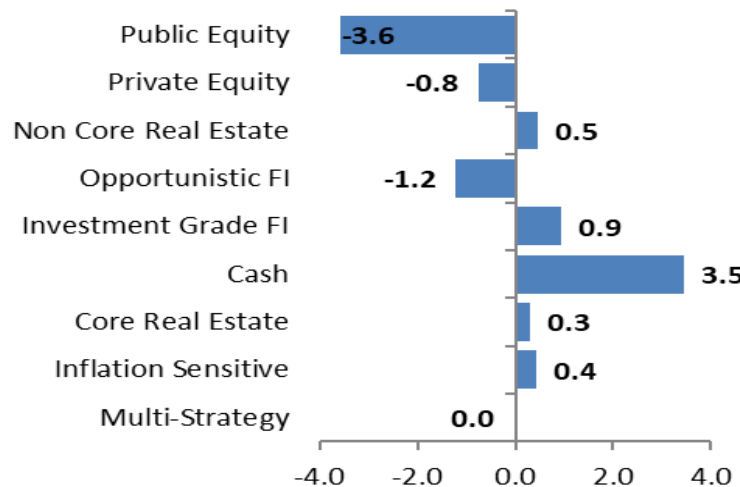
Total Fund Performance



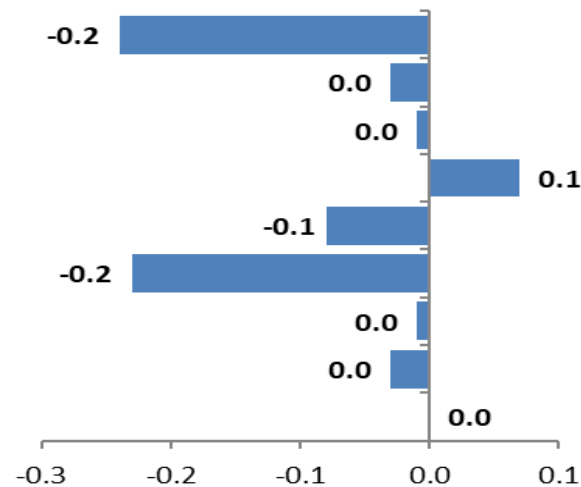
Attribution



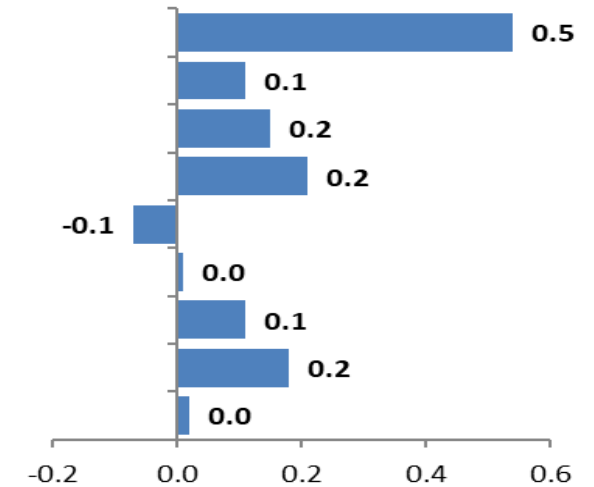
Avg Active Weight



Allocation Effect



Selection Effect

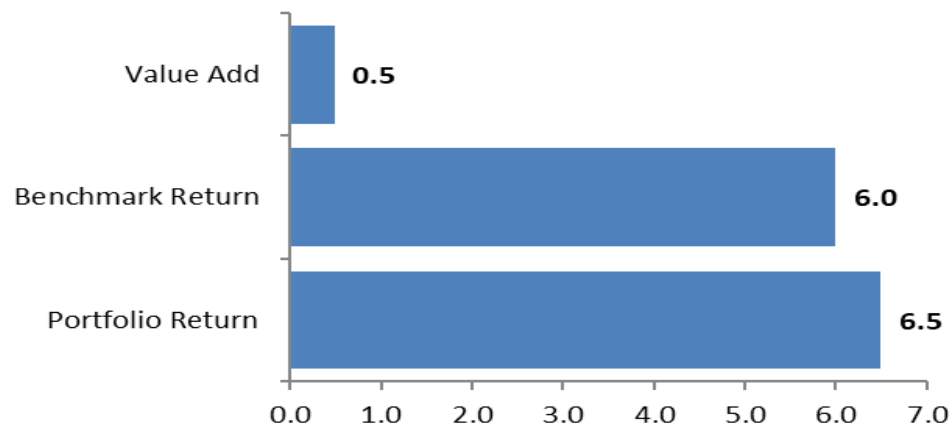




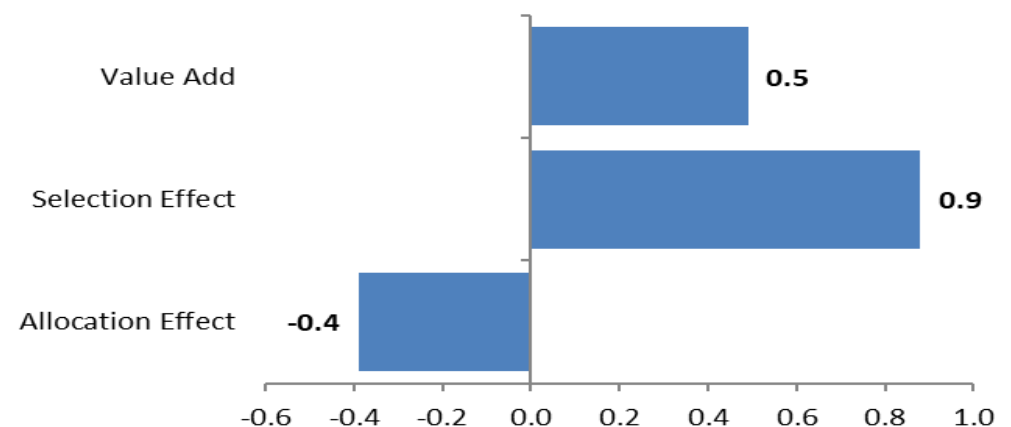
NCRS Net of Fees Return Attribution

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

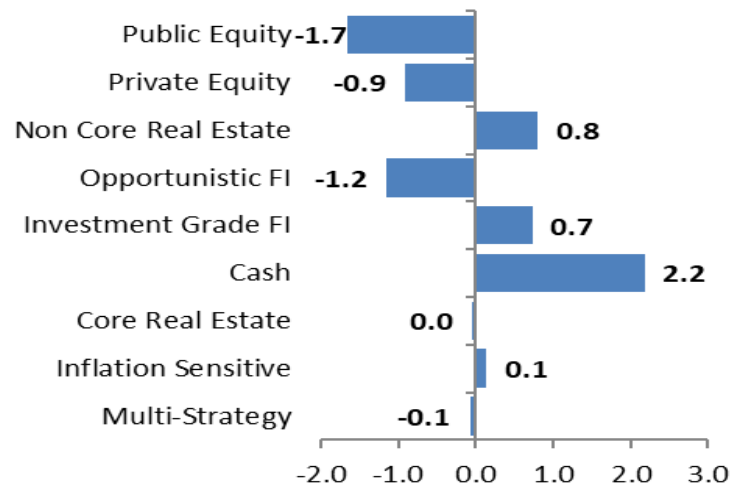
Total Fund Performance



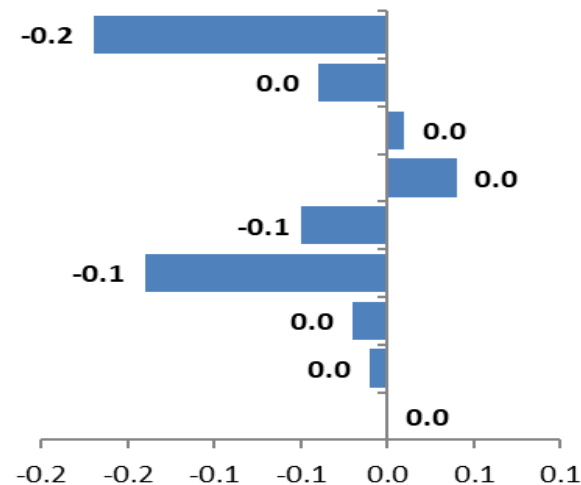
Attribution



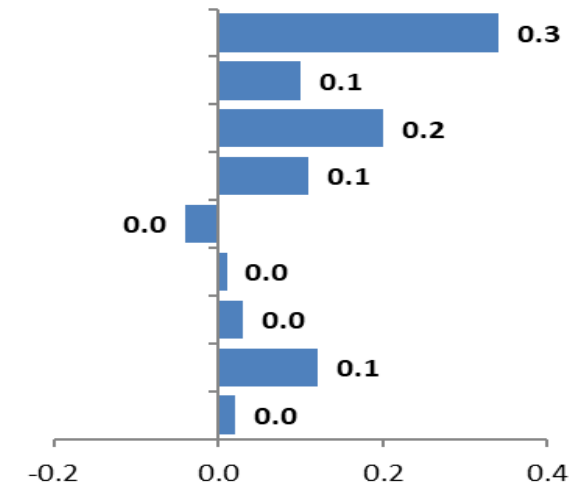
Avg Active Weight



Allocation Effect



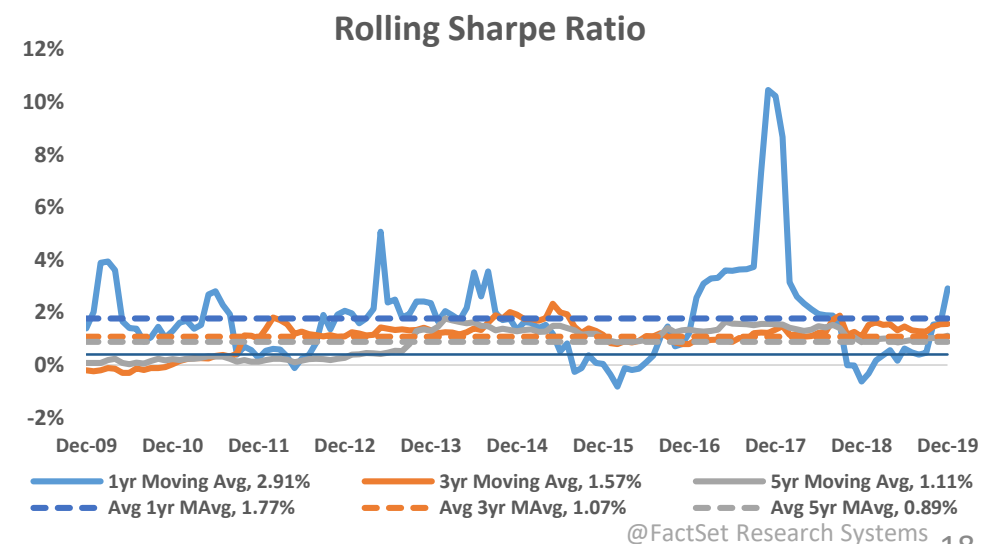
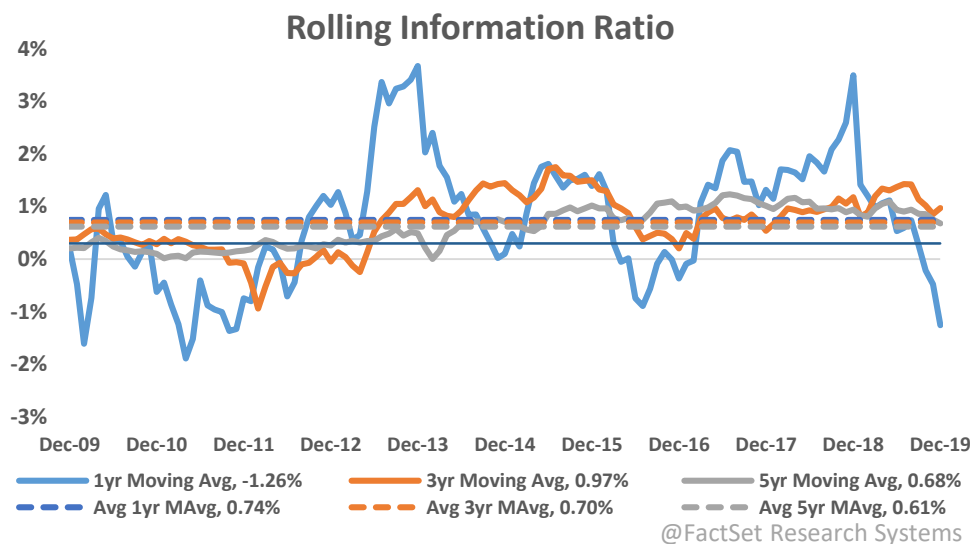
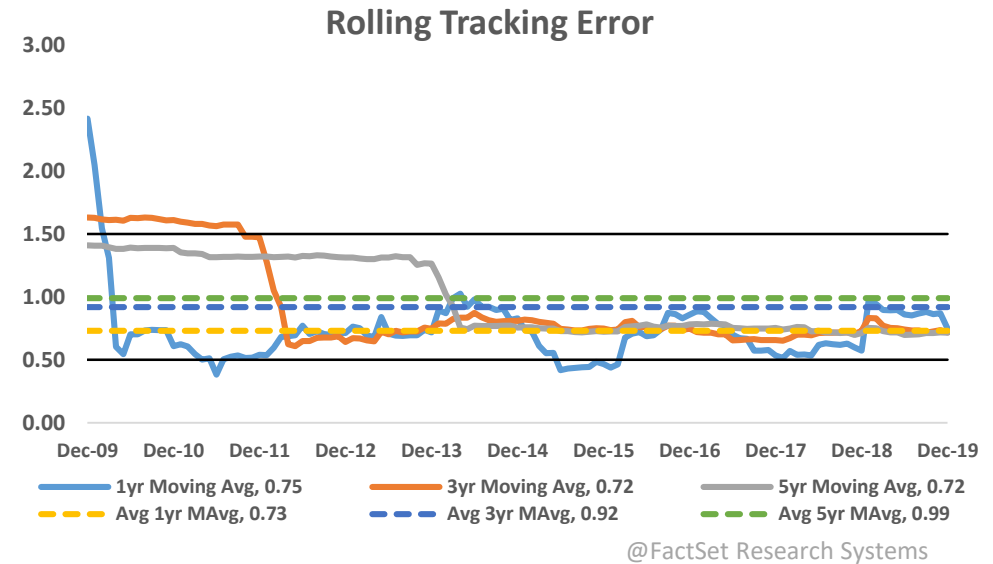
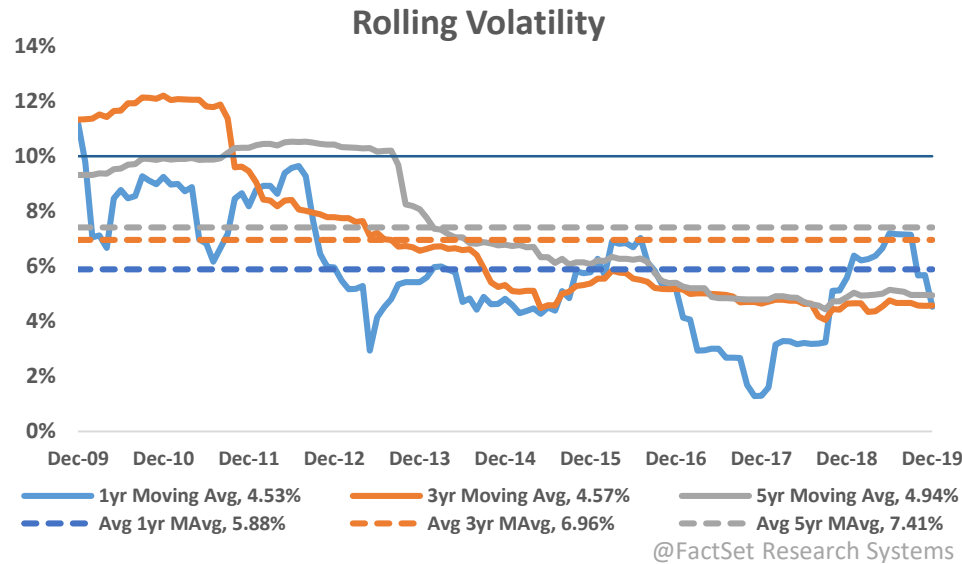
Selection Effect





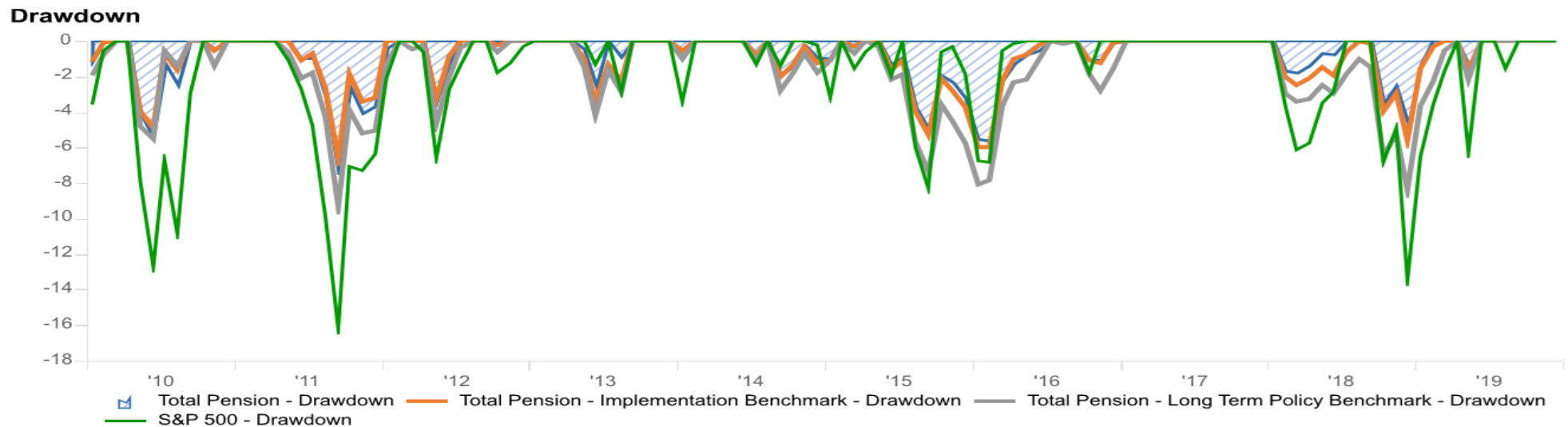
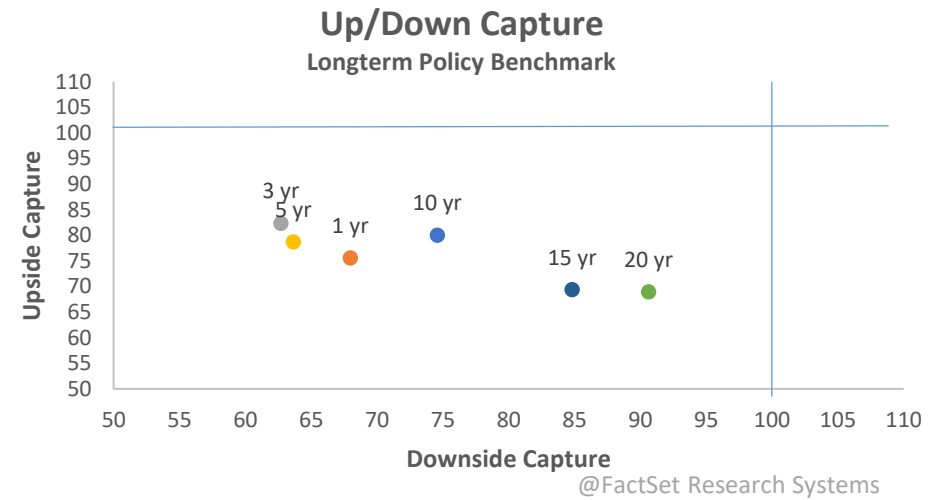
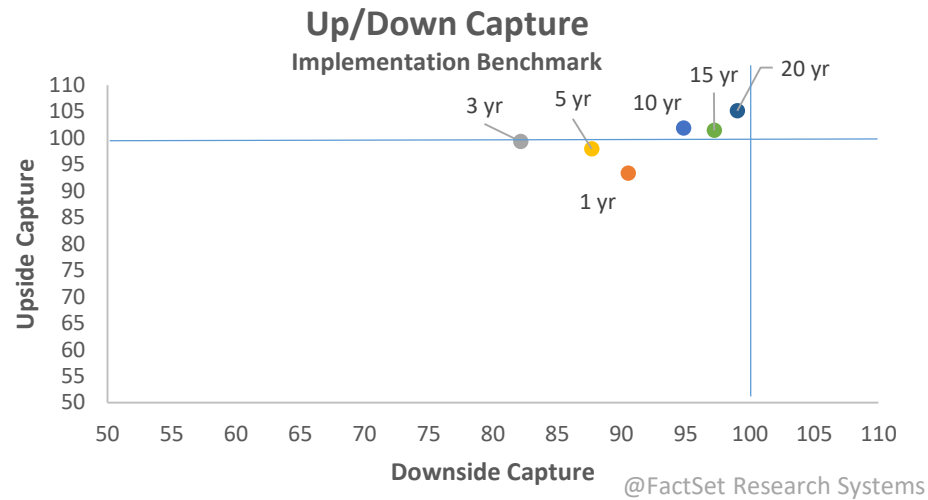
NCRS Net of Fees Risk Metrics

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
Median Percentile	17.24	9.78	7.56	8.63	7.03	6.20
75th Percentile	15.58	9.37	7.10	8.15	6.70	6.09
NCRS	15.26	9.22	7.08	8.15	6.70	6.19
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
Median Percentile	5.82	5.53	5.76	6.77	8.46	8.53
75th Percentile	4.45	4.67	4.97	5.89	7.83	8.06
NCRS	4.37	4.48	4.86	5.88	7.19	7.54
Percentile Rank (1 = highest risk)	77	83	83	77	94	94

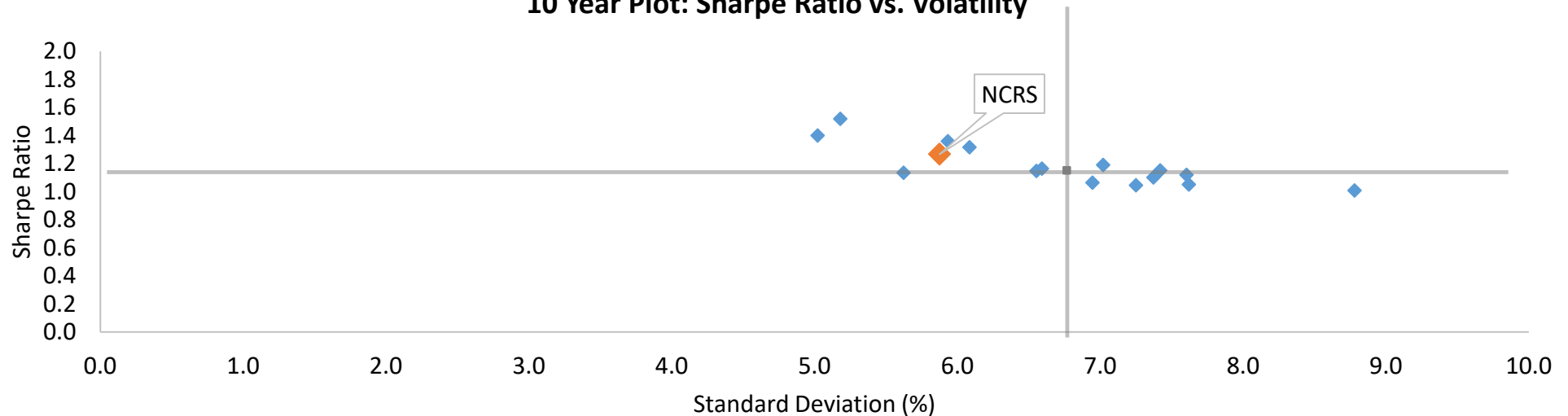


NCRS Gross of Fees Sharpe Ratio

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
Median Percentile	2.44	1.44	1.09	1.15	0.68	0.55
75th Percentile	2.29	1.34	1.02	1.07	0.64	0.50
NCRS	2.78	1.63	1.22	1.27	0.75	0.60
Percentile Rank (1 = highest performance)	18	18	24	30	19	19

10 Year Plot: Sharpe Ratio vs. Volatility



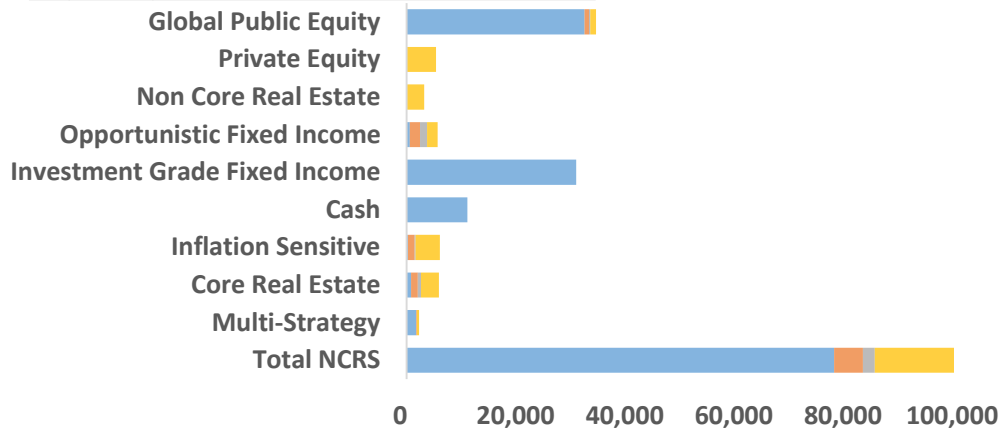
Note: Data shown is gross of fees with the exception of incentive payments, which have been deducted from NAV when applicable.



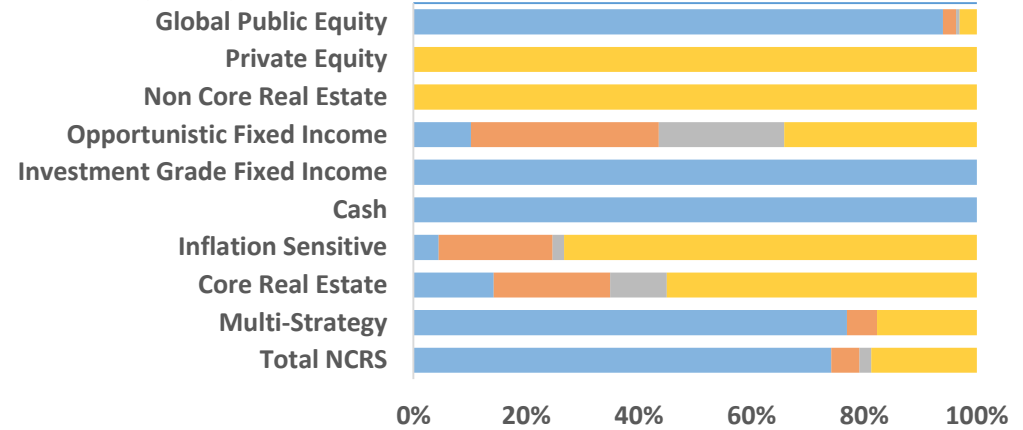
NCRS Liquidity Profile

As of December 31, 2019

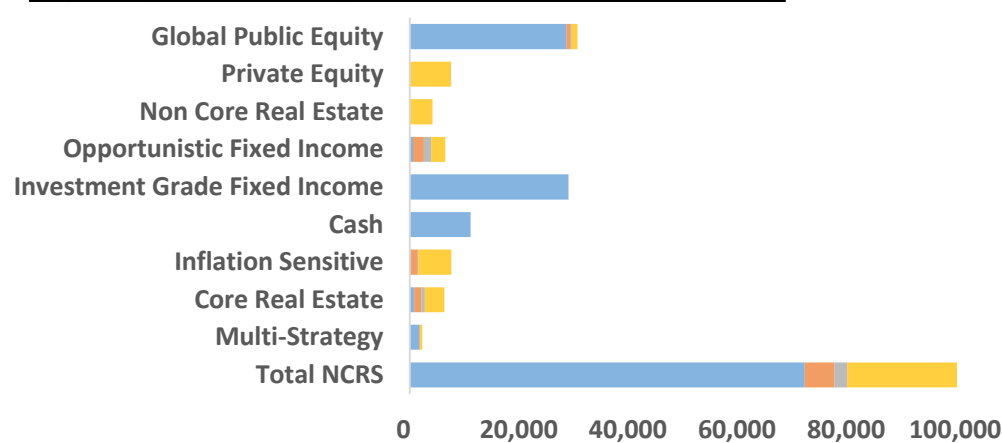
Liquidity Allocation (\$ Market Value)



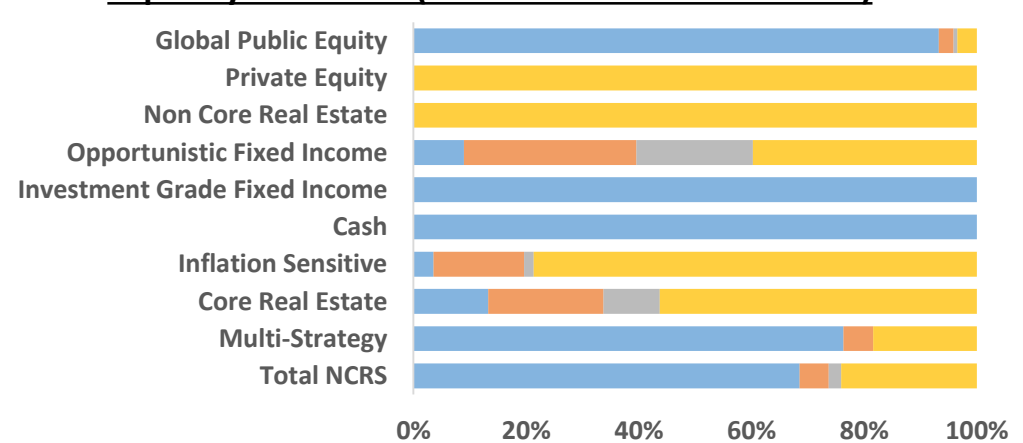
Liquidity Allocation (% Market Value)



Liquidity Allocation (\$ Market Value + Unfunded)



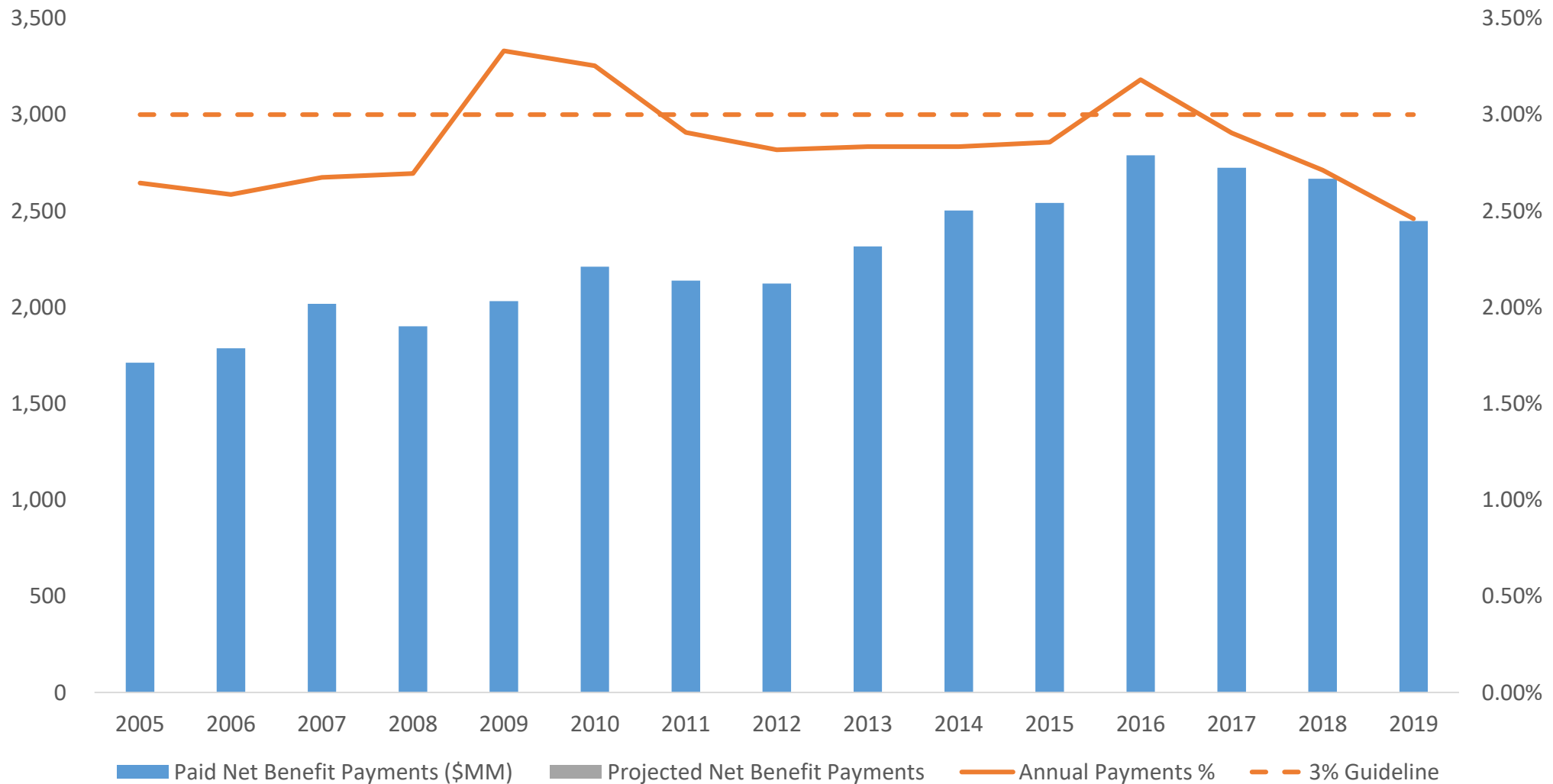
Liquidity Allocation (% Market Value + Unfunded)





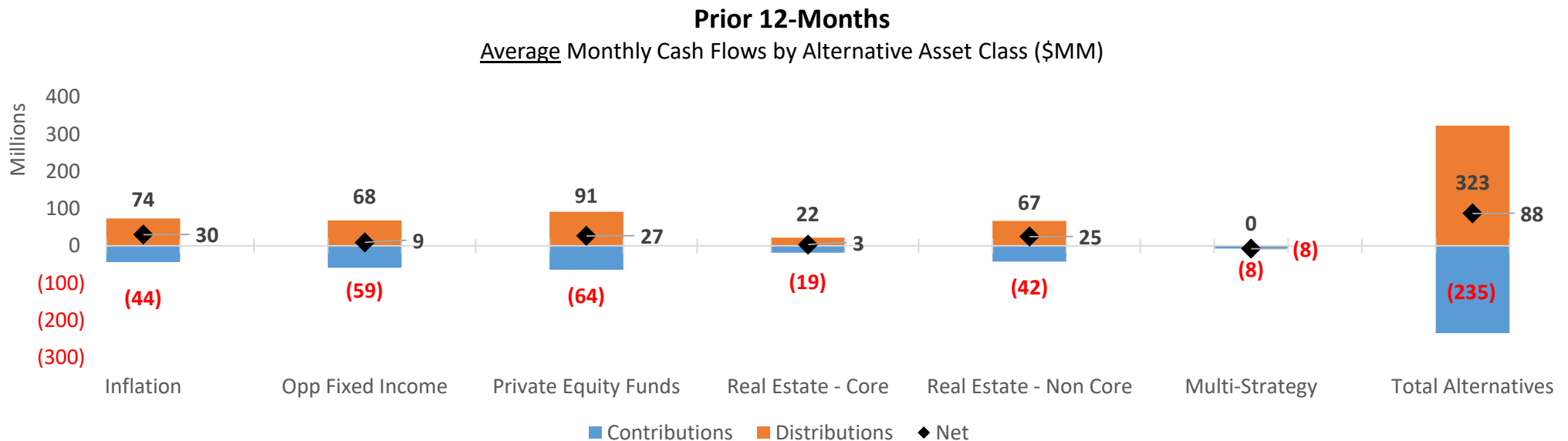
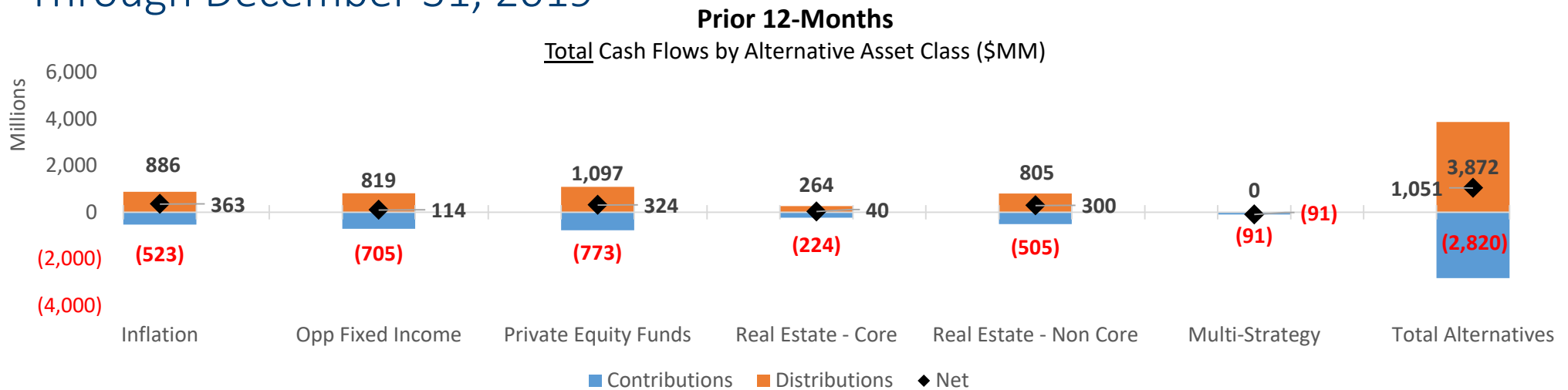
NCRS Liquidity Profile

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

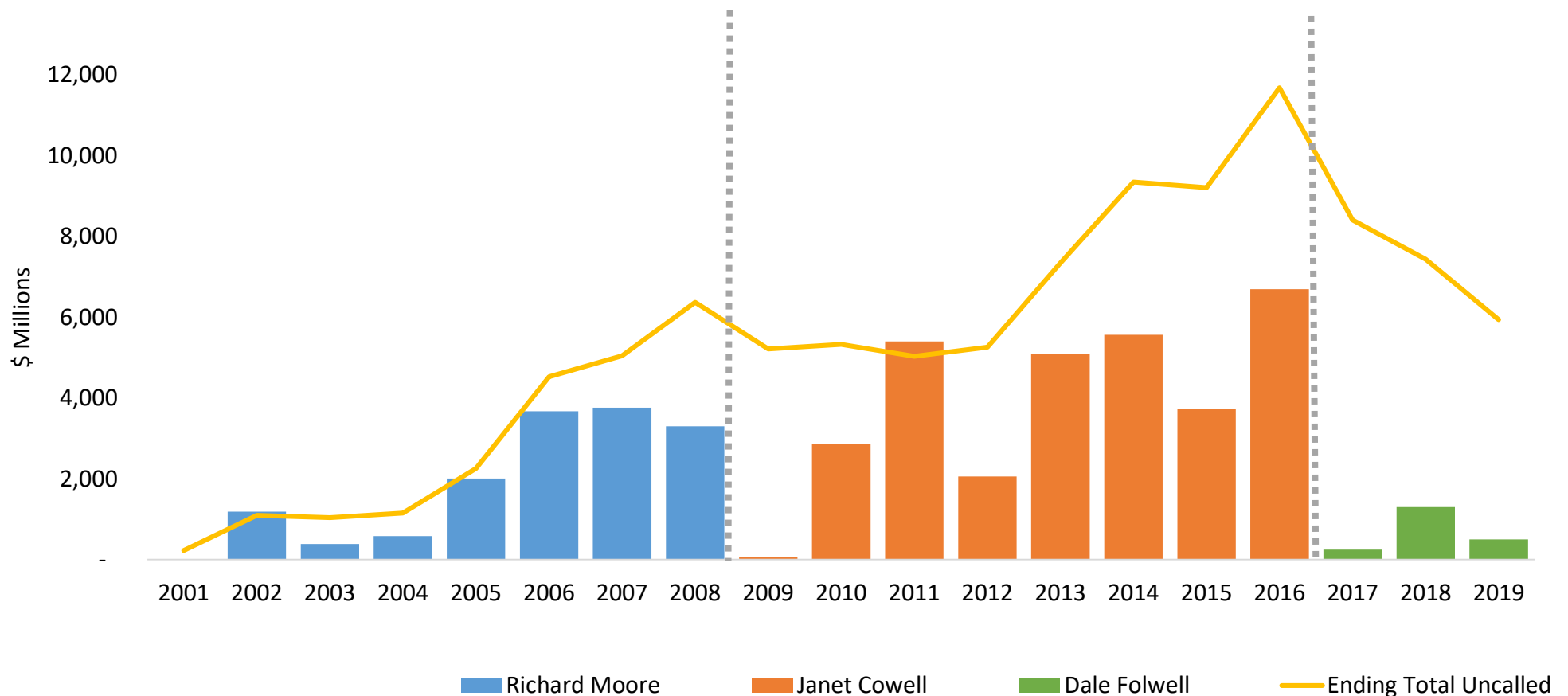
Since November 20th IAC Meeting As of December 31, 2019

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

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

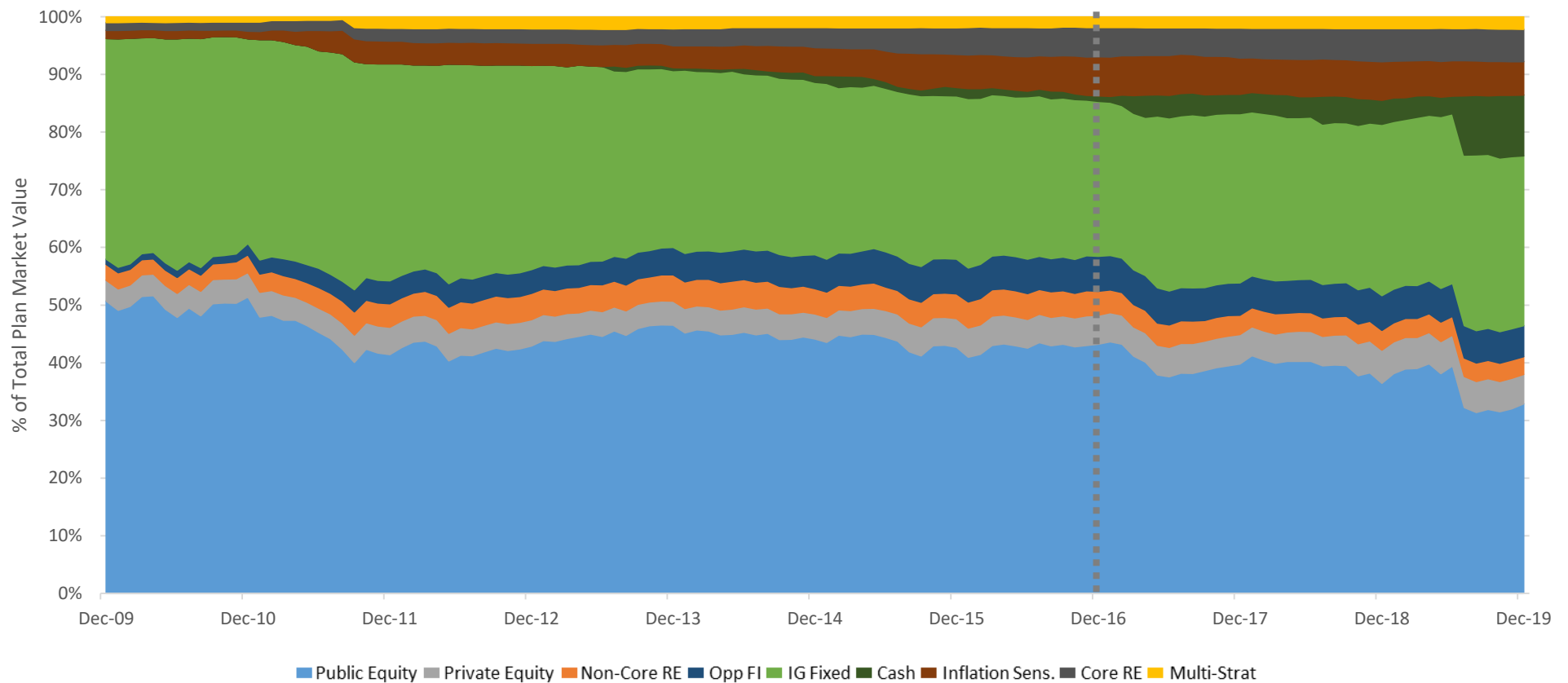


New and Total Unfunded Private Asset Class Commitments By Calendar Year of Closing





Asset Allocation History as of December 31, 2019





Exited Investments

Since November 20th 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		
BlackRock Developed REIT	423,449	1/8/2020
Multi Strategy		
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%
	Total	105,641,451,737	5,944,187,025	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 December 31, 2019

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

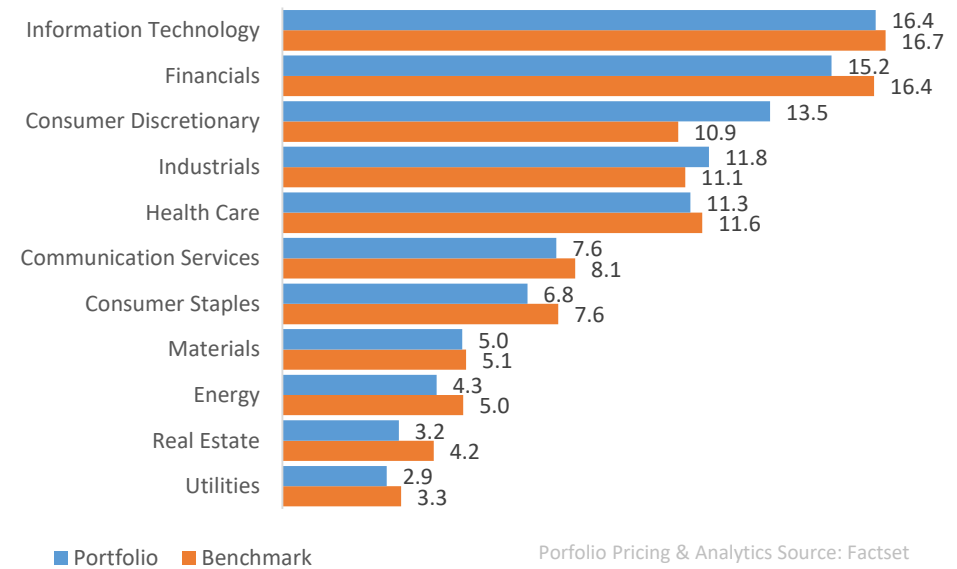


NCRS Public Equity Portfolio Characteristics

As of December 31, 2019

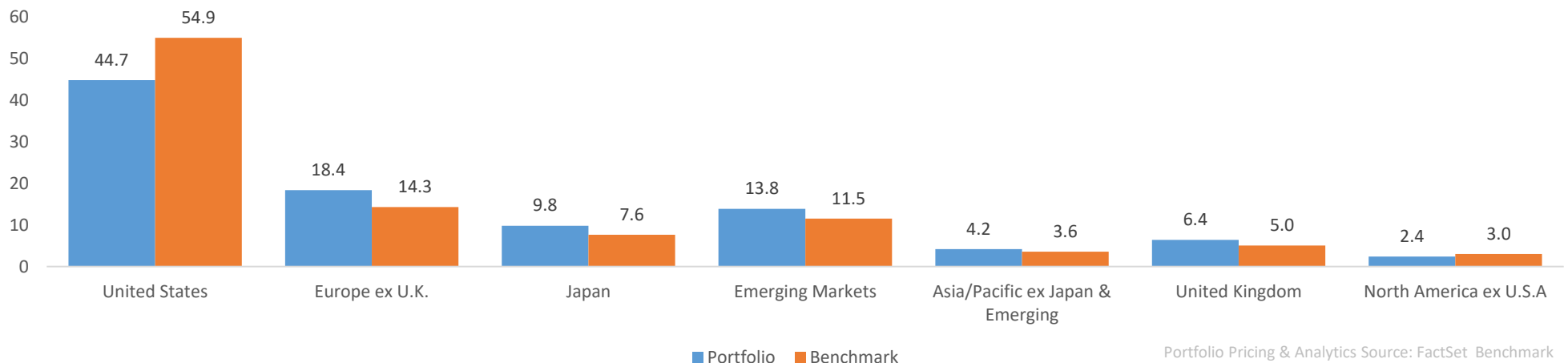
Portfolio Characteristics		
	Portfolio	MSCI ACWI IMI
Price/Earnings	19.0	18.5
Dividend Yield	2.2	2.3
Price/Book	2.3	2.3
Market Capitalization	156,741.0	166,915.6
Return On Equity	17.2	18.5

@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

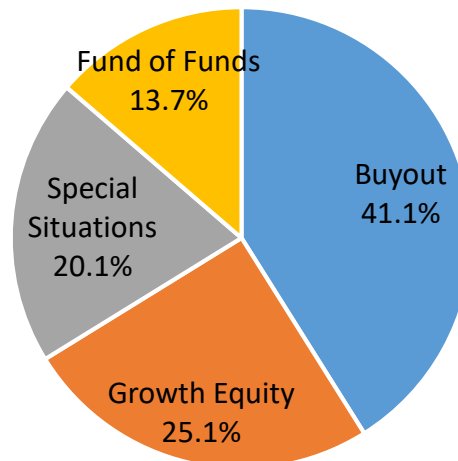
Net of Fees Performance (%)

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

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	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

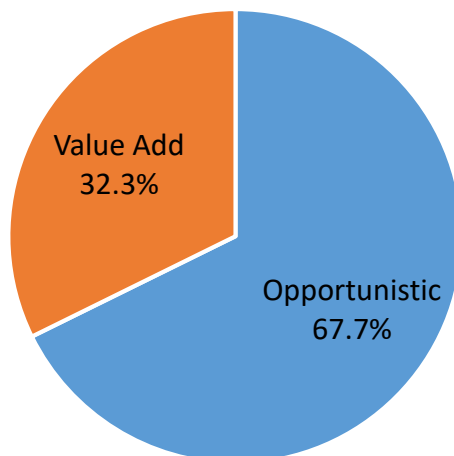
Net of Fees Performance (%)

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

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

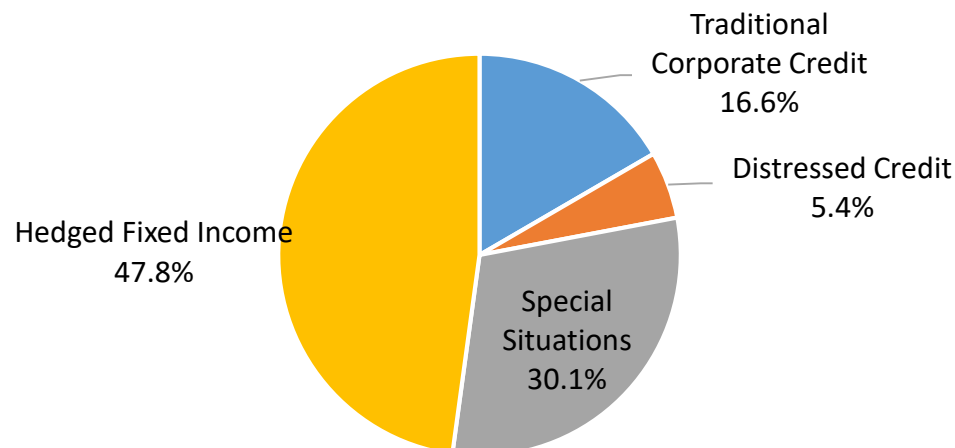
Net of Fees Performance (%)

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

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

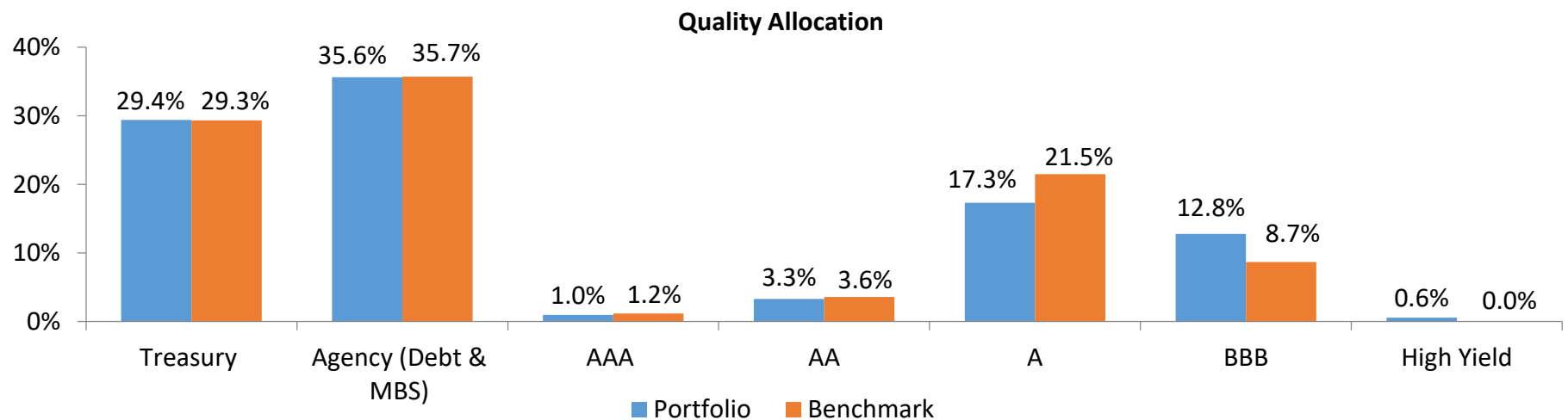
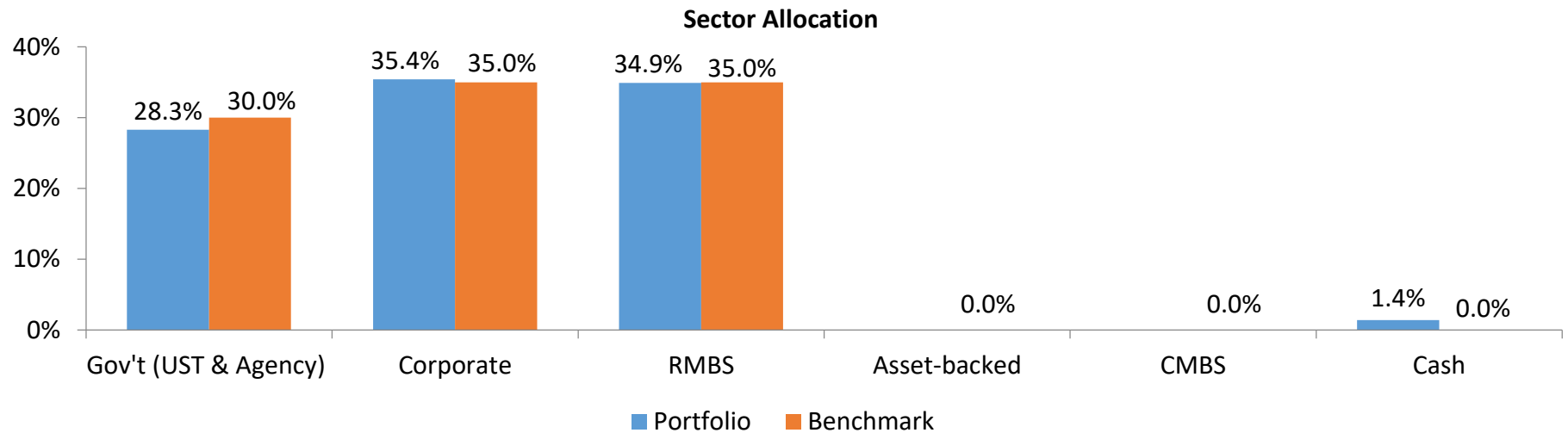
Net of Fees Performance (%)						
	Market Value	3 Month	1 Year	3 Years	5 Years	10 Years
Rates & Liquidity	\$42,237	0.12	9.19	4.25	3.23	4.78
Benchmark ⁶		(0.11)	10.47	4.73	3.50	4.94
IG Fixed Income	\$31,087	(0.02)	10.33	4.63	3.47	4.92
Core Fixed Income	\$27,975	(0.08)	11.34	5.00	3.74	5.10
IG Fixed Income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

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
Total	3.99%	2.63%	8.0



NCRS Core Fixed Income Portfolio Characteristics

As of December 31, 2019



NCRS Inflation Sensitive Portfolio

As of December 31, 2019

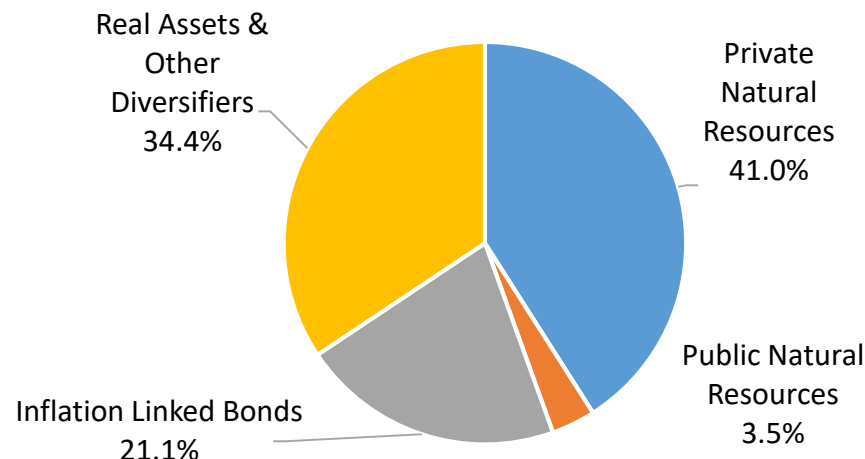
Net of Fees Performance (%)

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

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>Total</u>
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

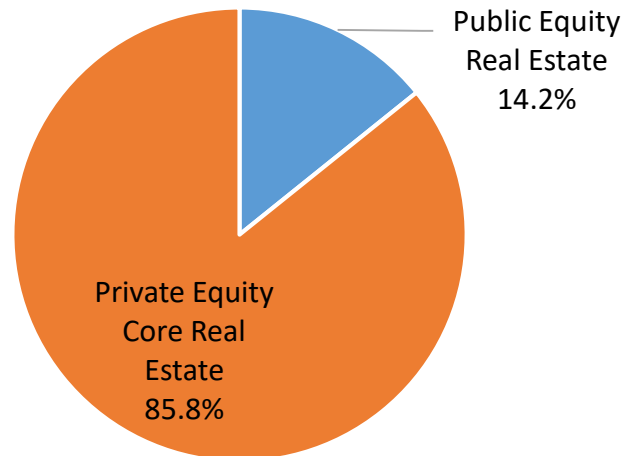
Net of Fees Performance (%)

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

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)



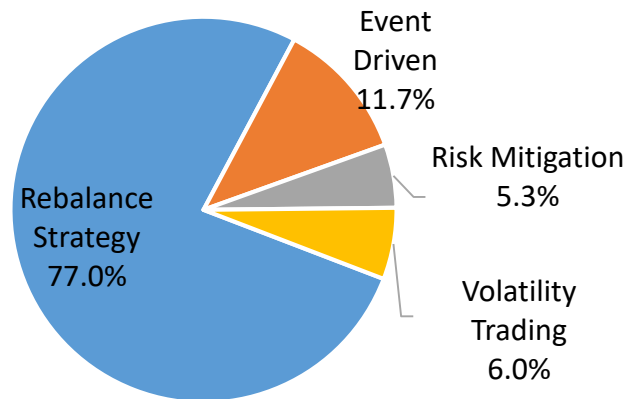


NCRS Multi-Strategy Portfolio

As of December 31, 2019

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

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 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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