



**RVK**

# Quarterly Investment Performance Analysis

Vermont State Teachers' Retirement System

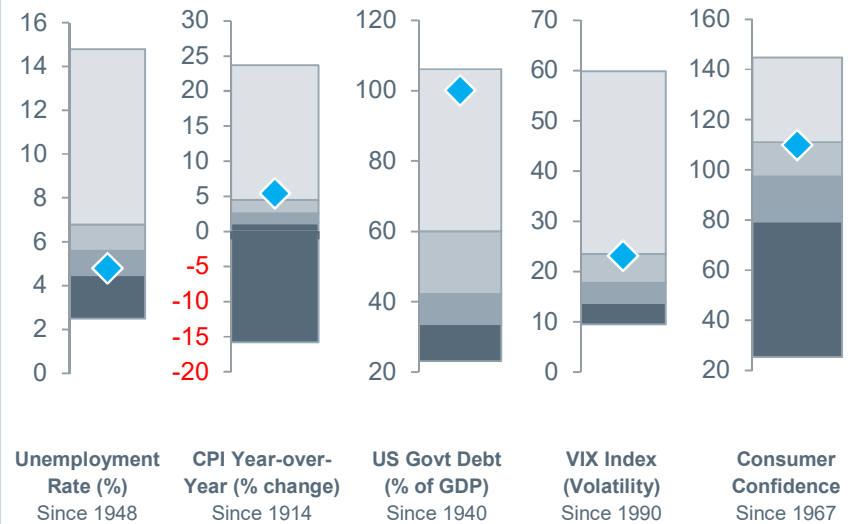
Period Ended: September 30, 2021



**Third Quarter Economic Environment**

Persistent inflationary pressures, disrupted supply chains, stalled fiscal negotiations, and the continued spread of the delta variant, all contributed to a quarter of mixed results for risk assets. In addition, heightened concerns over an increasingly stringent regulatory regime in China, combined with the debt restructuring of its second-largest property developer, led to a down quarter for emerging markets with volatility spreading to other regions as well. US markets outperformed on average, though were roughly flat. Investor sentiment was aided by a strong corporate earnings environment amid continued support from the Federal Reserve, along with improvement in some economic fundamentals. Globally, an uneven economic recovery continued, evidenced by labor market conditions and inflation readings showing mixed indications of progress. The September US non-farm payrolls report indicated a weaker than anticipated 194,000 added jobs, although past months were revised higher. The unemployment rate dropped to 4.8%, compared to 5.9% at the start of the quarter, but this decrease was largely driven by a declining labor force participation rate. The core PCE price index, the Federal Reserve's preferred measure for inflation, ran at a 30 year high based on the reading in August. Wage growth similarly rose higher in September with average hourly pay increasing 4.6% year-over-year. Overall, global growth forecasts remained relatively consistent with recent quarters.

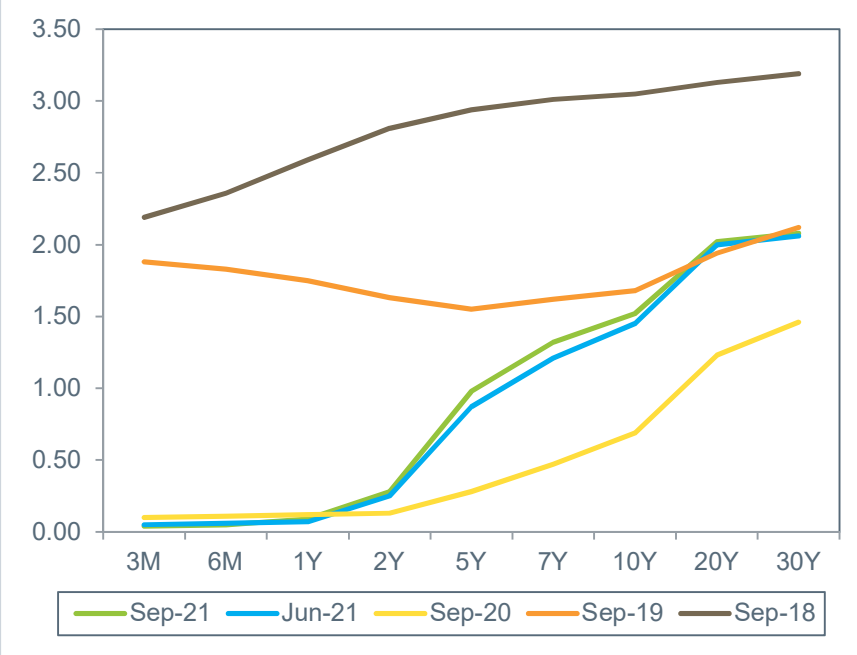
**Key Economic Indicators**



Economic Indicators	Sep-21	Jun-21	Sep-20	Sep-18	20 Yr
Federal Funds Rate (%)	0.06 ▼	0.08	0.09	2.18	1.33
Breakeven Infl. - 5 Yr (%)	2.53 ▲	2.50	1.49	2.03	1.84
Breakeven Infl. - 10 Yr (%)	2.38 ▲	2.34	1.63	2.14	2.03
CPI YoY (Headline) (%)	5.4 —	5.4	1.4	2.3	2.1
Unemployment Rate (%)	4.8 ▼	5.9	7.8	3.7	6.1
Real GDP YoY (%)	4.9 ▼	12.2	-2.9	3.1	1.9
PMI - Manufacturing	61.1 ▲	60.6	55.7	59.5	53.3
USD Total Wtd Idx	114.99 ▲	112.85	117.26	113.81	103.15
WTI Crude Oil per Barrel (\$)	75.0 ▲	73.5	40.2	73.3	63.7
Gold Spot per Oz (\$)	1,757 ▼	1,770	1,886	1,191	1,067

Market Performance (%)	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	0.58	15.92	30.00	16.90	16.63
Russell 2000	-4.36	12.41	47.68	13.45	14.63
MSCI EAFE (Net)	-0.45	8.35	25.73	8.81	8.10
MSCI EAFE SC (Net)	0.90	10.02	29.02	10.38	10.73
MSCI Emg Mkts (Net)	-8.09	-1.25	18.20	9.23	6.09
Bloomberg US Agg Bond	0.05	-1.56	-0.90	2.94	3.01
ICE BofAML 3 Mo US T-Bill	0.02	0.04	0.07	1.16	0.63
NCREIF ODCE (Gross)	6.63	13.15	14.63	7.51	9.92
FTSE NAREIT Eq REIT (TR)	0.98	23.15	37.39	6.83	11.27
HFRI FOF Comp	0.78	5.77	14.35	5.81	4.47
Bloomberg Cmdty (TR)	6.59	29.13	42.29	4.54	-2.66

**Treasury Yield Curve (%)**



Third Quarter Review

Broad Market

US equity markets cooled off in Q3, compared to recent quarters, as the S&P 500 finished relatively flat. The spread of the Delta variant throughout the country slowed consumer spending, although the overall recovery remained on course. Concerns over inflation, due to continued stimulus from the Fed and supply chain disruptions, continue to be a major theme in the US contributing to moderated investor sentiment.

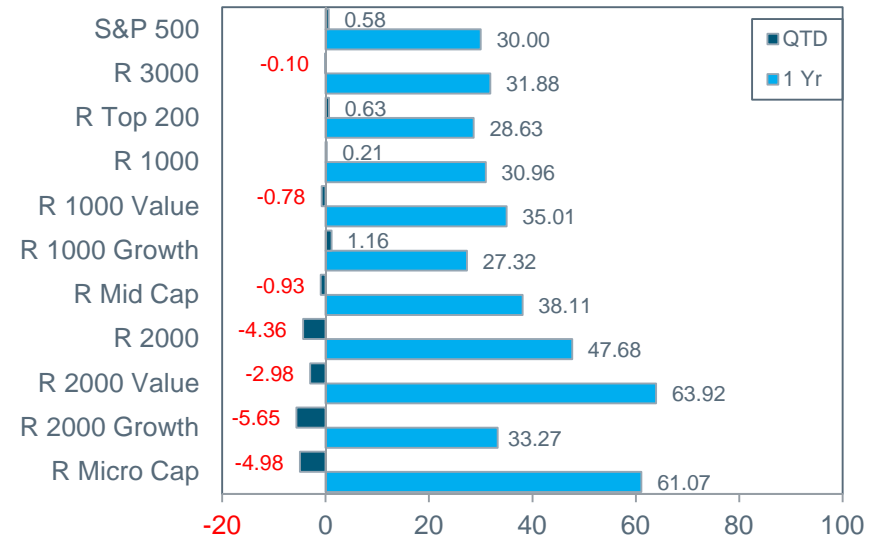
Market Cap

Large-cap stocks significantly outperformed their smaller-cap counterparts. The Russell 2000 Index returned -4.4% compared to 0.6% for the S&P 500.

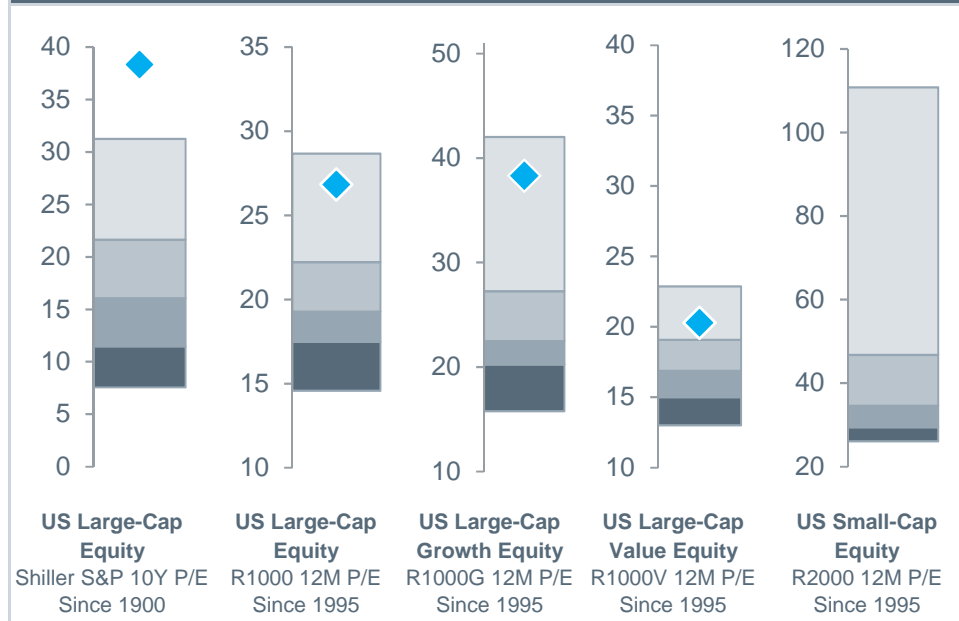
Style and Sector

Large-cap growth turned in modestly positive returns in Q3 while small-cap and value stocks generally struggled. The Russell 1000 Growth Index returned 1.2% vs. -0.8% for the Russell 1000 Value Index. The Russell 2000 Value Index returned -3.0% vs. -5.7% for the Russell 2000 Growth Index.

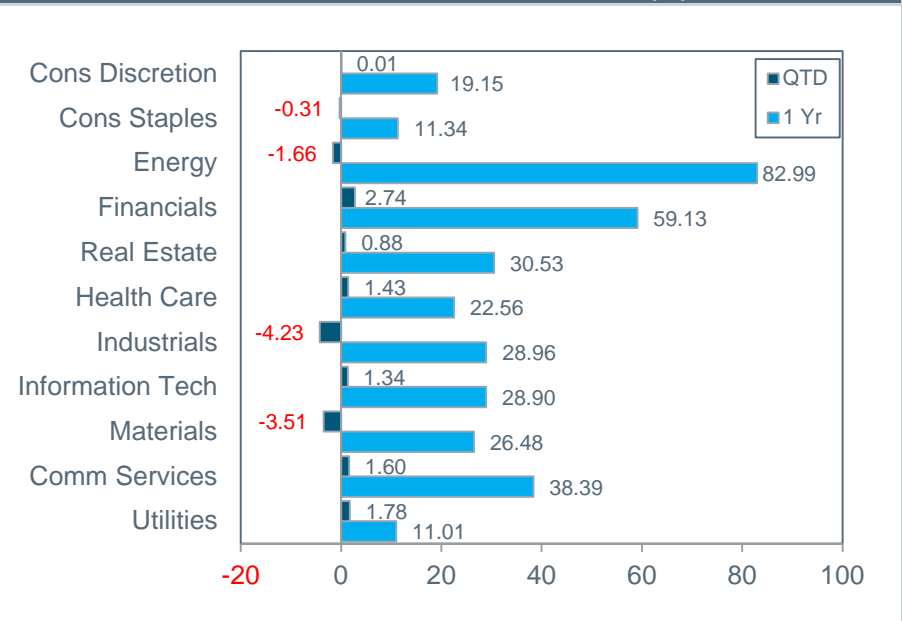
Style and Capitalization Market Performance (%)



Valuations



S&P 500 Index Sector Performance (%)



Valuation data courtesy of Bloomberg Professional Service and Robert J. Shiller, Irrational Exuberance, Second Edition. P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers. Current R2000 P/E is unavailable due to negative earnings per share as of 9/30/2021.



Third Quarter Review

Developed Markets

In similar fashion to the US equity market, developed international market returns were muted. The MSCI EAFE Index was slightly negative for Q3 with growth stocks outperforming value, although value stocks are still ahead year-to-date. Small cap stocks outperformed their larger counterparts.

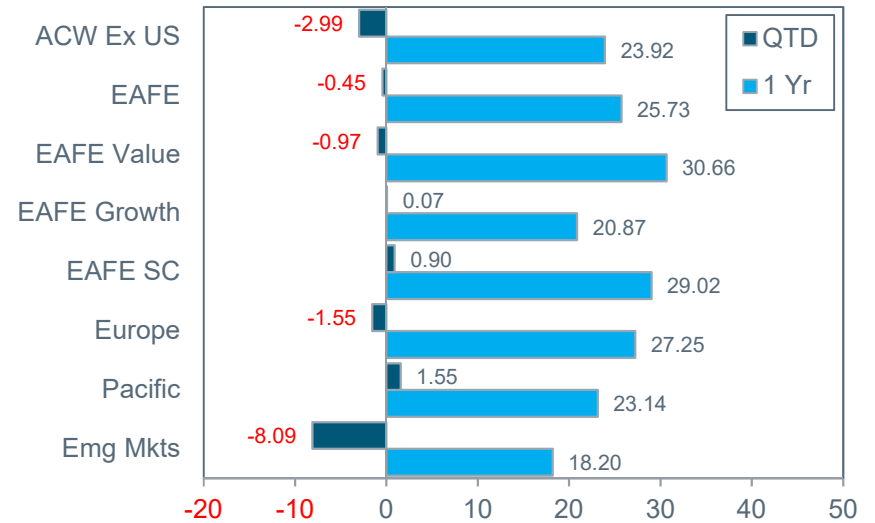
Emerging Markets

Unlike developed markets, emerging markets experienced significant negative absolute returns in Q3 driven by market volatility in China. Subsequently, value stocks outperformed growth and small cap stocks outperformed large.

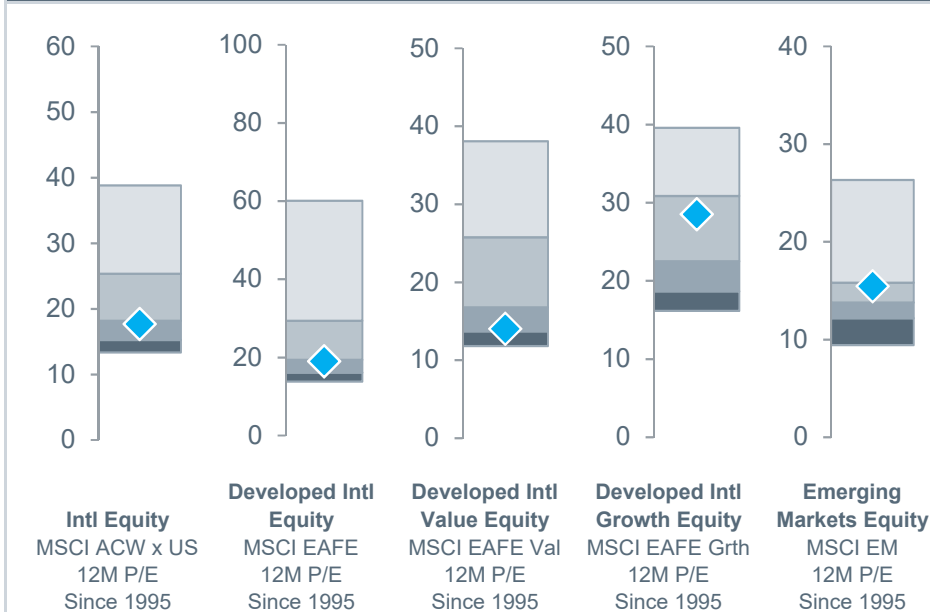
Market Cap & Style

In international markets, growth stocks outperformed value, while small-cap stocks outperformed large-cap. In emerging markets, value stocks outperformed growth, while small-cap stocks outperformed large-cap.

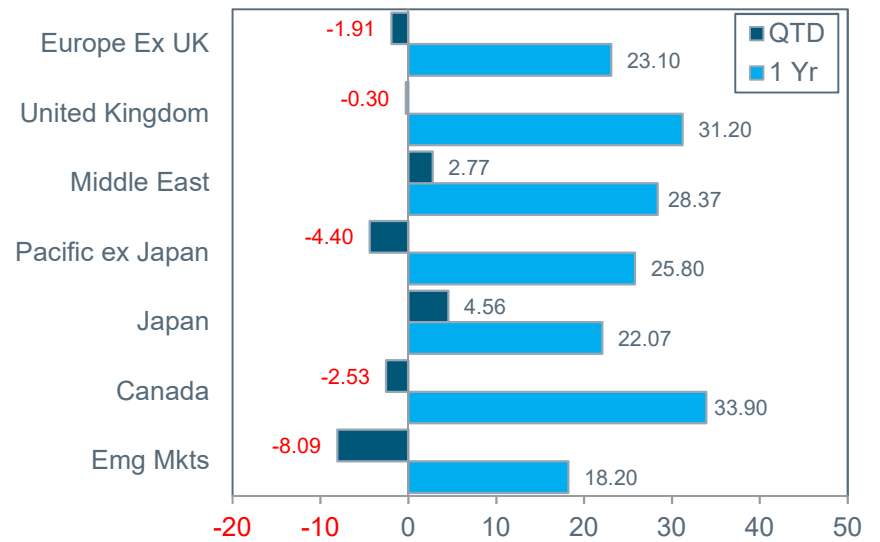
MSCI Style and Capitalization Market Performance (%)



Valuations



MSCI Region Performance (%)



Valuation data courtesy of Bloomberg Professional Service.

P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.

All returns are shown net of foreign taxes on dividends.

Third Quarter Review

**Broad Market**

The Bloomberg US Aggregate Index was flat, finishing with returns of 0.1% in Q3, while remaining down -1.6% year-to-date. Treasury yields rose in Q3 in light of inflation concerns sparked by supply chain constraints and sustained economic growth. Speculation over the timing of Federal Reserve tapering was also a contributing factor to the slight move in rates.

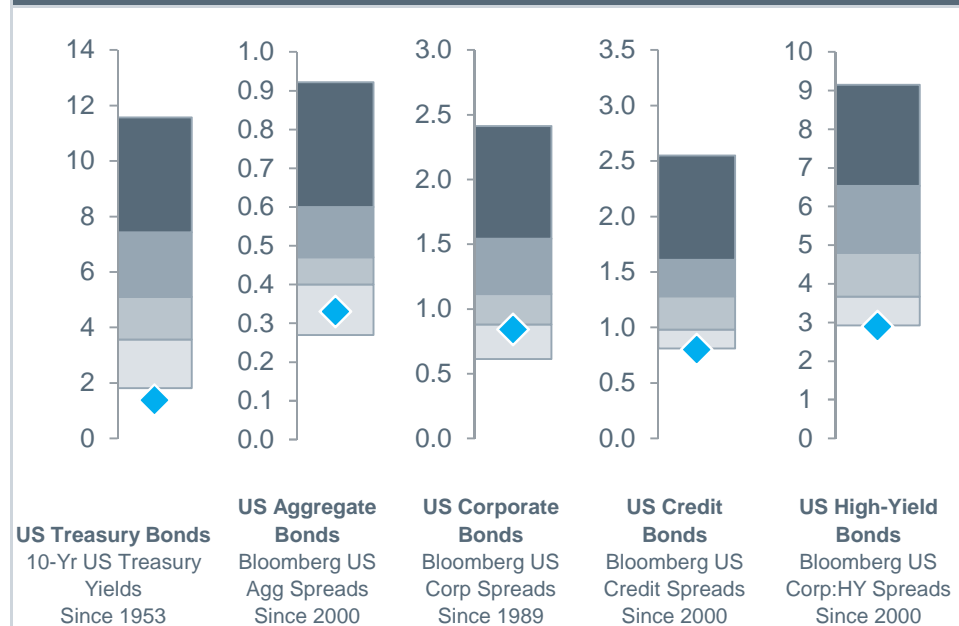
**Credit Market**

Low-rated debt remained a source of outperformance in a market starved for yield. The Bloomberg US Credit Index was flat, returning 0.0% QTD with BBB-rated debt marginally outperforming higher-rated debt. In contrast, the Bloomberg US High Yield Index returned 0.9% in Q3 with the Credit Suisse Leveraged Loan Index returned 1.1%.

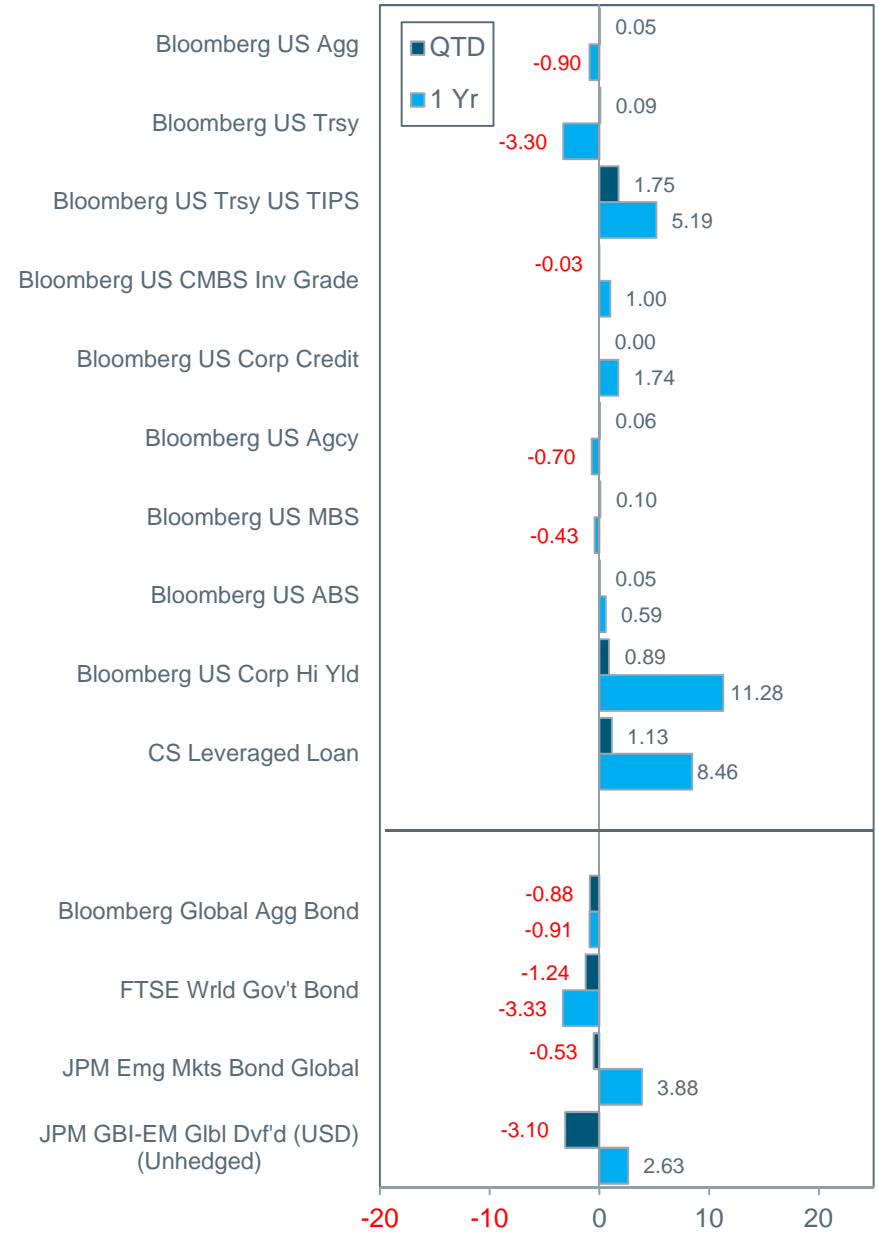
**Emerging Market Debt**

Emerging markets corporate debt continued to outpace local currency and hard currency sovereign debt, with local currency being a laggard in part due to a strengthening US dollar.

Valuations



Fixed Income Performance (%)



Valuation data courtesy of Bloomberg Professional Service. Valuations shown represent the 5th through 95th percentiles to minimize the effect of outliers.



**Third Quarter Review - Absolute Return**

**General Market - Hedge Funds**

After a strong first half of the year, hedge fund returns moderated during Q3, with the HFRI Fund Weighted Composite Index finishing the quarter roughly flat. The Asset Weighted composite, which relies far less heavily on directional long/short equity strategies, produced a modest gain of 0.03% in Q3. Hedged equity strategies, which had led the way in the first half of 2021, captured some of the downside, finishing the quarter with a -0.9% return according to the HFRI Equity Hedge Index.

**General Market - Global Tactical Asset Allocation (GTAA)**

Global Tactical Asset Allocation strategies that RVK follows closely generated disparate results in Q3. The top performing long-biased GTAA strategies incorporated inflation protection subcomponents, particularly in energy commodities, which continued to reward investors. These long-biased strategies also produced differentiated results compared to the modest performance of a less diversified blended benchmark of 60% US equity and 40% US fixed income.

**Third Quarter Review - Real Assets**

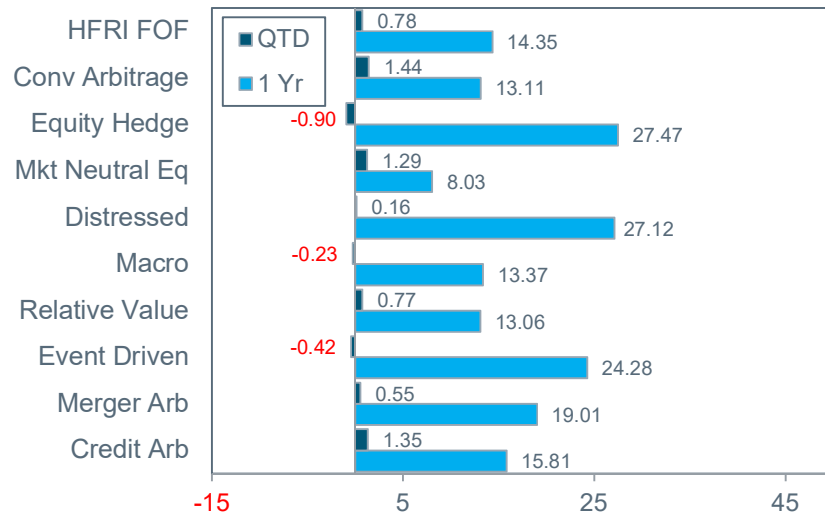
**General Market - Diversified Inflation Strategies (DIS)**

Diversified Inflation Strategies that RVK follows closely continued to generate strong positive absolute performance. Managers with higher commodities and TIPS exposures posted the strongest positive absolute returns. Commodities led the way, with the Bloomberg Commodity Index posting a 6.6% return, largely driven by gains in energy. Inflation, as measured by the year-over-year change in Headline CPI, was reported as 5.4% for September, a significant increase from 2.6% at the end of Q1.

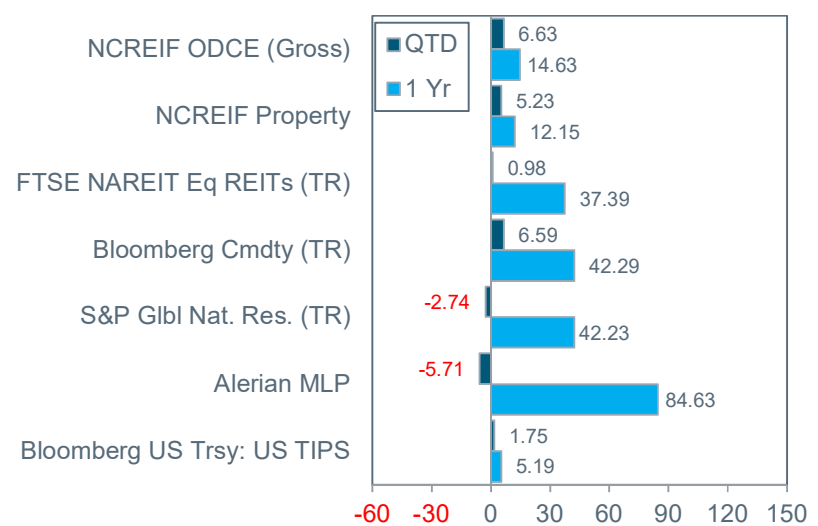
**General Market - Real Estate**

Core private real estate generated a positive 6.6% return in Q3, as reported by the NFI-ODCE Index, with the total return comprising of 1.0% income and 5.6% price appreciation. While the income return continues to trend in line with historical levels, price appreciation exceeded expectations and previous levels, such as the 2.6% return recorded in Q2. Investors in publicly traded real estate underperformed their private market counterparts.

**HFRI Hedge Fund Performance (%)**



**Real Asset Performance (%)**



Annual Asset Class Performance

As of September 30, 2021

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD
Best	39.38	8.44	78.51	27.94	22.49	20.00	38.82	30.14	15.02	21.31	37.28	8.35	31.49	19.96	29.13
	16.23	5.24	58.21	26.85	15.99	18.23	32.39	19.31	9.59	17.13	33.01	1.87	26.00	18.40	23.15
	15.97	2.06	46.78	22.04	13.56	18.06	29.30	13.69	3.20	11.96	25.03	0.01	25.53	18.31	15.92
	11.63	-2.35	31.78	18.88	8.29	17.32	22.78	12.50	1.38	11.77	21.83	-1.26	24.96	16.12	13.15
	11.17	-10.01	28.01	16.83	7.84	16.35	13.94	5.97	0.55	11.19	14.65	-2.08	22.01	13.28	12.41
	10.25	-21.37	27.17	16.36	4.98	16.00	8.96	4.89	0.05	9.27	13.79	-3.14	19.59	12.34	10.02
	6.97	-26.16	26.46	15.12	2.11	15.81	7.69	4.03	-0.27	8.77	10.71	-4.02	18.44	10.99	9.40
	6.60	-30.43	25.94	15.06	1.81	12.71	7.44	3.64	-0.81	8.52	7.77	-4.38	17.21	10.88	8.35
	5.86	-33.79	18.91	14.41	0.10	10.94	2.47	3.37	-1.44	6.67	7.62	-4.62	14.32	7.82	5.77
	5.49	-35.65	11.47	10.16	-4.13	8.78	0.07	2.45	-1.99	4.68	7.50	-4.68	8.72	7.51	4.53
	5.00	-37.00	11.41	7.75	-5.72	6.98	-2.02	0.04	-3.30	2.65	5.23	-11.01	8.43	7.11	3.51
	1.87	-37.74	5.93	6.54	-12.14	4.79	-2.60	-2.19	-4.41	2.18	3.54	-11.25	8.39	1.19	0.04
	1.45	-43.38	1.92	6.31	-13.32	4.21	-8.61	-4.90	-4.47	1.00	3.01	-13.79	7.69	0.67	-1.25
	-1.57	-47.01	0.21	5.70	-15.94	0.11	-8.83	-4.95	-14.92	0.51	1.70	-14.58	5.34	-3.12	-1.56
Worst	-15.70	-53.33	-29.76	0.13	-18.42	-1.06	-9.52	-17.01	-24.66	0.33	0.86	-17.89	2.28	-8.00	-4.57

VSTRS	S&P 500 - US Large Cap	R 2000 - US Small Cap	MSCI EAFE (Net) - Int'l Dev.	MSCI EAFE SC (Net) - Int'l SC	MSCI EM (Net) - Int'l Emg Mkts	Bloombrg US Agg Bond - FI	Bloombrg US Corp Hi Yield - FI	Bloombrg US Trsy US TIPS - FI	Bloombrg US Gov Credit Lng - FI	NCREIF ODCE (Gross) - Real Estate	FTSE NAREIT Eq REITs Index (TR)	HFRI FOF Comp Index - ARS	Bloombrg Cmdty (TR) - Commod.	ICE BofAML 3 Mo T-Bill - Cash Equiv
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NCREIF ODCE (Gross) performance is reported quarterly; performance is shown N/A in interim-quarter months.

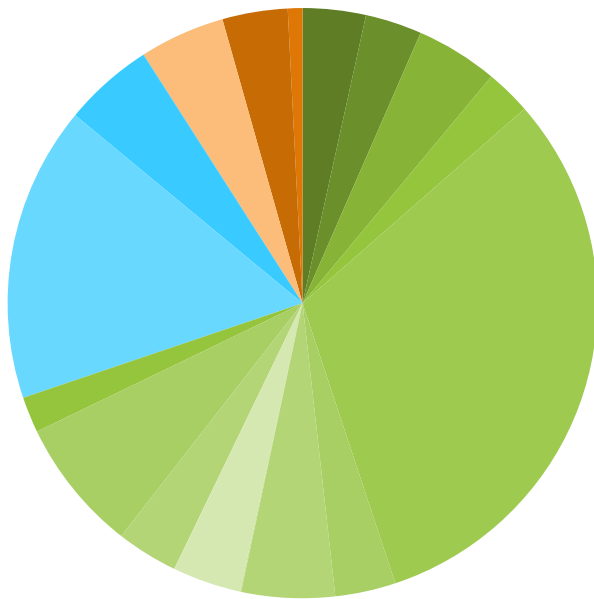


# VSTRS





September 30, 2021 : \$2,544,185,522



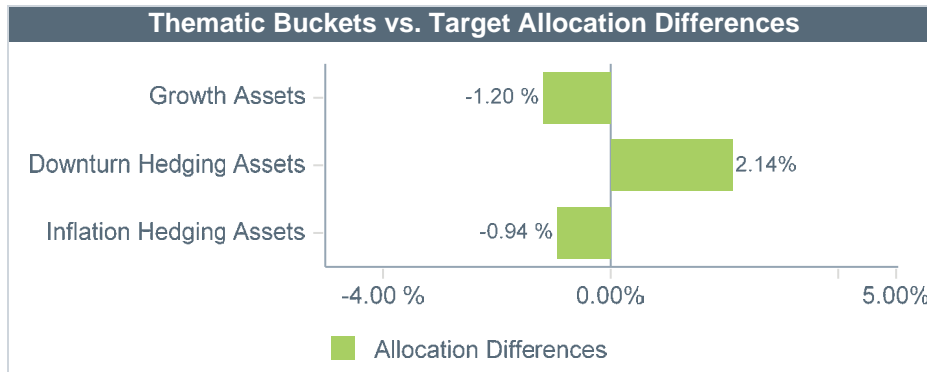
	Market Value (\$)	Allocation (%)
Blackrock S&P 500 (EqI Wtd) (CF)	87,979,380	3.46
Champlain US Mid Cap Core (SA)	78,839,797	3.10
SSgA Russell 2000 Growth (Ex Tobacco) (SA)	6,240	0.00
Acadian International All Cap (SA)	114,450,841	4.50
Mondrian International Equity (SA)	63,600,525	2.50
BlackRock MSCI ACW IMI (CF)	797,614,745	31.35
Blackrock MSCI World LCTR (SA)	84,450,145	3.32
Artisan Global Opportunities (CF)	130,043,646	5.11
PIMCO Liquidation (SA)	1,756,030	0.07
Wellington Opportunistic EMD (CF)	94,978,829	3.73
PIMCO Unconstrained (SA)	484,760	0.02
Private Debt	85,771,391	3.37
Private Equity	186,002,889	7.31
Non-Core Real Estate	49,974,216	1.96
BlackRock US Agg (CF)	411,890,468	16.19
PIMCO Core (SA)	125,490,342	4.93
Vermont Cash (SA)	414,690	0.02
BlackRock TIPS (CF)	119,134,499	4.68
UBS Trumbull Properties (CF)	90,949,107	3.57
Private Infrastructure/Land	20,352,520	0.80
Real Estate Cash (CF)	463	0.00

Allocations shown may not sum up to 100% exactly due to rounding. Market values for SSgA Russell 2000 Growth (SA) and PIMCO Unconstrained (SA) represent residual assets after liquidation.

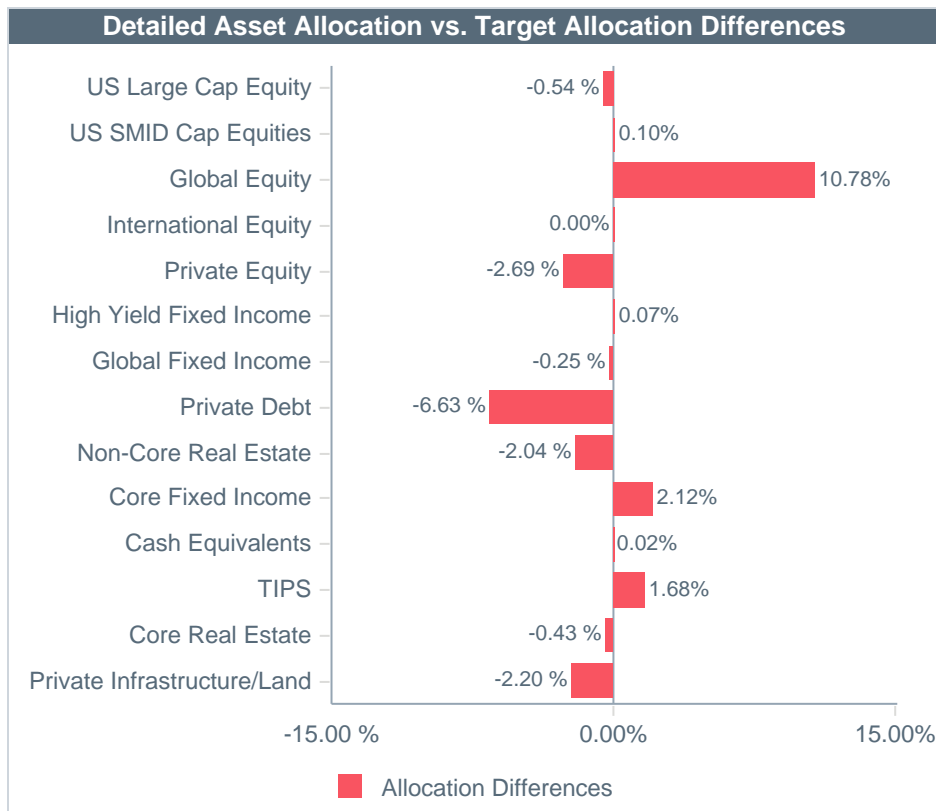
Vermont State Teachers' Retirement System  
 Total Fund  
 Asset Allocation vs. Target Allocation

As of September 30, 2021

Thematic Buckets vs. Target Allocation			
	Market Value (\$)	Allocation (%)	Target (%)
Growth Assets	1,775,953,434	69.80	71.00
Downturn Hedging Assets	537,795,500	21.14	19.00
Inflation Hedging Assets	230,436,589	9.06	10.00
<b>Total Fund</b>	<b>2,544,185,522</b>	<b>100.00</b>	<b>100.00</b>



Detailed Asset Allocation vs. Target Allocation			
	Market Value (\$)	Allocation (%)	Target (%)
US Large Cap Equity	87,979,380	3.46	4.00
US SMID Cap Equities	78,846,037	3.10	3.00
Global Equity	1,012,108,535	39.78	29.00
International Equity	178,051,367	7.00	7.00
Private Equity	186,002,889	7.31	10.00
High Yield Fixed Income	1,756,030	0.07	0.00
Global Fixed Income	95,463,589	3.75	4.00
Private Debt	85,771,391	3.37	10.00
Non-Core Real Estate	49,974,216	1.96	4.00
Core Fixed Income	537,380,810	21.12	19.00
Cash Equivalents	414,690	0.02	0.00
TIPS	119,134,499	4.68	3.00
Core Real Estate	90,949,570	3.57	4.00
Private Infrastructure/Land	20,352,520	0.80	3.00
<b>Total Fund</b>	<b>2,544,185,522</b>	<b>100.00</b>	<b>100.00</b>

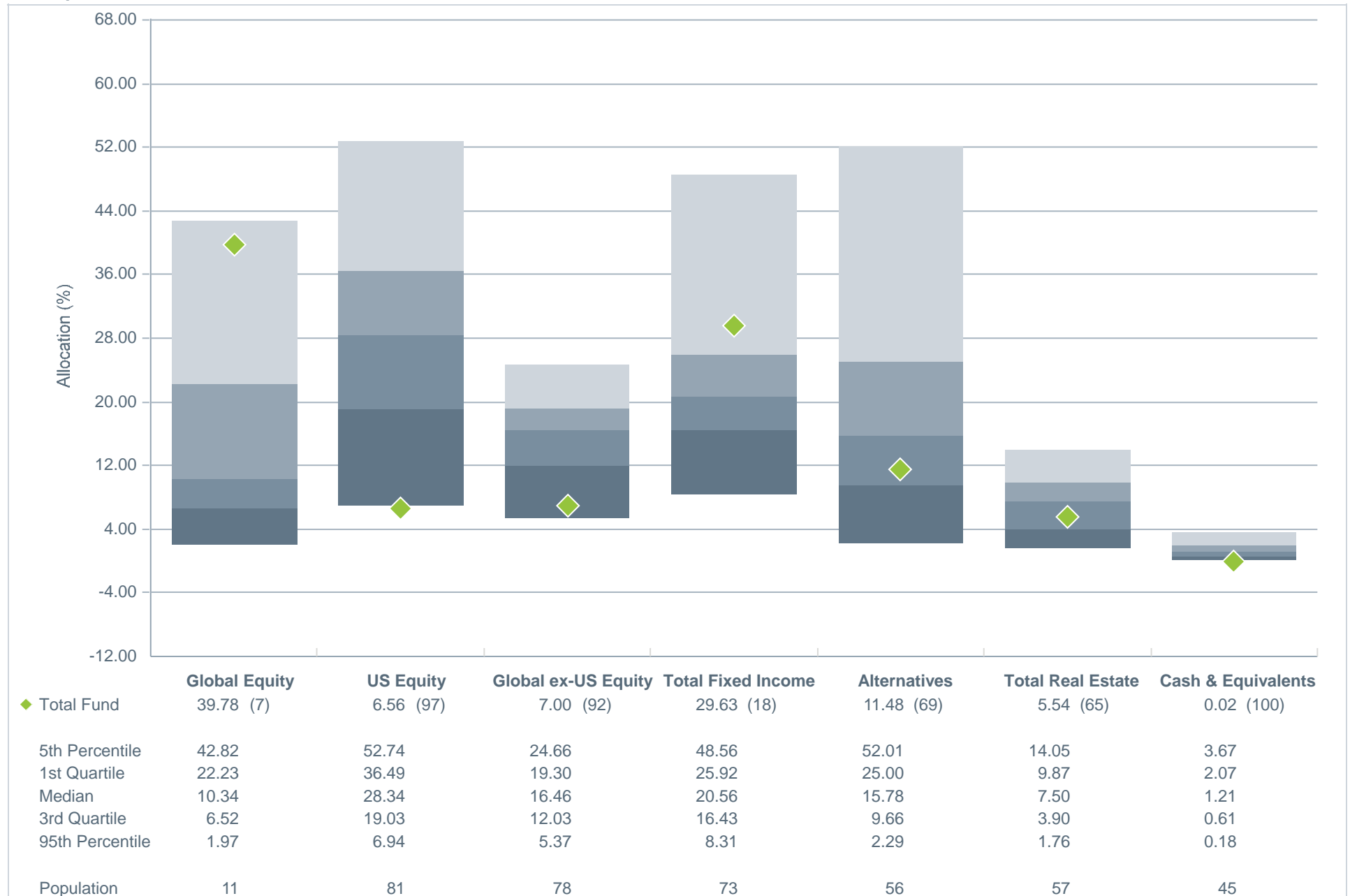


Allocations shown may not sum up to 100% exactly due to rounding.



Vermont State Teachers' Retirement System  
 All Public Plans (\$1B to \$10B) (Custom PG)  
 Plan Sponsor TF Asset Allocation

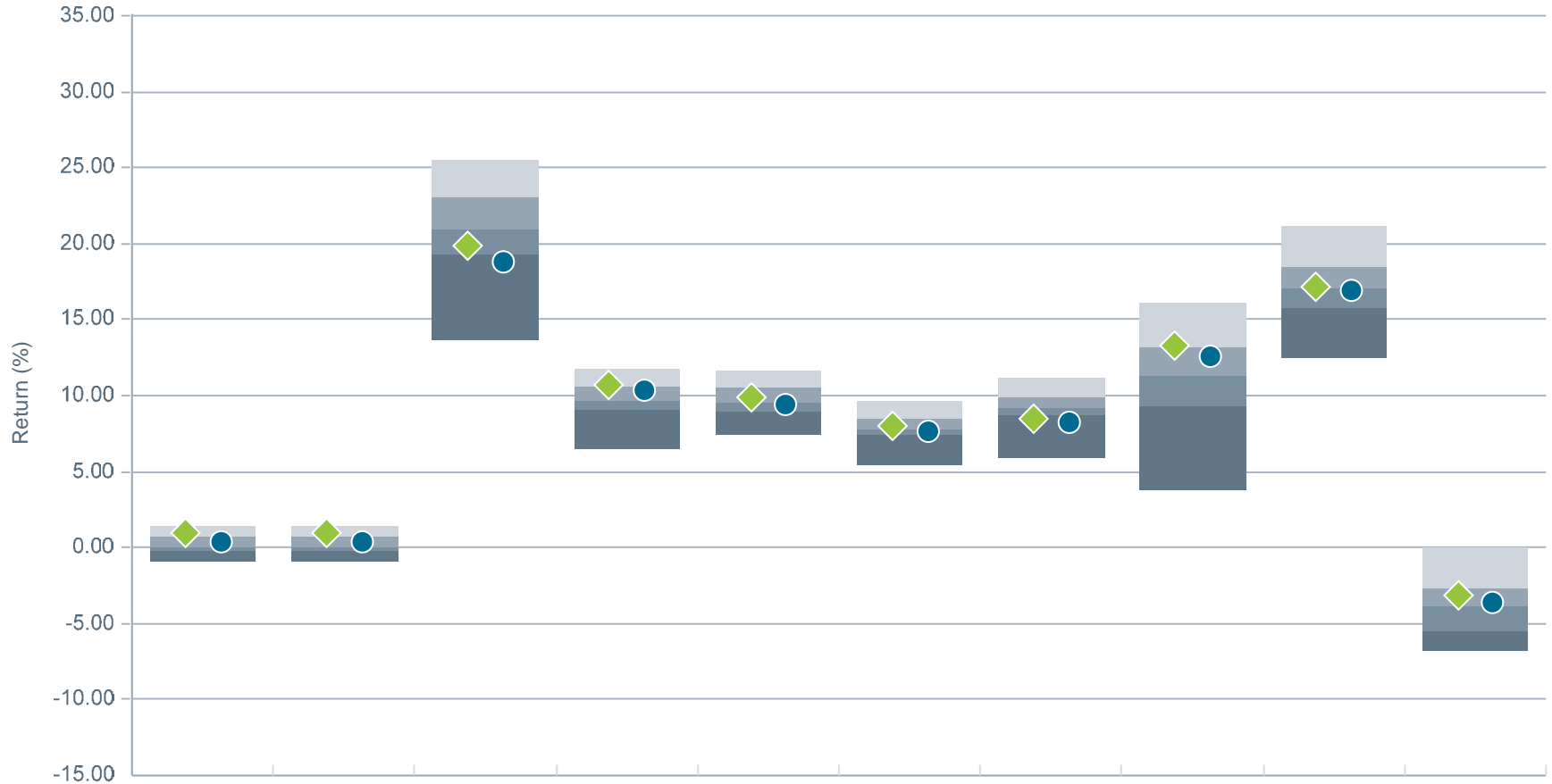
As of September 30, 2021



Parentheses contain percentile ranks. Total Fixed Income includes TIPS.

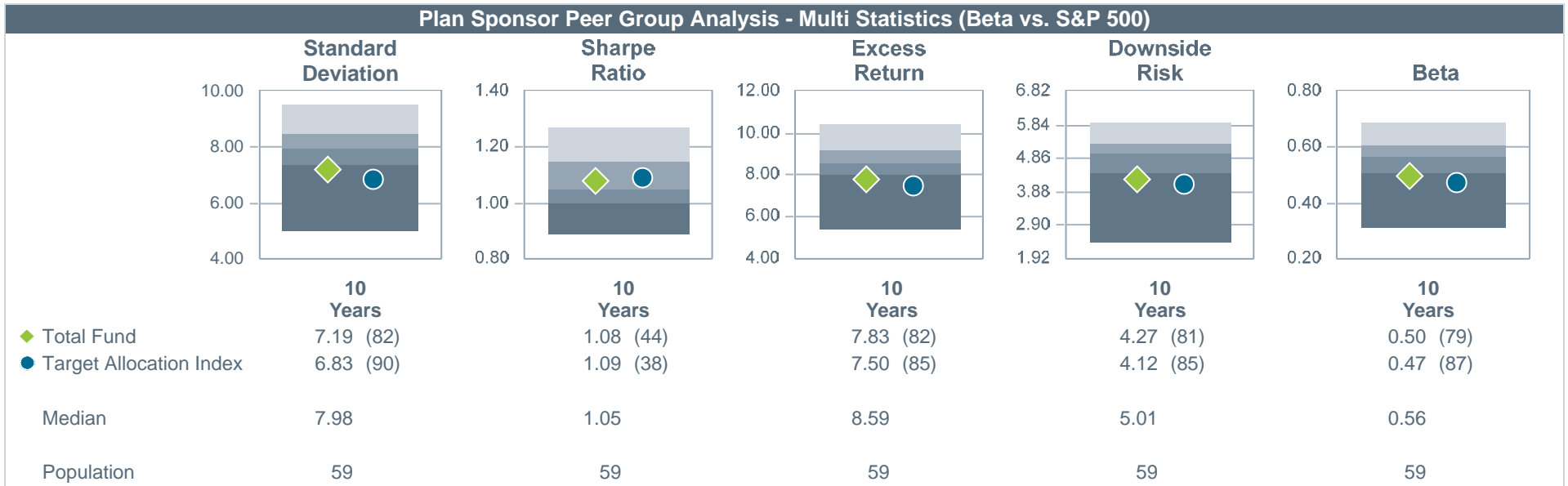
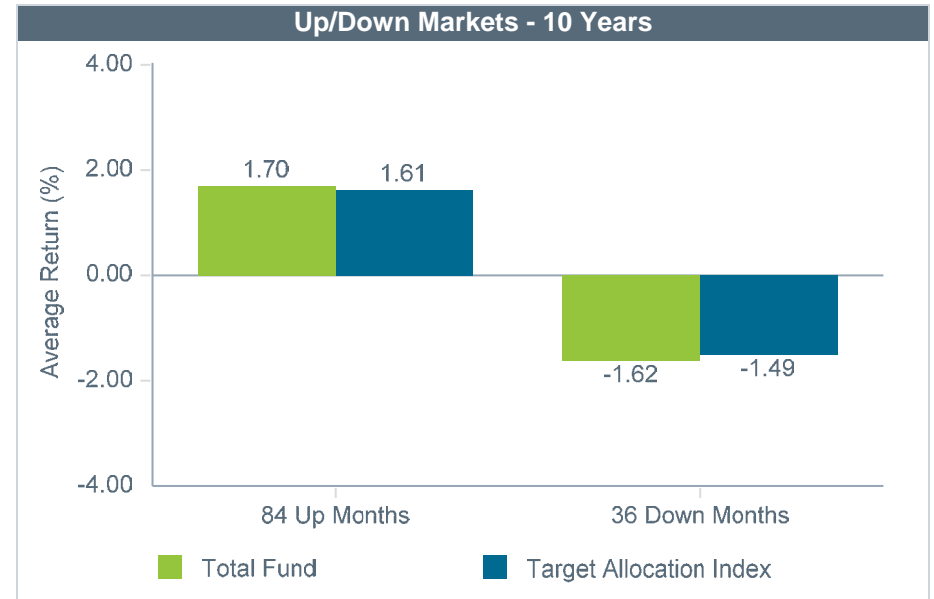
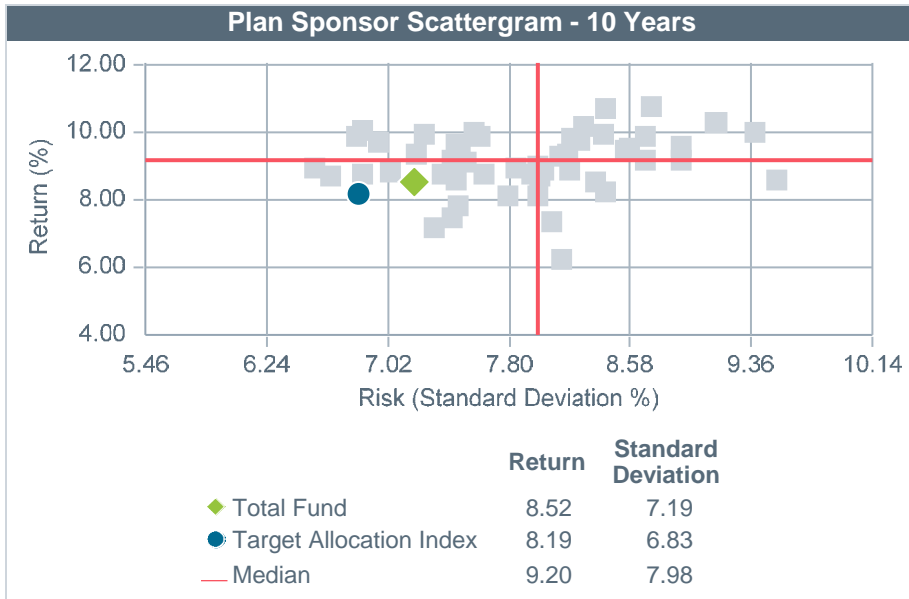
Vermont State Teachers' Retirement System  
 All Public Plans (\$1B to \$10B) (Custom PG)  
 Plan Sponsor Peer Group Analysis

As of September 30, 2021



	QTD	FYTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018
◆ Total Fund	0.92 (22)	0.92 (22)	19.88 (70)	10.66 (25)	9.91 (36)	7.97 (39)	8.52 (82)	13.28 (23)	17.21 (48)	-3.14 (39)
● Target Allocation Index	0.38 (35)	0.38 (35)	18.82 (84)	10.38 (32)	9.42 (59)	7.69 (61)	8.19 (84)	12.55 (35)	16.91 (55)	-3.63 (48)
5th Percentile	1.41	1.41	25.45	11.75	11.70	9.68	11.17	16.06	21.14	0.05
1st Quartile	0.78	0.78	23.02	10.64	10.57	8.53	9.91	13.19	18.43	-2.67
Median	0.07	0.07	20.89	9.70	9.57	7.79	9.20	11.23	17.09	-3.80
3rd Quartile	-0.25	-0.25	19.29	9.10	8.99	7.40	8.70	9.32	15.77	-5.54
95th Percentile	-0.86	-0.86	13.61	6.47	7.41	5.37	5.87	3.73	12.41	-6.78
Population	72	72	72	67	65	63	59	90	82	58

Performance shown is net of fees. Parentheses contain percentile ranks.



Performance shown is net of fees. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

Vermont State Teachers' Retirement System  
Asset Allocation & Performance - Net of Fees

As of September 30, 2021

	Allocation		Performance (%)									
	Market Value (\$)	Actual (%)	QTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years	2020	Since Incep.	Inception Date
<b>Total Fund</b>	<b>2,544,185,522</b>	<b>100.00</b>	<b>0.92</b>	<b>0.92</b>	<b>19.88</b>	<b>10.66</b>	<b>9.91</b>	<b>8.52</b>	<b>6.23</b>	<b>13.28</b>	<b>6.62</b>	<b>07/01/2005</b>
Target Allocation Index			0.38	0.38	18.82	10.38	9.42	8.19	6.30	12.55	6.67	
Difference			0.54	0.54	1.06	0.28	0.49	0.33	-0.07	0.73	-0.05	
Actual Allocation Index			-0.11	-0.11	19.24	9.70	9.10	7.95	5.97	11.90	6.37	
Difference			1.03	1.03	0.64	0.96	0.81	0.57	0.26	1.38	0.25	
<b>Growth Assets</b>	<b>1,775,953,434</b>	<b>69.80</b>	<b>1.11</b>	<b>1.11</b>	<b>30.00</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>25.67</b>	<b>09/01/2020</b>
MSCI ACW IM Index (USD) (Net)			-1.11	-1.11	28.92	12.38	13.06	11.96	7.37	16.25	22.80	
Difference			2.22	2.22	1.08	-	-	-	-	-	2.87	
<b>Downturn Hedging Assets</b>	<b>537,795,500</b>	<b>21.14</b>	<b>0.06</b>	<b>0.06</b>	<b>-0.76</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-0.71</b>	<b>09/01/2020</b>
Bloomberg US Agg Bond Index			0.05	0.05	-0.90	5.35	2.94	3.01	4.17	7.51	-0.88	
Difference			0.01	0.01	0.14	-	-	-	-	-	0.17	
<b>Inflation Hedging Assets</b>	<b>230,436,589</b>	<b>9.06</b>	<b>1.94</b>	<b>1.94</b>	<b>2.86</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2.50</b>	<b>09/01/2020</b>
Consumer Price Index+2.5%			1.59	1.59	8.02	5.38	5.15	4.46	4.58	3.90	7.73	
Difference			0.35	0.35	-5.16	-	-	-	-	-	-5.23	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Manager inception dates shown represent the first full month of available performance. Fiscal year ends 6/30. Please see addendum for custom benchmark definitions. Private Asset market values and performance are lagged to match custodian reported net asset values. Accordingly, fund reported performance will lag benchmark reported performance.

Vermont State Teachers' Retirement System  
Asset Allocation & Performance - Net of Fees

As of September 30, 2021

	Allocation			Performance (%)									
	Market Value (\$)	Actual (%)	Policy (%)	QTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years	2020	Since Incep.	Inception Date
<b>Total Fund</b>	<b>2,544,185,522</b>	<b>100.00</b>	<b>100.00</b>	<b>0.92</b>	<b>0.92</b>	<b>19.88</b>	<b>10.66</b>	<b>9.91</b>	<b>8.52</b>	<b>6.23</b>	<b>13.28</b>	<b>6.62</b>	<b>07/01/2005</b>
Target Allocation Index				0.38	0.38	18.82	10.38	9.42	8.19	6.30	12.55	6.67	
Difference				0.54	0.54	1.06	0.28	0.49	0.33	-0.07	0.73	-0.05	
Actual Allocation Index				-0.11	-0.11	19.24	9.70	9.10	7.95	5.97	11.90	6.37	
Difference				1.03	1.03	0.64	0.96	0.81	0.57	0.26	1.38	0.25	
All Public Plans (\$1B to \$10B)				0.07	0.07	20.89	9.70	9.57	9.20	6.61	11.23	6.86	
Rank				22	22	70	25	36	82	74	23	74	
<b>Domestic Equity</b>	<b>166,825,416</b>	<b>6.56</b>	<b>7.00</b>	<b>0.22</b>	<b>0.22</b>	<b>39.88</b>	<b>14.11</b>	<b>15.47</b>	<b>16.08</b>	<b>-</b>	<b>19.22</b>	<b>13.67</b>	<b>01/01/2011</b>
Russell 3000 Index				-0.10	-0.10	31.88	16.00	16.85	16.60	10.44	20.89	14.25	
Difference				0.32	0.32	8.00	-1.89	-1.38	-0.52	-	-1.67	-0.58	
<b>US Large Cap Equity</b>	<b>87,979,380</b>	<b>3.46</b>	<b>4.00</b>	<b>-0.29</b>	<b>-0.29</b>	<b>40.70</b>	<b>12.41</b>	<b>14.44</b>	<b>15.55</b>	<b>10.00</b>	<b>13.03</b>	<b>10.11</b>	<b>07/01/2005</b>
S&P 500 Index (Cap Wtd)				0.58	0.58	30.00	15.99	16.90	16.63	10.37	18.40	10.46	
Difference				-0.87	-0.87	10.70	-3.58	-2.46	-1.08	-0.37	-5.37	-0.35	
<b>Blackrock S&amp;P 500 (Eq Wtd) (CF)</b>	<b>87,979,380</b>	<b>3.46</b>	<b>-</b>	<b>-0.29</b>	<b>-0.29</b>	<b>40.70</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>13.03</b>	<b>18.14</b>	<b>07/01/2019</b>
S&P 500 Index (Eq Wtd)				-0.22	-0.22	40.87	14.29	14.61	15.99	10.67	12.83	18.13	
Difference				-0.07	-0.07	-0.17	-	-	-	-	0.20	0.01	
IM U.S. Large Cap Equity (MF) Median				0.05	0.05	28.72	15.45	16.19	15.73	9.83	18.34	20.02	
Rank				63	63	8	-	-	-	-	64	59	
<b>US SMID Cap Equities</b>	<b>78,846,037</b>	<b>3.10</b>	<b>3.00</b>	<b>0.83</b>	<b>0.83</b>	<b>37.84</b>	<b>15.67</b>	<b>16.85</b>	<b>16.87</b>	<b>11.31</b>	<b>27.32</b>	<b>10.85</b>	<b>07/01/2005</b>
Russell 2500 Index				-2.68	-2.68	45.03	12.47	14.25	15.27	10.01	19.99	10.10	
Difference				3.51	3.51	-7.19	3.20	2.60	1.60	1.30	7.33	0.75	
<b>Champlain US Mid Cap Core (SA)</b>	<b>78,839,797</b>	<b>3.10</b>	<b>-</b>	<b>0.82</b>	<b>0.82</b>	<b>37.84</b>	<b>15.67</b>	<b>17.62</b>	<b>17.24</b>	<b>-</b>	<b>27.32</b>	<b>15.86</b>	<b>10/01/2009</b>
Custom SMID Cap Equity Index				-2.63	-2.63	47.33	11.75	14.15	15.17	9.94	19.99	13.67	
Difference				3.45	3.45	-9.49	3.92	3.47	2.07	-	7.33	2.19	
IM U.S. SMID Cap Equity (MF) Median				-1.79	-1.79	41.86	11.95	14.62	14.67	10.24	20.27	13.69	
Rank				13	13	61	30	30	24	-	41	23	
<b>Global Equity</b>	<b>1,012,108,535</b>	<b>39.78</b>	<b>29.00</b>	<b>-0.66</b>	<b>-0.66</b>	<b>28.11</b>	<b>12.85</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>19.89</b>	<b>8.45</b>	<b>02/01/2018</b>
MSCI ACW IM Index (USD) (Net)				-1.11	-1.11	28.92	12.38	13.06	11.96	7.37	16.25	9.53	
Difference				0.45	0.45	-0.81	0.47	-	-	-	3.64	-1.08	

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	Allocation			Performance (%)									
	Market Value (\$)	Actual (%)	Policy (%)	QTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years	2020	Since Incep.	Inception Date
<b>BlackRock MSCI ACW IMI (CF)</b>	<b>797,614,745</b>	<b>31.35</b>	<b>-</b>	<b>-1.03</b>	<b>-1.03</b>	<b>29.51</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16.77</b>	<b>16.99</b>	<b>07/01/2019</b>
MSCI ACW IM Index (USD) (Net)				-1.11	-1.11	28.92	12.38	13.06	11.96	7.37	16.25	16.50	
Difference				0.08	0.08	0.59	-	-	-	-	0.52	0.49	
IM Global Equity (MF) Median				-1.15	-1.15	26.61	11.90	11.93	11.62	7.23	15.21	16.01	
Rank				49	49	35	-	-	-	-	44	47	
<b>Blackrock MSCI World LCTR (SA)</b>	<b>84,450,145</b>	<b>3.32</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-4.24</b>	<b>09/01/2021</b>
MSCI Wrld Index (USD) (Net)				-0.01	-0.01	28.82	13.14	13.74	12.68	7.47	15.90	-4.15	
Difference				-	-	-	-	-	-	-	-	-0.09	
IM Global Equity (MF) Median				-0.59	-0.84	28.20	13.13	13.31	12.92	8.29	16.28	-4.16	
Rank				-	-	-	-	-	-	-	-	55	
<b>Artisan Global Opportunities (CF)</b>	<b>130,043,646</b>	<b>5.11</b>	<b>-</b>	<b>2.01</b>	<b>2.01</b>	<b>20.66</b>	<b>20.87</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>40.50</b>	<b>20.40</b>	<b>07/01/2018</b>
MSCI ACW Index (USD) (Net)				-1.05	-1.05	27.44	12.58	13.20	11.90	7.21	16.25	13.00	
Difference				3.06	3.06	-6.78	8.29	-	-	-	24.25	7.40	
IM Global Equity (MF) Median				-1.15	-1.15	26.61	11.90	11.93	11.62	7.23	15.21	12.31	
Rank				6	6	77	10	-	-	-	14	10	
<b>International Equity</b>	<b>178,051,367</b>	<b>7.00</b>	<b>7.00</b>	<b>-2.20</b>	<b>-2.20</b>	<b>28.46</b>	<b>7.50</b>	<b>8.53</b>	<b>7.55</b>	<b>-</b>	<b>4.84</b>	<b>5.63</b>	<b>01/01/2011</b>
MSCI EAFE Index (USD) (Net)				-0.45	-0.45	25.73	7.62	8.81	8.10	4.10	7.82	5.90	
Difference				-1.75	-1.75	2.73	-0.12	-0.28	-0.55	-	-2.98	-0.27	
<b>Acadian International All Cap (SA)</b>	<b>114,450,841</b>	<b>4.50</b>	<b>-</b>	<b>-2.71</b>	<b>-2.71</b>	<b>27.10</b>	<b>8.03</b>	<b>11.19</b>	<b>10.53</b>	<b>4.89</b>	<b>12.37</b>	<b>6.45</b>	<b>11/01/2005</b>
MSCI EAFE IM Index (USD) (Net)				-0.24	-0.24	26.23	7.83	9.04	8.45	4.41	8.47	5.50	
Difference				-2.47	-2.47	0.87	0.20	2.15	2.08	0.48	3.90	0.95	
IM All EAFE (MF) Median				-1.23	-1.23	24.53	7.31	8.29	8.04	3.99	8.17	5.11	
Rank				82	82	27	43	15	9	29	33	18	
<b>Mondrian International Equity (SA)</b>	<b>63,600,525</b>	<b>2.50</b>	<b>-</b>	<b>-1.28</b>	<b>-1.28</b>	<b>30.97</b>	<b>4.68</b>	<b>6.42</b>	<b>6.61</b>	<b>3.74</b>	<b>-4.01</b>	<b>5.23</b>	<b>07/01/2005</b>
MSCI EAFE Index (USD) (Net)				-0.45	-0.45	25.73	7.62	8.81	8.10	4.10	7.82	5.54	
Difference				-0.83	-0.83	5.24	-2.94	-2.39	-1.49	-0.36	-11.83	-0.31	
IM All EAFE (MF) Median				-1.23	-1.23	24.53	7.31	8.29	8.04	3.99	8.17	5.45	
Rank				51	51	14	82	79	84	57	98	59	
<b>Fixed Income</b>	<b>634,600,429</b>	<b>24.94</b>	<b>23.00</b>	<b>-0.03</b>	<b>-0.03</b>	<b>-0.01</b>	<b>5.28</b>	<b>3.71</b>	<b>4.13</b>	<b>-</b>	<b>8.23</b>	<b>4.32</b>	<b>01/01/2011</b>
Bloomberg US Agg Bond Index				0.05	0.05	-0.90	5.35	2.94	3.01	4.17	7.51	3.42	
Difference				-0.08	-0.08	0.89	-0.07	0.77	1.12	-	0.72	0.90	

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<b>Core Fixed Income</b>	<b>537,380,810</b>	<b>21.12</b>	<b>20.00</b>	<b>0.07</b>	<b>0.07</b>	<b>-0.76</b>	-	-	-	-	-	<b>-0.71</b>	<b>09/01/2020</b>
Bloomberg US Agg Bond Index				0.05	0.05	-0.90	5.35	2.94	3.01	4.17	7.51	-0.88	
Difference				0.02	0.02	0.14	-	-	-	-	-	0.17	
<b>BlackRock US Agg (CF)</b>	<b>411,890,468</b>	<b>16.19</b>	<b>-</b>	<b>0.07</b>	<b>0.07</b>	<b>-0.86</b>	-	-	-	-	<b>7.54</b>	<b>3.94</b>	<b>06/01/2019</b>
Bloomberg US Agg Bond Index				0.05	0.05	-0.90	5.35	2.94	3.01	4.17	7.51	4.08	
Difference				0.02	0.02	0.04	-	-	-	-	0.03	-0.14	
IM U.S. Broad Mkt Core FI (MF)				0.03	0.03	0.18	5.58	3.17	3.26	4.15	8.19	4.57	
Rank				39	39	81	-	-	-	-	71	79	
<b>PIMCO Core (SA)</b>	<b>125,490,342</b>	<b>4.93</b>	<b>-</b>	<b>0.04</b>	<b>0.04</b>	<b>-0.32</b>	-	-	-	-	-	<b>-0.18</b>	<b>09/01/2020</b>
Bloomberg US Agg Bond Index				0.05	0.05	-0.90	5.35	2.94	3.01	4.17	7.51	-0.88	
Difference				-0.01	-0.01	0.58	-	-	-	-	-	0.70	
IM U.S. Broad Mkt Core FI (MF)				0.03	0.03	0.18	5.58	3.17	3.26	4.15	8.19	0.10	
Rank				47	47	67	-	-	-	-	-	61	
<b>Emerging Markets Debt</b>	<b>94,978,829</b>	<b>3.73</b>	<b>4.00</b>	<b>-0.58</b>	<b>-0.58</b>	<b>4.16</b>	-	-	-	-	-	<b>2.07</b>	<b>09/01/2020</b>
JPM Emg Mkts Bond Gbl Index (USD)				-0.53	-0.53	3.88	5.64	3.57	5.48	6.25	5.88	1.99	
Difference				-0.05	-0.05	0.28	-	-	-	-	-	0.08	
<b>Wellington Opportunistic EMD (CF)</b>	<b>94,978,829</b>	<b>3.73</b>	<b>-</b>	<b>-0.58</b>	<b>-0.58</b>	<b>4.16</b>	<b>5.98</b>	<b>4.27</b>	<b>5.94</b>	-	<b>7.69</b>	<b>6.32</b>	<b>12/01/2009</b>
JPM Emg Mkts Bond Gbl Index (USD)				-0.53	-0.53	3.88	5.64	3.57	5.48	6.25	5.88	5.93	
Difference				-0.05	-0.05	0.28	0.34	0.70	0.46	-	1.81	0.39	
IM Emerging Markets Debt (MF) Median				-0.71	-0.71	5.55	5.48	3.70	4.81	5.22	5.57	4.99	
Rank				39	39	84	33	30	6	-	15	4	
<b>High Yield Fixed Income</b>	<b>1,756,030</b>	<b>0.07</b>	<b>0.00</b>	<b>0.34</b>	<b>0.34</b>	<b>14.20</b>	<b>4.04</b>	<b>4.29</b>	<b>5.96</b>	<b>6.19</b>	<b>3.26</b>	<b>6.23</b>	<b>06/01/2006</b>
Bloomberg US Corp Hi Yld Index				0.89	0.89	11.28	6.91	6.52	7.42	7.31	7.11	7.40	
Difference				-0.55	-0.55	2.92	-2.87	-2.23	-1.46	-1.12	-3.85	-1.17	
<b>PIMCO Liquidation (SA)</b>	<b>1,756,030</b>	<b>0.07</b>	<b>-</b>	<b>0.34</b>	<b>0.34</b>	<b>14.20</b>	<b>4.02</b>	-	-	-	<b>3.25</b>	<b>3.72</b>	<b>08/01/2018</b>
Bloomberg US Corp Hi Yld Index				0.89	0.89	11.28	6.91	6.52	7.42	7.31	7.11	6.97	
Difference				-0.55	-0.55	2.92	-2.89	-	-	-	-3.86	-3.25	
IM U.S. High Yield Bonds (MF) Median				0.67	0.67	10.49	5.87	5.50	6.39	6.03	5.28	5.93	
Rank				84	84	10	92	-	-	-	82	94	

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<b>Private Debt</b>	<b>85,771,391</b>	<b>3.37</b>	<b>10.00</b>	<b>6.57</b>	<b>6.57</b>	<b>15.84</b>	<b>7.54</b>	-	-	-	<b>2.36</b>	<b>7.65</b>	<b>01/01/2018</b>
CS Lvg'd Loan Index+2% (Spliced)				1.64	1.64	10.27	4.74	4.94	5.09	4.72	3.12	4.87	
Difference				4.93	4.93	5.57	2.80	-	-	-	-0.76	2.78	
<b>Private Equity</b>	<b>186,002,889</b>	<b>7.31</b>	<b>10.00</b>	<b>16.33</b>	<b>16.33</b>	<b>64.56</b>	<b>29.10</b>	<b>24.84</b>	-	-	<b>17.27</b>	<b>20.24</b>	<b>01/01/2013</b>
Cambridge US Prvt Eq Index				0.00	0.00	39.06	19.19	18.64	15.85	13.39	21.77	15.91	
Difference				16.33	16.33	25.50	9.91	6.20	-	-	-4.50	4.33	
<b>Non-Core Real Estate</b>	<b>49,974,216</b>	<b>1.96</b>	<b>3.00</b>	<b>0.11</b>	<b>0.11</b>	<b>14.36</b>	<b>3.92</b>	<b>7.90</b>	-	-	<b>-1.77</b>	<b>9.17</b>	<b>09/01/2014</b>
NCREIF ODCE Index+2% (Spliced)				6.93	6.93	15.38	7.73	7.45	9.30	7.30	1.60	8.84	
Difference				-6.82	-6.82	-1.02	-3.81	0.45	-	-	-3.37	0.33	
<b>Inflation Hedging Assets (Spliced)</b>	<b>230,436,589</b>	<b>9.06</b>	<b>10.00</b>	<b>1.94</b>	<b>1.94</b>	<b>2.86</b>	<b>-0.17</b>	<b>2.72</b>	<b>7.41</b>	-	<b>-2.80</b>	<b>8.42</b>	<b>01/01/2011</b>
CPI+2.5% (Spliced)				1.59	1.59	8.02	5.25	5.96	8.54	6.80	0.75	8.97	
Difference				0.35	0.35	-5.16	-5.42	-3.24	-1.13	-	-3.55	-0.55	
<b>TIPS</b>	<b>119,134,499</b>	<b>4.68</b>	<b>2.00</b>	<b>1.73</b>	<b>1.73</b>	<b>5.14</b>	-	-	-	-	-	<b>4.39</b>	<b>09/01/2020</b>
Bloomberg US Trsy US TIPS Index				1.75	1.75	5.19	7.45	4.34	3.12	4.43	10.99	4.42	
Difference				-0.02	-0.02	-0.05	-	-	-	-	-	-0.03	
<b>BlackRock TIPS (CF)</b>	<b>119,134,499</b>	<b>4.68</b>	-	<b>1.73</b>	<b>1.73</b>	<b>5.14</b>	<b>7.36</b>	<b>4.28</b>	<b>3.04</b>	-	<b>10.97</b>	<b>3.80</b>	<b>12/01/2009</b>
Bloomberg US Trsy US TIPS Index				1.75	1.75	5.19	7.45	4.34	3.12	4.43	10.99	3.85	
Difference				-0.02	-0.02	-0.05	-0.09	-0.06	-0.08	-	-0.02	-0.05	
IM U.S. TIPS (MF) Median				1.59	1.59	5.37	6.56	3.81	2.48	3.75	9.64	3.21	
Rank				28	28	59	20	26	16	-	26	11	
<b>Core Real Estate</b>	<b>90,949,570</b>	<b>3.57</b>	<b>5.00</b>	<b>2.74</b>	<b>2.74</b>	<b>1.60</b>	<b>-0.51</b>	<b>2.03</b>	<b>7.06</b>	-	<b>-2.26</b>	<b>8.09</b>	<b>01/01/2011</b>
NCREIF ODCE Index (AWA) (Net)				6.41	6.41	13.64	6.13	6.56	8.92	5.55	0.34	9.41	
Difference				-3.67	-3.67	-12.04	-6.64	-4.53	-1.86	-	-2.60	-1.32	
<b>UBS Trumbull Properties (CF)</b>	<b>90,949,107</b>	<b>3.57</b>	-	<b>2.74</b>	<b>2.74</b>	<b>1.60</b>	<b>-0.46</b>	<b>1.93</b>	<b>5.82</b>	<b>4.47</b>	<b>-2.26</b>	<b>5.23</b>	<b>07/01/2005</b>
NCREIF ODCE Index (AWA) (Net)				6.41	6.41	13.64	6.13	6.56	8.92	5.55	0.34	6.40	
Difference				-3.67	-3.67	-12.04	-6.59	-4.63	-3.10	-1.08	-2.60	-1.17	
<b>Private Infrastructure/Land</b>	<b>20,352,520</b>	<b>0.80</b>	<b>3.00</b>	<b>-0.16</b>	<b>-0.16</b>	<b>2.63</b>	-	-	-	-	-	<b>2.25</b>	<b>08/01/2020</b>
NCREIF Farmland Index (TR)				1.51	1.51	5.54	4.90	5.53	10.19	11.09	3.08	5.59	
Difference				-1.67	-1.67	-2.91	-	-	-	-	-	-3.34	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Manager inception dates shown represent the first full month of available performance. Fiscal year ends 6/30. Please see addendum for custom benchmark definitions. Private Asset market values and performance are lagged to match custodian reported net asset values. Accordingly, fund reported performance will lag benchmark reported performance.

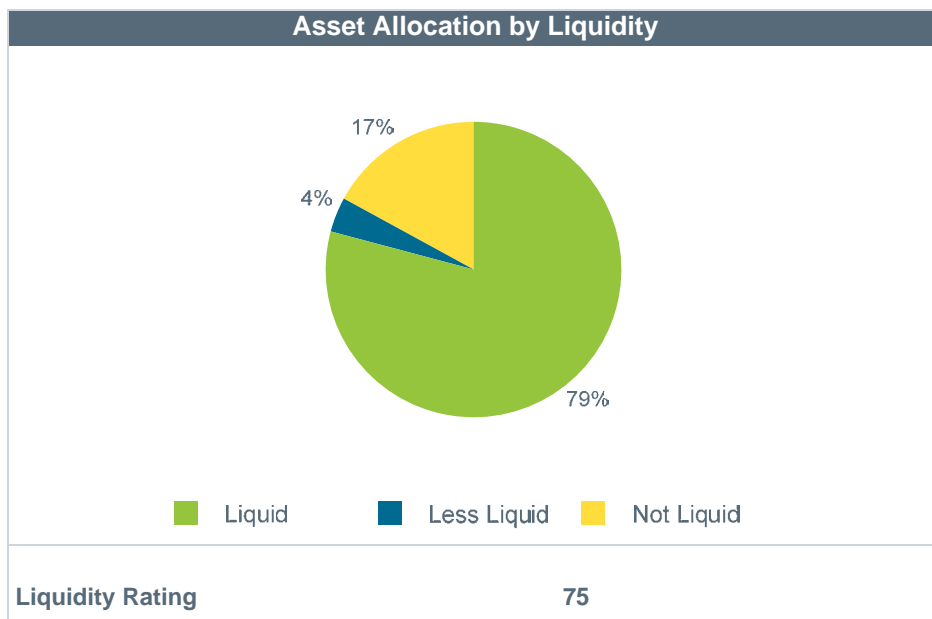
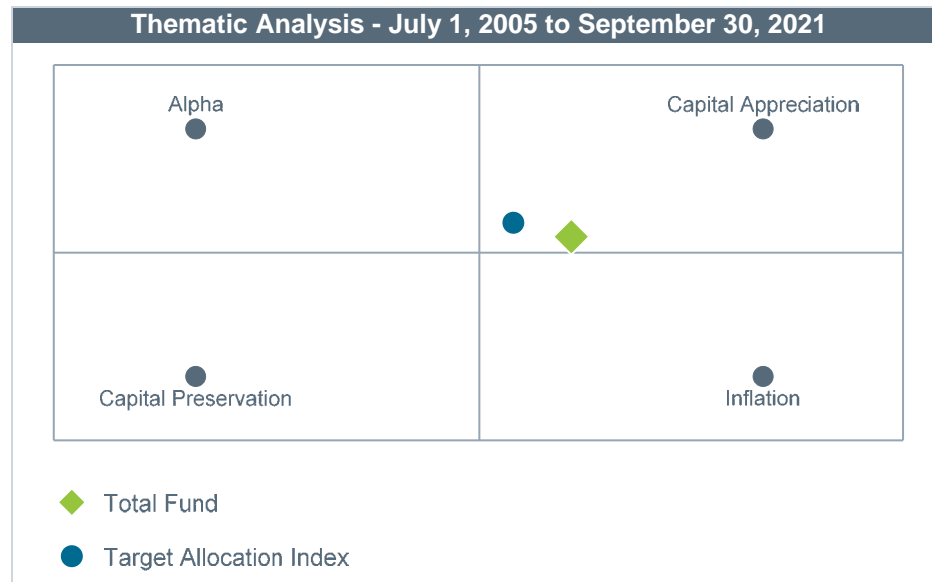
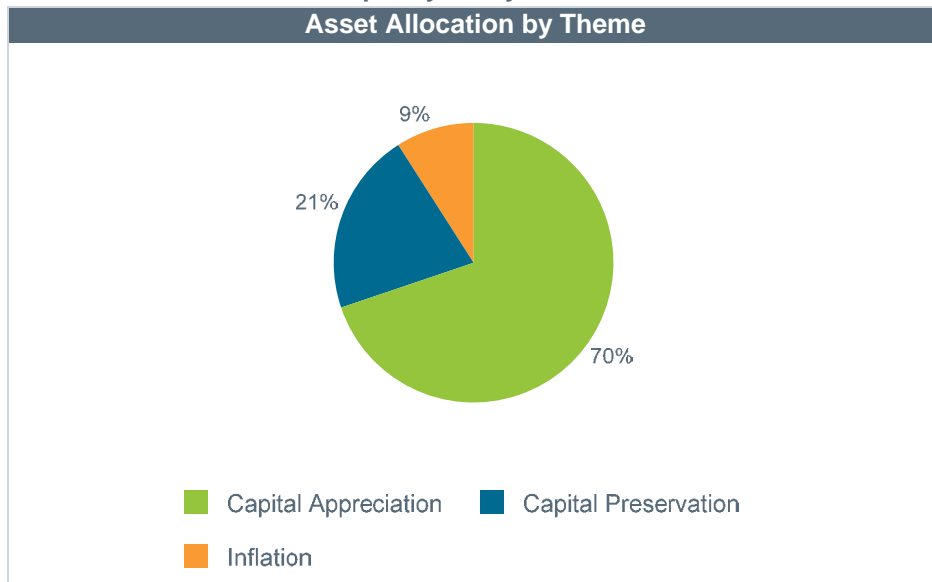
Vermont State Teachers' Retirement System  
 Asset Allocation & Performance - Net of Fees

As of September 30, 2021

	Allocation			Performance (%)									
	Market Value (\$)	Actual (%)	Policy (%)	QTD	FYTD	1 Year	3 Years	5 Years	10 Years	15 Years	2020	Since Incep.	Inception Date
<b>Cash Equivalents</b>	<b>414,690</b>	<b>0.02</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.02</b>	<b>0.45</b>	<b>0.29</b>	<b>0.16</b>	<b>-</b>	<b>0.36</b>	<b>0.16</b>	<b>01/01/2011</b>
ICE BofAML 3 Mo US T-Bill Index				0.02	0.02	0.07	1.18	1.16	0.63	1.00	0.67	0.59	
Difference				-0.02	-0.02	-0.09	-0.73	-0.87	-0.47	-	-0.31	-0.43	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Manager inception dates shown represent the first full month of available performance. Fiscal year ends 6/30. Please see addendum for custom benchmark definitions. Private Asset market values and performance are lagged to match custodian reported net asset values. Accordingly, fund reported performance will lag benchmark reported performance.



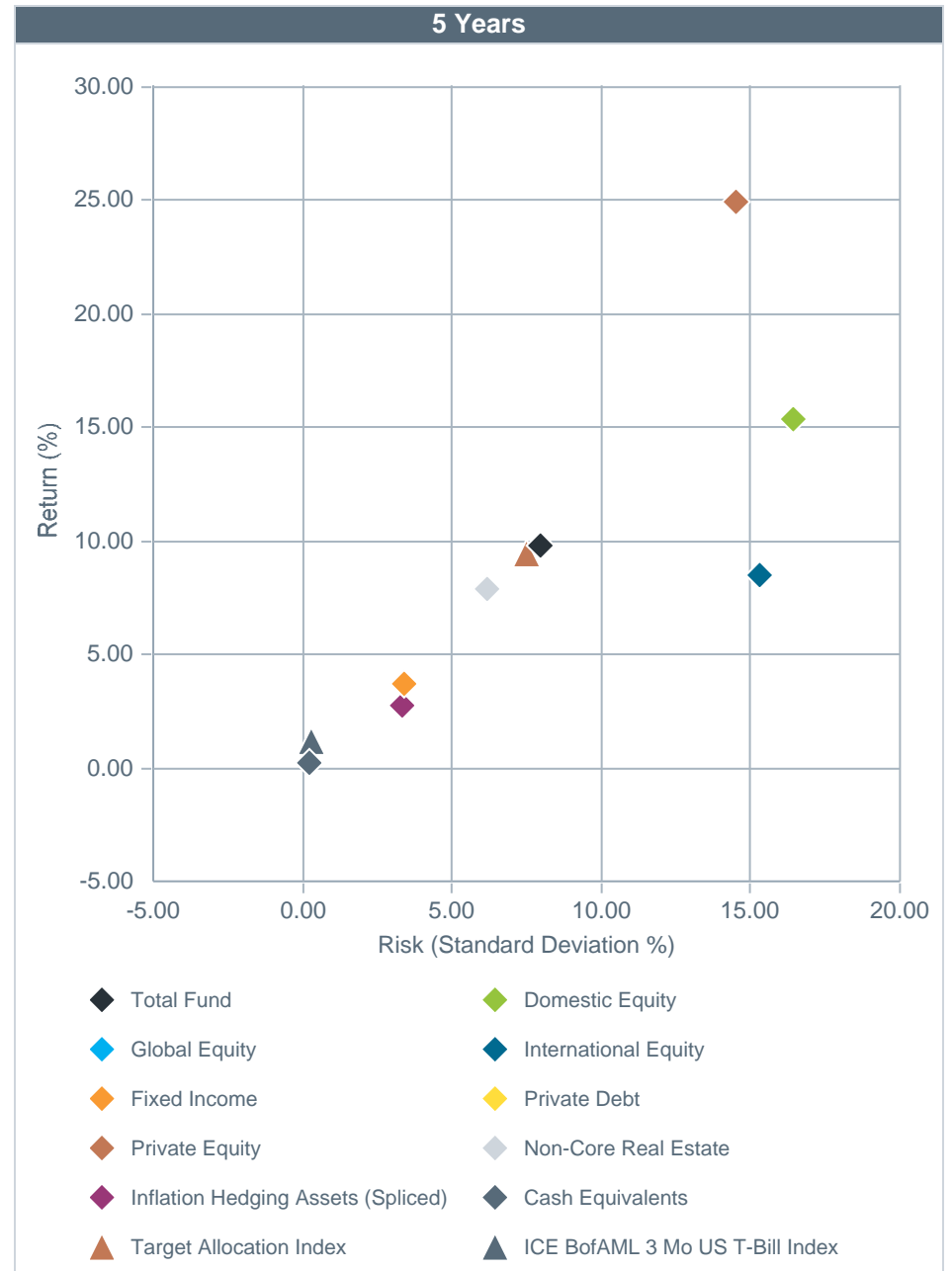
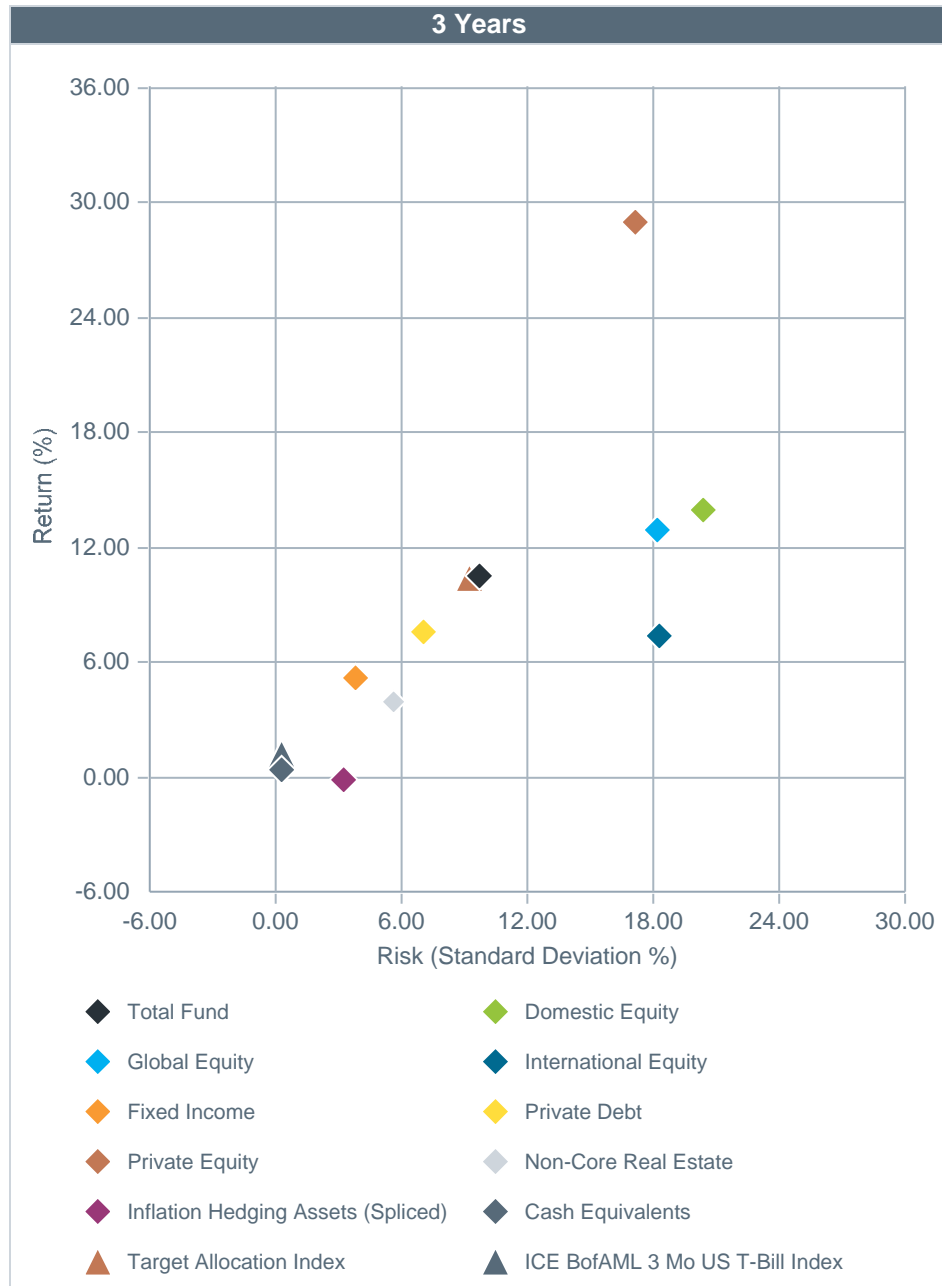


### Correlation Matrix - 10 Years

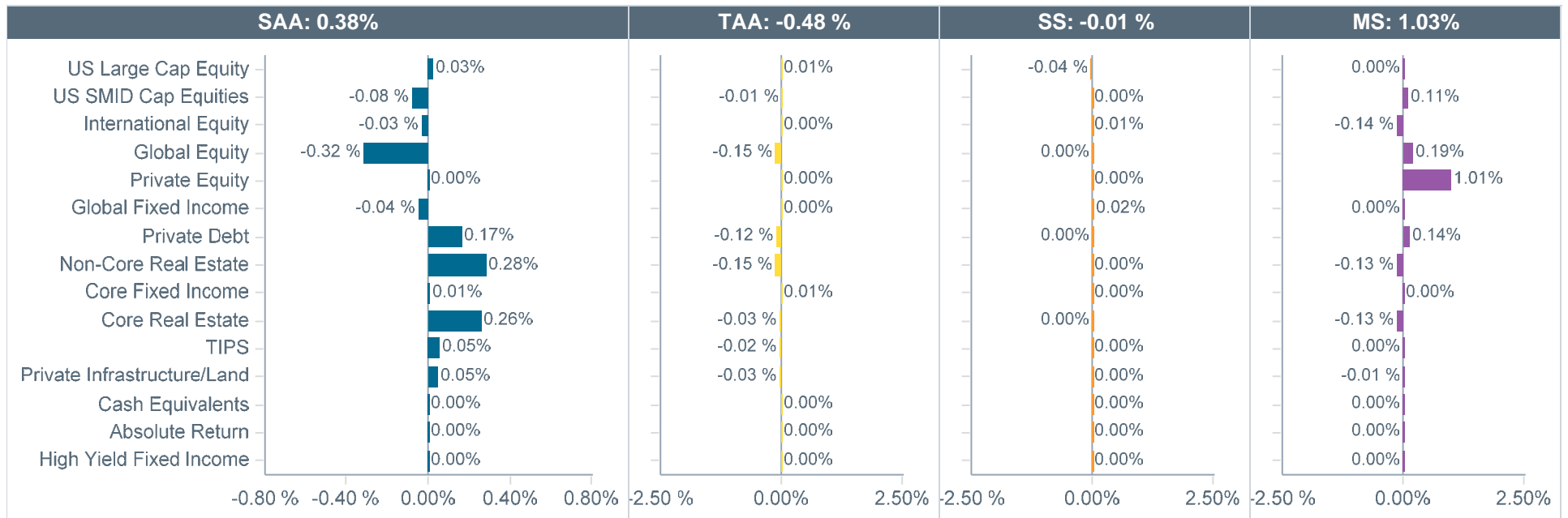
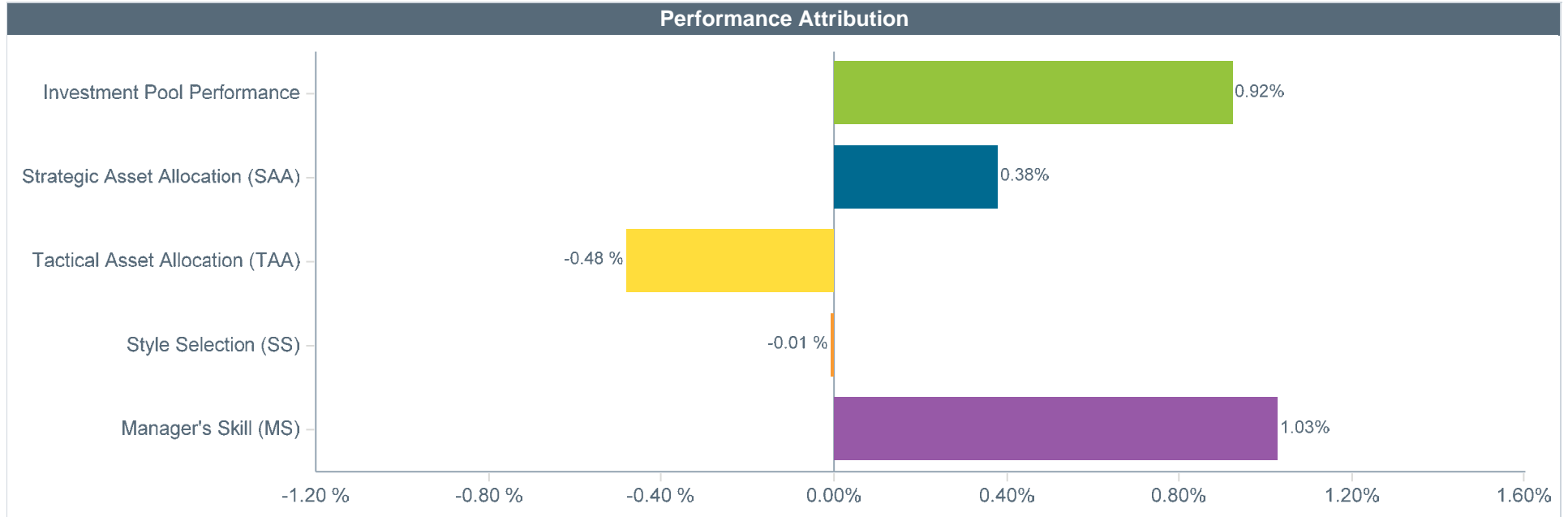
	A	B	C	D
A	1.00			
B	0.66	1.00		
C	-0.18	-0.32	1.00	
D	0.59	0.78	-0.06	1.00

A = HFRI EH: Equity Market Neutral Index (Alpha)  
 B = MSCI ACW Index (USD) (Gross) (Capital Appreciation)  
 C = Bloomberg US Gov't Bond Index (Capital Preservation)  
 D = Real Return Custom Index (Inflation)

Asset Allocation by Theme is based on dedicated manager allocations; as such, thematic allocations are approximations. The RVK Liquidity Rating is calculated using beginning of month investment weights applied to each corresponding asset class liquidity rating. Please see the Glossary for additional information regarding liquidity, thematic, and custom index descriptions. Allocations may not sum to 100% due to rounding.



Performance shown is net of fees. Calculation is based on monthly periodicity. Funds or composites with less history than the specified time period will not appear in the chart.

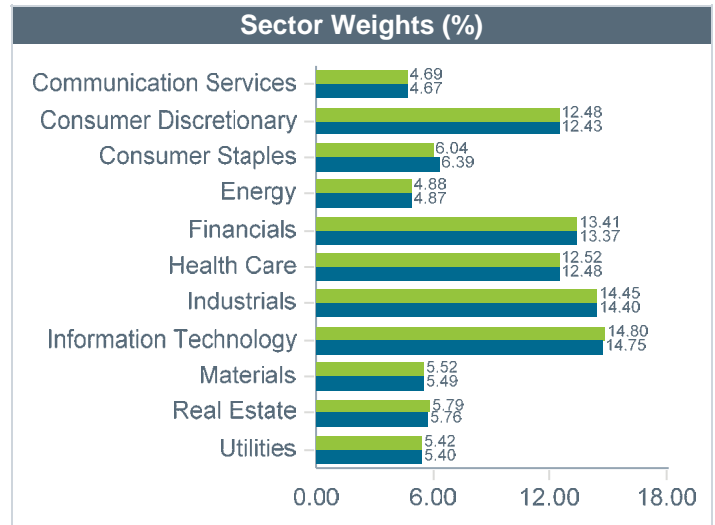
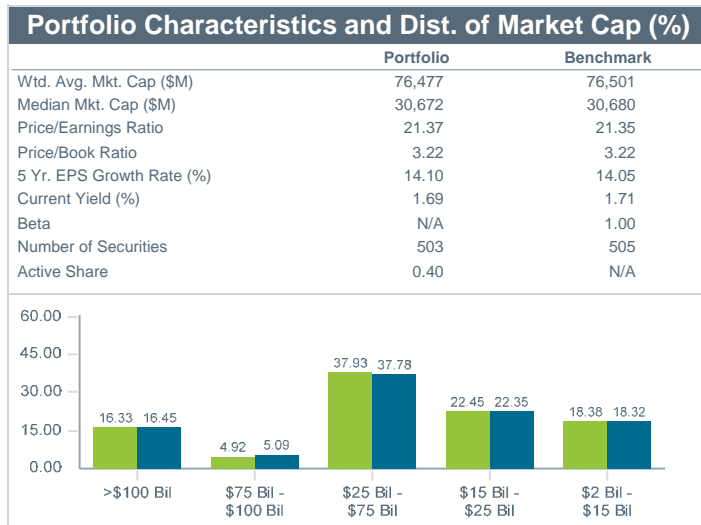
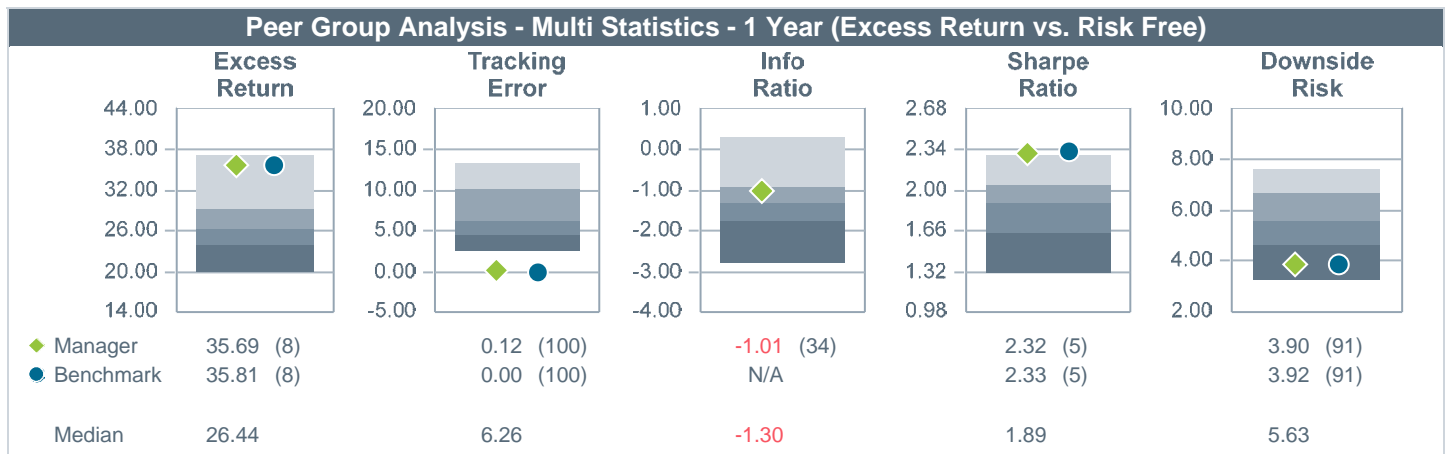
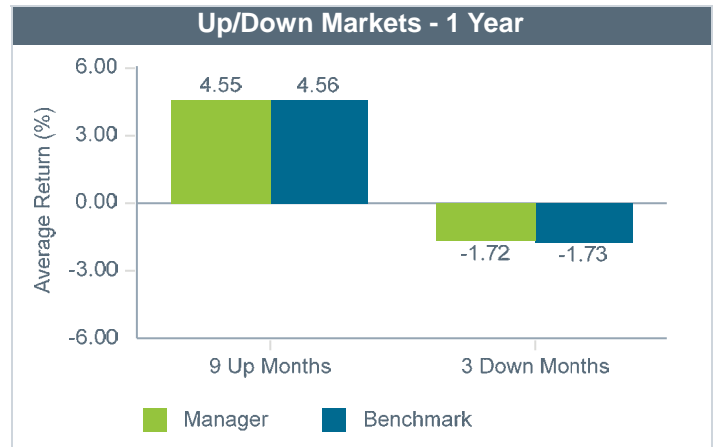
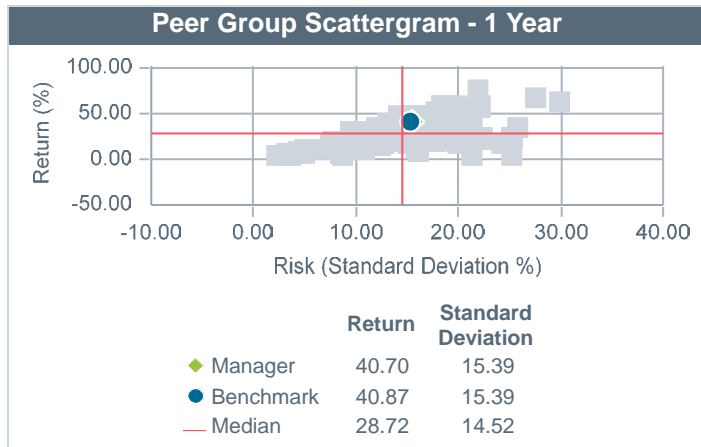


Performance shown is net of fees. Calculation is based on monthly. Private Asset market values, performance and benchmarks are valued quarterly and shown as of most recently available quarter end, adjusted for subsequent cash flows. RVK cautions that the interpretation of time-weighted data on non-marketable investments, such as Private Equity, is imperfect at best and can potentially be misleading. See Glossary for additional information regarding the Total Fund Attribution - IDP calculation.

# Investment Manager Profiles



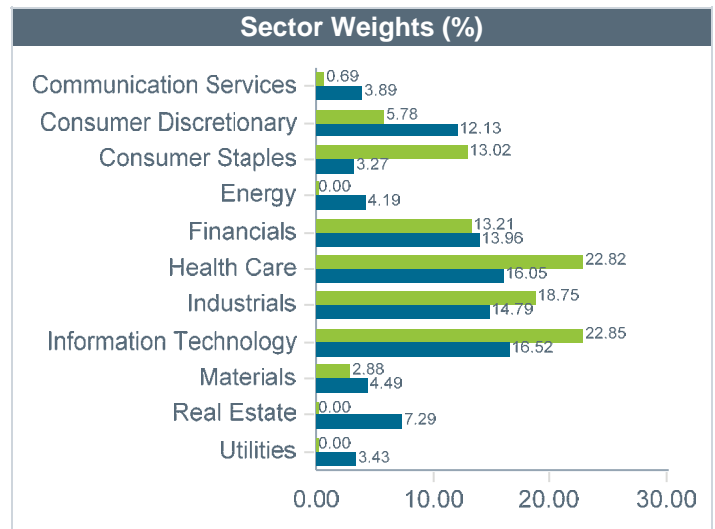
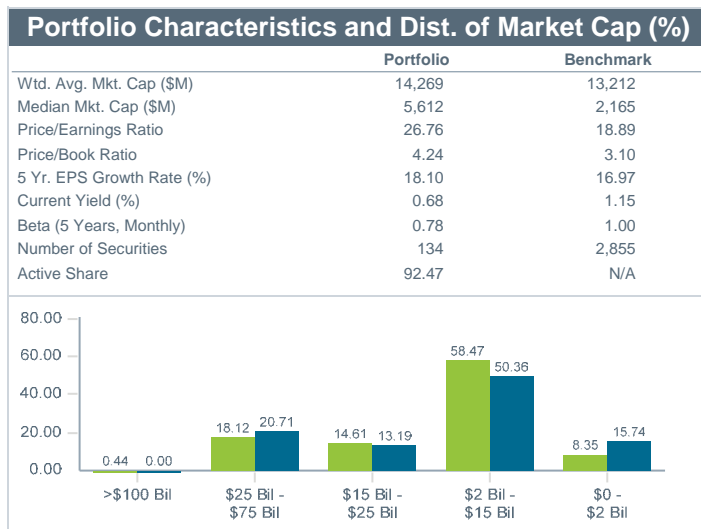
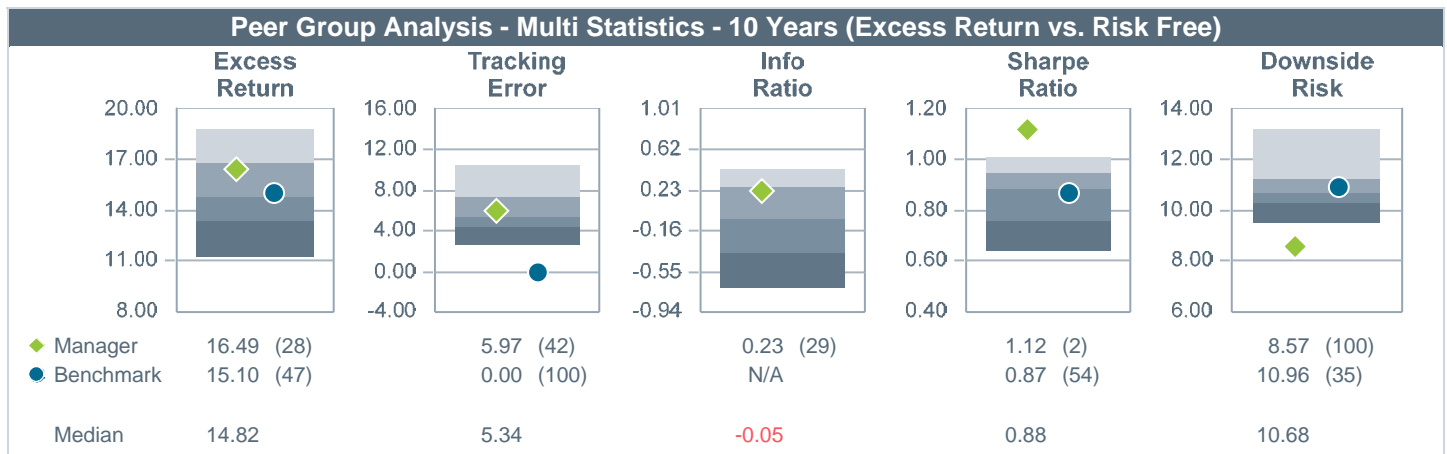
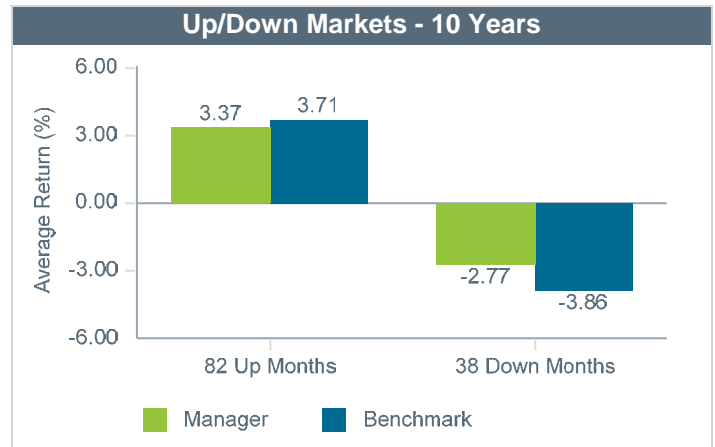
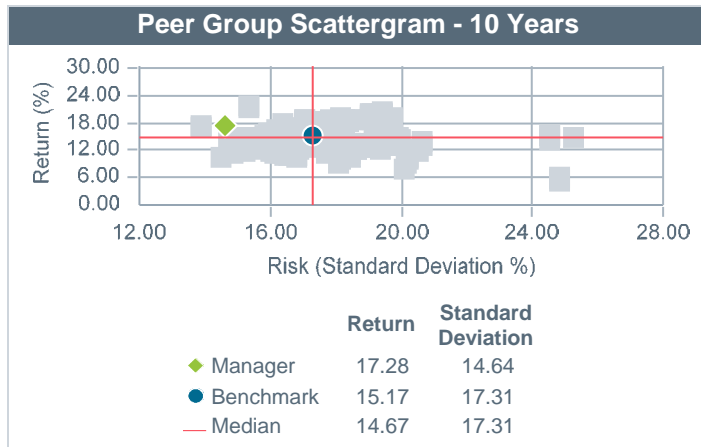
Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	-0.29	40.70	N/A	N/A	N/A	N/A	13.03	N/A	N/A	N/A	N/A
Benchmark	-0.22	40.87	14.29	14.61	12.41	15.99	12.83	29.24	-7.64	18.90	14.80
Difference	-0.07	-0.17	N/A	N/A	N/A	N/A	0.20	N/A	N/A	N/A	N/A
Peer Group Median	0.05	28.72	15.45	16.19	13.08	15.73	18.34	30.00	-5.02	21.89	9.05
Rank	63	8	N/A	N/A	N/A	N/A	64	N/A	N/A	N/A	N/A
Population	1,943	1,874	1,706	1,521	1,357	1,179	1,868	1,847	1,862	1,791	1,706



Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.



Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	0.82	37.84	15.67	17.62	15.55	17.28	27.32	27.29	0.47	17.33	19.16
Benchmark	-2.63	47.33	11.75	14.15	12.29	15.17	19.99	26.65	-10.50	14.67	22.77
Difference	3.45	-9.49	3.92	3.47	3.26	2.11	7.33	0.64	10.97	2.66	-3.61
Peer Group Median	-1.79	41.86	11.95	14.62	12.19	14.67	20.27	27.56	-10.18	17.90	14.58
Rank	13	61	30	30	25	23	41	53	9	53	25
Population	468	463	434	391	333	288	466	490	489	462	425



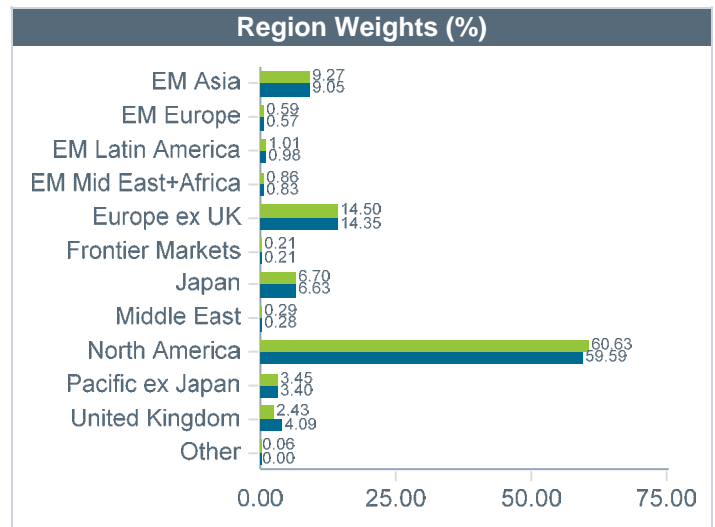
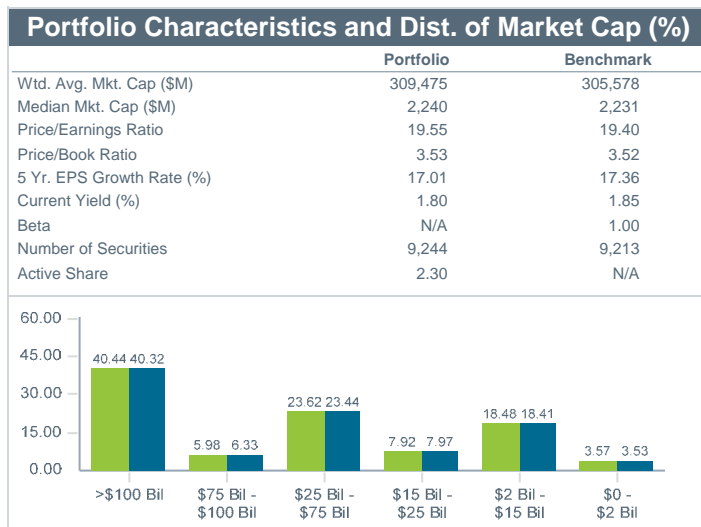
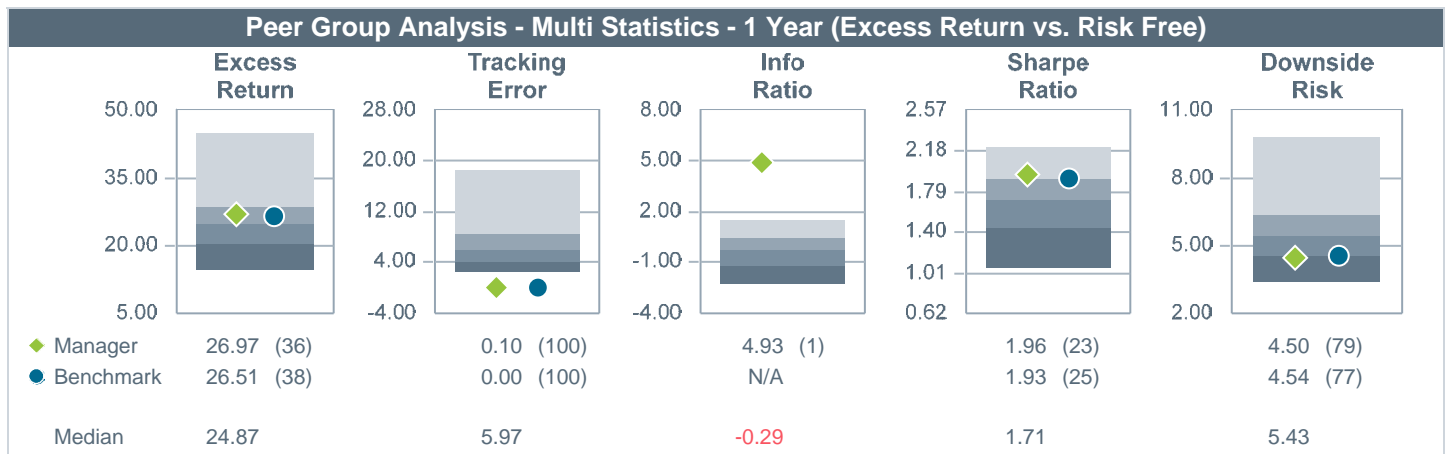
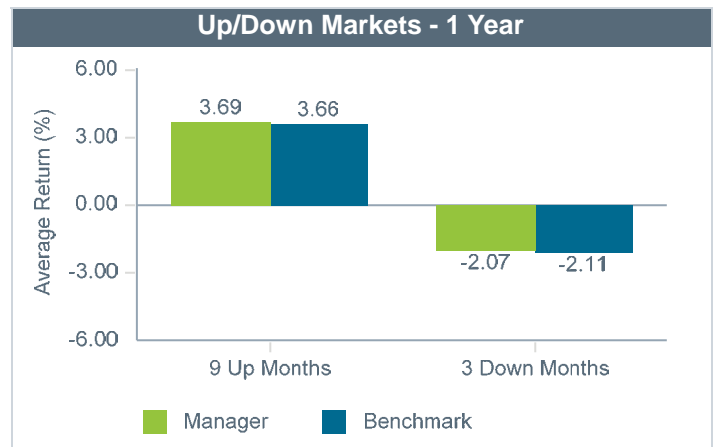
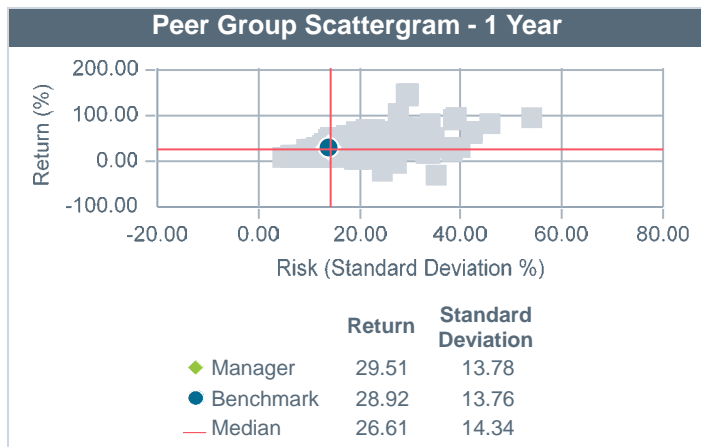
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. The Custom SMID Cap Equity Index currently consists of 50% Russell Midcap Index and 50% Russell 2000 index. From 08/2020 through 12/2020 it consisted of 50% Russell 2500 index and 50% Russell 2000 index. Prior data was provided by the previous consultant.



**Manager: BlackRock MSCI ACW IMI (SA)**  
**Benchmark: MSCI ACW IM Index (USD) (Net)**  
**Peer Group: IM Global Equity (MF)**

As of September 30, 2021

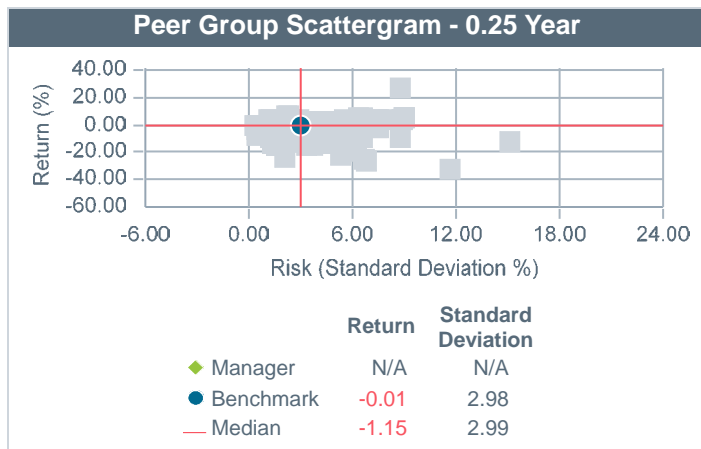
Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	-1.03	29.51	N/A	N/A	N/A	N/A	16.77	N/A	N/A	N/A	N/A
Benchmark	-1.11	28.92	12.38	13.06	9.97	11.96	16.25	26.35	-10.08	23.95	8.36
Difference	0.08	0.59	N/A	N/A	N/A	N/A	0.52	N/A	N/A	N/A	N/A
Peer Group Median	-1.15	26.61	11.90	11.93	9.09	11.62	15.21	26.35	-9.73	22.32	6.37
Rank	49	35	N/A	N/A	N/A	N/A	44	N/A	N/A	N/A	N/A
Population	1,453	1,371	1,193	1,006	850	610	1,356	1,396	1,395	1,307	1,190



Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

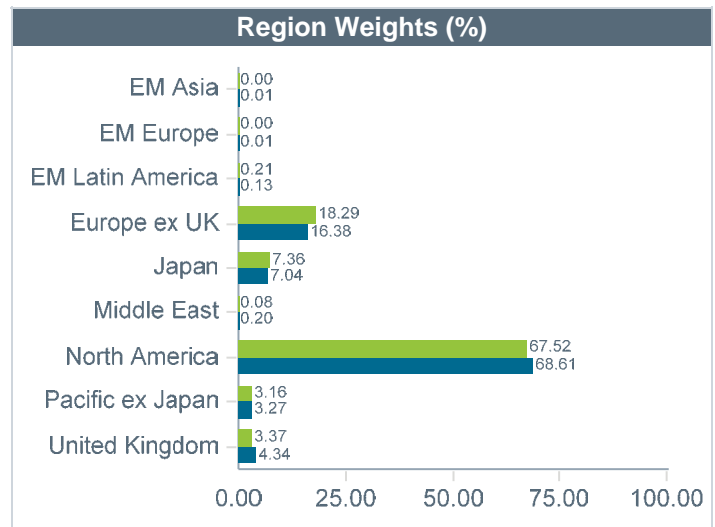
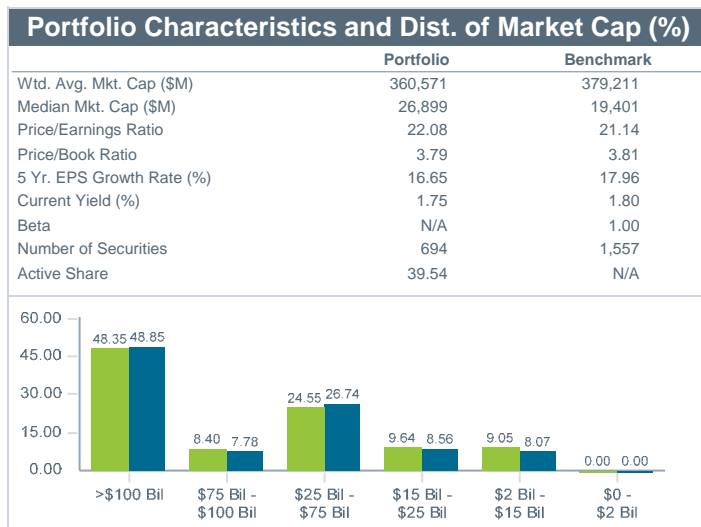
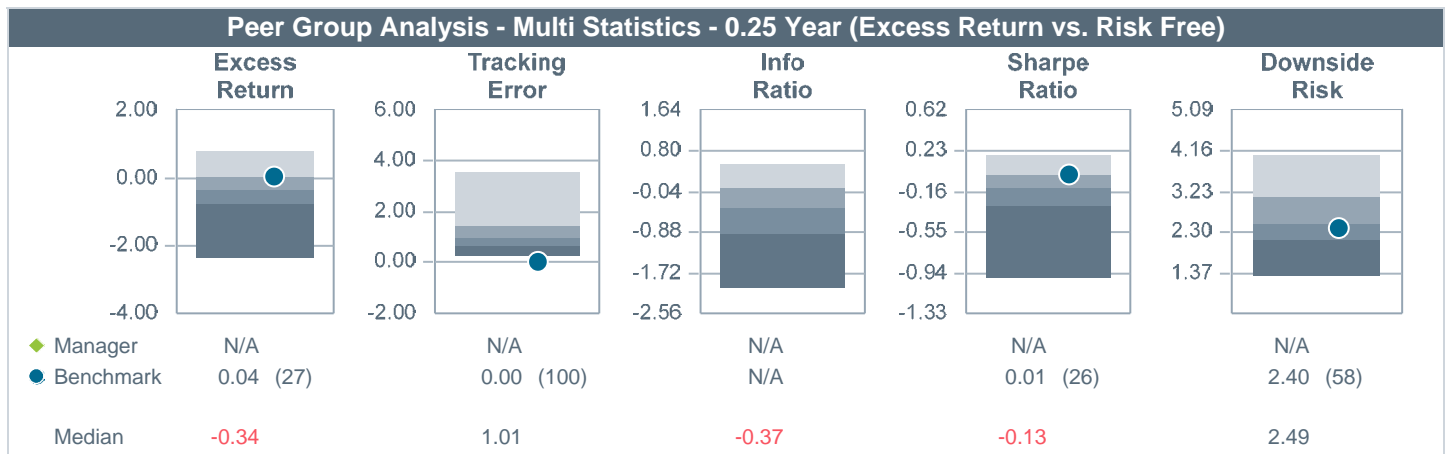


Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benchmark	-0.01	28.82	13.14	13.74	10.50	12.68	15.90	27.67	-8.71	22.40	7.51
Difference	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



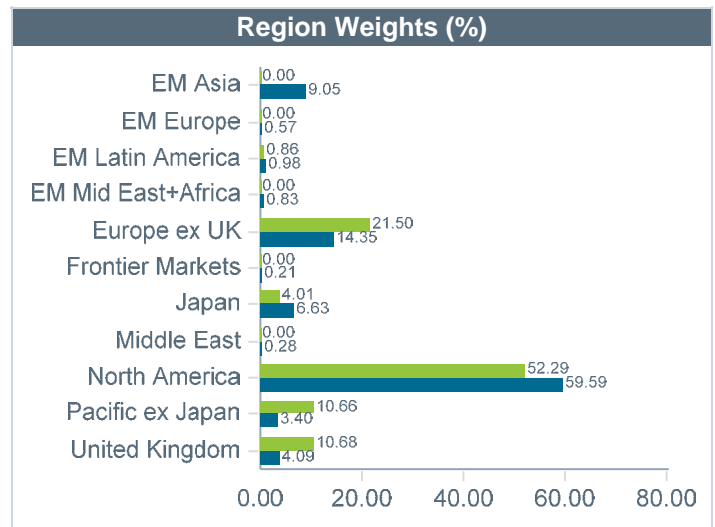
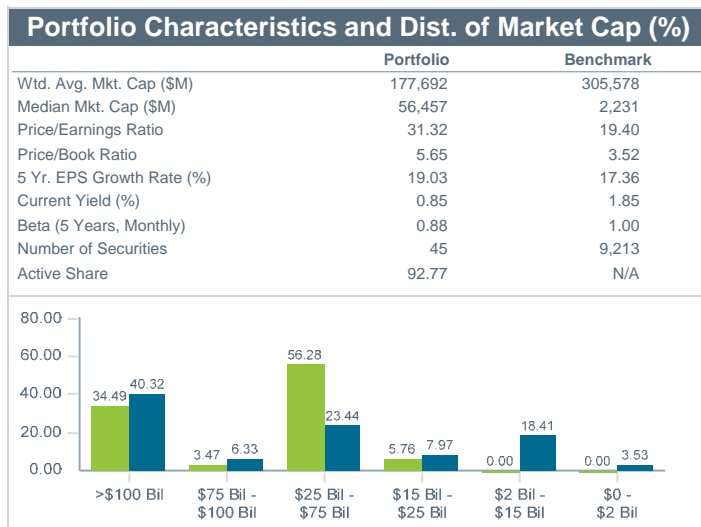
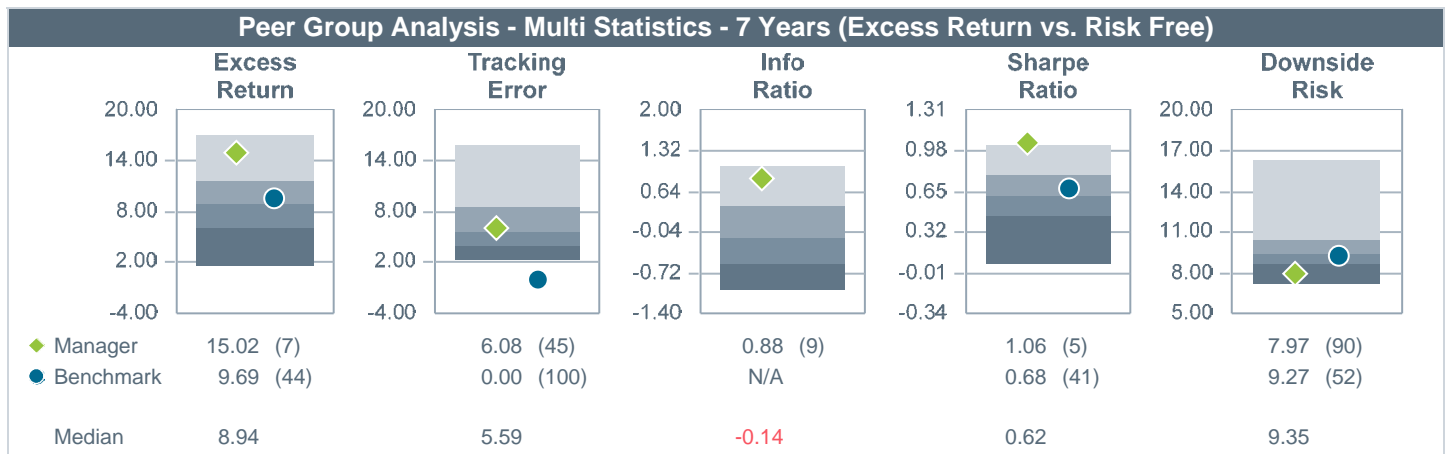
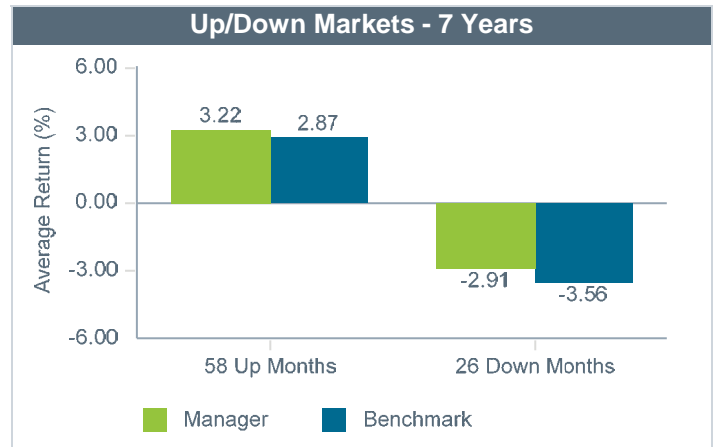
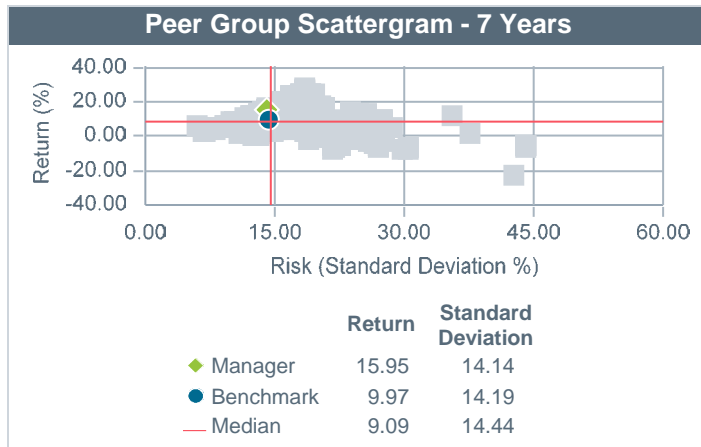
### Up/Down Markets - 0.25 Year

Data is currently unavailable.



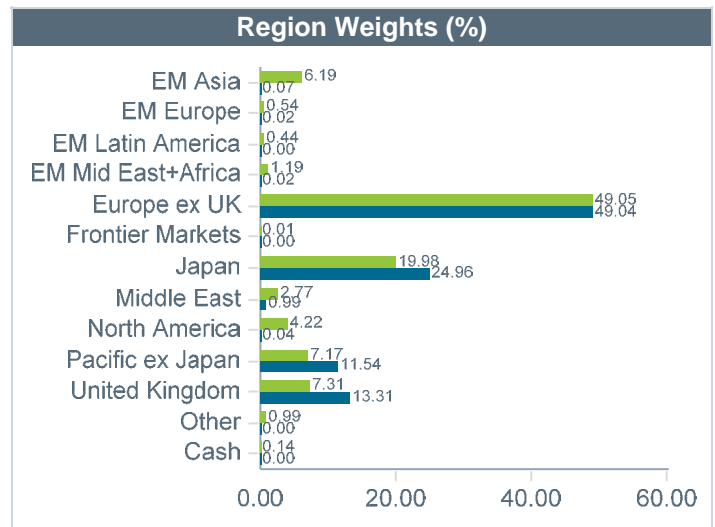
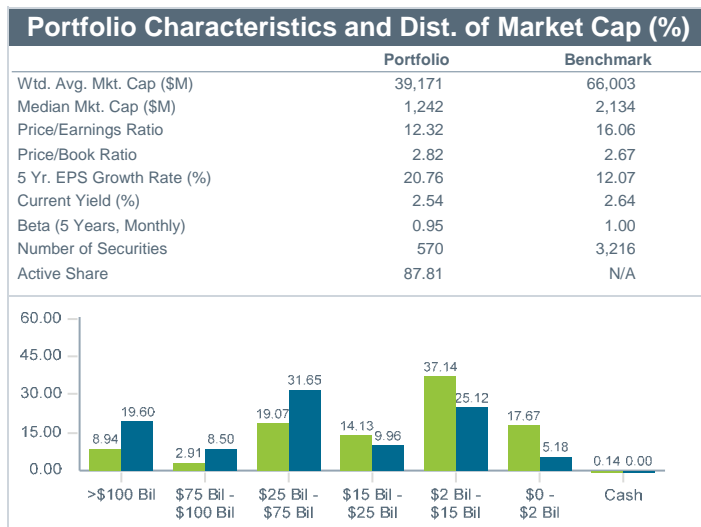
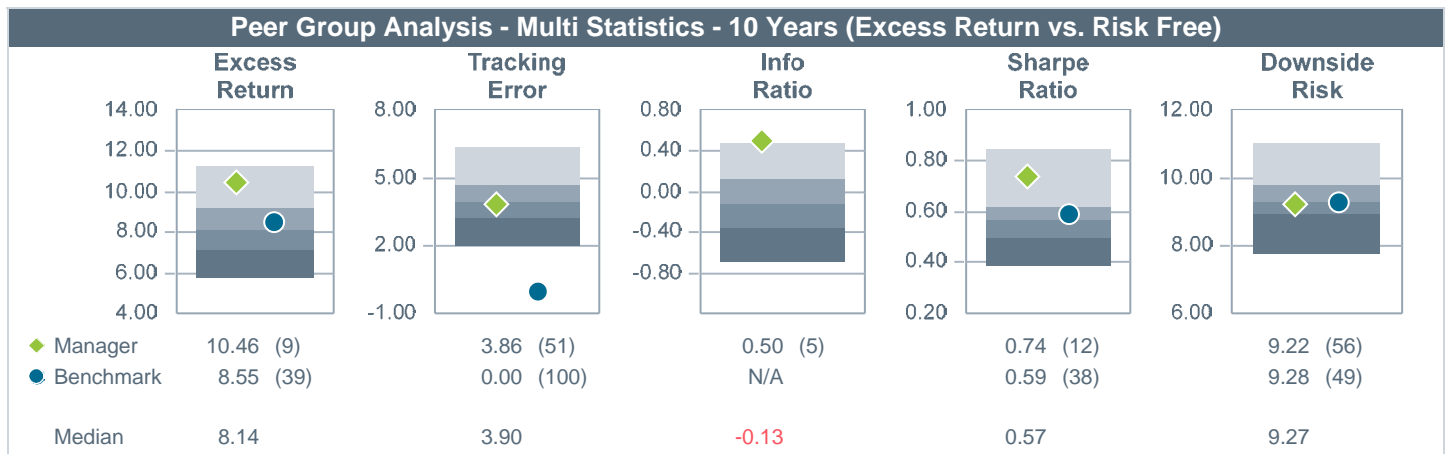
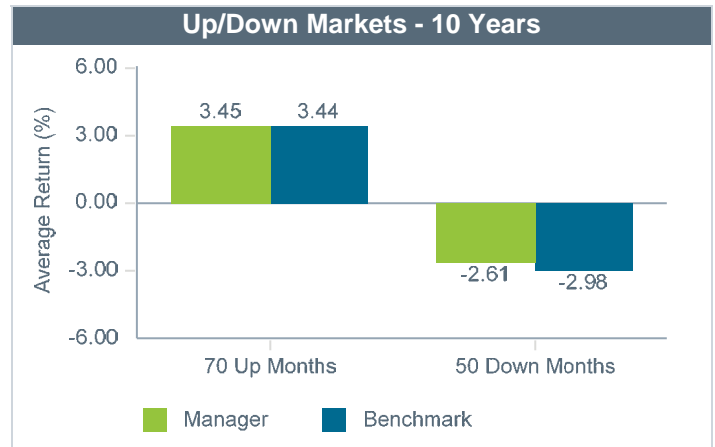
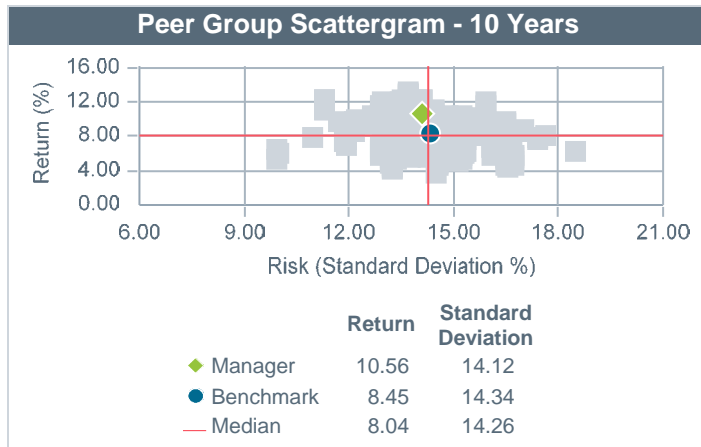
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	2.04	20.57	20.76	18.73	15.95	N/A	40.32	35.89	-8.68	31.69	4.77
Benchmark	-1.11	28.92	12.38	13.06	9.97	11.96	16.25	26.35	-10.08	23.95	8.36
Difference	3.15	-8.35	8.38	5.67	5.98	N/A	24.07	9.54	1.40	7.74	-3.59
Peer Group Median	-1.15	26.61	11.90	11.93	9.09	11.62	15.21	26.35	-9.73	22.32	6.37
Rank	6	77	11	10	7	N/A	14	6	38	12	64
Population	1,453	1,371	1,193	1,006	850	610	1,356	1,396	1,395	1,307	1,190



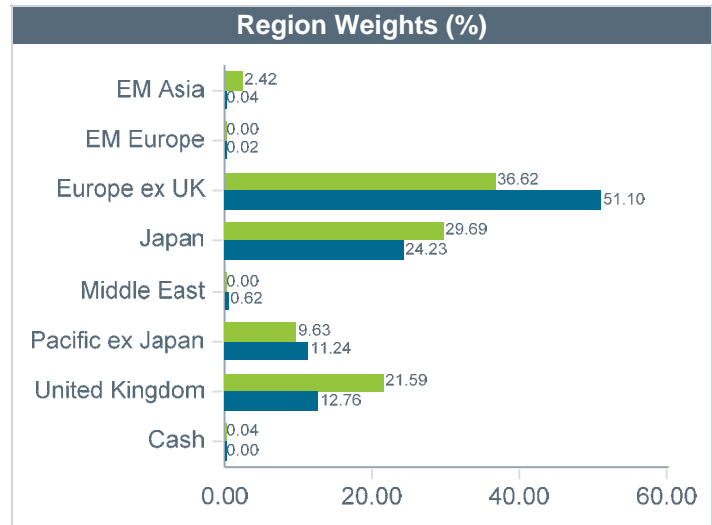
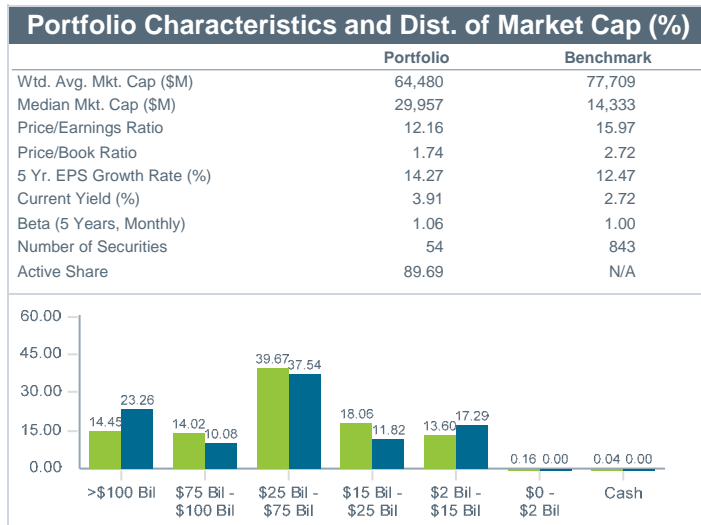
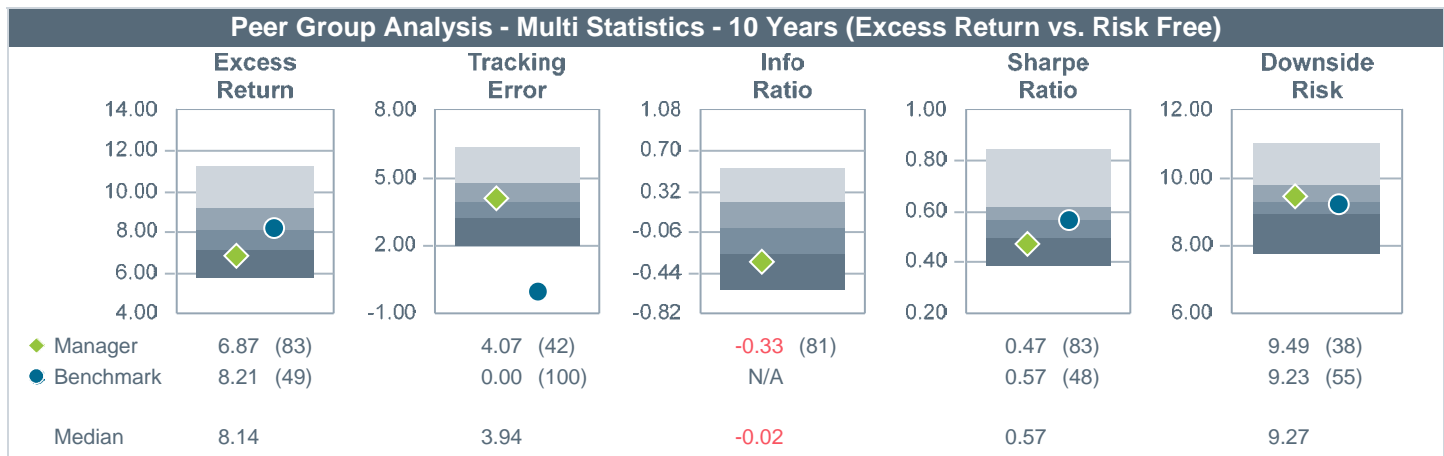
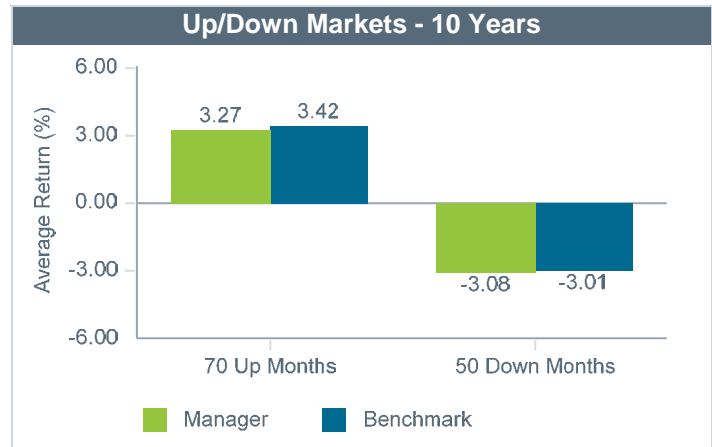
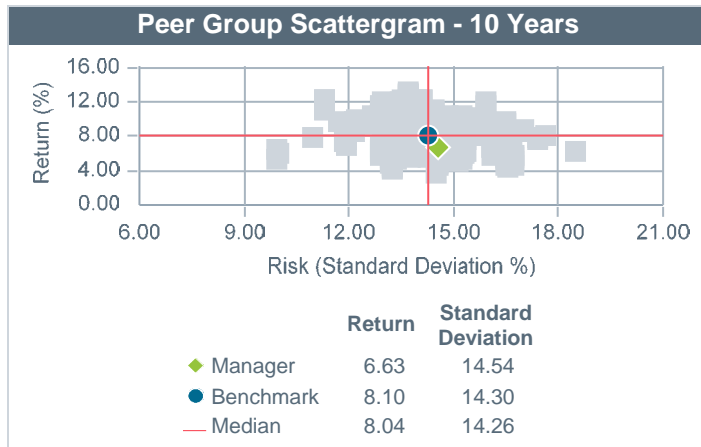
Performance shown is net of fees and product specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	-2.71	27.10	8.03	11.19	8.91	10.56	12.37	18.22	-15.89	36.78	7.45
Benchmark	-0.24	26.23	7.83	9.04	6.26	8.45	8.47	22.44	-14.40	26.16	1.15
Difference	-2.47	0.87	0.20	2.15	2.65	2.11	3.90	-4.22	-1.49	10.62	6.30
Peer Group Median	-1.23	24.53	7.31	8.29	5.65	8.04	8.17	21.59	-15.91	25.26	0.09
Rank	82	27	42	15	9	9	33	78	50	3	4
Population	560	559	559	550	479	399	596	642	671	698	669



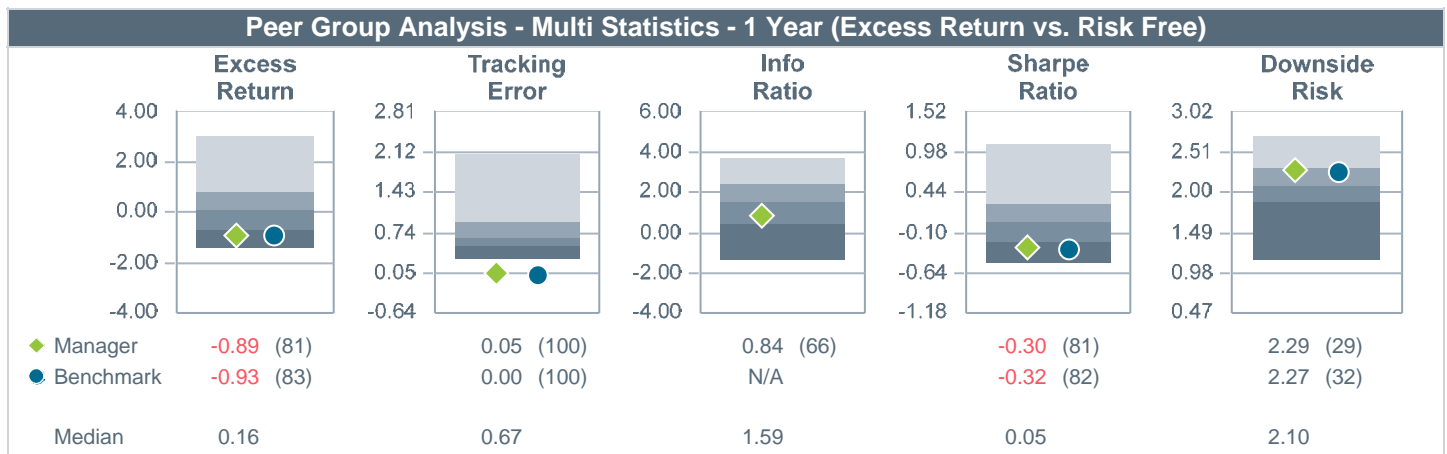
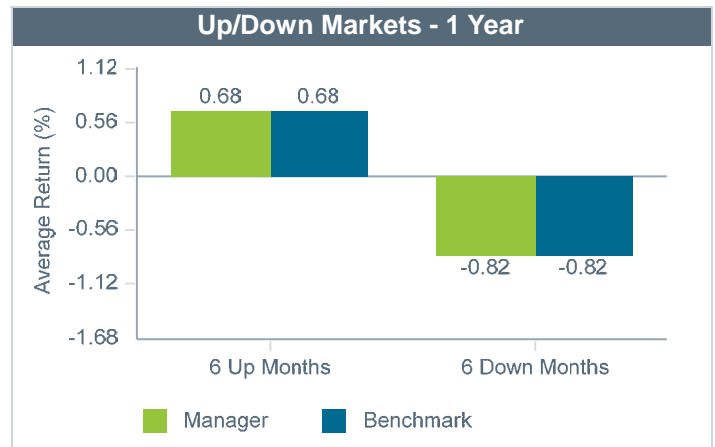
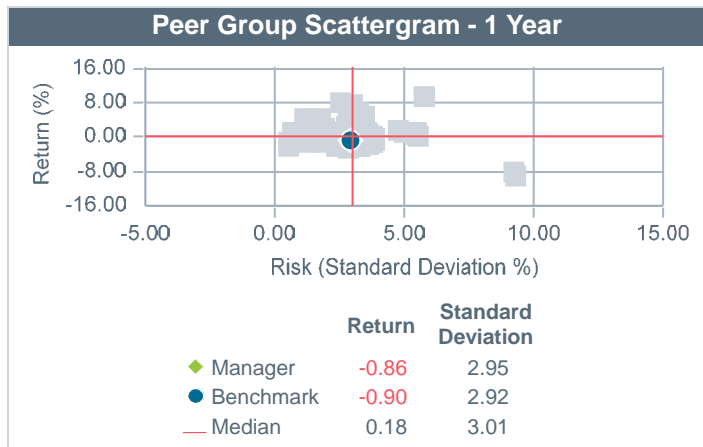
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	-1.28	30.97	4.68	6.41	4.09	6.63	-4.01	19.29	-11.66	22.08	4.37
Benchmark	-0.45	25.73	7.62	8.81	5.80	8.10	7.82	22.01	-13.79	25.03	1.00
Difference	-0.83	5.24	-2.94	-2.40	-1.71	-1.47	-11.83	-2.72	2.13	-2.95	3.37
Peer Group Median	-1.23	24.53	7.31	8.29	5.65	8.04	8.17	21.59	-15.91	25.26	0.09
Rank	51	14	82	79	78	83	98	69	14	85	8
Population	560	559	559	550	479	399	596	642	671	698	669



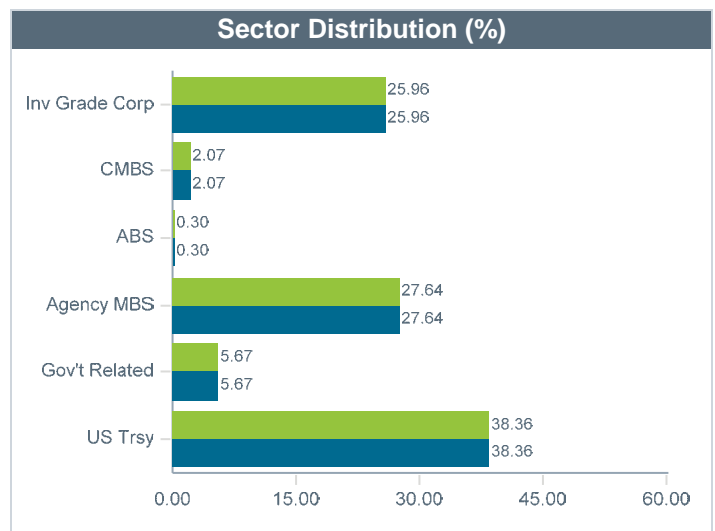
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	0.07	-0.86	N/A	N/A	N/A	N/A	7.54	N/A	N/A	N/A	N/A
Benchmark	0.05	-0.90	5.35	2.94	3.26	3.01	7.51	8.72	0.01	3.54	2.65
Difference	0.02	0.04	N/A	N/A	N/A	N/A	0.03	N/A	N/A	N/A	N/A
Peer Group Median	0.03	0.18	5.58	3.17	3.27	3.26	8.19	8.76	-0.63	3.59	2.86
Rank	39	81	N/A	N/A	N/A	N/A	71	N/A	N/A	N/A	N/A
Population	502	490	465	411	351	305	488	511	506	498	469



### Portfolio Characteristics

	Portfolio	Benchmark
Effective Duration	6.71	6.71
Spread Duration	N/A	N/A
Avg. Maturity	8.63	8.63
Avg. Quality	Aa1/Aa2	Aa1/Aa2
Yield To Maturity (%)	1.57	1.57
Coupon Rate (%)	2.48	2.48
Current Yield (%)	N/A	N/A
Holdings Count	12,226	12,226



Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. Portfolio characteristics are proxied using benchmark statistics.



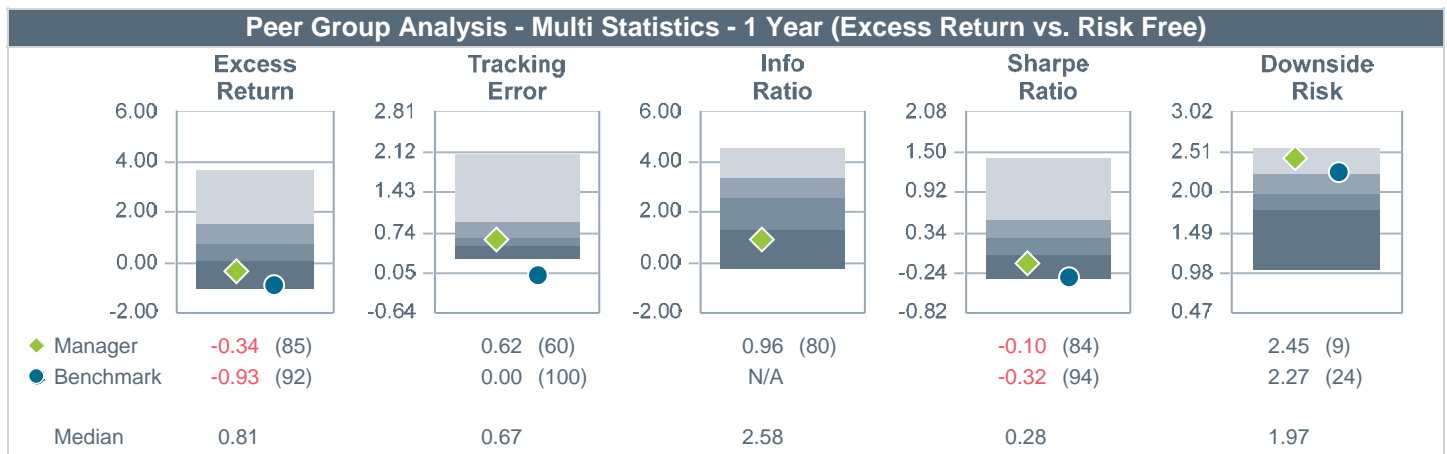
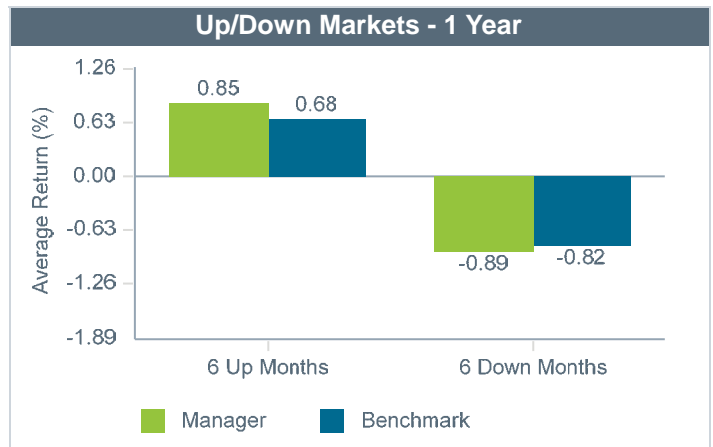
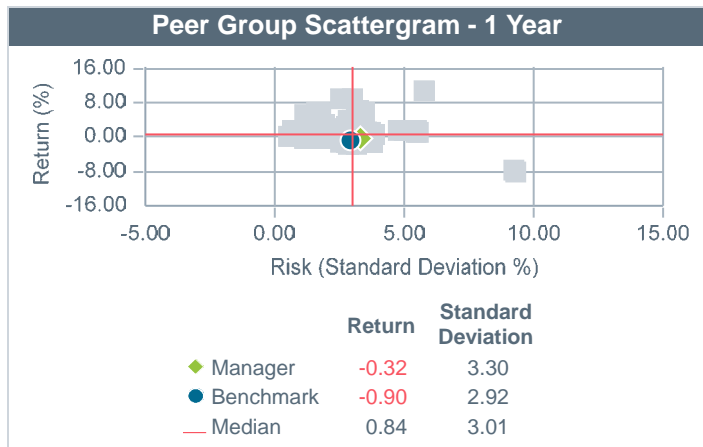
Manager: PIMCO Core (SA)

As of September 30, 2021

Benchmark: Bloomberg US Agg Bond Index

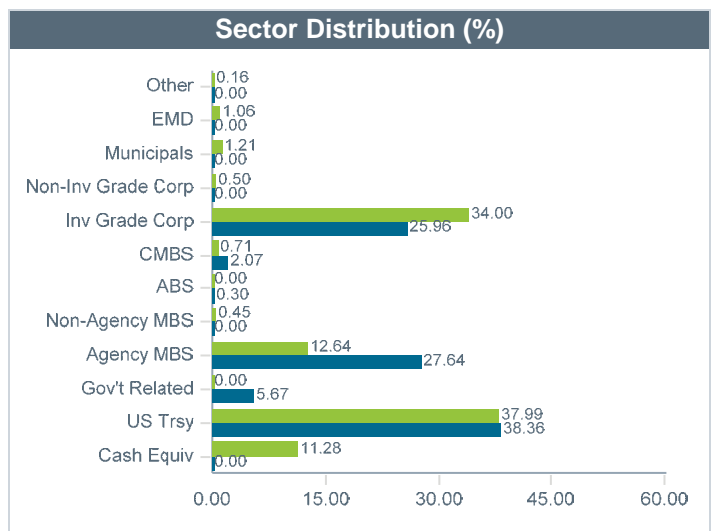
Peer Group: IM U.S. Broad Market Core Fixed Income (MF)

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	0.04	-0.32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benchmark	0.05	-0.90	5.35	2.94	3.26	3.01	7.51	8.72	0.01	3.54	2.65
Difference	-0.01	0.58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Peer Group Median	0.34	0.84	6.34	3.84	4.01	4.03	8.99	9.56	-0.01	4.37	3.49
Rank	92	85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Population	502	490	465	411	351	305	488	511	506	498	469



### Portfolio Characteristics

	Portfolio	Benchmark
Effective Duration	5.83	6.71
Spread Duration	4.15	N/A
Avg. Maturity	7.20	8.63
Avg. Quality	Aa2	Aa1/Aa2
Yield To Maturity (%)	1.49	1.57
Coupon Rate (%)	2.01	2.48
Current Yield (%)	1.93	N/A
Holdings Count	284	12,226

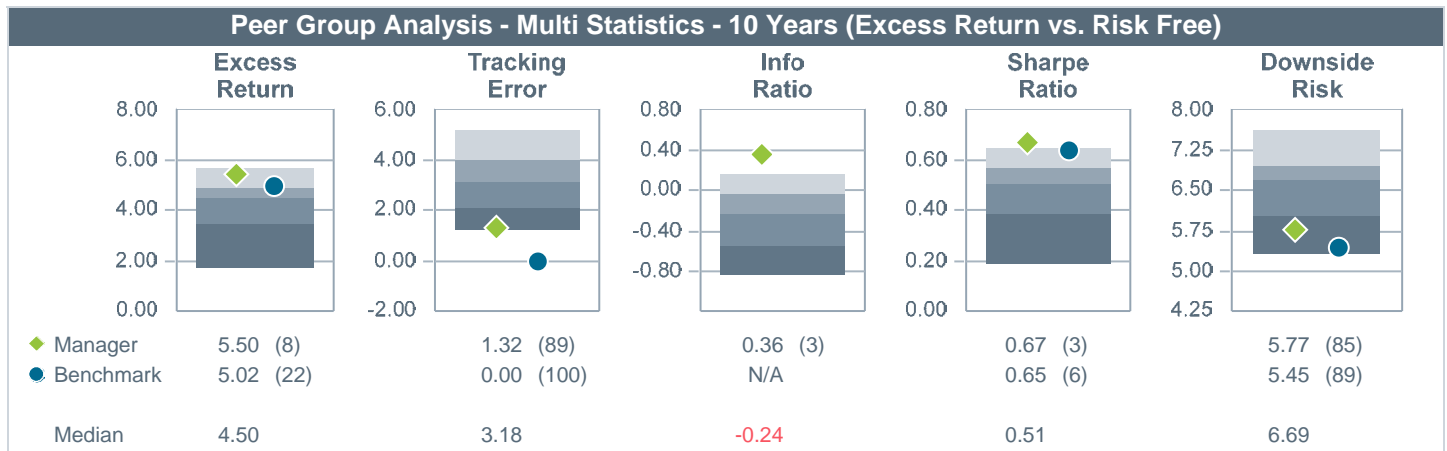
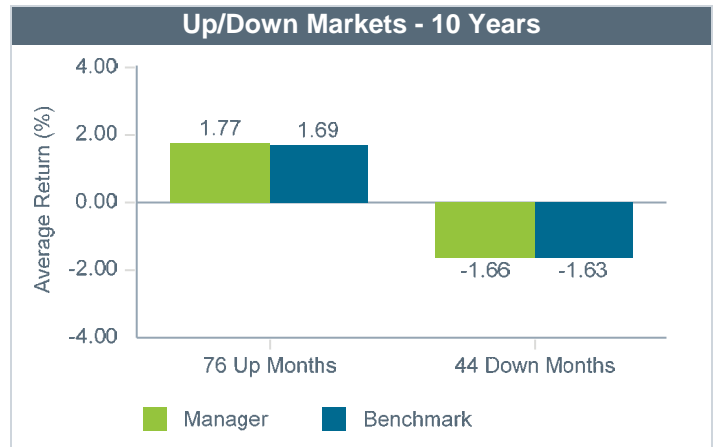
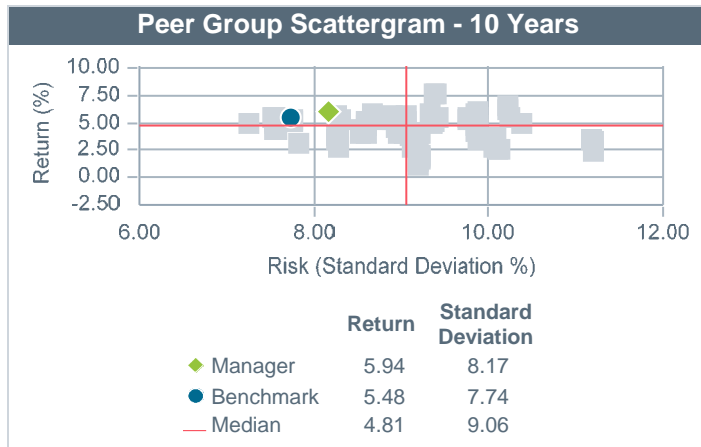


Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. Allocation to "other" consists of Euro/Yankees.



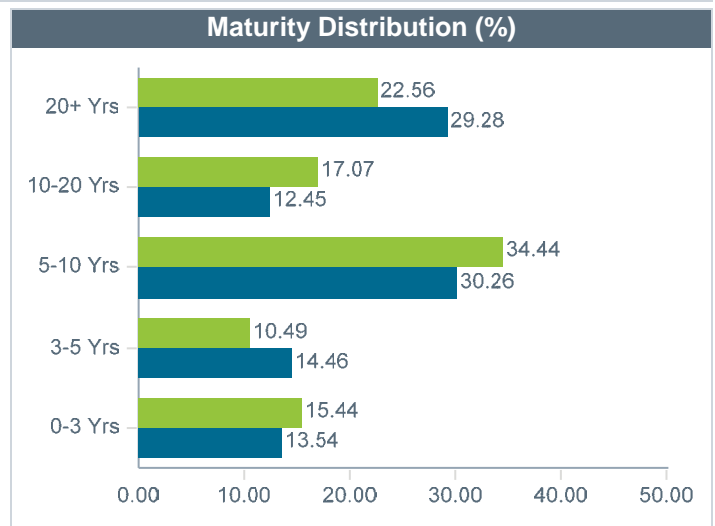


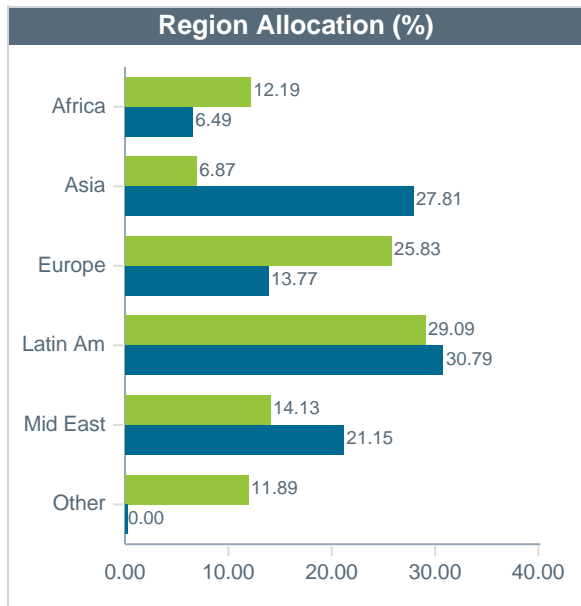
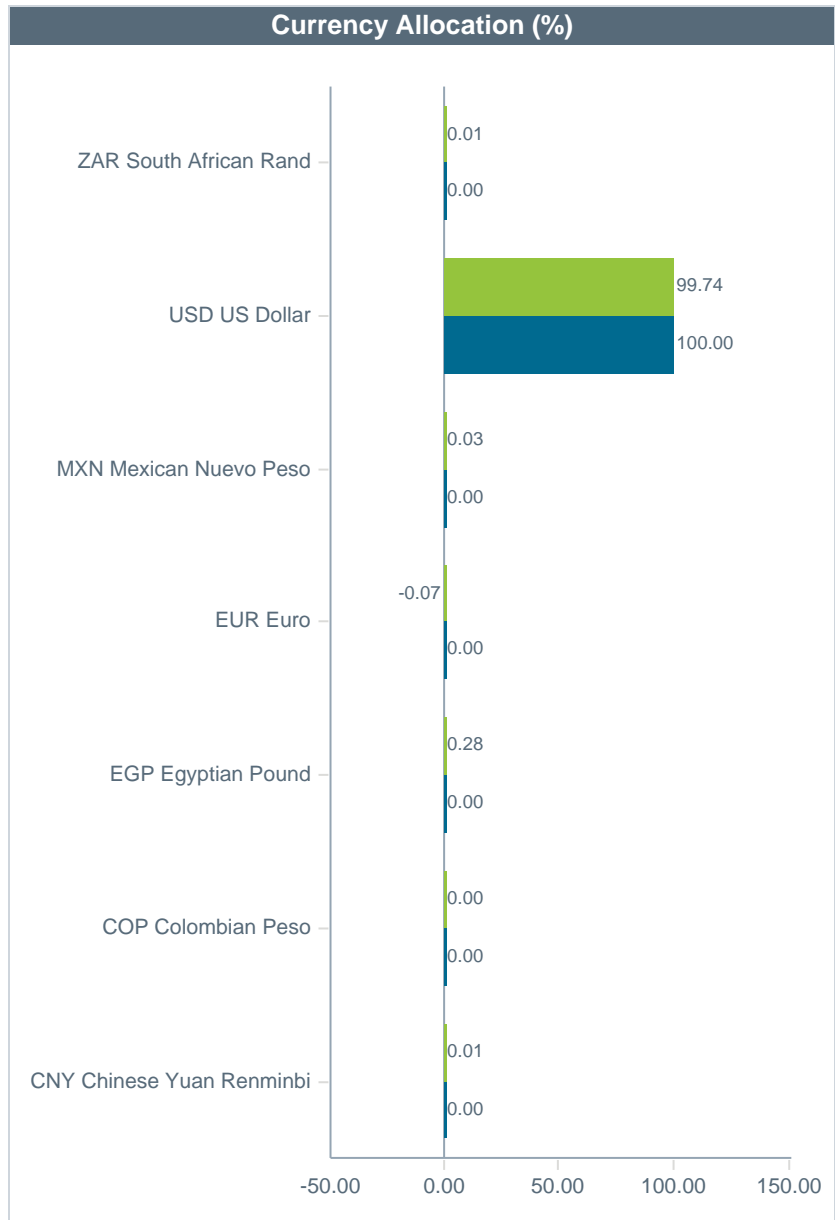
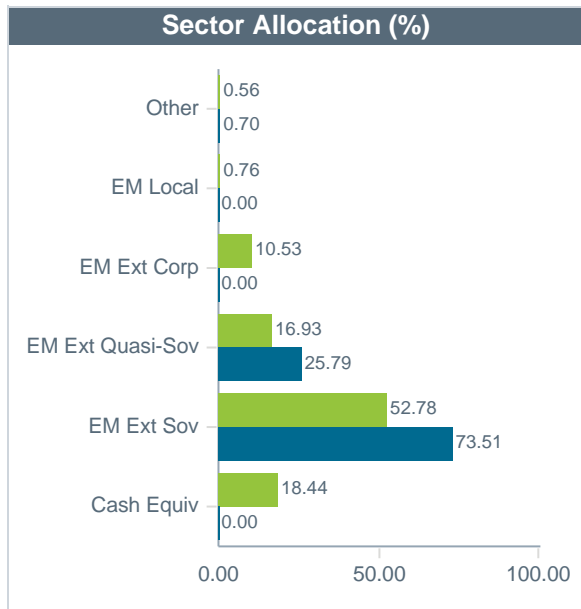
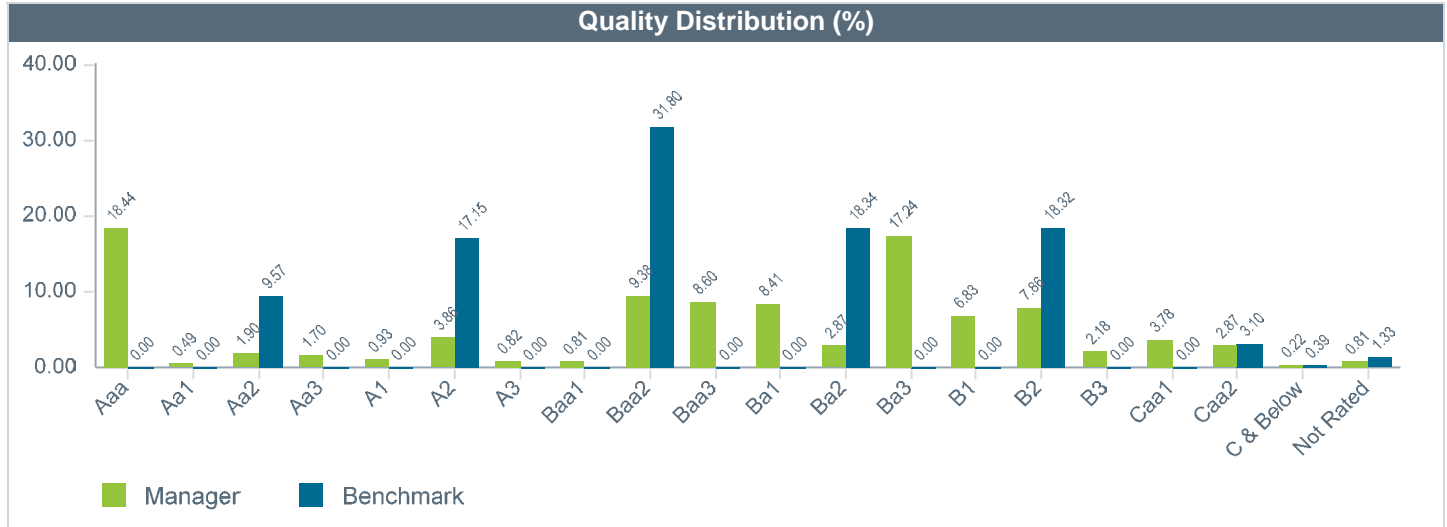
Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	-0.58	4.16	5.98	4.27	4.98	5.94	7.69	15.84	-5.78	10.56	12.85
Benchmark	-0.53	3.88	5.64	3.57	4.54	5.48	5.88	14.42	-4.61	9.32	10.19
Difference	-0.05	0.28	0.34	0.70	0.44	0.46	1.81	1.42	-1.17	1.24	2.66
Peer Group Median	-0.71	5.55	5.48	3.70	3.83	4.81	5.57	13.58	-5.92	10.49	10.42
Rank	39	84	33	30	10	6	15	9	48	50	28
Population	274	264	244	215	166	81	262	274	275	265	233



### Portfolio Characteristics (%)

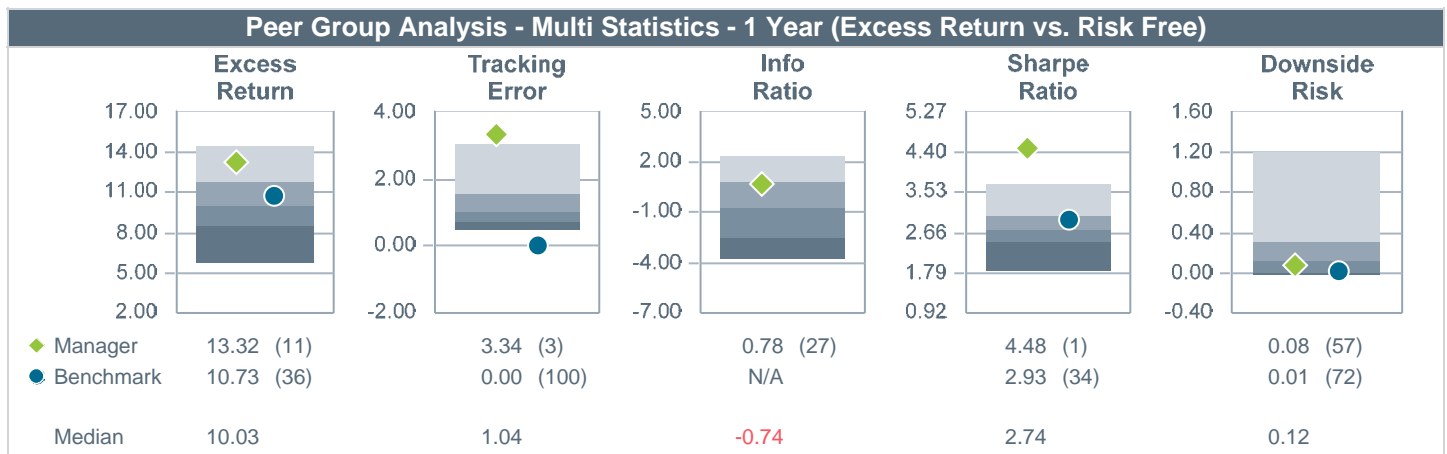
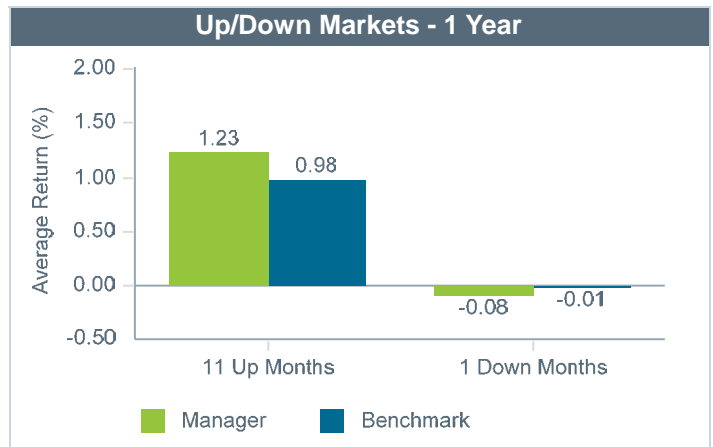
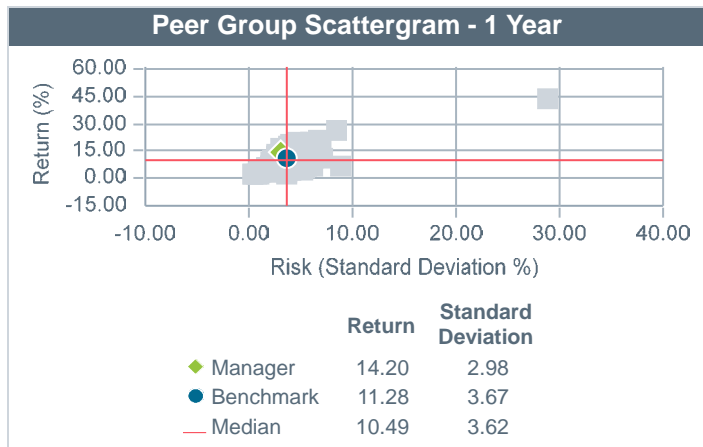
	Portfolio	Benchmark
Effective Duration	8.16	8.15
Spread Duration	7.56	7.94
Avg. Maturity	12.80	13.49
Avg. Quality	Baa3	Baa3
Yield To Maturity (%)	4.50	4.26
Coupon Rate (%)	4.15	4.75
Current Yield (%)	4.51	4.66
Holdings Count	404	953





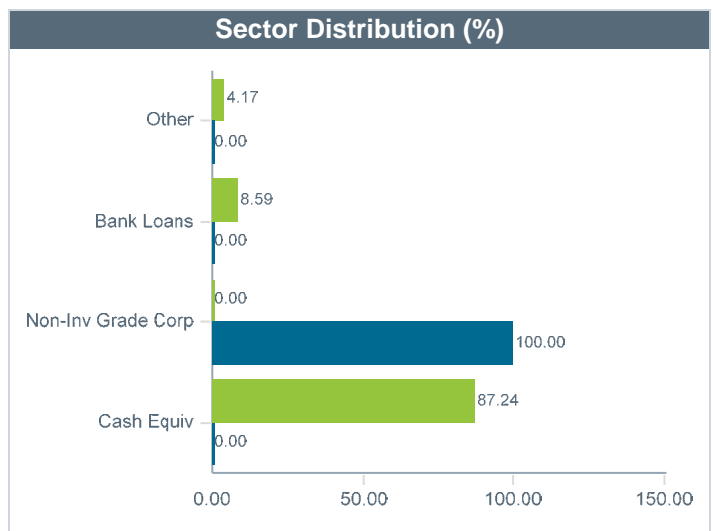
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. Region allocation to other consists of cash, cash equivalents, currency forwards, EM CDX and North America. Region allocation to other consists of EM government debt.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	0.34	14.20	4.02	N/A	N/A	N/A	3.26	6.30	N/A	N/A	N/A
Benchmark	0.89	11.28	6.91	6.52	5.89	7.42	7.11	14.32	-2.08	7.50	17.13
Difference	-0.55	2.92	-2.89	N/A	N/A	N/A	-3.85	-8.02	N/A	N/A	N/A
Peer Group Median	0.67	10.49	5.87	5.50	4.66	6.39	5.28	13.51	-2.91	6.65	13.52
Rank	84	10	92	N/A	N/A	N/A	81	99	N/A	N/A	N/A
Population	664	649	613	535	470	344	659	682	669	626	594



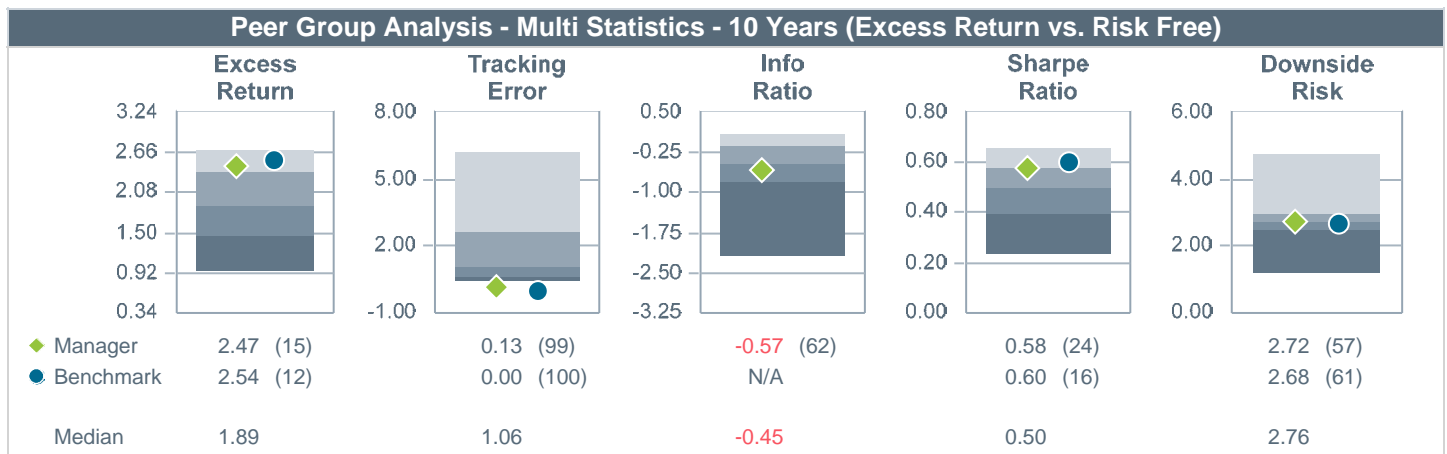
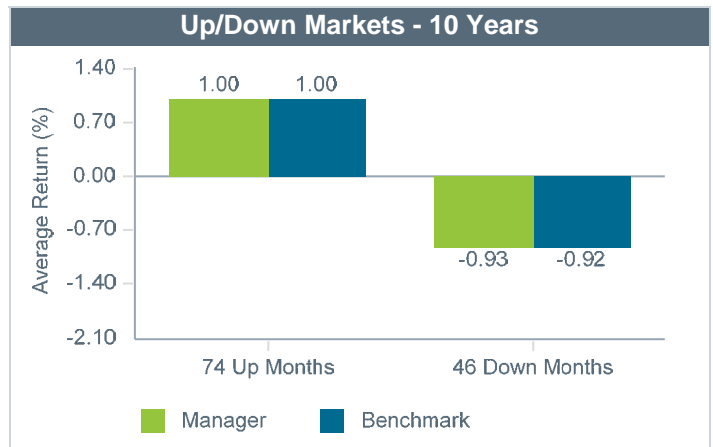
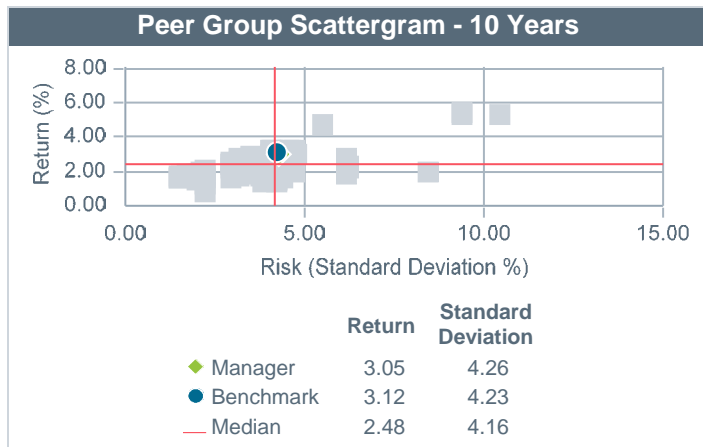
### Portfolio Characteristics

	Portfolio	Benchmark
Effective Duration	0.11	3.97
Spread Duration	2.13	3.92
Avg. Maturity	0.84	6.60
Avg. Quality	Aaa	Ba3/B1
Yield To Maturity (%)	0.80	4.68
Coupon Rate (%)	1.20	5.72
Current Yield (%)	1.21	N/A
Holdings Count	11	2,238



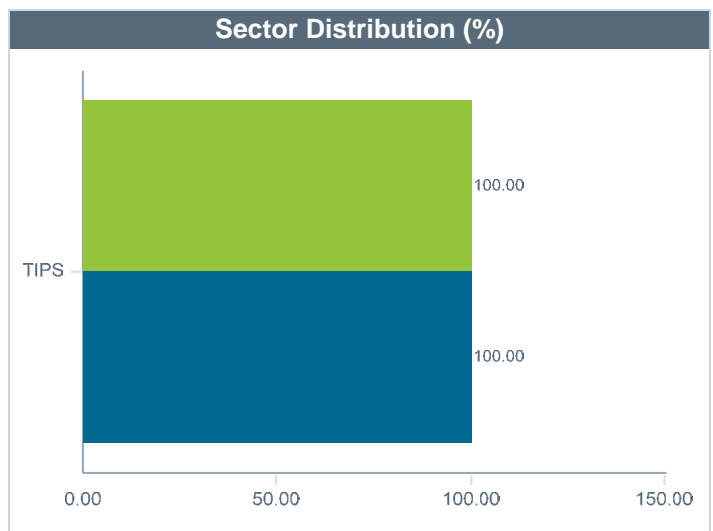
Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. Allocation to other consists of common stock.

Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	1.73	5.14	7.36	4.27	3.84	3.05	10.97	8.33	-1.36	2.98	4.67
Benchmark	1.75	5.19	7.45	4.34	3.90	3.12	10.99	8.43	-1.26	3.01	4.68
Difference	-0.02	-0.05	-0.09	-0.07	-0.06	-0.07	-0.02	-0.10	-0.10	-0.03	-0.01
Peer Group Median	1.59	5.37	6.56	3.81	3.06	2.48	9.64	7.53	-1.57	2.62	4.39
Rank	28	59	20	26	13	15	26	25	42	31	38
Population	210	205	200	174	144	118	206	221	227	228	220



### Portfolio Characteristics

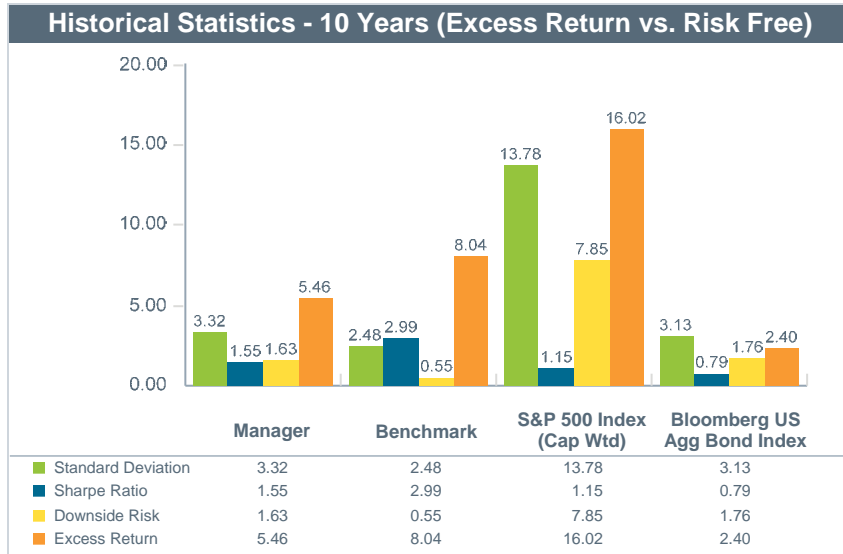
	Portfolio	Benchmark
Effective Duration	5.48	5.48
Spread Duration	5.48	5.48
Avg. Maturity	8.17	8.17
Avg. Quality	Aaa	Aaa
Yield To Maturity (%)	1.17	1.17
Coupon Rate (%)	0.67	0.67
Current Yield (%)	N/A	N/A
Holdings Count	44	44



Performance shown is net of fees and client specific. Calculation is based on monthly periodicity. Parentheses contain percentile ranks. Portfolio characteristics are proxied using benchmark statistics.

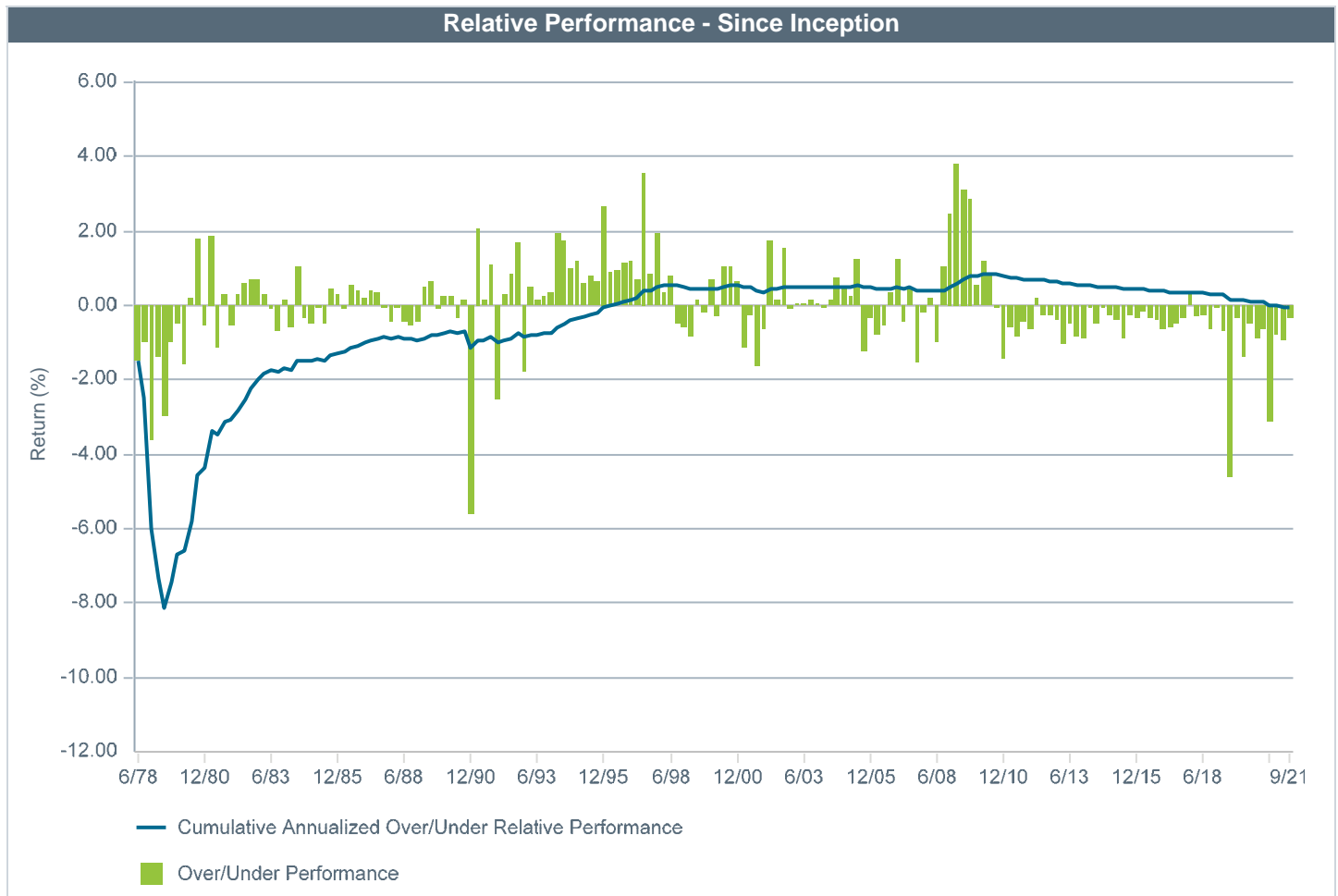


Performance											
	QTD	1 Year	3 Years	5 Years	7 Years	10 Years	2020	2019	2018	2017	2016
Manager	6.03	7.78	1.12	2.90	4.82	6.17	-4.74	-2.87	6.15	5.42	6.14
Benchmark	6.41	13.64	6.13	6.56	7.93	8.92	0.34	4.39	7.36	6.66	7.79
Difference	-0.38	-5.86	-5.01	-3.66	-3.11	-2.75	-5.08	-7.26	-1.21	-1.24	-1.65



### Actual Correlation - 10 Years

	Actual Correlation
NCREIF ODCE Index (AWA) (Net)	0.87
S&P 500 Index (Cap Wtd)	-0.26
Russell 2000 Index	-0.32
MSCI EAFE Index (USD) (Net)	-0.28
MSCI Emg Mkts Index (USD) (Net)	-0.38
Bloomberg US Agg Bond Index	-0.29
Bloomberg US Trsy US TIPS Index	-0.31
Wilshire US REIT Index	-0.02
HFRI FOF Comp Index	-0.32
Bloomberg Comdty Index (TR)	-0.15
ICE BofAML 3 Mo US T-Bill Index	-0.44
Cons Price Index (Unadjusted)	0.02
NCREIF Property Index	0.82



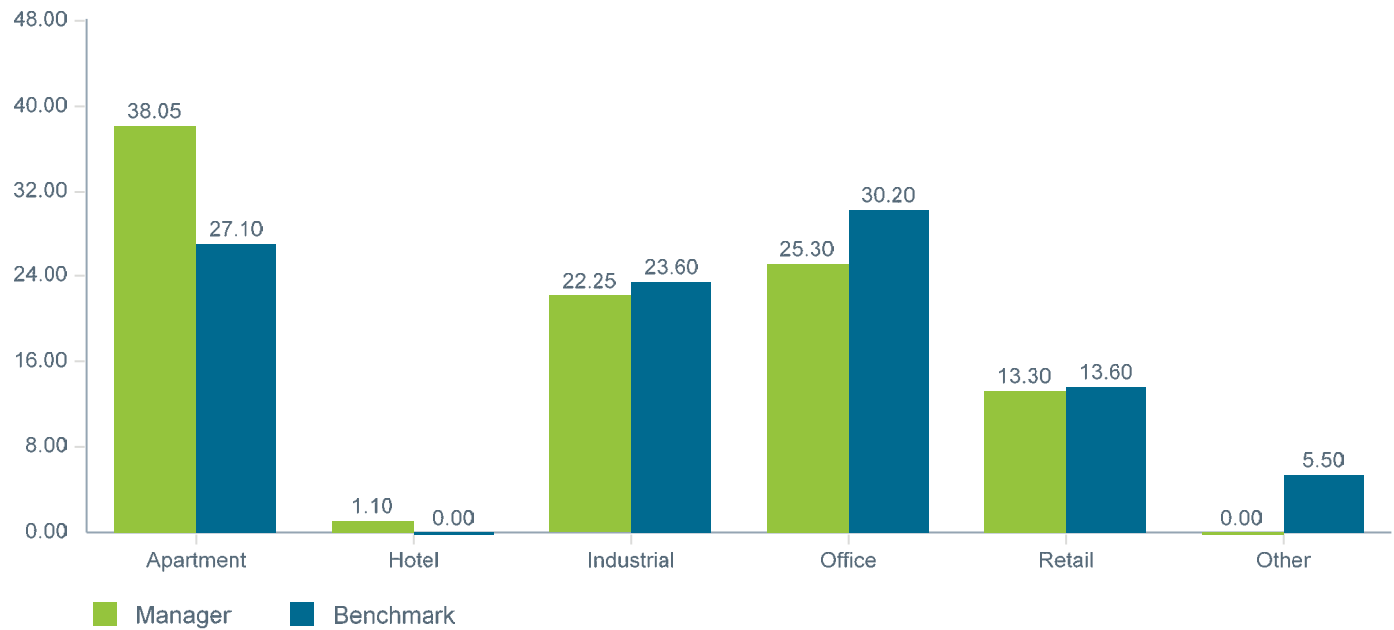
**Investment Strategy**

The Fund pursues a diversified core real estate strategy that seeks to produce attractive risk-adjusted returns by focusing on selective acquisitions, diversification, active portfolio management, and asset management. The Fund invests in well-leased, stabilized assets in major US metropolitan markets and receives the majority of its return from the income component. Diversification for the Fund is consistently pursued on many levels, including geographic region, property type, and economic sector. The Fund has historically maintained a leverage ratio significantly lower than the NCREIF ODCE Index and invests 5-15% of its gross assets in value-added type real estate investment opportunities.

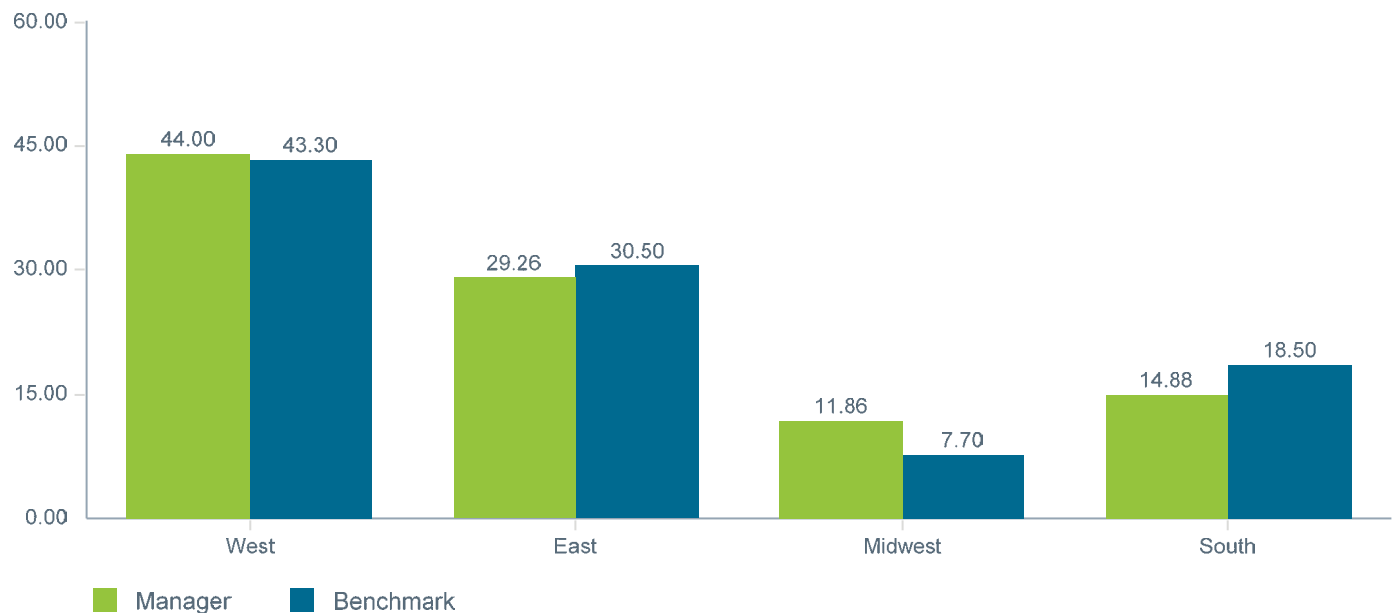
**Investment Profile**

Fund Inception	1978
Legal Structure	LP
Fund Structure	Open-End
Gross Real Estate Assets (\$M)	17,816
Fund Leverage %	17.00
Portfolio Occupancy %	93.00
Cash Reserve %	5.50
Number of Investments	172
Number of Limited Partners	446

**Property Type Allocation (%)**



**Geographic Allocation (%)**



Performance shown is net and product specific. Calculation is based on quarterly periodicity. Investment profile data shown is provided by the investment manager and is as of the most recently available quarter end. Allocation data shown is based on NAV. Benchmark allocation to "Other" consists of entertainment (theaters, golf courses, bowling alleys), healthcare (hospitals, clinics), manufactured homes, parking lots, self-storage units, senior living, and undeveloped land.



# VPIC Total Alternatives Portfolio



General Comments

- Through this reporting period, Vermont Pension Investment Committee has committed a total of \$1,350,000,000 to 29 non-marketable alternative investments.
- The average age of active investments (based upon vintage year and weighted by commitment) was 3.12 years.
- A total of \$657,374,330 has been called or otherwise contributed to date.
- Distributions have totaled \$211,985,810 since plan inception.
- The residual estimated value of interests in these partnerships/investments is \$756,980,320.
- Since inception net performance for the investments are as follows:
  - Annualized since-inception estimated Internal Rate of Return (IRR) of 20.72%.
  - Were an investment into the benchmark index (MSCI ACW IM Index (USD) (Net)) ("Index IRR") made with the identical cash-flow pattern, the resulting return would be equal to 15.50% indicating roughly 521 basis points of annualized out-performance.
  - For every \$1 paid into the portfolio, \$1.47 has been returned as a distribution or is held in residual value (multiple on invested capital = 1.47x).



**Private Credit - Direct Lending**

- Private Credit - Direct Lending funds account for 19.63% of commitments, 23.77% of contributed funds, 20.24% of distributed funds, and 18.14% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 7.81%
  - MSCI ACW IM Index (USD) (Net) IRR of 15.40%
  - A multiple on invested capital of 1.15x.

**Private Credit - Distressed/Special Situations**

- Private Credit - Distressed/Special Situations funds account for 3.70% of commitments, 4.59% of contributed funds, 0.00% of distributed funds, and 4.46% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR - Not Material
  - MSCI ACW IM Index (USD) (Net) IRR - Not Material
  - A multiple on invested capital of 1.12x.

**Private Credit - Specialty Finance**

- Private Credit - Specialty Finance funds account for 4.81% of commitments, 1.54% of contributed funds, 0.03% of distributed funds, and 1.74% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR - Not Material
  - MSCI ACW IM Index (USD) (Net) IRR - Not Material
  - A multiple on invested capital of 1.31x.

**Private Equity - Buyout**

- Private Equity - Buyout funds account for 19.04% of commitments, 17.50% of contributed funds, 17.87% of distributed funds, and 21.40% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 28.72%
  - MSCI ACW IM Index (USD) (Net) IRR of 17.69%
  - A multiple on invested capital of 1.74x.

#### Private Equity - Fund of Funds

- Private Equity - Fund of Funds funds account for 4.74% of commitments, 4.21% of contributed funds, 3.37% of distributed funds, and 5.32% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 28.70%
  - MSCI ACW IM Index (USD) (Net) IRR of 15.96%
  - A multiple on invested capital of 1.72x.

#### Private Equity - Natural Resources

- Private Equity - Natural Resources funds account for 9.63% of commitments, 7.20% of contributed funds, 0.33% of distributed funds, and 6.30% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 3.87%
  - MSCI ACW IM Index (USD) (Net) IRR of 33.57%
  - A multiple on invested capital of 1.02x.

#### Private Equity - Non-US Private Equity

- Private Equity - Non-US Private Equity funds account for 7.04% of commitments, 1.89% of contributed funds, 2.38% of distributed funds, and 3.18% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 27.01%
  - MSCI ACW IM Index (USD) (Net) IRR of 13.86%
  - A multiple on invested capital of 2.34x.

#### Private Equity - Secondaries

- Private Equity - Secondaries funds account for 12.22% of commitments, 12.93% of contributed funds, 26.42% of distributed funds, and 11.74% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 28.33%
  - MSCI ACW IM Index (USD) (Net) IRR of 13.14%
  - A multiple on invested capital of 1.70x.

**Private Equity - Venture**

- Private Equity - Venture funds account for 5.11% of commitments, 7.00% of contributed funds, 10.74% of distributed funds, and 12.30% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 32.89%
  - MSCI ACW IM Index (USD) (Net) IRR of 13.49%
  - A multiple on invested capital of 2.52x.

**Real Estate - Opportunistic**

- Real Estate - Opportunistic funds account for 11.48% of commitments, 17.21% of contributed funds, 17.68% of distributed funds, and 13.53% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 8.61%
  - MSCI ACW IM Index (USD) (Net) IRR of 13.44%
  - A multiple on invested capital of 1.24x.

**Real Estate - Value Added**

- Real Estate - Value Added funds account for 2.59% of commitments, 2.16% of contributed funds, 0.93% of distributed funds, and 1.89% of reported residual value.
- Pooled portfolio since inception performance is as follows:
  - Annualized since-inception IRR of 15.03%
  - MSCI ACW IM Index (USD) (Net) IRR of 37.76%
  - A multiple on invested capital of 1.15x.

Vermont Pension Investment Committee  
Alternative Investment Private Equity Fund Performance Listing

As of June 30, 2021

Fund Name	Vintage	Asset Class	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Fund IRR (%)	Quartile	Index IRR (%)	Fund Multiple
HarbourVest Partners IX - Buyout, LP	2011	Private Equity - Buyout	24,000,000	20,507,188	21,837,565	22,449,608	20.37	1st	9.98	2.16
HarbourVest Partners IX - Credit Opportunities Fund, LP	2011	Private Equity - Fund of Funds	4,000,000	3,210,265	2,805,194	2,370,931	13.37	2nd	11.33	1.61
HarbourVest Partners IX - Venture, LP	2011	Private Equity - Venture	12,000,000	11,437,671	15,554,241	23,262,416	25.75	1st	9.17	3.39
Dover Street VIII, LP (HarbourVest)	2012	Private Equity - Secondaries	25,000,000	23,000,000	30,497,651	9,308,986	20.78	2nd	8.62	1.73
HarbourVest International Private Equity Partners VII Partnership, LP	2014	Private Equity - Non-US Private Equity	15,000,000	12,450,000	5,040,604	21,179,871	23.73	2nd	13.86	2.11
HarbourVest International Private Equity Partners VIII Partnership, LP	2014	Private Equity - Fund of Funds	60,000,000	24,450,000	4,330,259	37,934,975	38.26	1st	18.21	1.73
HarbourVest Partners X - Buyout, LP	2015	Private Equity - Buyout	45,500,000	26,847,787	11,421,637	38,143,121	29.84	2nd	16.24	1.85
HarbourVest Partners X - Venture, LP	2015	Private Equity - Venture	19,500,000	15,650,422	5,188,257	39,372,590	43.41	1st	14.63	2.85
Dover Street IX, LP (HarbourVest)	2016	Private Equity - Secondaries	40,000,000	32,000,000	20,893,598	37,048,688	32.00	1st	14.46	1.81
Dover Street X, LP (HarbourVest)	2018	Private Equity - Secondaries	100,000,000	30,000,000	4,617,188	42,532,408	94.78	1st	29.55	1.57
HarbourVest Partners XI - Buyout Fund, LP	2018	Private Equity - Buyout	75,000,000	23,625,000	3,633,681	35,512,274	65.70	1st	34.35	1.66
HarbourVest Partners XI - Micro Buyout Fund, LP	2018	Private Equity - Buyout	12,500,000	3,562,500	517,563	5,458,917	81.98	1st	41.80	1.68
HarbourVest Partners Co-Investment Fund V, LP	2019	Private Equity - Buyout	25,000,000	17,500,000	0	30,772,398	63.55	N/A	31.10	1.76
HarbourVest Partners XI - Venture Fund, LP	2019	Private Equity - Venture	37,500,000	18,937,500	2,024,729	30,498,769	80.47	N/A	33.19	1.72
Nuveen Global Farmland Fund, LP	2019	Private Equity - Natural Resources	100,000,000	40,214,982	707,213	41,050,959	N/M	N/A	N/M	1.04
Pontifax Global Food and Agriculture Technology Fund II, LP	2019	Private Equity - Natural Resources	30,000,000	7,147,202	0	6,663,330	-10.08	N/A	24.13	0.93
Siguler Guff Small Buyout Opportunities Fund IV	2019	Private Equity - Buyout	50,000,000	17,850,000	479,009	22,115,006	36.12	N/A	49.16	1.27

Certain valuations (marked with a \*\*) are preliminary estimates of valuation as of the date of reporting and reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. Index IRR represents the dollar-weighted returns calculated using the MSCI ACWI Index (USD) (Net) assuming an index investment with the same cash flow timing. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated. Applicable IRRs are marked with 'N/M' for not material. Fund IRR is the annualized since-inception net internal rate for the indicated fund or composite. Fund Multiple is the since inception sum of distributions and valuation divided by paid in capital. Quartile data is based on information provided by Preqin.



Vermont Pension Investment Committee  
 Alternative Investment Private Equity Fund Performance Listing

As of June 30, 2021

Fund Name	Vintage	Asset Class	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Fund IRR (%)	Quartile	Index IRR (%)	Fund Multiple
HarbourVest HIPEP IX Fund, LP	2020	Private Equity - Non-US Private Equity	80,000,000	0	0	2,903,689	N/M	N/A	N/M	
NB Strategic Co-Investment Partners IV LP	2020	Private Equity - Buyout	25,000,000	5,130,604	0	7,522,736	114.77	N/A	37.61	1.47
			<b>780,000,000</b>	<b>333,521,121</b>	<b>129,548,389</b>	<b>456,101,672</b>	<b>29.10</b>		<b>15.79</b>	<b>1.76</b>

Certain valuations (marked with a \*\*) are preliminary estimates of valuation as of the date of reporting and reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. Index IRR represents the dollar-weighted returns calculated using the MSCI ACW IM Index (USD) (Net) assuming an index investment with the same cash flow timing. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated. Applicable IRRs are marked with 'N/M' for not material. Fund IRR is the annualized since-inception net internal rate for the indicated fund or composite. Fund Multiple is the since inception sum of distributions and valuation divided by paid in capital. Quartile data is based on information provided by Preqin.



Vermont Pension Investment Committee  
Alternative Investment Real Estate Fund Performance Listing

As of June 30, 2021

Fund Name	Vintage	Asset Class	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Fund IRR (%)	Quartile	Index IRR (%)	Fund Multiple
Siguler Guff Distressed Real Estate Opportunities Fund II	2013	Real Estate - Opportunistic	40,000,000	35,272,308	23,986,725	27,006,348	8.87	4th	7.24	1.45
Siguler Guff DREOF II Co-Investment Fund	2016	Real Estate - Opportunistic	15,000,000	12,669,146	6,164,010	9,772,703	6.69	4th	5.50	1.26
Blue Vista Real Estate Partners V	2018	Real Estate - Value Added	35,000,000	14,175,000	1,978,763	14,288,872	15.03	2nd	5.98	1.15
Brookfield Strategic Real Estate Partners III	2019	Real Estate - Opportunistic	100,000,000	65,161,125	7,329,401	65,604,071	9.19	N/A	4.88	1.12
			<b>190,000,000</b>	<b>127,277,579</b>	<b>39,458,899</b>	<b>116,671,994</b>	<b>8.85</b>		<b>6.38</b>	<b>1.23</b>

Certain valuations (marked with a \*\*) are preliminary estimates of valuation as of the date of reporting and reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. Index IRR represents the dollar-weighted returns calculated using the NCREIF ODCE Index (AWA)(Net) assuming an index investment with the same cash flow timing. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated. Applicable IRRs are marked with 'N/M' for not material. Fund IRR is the annualized since-inception net internal rate for the indicated fund or composite. Fund Multiple is the since inception sum of distributions and valuation divided by paid in capital. Quartile data is based on information provided by Preqin.



Vermont Pension Investment Committee  
Alternative Investment Private Credit Fund Performance Listing

As of June 30, 2021

Fund Name	Vintage	Asset Class	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Fund IRR (%)	Quartile	Index IRR (%)	Fund Multiple
Benefit Street Partners Senior Secured Opportunities Fund	2016	Private Credit - Direct Lending	70,000,000	70,000,000	29,624,702	54,401,804	6.30	4th	4.58	1.20
(Arcmont) Direct Lending Fund III (USD-L) SLP	2018	Private Credit - Direct Lending	70,000,000	42,499,755	13,286,581	35,593,208	10.76	3rd	4.11	1.15
Benefit Street Partners Senior Secured Opportunities Fund II (Levered US)	2019	Private Credit - Direct Lending	75,000,000	27,534,994	0	29,791,634	23.55	N/A	9.19	1.08
AG Direct Lending Fund IV, LP	2020	Private Credit - Direct Lending	50,000,000	16,250,000	0	17,498,969	N/M	N/A	N/M	1.08
Ares Pathfinder Fund, LP	2020	Private Credit - Specialty Finance	65,000,000	10,092,163	67,239	13,163,241	N/M	N/A	N/M	1.31
Kennedy Lewis Capital Partners Master Fund II, LP	2020	Private Credit - Distressed/Special Situations	50,000,000	30,198,717	0	33,757,799	N/M	N/A	N/M	1.12
			<b>380,000,000</b>	<b>196,575,629</b>	<b>42,978,522</b>	<b>184,206,655</b>	<b>9.36</b>		<b>5.01</b>	<b>1.16</b>

Certain valuations (marked with a \*\*) are preliminary estimates of valuation as of the date of reporting and reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. Index IRR represents the dollar-weighted returns calculated using the CS Lvg'd Loan Index assuming an index investment with the same cash flow timing. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated. Applicable IRRs are marked with 'N/M' for not material. Fund IRR is the annualized since-inception net internal rate for the indicated fund or composite. Fund Multiple is the since inception sum of distributions and valuation divided by paid in capital. Quartile data is based on information provided by Preqin.



Average Commitment-weighted Active Investment Age (in years): 3.29

Vintage Year	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Vintage Year IRR (%)	Index IRR (%)	Vintage Year Multiple	Cumulative Multiple
2011	40,000,000	35,155,124	40,197,000	48,082,955	22.25	9.79	2.51	2.51
2012	25,000,000	23,000,000	30,497,651	9,308,986	20.78	8.62	1.73	2.20
2014	75,000,000	36,900,000	9,370,863	59,114,846	29.24	15.67	1.86	2.07
2015	65,000,000	42,498,209	16,609,894	77,515,711	36.03	15.57	2.21	2.11
2016	40,000,000	32,000,000	20,893,598	37,048,688	32.00	14.46	1.81	2.06
2018	187,500,000	57,187,500	8,768,432	83,503,599	77.96	32.91	1.61	1.94
2019	242,500,000	101,649,684	3,210,951	131,100,462	43.04	35.52	1.32	1.75
2020	105,000,000	5,130,604	0	10,426,425	269.88	37.61	2.03	1.76
<b>TOTAL</b>	<b>780,000,000</b>	<b>333,521,121</b>	<b>129,548,389</b>	<b>456,101,672</b>	<b>29.10</b>	<b>15.79</b>		<b>1.76</b>

Index IRR represents the dollar-weighted returns calculated using the MSCI ACW IM Index (USD) (Net) assuming an index investment with the same cash flow timing. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated. Applicable IRRs are marked with 'N/M' for not material. Vintage Year IRR is the annualized since-inception net internal rate for the indicated fund or composite. This report may contain valuations for investments that are preliminary estimates of valuation as of the date of reporting which reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. Vintage Year Multiple is the since inception sum of distributions and valuation divided by paid in capital. Cumulative Multiple is the since inception sum of distributions and valuation divided by paid in capital for all investments through the indicated vintage year.





Average Commitment-weighted Active Investment Age (in years): 3.98

Vintage Year	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Vintage Year IRR (%)	Index IRR (%)	Vintage Year Multiple	Cumulative Multiple
2013	40,000,000	35,272,308	23,986,725	27,006,348	8.87	7.24	1.45	1.45
2016	15,000,000	12,669,146	6,164,010	9,772,703	6.69	5.50	1.26	1.40
2018	35,000,000	14,175,000	1,978,763	14,288,872	15.03	5.98	1.15	1.34
2019	100,000,000	65,161,125	7,329,401	65,604,071	9.19	4.88	1.12	1.23
<b>TOTAL</b>	<b>190,000,000</b>	<b>127,277,579</b>	<b>39,458,899</b>	<b>116,671,994</b>	<b>8.85</b>	<b>6.38</b>		<b>1.23</b>

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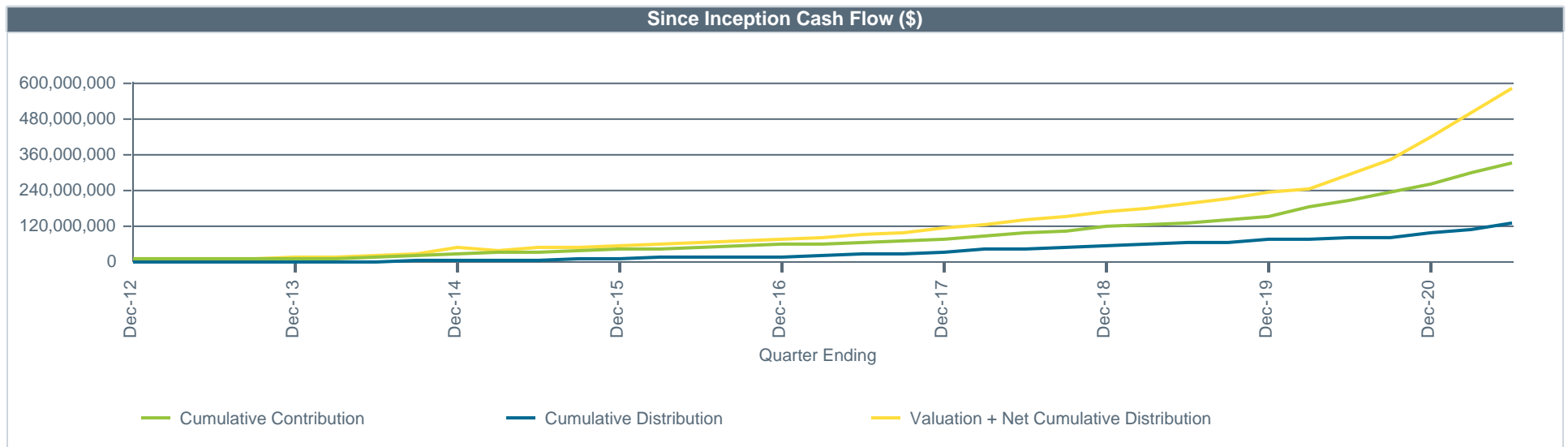
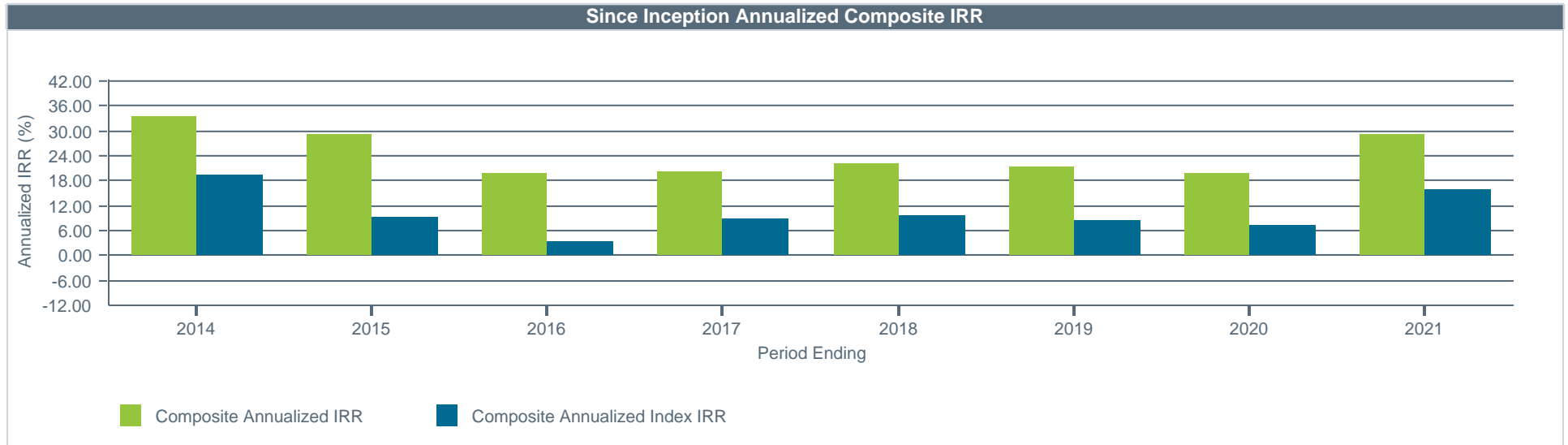


Average Commitment-weighted Active Investment Age (in years): 2.36

Vintage Year	Commitment (\$)	Paid In Capital (\$)	Distributions (\$)	Valuation (\$)	Vintage Year IRR (%)	Index IRR (%)	Vintage Year Multiple	Cumulative Multiple
2016	70,000,000	70,000,000	29,624,702	54,401,804	6.30	4.58	1.20	1.20
2018	70,000,000	42,499,755	13,286,581	35,593,208	10.76	4.11	1.15	1.18
2019	75,000,000	27,534,994	0	29,791,634	23.55	9.19	1.08	1.16
2020	165,000,000	56,540,880	67,239	64,420,009	N/M	N/M	1.14	1.16
<b>TOTAL</b>	<b>380,000,000</b>	<b>196,575,629</b>	<b>42,978,522</b>	<b>184,206,655</b>	<b>9.36</b>	<b>5.01</b>		<b>1.16</b>

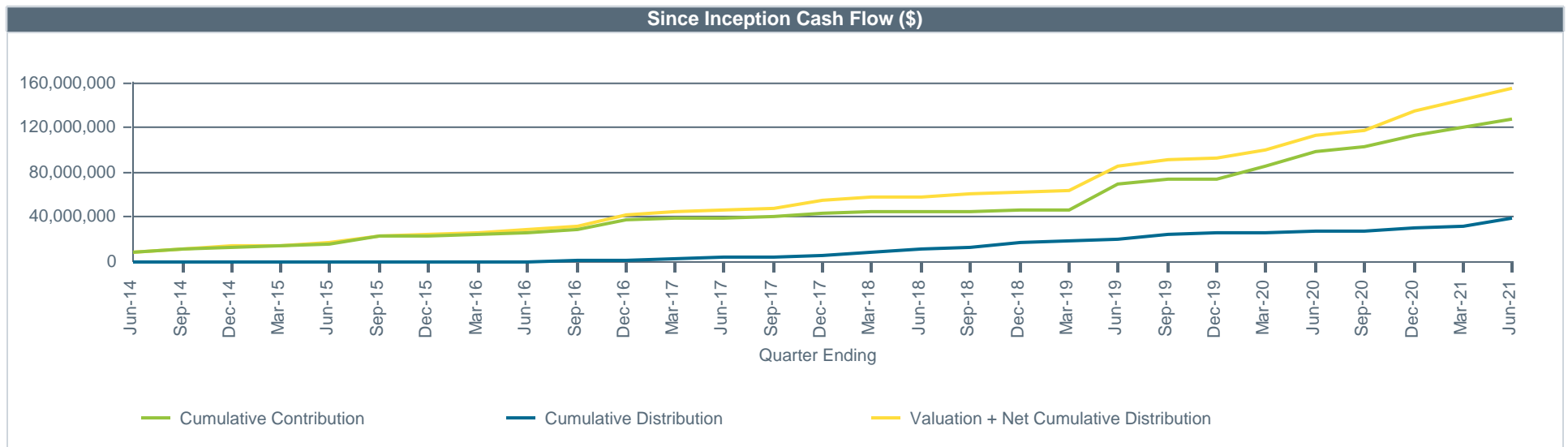
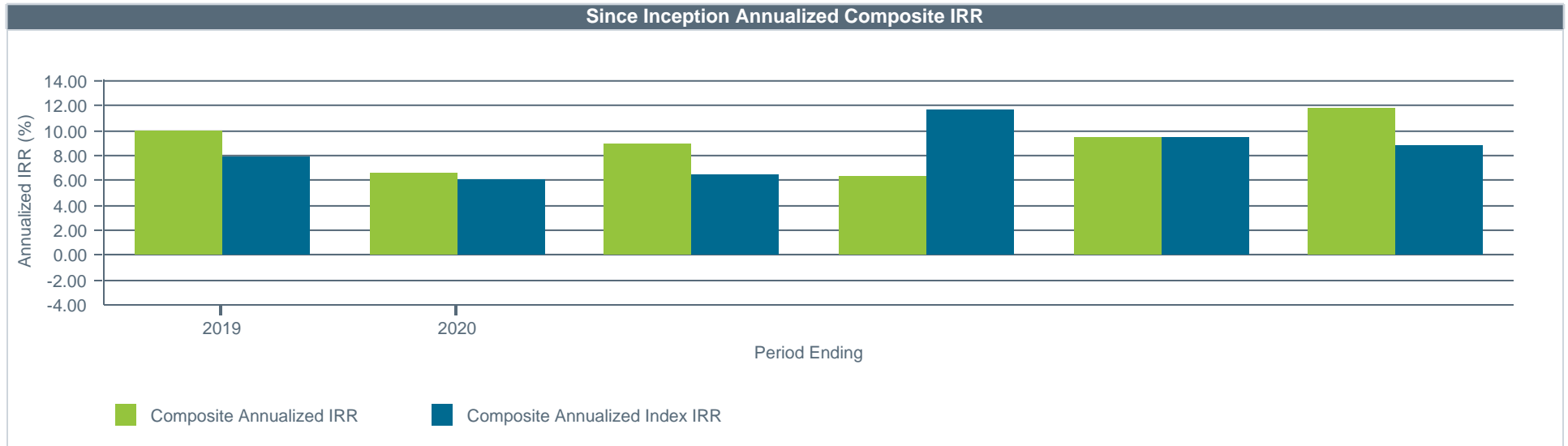
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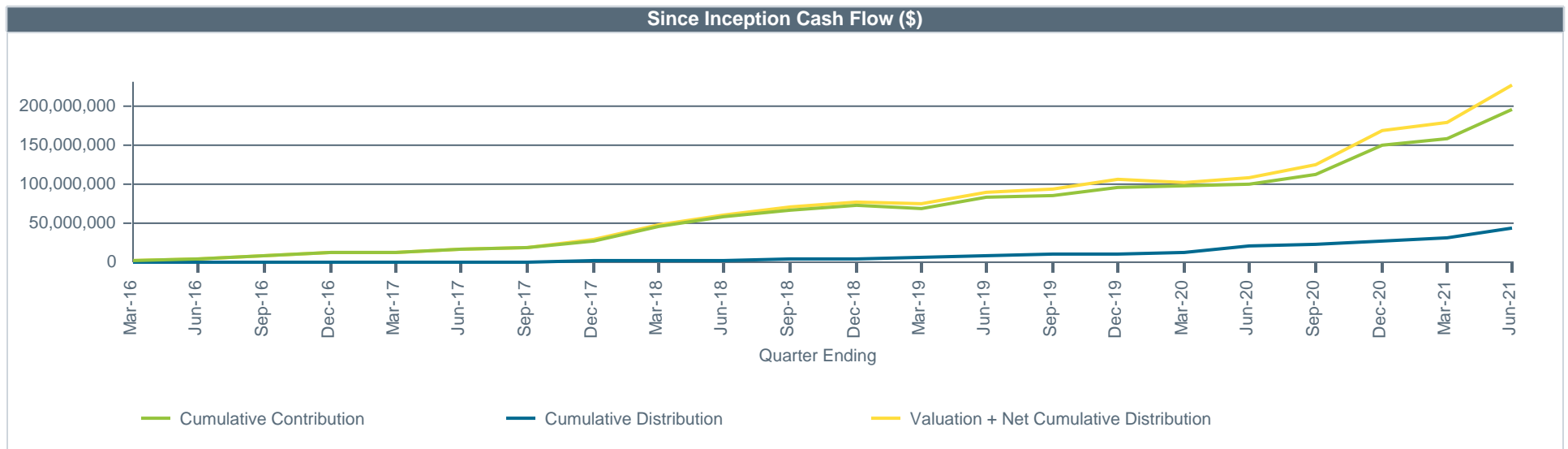
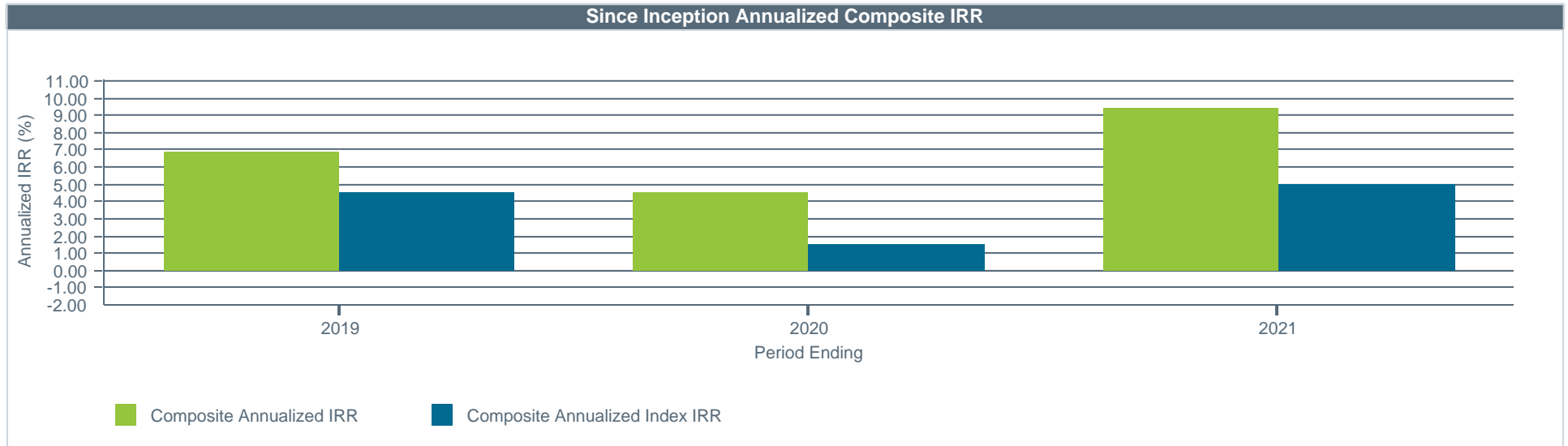
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Index IRR represents the dollar-weighted returns calculated using the NCREIF ODCE Index (AWA)(Net) assuming an index investment with the same cash flow timing. This report may contain valuations for investments that are preliminary estimates of valuation as of the date of reporting which reflect the estimated impact of subsequent net cash contributions/distributions. These figures may be used in calculations contained in this report. IRRs are shown only for investments with one year or more of cash flows and for which an accurate IRR could be calculated.





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# Addendum & Glossary



**Vermont State Teachers' Retirement System  
Fee Schedule**

**As of September 30, 2021**

	<b>Fee Schedule</b>	<b>Market Value As of 09/30/2021 (\$)</b>	<b>Estimated Annual Fee (\$)</b>	<b>Estimated Annual Fee (%)</b>
Blackrock S&P 500 (EqI Wtd) (CF)	0.020 % of Assets	87,979,380	17,596	0.020
Champlain US Mid Cap Core (SA)	0.850 % of First \$50 M 0.750 % of Next \$50 M 0.650 % Thereafter	78,839,797	641,298	0.813
BlackRock MSCI ACW (CF)	0.025 % of Assets	797,614,745	199,404	0.025
Blackrock MSCI World LCTR (SA)	0.055 % of Assets	84,450,145	46,448	0.055
Artisan Global Opportunities (CF)	0.750 % of Assets	130,043,646	975,327	0.750
Acadian International All Cap (SA)	0.700 % of First \$25 M 0.600 % of Next \$25 M 0.500 % of Next \$25 M 0.300 % Thereafter	114,450,841	568,353	0.497
Mondrian International Equity (SA)	0.500 % of First \$50 M 0.350 % of Next \$50 M 0.300 % Thereafter	63,600,525	297,602	0.468
Wellington Opportunistic EMD (CF)	0.550 % of Assets	94,978,829	522,384	0.550
PIMCO Liquidation (SA)	0.300 % of Assets	1,756,030	5,268	0.300
BlackRock US Agg (CF)	0.030 % of Assets	411,890,468	123,567	0.030
PIMCO Core (SA)	0.190 % of Assets	125,490,342	238,432	0.190
UBS Trumbull Properties (CF)	0.955 % of First \$10 M 0.825 % of Next \$15 M 0.705 % of Next \$25 M 0.790 % of Next \$50 M 0.670 % of Next \$150 M 0.600 % of Next \$150 M 0.560 % of Next \$200 M 0.520 % Thereafter	90,949,107	718,998	0.791
BlackRock TIPS (CF)	0.025 % of Assets	119,134,499	29,784	0.025
<b>Total Fund</b>		<b>2,544,185,522</b>	<b>4,384,459</b>	<b>0.172</b>

Mutual Fund fees are sourced from Morningstar and/or the investment manager. UBS also has a variable fee ranging from 0.00% to 0.25%. The variable fee has been suspended from 4/01/2018 to 3/31/2022. Total fund fee shown excludes fees on Private Assets.



**Performance Related Comments**

- RVK began monitoring the plan's assets as of 9/2020. Prior data was provided by the previous consultant.
- Performance shown is net of fees.
- Inception dates shown represent the first full month of available performance.
- Fiscal year ends 6/30.
- Private Asset market values and performance are lagged to match custodian reported net asset values. Accordingly, fund reported performance will lag benchmark reported performance.
- Inception dates for allocation buckets are when RVK started calculating performance in 09/2020.
- PIMCO Liquidation (SA) consists of residual assets from Vermont Pension's High Yield allocation.
- During 12/2020, the Real Assets composite consisting of Core Real Estate, Non-Core Real Estate, and Private Infrastructure/Land was replaced by the Inflation Hedging Assets composite consisting of TIPS, Core Real Estate, and Private Infrastructure/Land. A new Non-Core Real Estate composite was created.
- During 06/2021, the inception dates for Blackrock S&P 500, Artisan Global Opportunities and Wellington EMD were adjusted to reflect the first full month of performance.

**Decisions Made by the Committee Over the Last 18 Months**

**Manager Additions**

- Nuveen Global Agriculture (CF), Angelo Gordan Direct Lending, Harbourvest Dover X, Harbourvest XI Funds, Siguer Guff SBOF IV, Neuberger Berman, Benefit Street Partners II, Blue Vista Real Estate Partners, Ares Pathfinder Fund I, Blackrock MSCI World LCTR (SA) and Kennedy Lewis Capital II.

**Manager Liquidations**

- SGA International Small Cap (CF), Pinnacle Natural Resources and Blackrock Transition Account.

**Policy Changes**

- During 01/2021, the board approved an updated target allocation index and fund level benchmarks. Benchmark changes were reflected starting 01/2021.

**Historical Transition Comments**

- SGA International Small Cap (CF) was liquidated during 09/2020. Remaining market value represents residual assets.
- Angelo Gordon Direct Lending IV was funded during 09/2020.
- Wellington Small Cap Value (SA), SSgA Russell 2000 Growth (SA), Pinnacle Natural Resources (CF) and PIMCO Unconstrained (SA) were liquidated prior to 09/2020. Remaining market values represent residual assets.
- The Wellington Small Cap Value (SA) liquidation was completed during 03/2021.
- Ares Pathfinder Fund I was funded during 04/2021.
- During 06/2021, Blackrock Transition was liquidated.
- During 08/2021, Blackrock MSCI World LCTR (SA) was funded.
- The Pinnacle Natural Resources (CF) liquidation was completed during 09/2021.

**Benchmark Comments**

- The Target Allocation Index currently consists of 4% S&P 500 Index (Cap Wtd), 3% Russell 2500 Index, 5% MSCI EAFE Index, 29% MSCI ACW IM Index (USD) (Net), 2% MSCI EAFE Small Cap Index, 20% Bloomberg US Aggregate Bond Index, 3% NCREIF ODCE Index (AWA) (Net)+2%, 4% JP Morgan Emerging Mkts Bond Gbl Index, 10% Credit Suisse Leveraged Loan Index + 2%, 10% Cambridge US PE Index and 10% CPI+ 2.5%. From 08/31/2020 through 12/31/2020, the index consisted of 4% S&P 500 Index (Cap Wtd), 3% Russell 2500 Index, 5% MSCI EAFE Index, 29% MSCI ACW IM Index (USD) (Net), 2% MSCI EAFE Small Cap Index, 20% Bloomberg US Aggregate Bond Index, 3% Bloomberg US Treasury US TIPS Index (TR), 4% JP Morgan Emerging Mkts Bond Gbl Index, 10% S&P/LSTA Leveraged Loan Index (TR), 10% Cambridge US PE Index and 10% NCREIF Property Index. Prior data was provided by the previous consultant.
- The Actual Allocation Indices are calculated monthly using beginning of month investment weights applied to each corresponding benchmark return.
- The Custom SMID Cap Equity Index currently consists of 50% Russell Midcap Index and 50% Russell 2000 index. From 08/2020 through 12/2020 it consisted of 50% Russell 2500 index and 50% Russell 2000 index. Prior data was provided by the previous consultant.
- The CPI+2.5% (Spliced) consists of the NCREIF Property Index prior to 08/31/2020 and the Consumer Price Index+2.5% thereafter.



- CS Lvg'd Loan Index+2% (Spliced) consists of the S&P/LSTA Loan Index prior to 12/31/2020 and the Credit Suisse Leveraged Loan Index+2% thereafter.
- NCREIF ODCE Index+2% (Spliced) consists of the NCREIF Property Index prior to 12/31/2020 and the NCREIF ODCE Index (Net)+2% thereafter.

## Glossary

**Active Return** - The difference between the investment manager/composite performance relative to the performance of an appropriate market benchmark.

**Active Share** - Measures the degree to which the holdings of a fund differ from the holdings of the benchmark. Active share is calculated by taking the sum of the absolute value of the differences of the weight of each holding in the fund versus the weight of each holding in the benchmark and dividing by two.

**Alpha** - A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market or a portfolio's non-systematic return.

**Alpha Ratio** - A measure of a portfolio's non-systematic return per unit of downside risk. It is measured by dividing the alpha of a portfolio by the downside risk. The non-systematic return is a measure of a portfolio's historical performance not explained by movements of the market.

**Average Quality** - Bond quality ratings are reported using the investment managers' and the index providers' preferred rating agency. *Average Quality for managers unable to provide this statistic is instead provided by Morningstar; if unavailable on Morningstar, it has been estimated using a credit quality distribution provided by the manager.* There are two primary rating agencies in the US. *Moody's* assigns ratings on a system that employs up to four symbols (consisting of letters and numbers), such as, Aaa, Aa2, etc., with Aaa being the highest or safest rating. *Standard & Poor's (S&P)* employs a system that uses + and - along with letters, such as AAA, AA+, etc. The two rating agencies' systems are summarized below:

<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>	<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>
<b>Higher Credit Quality – Investment Grade</b>			<b>Lower Credit Quality – Below Investment Grade</b>		
AAA	Aaa	Prime/Highest credit quality	BB+	Ba1	Speculative/Low credit quality
AA+	Aa1	High credit quality	BB	Ba2	
AA	Aa2		BB-	Ba3	
AA-	Aa3		B+	B1	Highly speculative
A+	A1	Upper-medium credit quality	B	B2	
A	A2		B-	B3	
A-	A3		CCC+	Caa1	Substantial credit/default risk
BBB+	Baa1	Lower-medium credit quality	CCC	Caa2	Extremely speculative
BBB	Baa2		CCC-	Caa3	
BBB-	Baa3		CC	Ca	Vulnerable to default
			C	Ca	
			D	C	In default

**Benchmark Effect** - The difference between the blended return of each respective managers' benchmark within a composite and the composite's benchmark return.

**Beta** - A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk.

**Box Plots** - A graphical representation of the distribution of observations. From top to bottom, the four boxes represent the spread between the maximum value and the minimum value in each quartile. A quartile represents the values that divide the observations into four quarters (i.e., 1<sup>st</sup> quartile, 2<sup>nd</sup> quartile, 3<sup>rd</sup> quartile, and 4<sup>th</sup> quartile). The median observation is where the 2<sup>nd</sup> quartile and 3<sup>rd</sup> quartile meet.

**Buy and Hold Attribution** - At the beginning of the time period under analysis, the manager and benchmark portfolios are broken down into segments (i.e., styles, sectors, countries, and regions) based on the desired type of attribution. The formula assumes zero turn-over to the manager and benchmark portfolios throughout the period and calculates the segment returns ("buy and hold returns") to arrive at performance attribution. Due to portfolio turnover, buy and hold attribution may not accurately represent quarterly performance relative to the benchmark. Country, region, sector, and style allocations are as of the date one quarter prior to the reporting date, and the returns shown are for those segments throughout the quarter reported. Due to disclosure guidelines set by each investment manager, equity characteristics shown are as of the most recent date available. The following is the methodology for segment classification:

**Sector** - Attribution is calculated using the Global Industry Classification Standard (GICS), which is a detailed and comprehensive structure for sector and industry analysis. Stocks are classified by their primary sector as defined by S&P Capital IQ data.

**Country/Region** - Attribution is calculated using the Morgan Stanley Capital International (MSCI) region standards. Stocks are classified by their domicile country/region, as defined by S&P Capital IQ data, and thus may differ from the classification of the investment manager and/or index provider.

**Style** - Stocks are classified into the following style boxes: large/mid/small vs. growth/neutral/value. Stocks are classified along large/mid/small categories at the time of the Russell index rebalancing, using the index market cap boundaries as cutoff points. Stocks are classified along growth/neutral/value categories at the time of the Russell index rebalancing, using the price/book ratio as supplied by S&P Capital IQ. Stocks in the Russell 3000 Index portfolio are sorted by price/book ratio; names with the highest price/book ratio that make up 1/3 of the total market capitalization are assigned to the growth category, and names that make up the subsequent 1/3 of the total market capitalization are assigned to the neutral category, while the balance of the names are assigned to the value category. Stocks are unclassified when there is not enough data to determine a size and style metric.

Portfolio Characteristics and Buy and Hold Attribution reports utilize product-specific data for all mutual funds and commingled funds.

### Capital Markets Review -

**Breakeven Inflation** - Measures the expected inflation rate at each stated maturity by taking the difference between the real yield of the inflation-linked maturity curve and the yield of the closest nominal Treasury maturity.

**Consumer Confidence** - Measures domestic consumer confidence as defined by the degree of optimism on the state of the economy that consumers express through saving and spending.

**Consumer Price Index (CPI)** - Measures the change in the price level of consumer goods and services.



## Glossary

- Federal Funds Rate** - The interest rate at which a depository institution lends funds maintained at the Federal Reserve to another depository institution overnight. It is one of the most influential interest rates in the US economy, since it affects monetary and financial conditions, which in turn have a bearing on key aspects of the broad economy including employment, growth and inflation.
- Option-Adjusted Spread** - Measures the flat spread of an index or bond to the Treasury yield curve after removing the effect of any embedded options.
- Purchasing Managers Index (PMI)** - Measures economic activity by surveying purchasing managers on a monthly basis as to whether business conditions have improved, worsened, or stayed the same.
- Real Gross Domestic Product (Real GDP)** - An inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year.
- Unemployment Rate** - The percentage of the total labor force that is unemployed but actively seeking employment.
- US Dollar Total Weighted Index** - Measures the value of the US Dollar relative to a basket of other world currencies. It is calculated as the weighted geometric mean of the dollar's value versus the EUR, GBP, CAD, SEK, CHF, and JPY.
- VIX** - Measures the implied volatility of S&P 500 Index options by looking at the market's expectation of the S&P 500 Index volatility over the next 30 day period. Commonly referred to as the "fear index" or the "fear gauge."
- Cash Flow Effect** - The composite's active return minus the sum of each managers' active return minus the benchmark effect.
- Consistency** - The percentage of quarters that a product achieved a rate of return higher than that of its benchmark. The higher the consistency figure, the more value a manager has contributed to the product's performance.
- Convexity** - A measure of the shape of the curve that describes the relationship between bond prices and bond yields.
- Correlation** - A statistical measure of the relationship between asset class returns. A value of 1.00 is a perfect correlation; that is, the asset classes always move in the same direction. A value of -1.00 indicates a perfect negative correlation, in which the asset classes always move in opposite directions of each other. A value of 0 indicates there is no relationship between the direction of returns of the two asset classes. Correlation calculations only consider the direction of changes relative to two variables and not the magnitude of those changes.
- Coupon Rate** - The percentage rate of interest paid on a bond or fixed income security; it is typically paid twice per year.
- Current Yield** - The annual income of a security divided by the security's current price.
- Down Market Capture** - Down market by definition is negative benchmark return and down market capture represents the ratio in % terms of the average portfolios return over the benchmark during the down market period. The lower the value of the down market capture the better the product's performance.
- Downside Risk** - A measure similar to standard deviation that focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative returns for the selected periodicity. The higher the factor, the riskier the product.
- Earnings Per Share** - It is backward looking, calculated using the one year current EPS divided by the one year EPS five years ago.
- Effective Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield.
- Excess Return vs. Market** - Average of the monthly arithmetic difference between the manager's return and the benchmark return over a specified time period, shown on an annualized basis.
- Excess Return vs. Risk Free** - Average of the monthly arithmetic difference between the manager's return and the risk-free return (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise) over a specified time period, shown on an annualized basis.
- Excess Risk** - A measure of the standard deviation of a portfolio's performance relative to the risk-free return.
- Expense Ratios** - Morningstar is the source for mutual fund expense ratios.
- Gain/Loss** - The net increase or decrease in the market value of a portfolio excluding its Net Cash Flow for a given period.
- Indices** - All indices and related information are considered intellectual property and are licensed by each index provider. The indices may not be copied, used, or distributed without the index provider's prior written approval. Index providers make no warranties and bear no liability with respect to the indices, any related data, their quality, accuracy, suitability, and/or completeness.
- Information Ratio** - Measured by dividing the active rate of return by the tracking error. The higher the information ratio, the more value-added contribution by the manager.
- Liability Driven Investing (LDI)** - A method to optimally structure asset investments relative to liabilities. The change in liabilities is estimated by the Ryan Labs Generic PPA Index of appropriate duration for that Plan. This benchmark is based on generic data and is therefore an approximation. RVK is not an actuarial firm, and does not have actuarial expertise.
- Estimated Funded Status** - The estimated ratio of a Plan's assets relative to its future liabilities. This is calculated by dividing the Plan's asset market value by the estimated present value of its liabilities. The higher the estimated funded status, the better the Plan's ability to cover its projected benefit obligations. An estimated funded status of 100% indicates a Plan that is fully funded.
- Estimated PV of Liabilities** - An estimate of a Plan's future liabilities in present value terms. The beginning of the period liability is provided by the Plan's actuary. The period-end present value liability estimate provided in this report is derived by applying the estimated percentage change generated using the Ryan Labs Generic PPA Index with duration similar to that reported on the most recent actuarial valuation report.
- Duration of Liabilities** - The sensitivity of the value of a Plan's liabilities to changes in interest rates, as calculated by the Plan's actuary.
- Duration of Assets** - The dollar-weighted average duration of all the individual Plan assets.
- Estimated Plan Hedge Ratio** - The estimate of how well a Plan's investment portfolio is hedged against changes in interest rates - a primary driver of funded status movements. This is calculated by dividing the dollar-weighted values of both the Plan asset duration by the liability duration and

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multiplying by the estimated funded status. An estimated plan hedge ratio of zero indicates that the Plan's liabilities have not been hedged, whereas a value of one indicates fully hedged.

**Modified Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield, assuming the bonds' expected cash flows do not change.

**Mutual Fund Performance** - Whenever possible, manager performance is extended for any share class that does not have 10 years of history. Using Morningstar's methodology, a single ticker within the same fund family (often the oldest share class) is chosen to append historical performance.

**Net Cash Flow** - The sum, in dollars, of a portfolio's contributions and withdrawals. This includes all management fees and expenses only when performance shown is gross of fees.

### Peer Groups -

**Plan Sponsor Peer Groups** - RVK utilizes the Mellon Analytical Solutions Trust Universe along with the Investment Metrics Plan Sponsor Universe. The combined Mellon Analytical Solutions Trust Universe and Investment Metrics Plan Sponsor Universe is used for comparison of total fund composite results and utilizes actual client performance compiled from consultant and custodian data. The Plan Sponsor Peer Group database includes performance and other quantitative data for over 2,100 plans which include corporate, endowment, foundation, public, and Taft Hartley plans.

**Investment Manager Peer Groups** - RVK utilizes Investment Metrics' Peer Groups for investment manager peer comparison and ranking. The Investment Metrics Peer Group database includes performance and other quantitative data for over 840 investment management firms and 29,000 investments products, across more than 160 standard peer groups. Mutual Fund Peer Groups are net of fees.

**Percentile Rankings** - Percentile rank compares an individual fund's performance with those of other funds within a defined peer group of managers possessing a similar investment style. Percentile rank identifies the percentage of a fund's peer group that has a higher return (or other comparative measurement) than the fund being ranked. Conversely, 100 minus the individual fund's ranking will identify the percentage of funds within the peer group that have a lower return than the fund being ranked.

1 - Highest Statistical Value                      100 - Lowest Statistical Value

*Example: American Funds AMCP;R-4 (RAFEX) is ranked in the 4<sup>th</sup> percentile within the IM US Equity Large-Cap Growth Funds (MF) Peer Group for the Sharpe Ratio. Within the IM US Equity Large-Cap Growth Funds peer group, 4% of the other funds performed better than American Funds AMCP;R-4 (RAFEX), while 96% of the funds performed worse.*

**Performance Methodology** - RVK calculates performance for investment managers and composites using different methodologies.

**Investment Managers** - Performance is calculated for interim periods between all large external cash flows for a given month and geometrically linked to calculate period returns. An external cash flow is defined as cash, securities, or assets that enter or exit a portfolio. RVK defines a "large cash flow" as a net aggregate cash flow of  $\geq 10\%$  of the beginning-period portfolio market value or any cash flow that causes RVK calculated performance to deviate from manager/custodian reported performance in excess of 5 basis points for a given month.

**Composites** - The Modified Dietz methodology is utilized to calculate asset class, sub-asset class, and total fund composite performance. The Modified Dietz method calculates a time-weighted total rate of return that considers the timing of external cash flows; however, it does not utilize interim period performance to mitigate the impact of significant cash in- and outflows to the composite.

RVK calculates performance beginning with the first full month following inception. Since inception performance may vary from manager reported performance due to RVK using the first full month of returns as the inception date. Performance for both managers and composites is annualized for periods greater than one year.

**Portfolio Characteristics** - Due to disclosure guidelines set by each investment manager, portfolio characteristics shown are as of the most recent date available.

**Price to Earnings Ratio** - The ratio valuing a company's current share price relative to its trailing 12-month per-share earnings (EPS).

**Private Equity Quartile Ranks** - Private Equity quartile ranks are generated using vintage year peer group data provided by Thomson Reuters, and are based on each fund's annualized, since inception internal rate of return (IRR). Three Private Equity peer groups are available via Thomson Reuters: Buyout, Venture, and All Private Equity. Ranks are available quarterly, at a one-quarter lag.

**R-Squared** - The percentage of a portfolio's performance explained by the behavior of the appropriate benchmark. High R-Squared means a higher correlation of the portfolio's performance to the appropriate benchmark.

**Return** - Compounded rate of return for the period.

**% Return** - The time-weighted rate of return of a portfolio for a given period.

**Risk Free Benchmark** - ICE BofAML 3 Mo US T-Bill Index unless specified otherwise.

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**RVK Liquidity Rating** - A qualitative method for determining the relative amount of liquidity in a portfolio. The characteristics considered when determining relative liquidity include trading volume, gates for redemption, leverage, nature of transactions, and pricing mechanisms. The RVK Liquidity Rating is calculated using beginning of month investment weights applied to each corresponding asset class liquidity rating.

<u>Asset Class</u>	<u>RVK Liquidity Rating</u>	<u>Asset Class</u>	<u>RVK Liquidity Rating</u>
<b><u>Liquid Investments</u></b>		<b><u>Less Liquid Investments</u></b>	
T-Bills and Treasuries	100	Fixed Income Plus Sector	50
Cash Equivalents	98	Stable Value (Plan Sponsor Directed)	50
TIPS	95	Hedge Funds of Funds	35
US Large Cap Equity	95		
Diversified Real Return	93		
Stable Value (Participant Directed)	91		
Global Equity	90	<b><u>Not Liquid Investments</u></b>	
Non-US Large Cap Equity	90	Core Real Estate	25
Global Tactical Asset Allocation	88	Core Plus Real Estate	15
MLPs	85	Non-Core Real Estate	5
US Mid Cap Equity	85	Private Equity Funds of Funds	5
US SMid Cap Equity	85		
US Small Cap Equity	85		
REITs	85		
Non-US Small Cap Equity	85		
Emerging Markets Equity	85		
Core Fixed Income	85		
Core Plus Fixed Income	80		

**Sector Allocation** - Negative fixed income sector allocation reflects manager's use of derivatives, short selling, or interest rate swaps.

**Sharpe Ratio** - Represents the excess rate of return over the risk-free return (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise), divided by the standard deviation of the excess return to the risk free asset. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.

**Simple Alpha** - The difference between the manager's return and the benchmark's return.

**Spread Duration** - The approximate percentage change in a bond's price for a 100 basis point change in its spread over a Treasury of the same maturity.

**Standard Deviation** - A statistical measure of the range of a portfolio's performance. The variability of a return around its average return over a specified time period.

**Thematic Classification** - Represents dedicated manager allocations; as such, thematic allocations are approximations. RVK categorizes the following asset classes as Alpha, Capital Appreciation, Capital Preservation, and Inflation:

<u>Alpha</u>	<u>Capital Appreciation</u>	<u>Capital Preservation</u>	<u>Inflation</u>
Absolute Return Strategies	Public Equity	Core Fixed Income	TIPS
Currency Overlay	Private Equity	CMBS Fixed Income	Bank Loans
	Preferred Securities	Asset Backed Fixed Income	Core Real Estate
	High Yield	Domestic Core Plus Fixed Income	Real Return
	Convertible Fixed Income	Mortgage Backed Fixed Income	Inflation Hedges
	TALF Funds	International Developed Fixed Income	REITs
	Distressed Debt	Cash Equivalents	Commodities
	Emerging Market Fixed Income	Stable Value	
	Value Added Real Estate		
	Opportunistic Real Estate		

**Time Period Abbreviations** - **QTD** - Quarter-to-Date. **CYTD** - Calendar Year-to-Date. **FYTD** - Fiscal Year-to-Date. **YOY** - Year Over Year.

**Total Fund Attribution** - The Investment Decision Process (IDP) model provides an approach to evaluating investment performance that applies to all asset classes and investment styles. The IDP model is based on a top-down hierarchy framework of investment decisions, with each decision contributing to the overall profit or loss. The IDP approach starts from the strategic asset allocation and follows the flow of the investments down to the manager's skill.

**Strategic Asset Allocation (SAA)** - The percentage return gained or lost from the long-term strategic asset allocation decision, the most significant determinant of long-term performance. SAA is the product of the target asset allocation multiplied by the corresponding benchmark returns.

**Tactical Asset Allocation (TAA)** - The percentage return gained or lost from not having been precisely allocated at the target asset allocation mix, whether by deviations that are tactical in nature or a by-product of moving towards the target mix. TAA is the product of the actual asset allocation multiplied by the broad asset class benchmarks, less the SAA.

**Style Selection (SS)** - The percentage return gained or lost from intentional style biases within each asset class (e.g. value rather than core or overweight to emerging markets relative to benchmark). SS is the product of the actual manager allocation within each asset class multiplied by their specific benchmark, less TAA.

**Manager's Skill (MS)** - The percentage return gained or lost from manager value added relative to their specific benchmark. MS is the product of the actual manager allocation multiplied by their achieved excess return.

**Total Fund Beta** - Total Fund Beta is calculated using the S&P 500 as the benchmark. It represents a measure of the sensitivity of the total fund to movements in the S&P 500 and is a measure of the Total Fund's non-diversifiable or systematic risk.



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**Tracking Error** - A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

**Treynor Ratio** - Similar to Sharpe ratio, but focuses on beta rather than excess risk (standard deviation). Treynor ratio represents the excess rate of return over the risk-free rate (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise) divided by the beta. The result is the absolute rate of return per unit of risk. The higher the value, the better historical risk-adjusted performance.

**Unit Value** - The dollar value of a portfolio, assuming an initial nominal investment of \$100, growing at the compounded rate of %Return for a given period.

**Up Market Capture** - Up market by definition is positive benchmark return and up market capture represents the ratio in % terms of the average portfolio's return over the benchmark during the up market period. The higher the value of the up market capture the better the product's performance.

**Yield to Maturity** - The rate of return achieved on a bond or other fixed income security assuming the security is bought and held to maturity and that the coupon interest paid over the life of the bond will be reinvested at the same rate of return. The 30-Day SEC Yield is similar to the Yield to Maturity and is reported for mutual funds.

**Yield to Worst** - The bond yield calculated by using the worst possible yield taking into consideration all call, put, and optional sink dates.