

# Western States Office & Professional Employees Pension Fund

Investment Performance Review  
Period Ending: December 31, 2021



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# 4<sup>th</sup> quarter summary

## THE ECONOMIC CLIMATE

- Real GDP grew at a 4.9% rate year-over-year in the third quarter (+2.3% quarterly annualized rate). A slowdown in consumer spending contributed to a lower rate of growth. This was due to a combination of factors, including new COVID-19 restrictions, a delay in the reopening of businesses across the country, and general fear of virus spread which has led to less spending on services.
- The U.S. labor market improved further, as unemployment fell from 4.8% to 3.9%. The labor force participation rate has also improved, though very gradually, rising from 61.6% to 61.9%.

## PORTFOLIO IMPACTS

- Credit spreads have reached extremely tight levels. High yield bonds traded at a credit spread of 283 bps at year-end. However, these spread levels may be justified by record-low bond default activity. Just 0.4% of U.S. high yield bonds defaulted in 2021, on a par-weighted basis.
- U.S. core CPI increased 5.5% year-over-year in December. Headline inflation, which includes all goods, reached 7.0%. Large price increases have occurred across many goods and services, though approximately half of the rise in inflation continues to be driven by energy prices and automobiles.

## THE INVESTMENT CLIMATE

- In December it was announced that Senator Joe Manchin had communicated a hard “No” regarding his support for the Build Back Better bill. For months, Democrats have sought a solution to the disparate needs and spending interests of their party.
- Extremely fast spread of the Omicron variant worldwide does not seem to have had an outsized impact on the markets. While this new wave has in fact led to shutdowns in certain economies, much of the world has remained open, perhaps in acknowledgment that the health effects of Omicron are believed to be milder in nature.

## ASSET ALLOCATION ISSUES

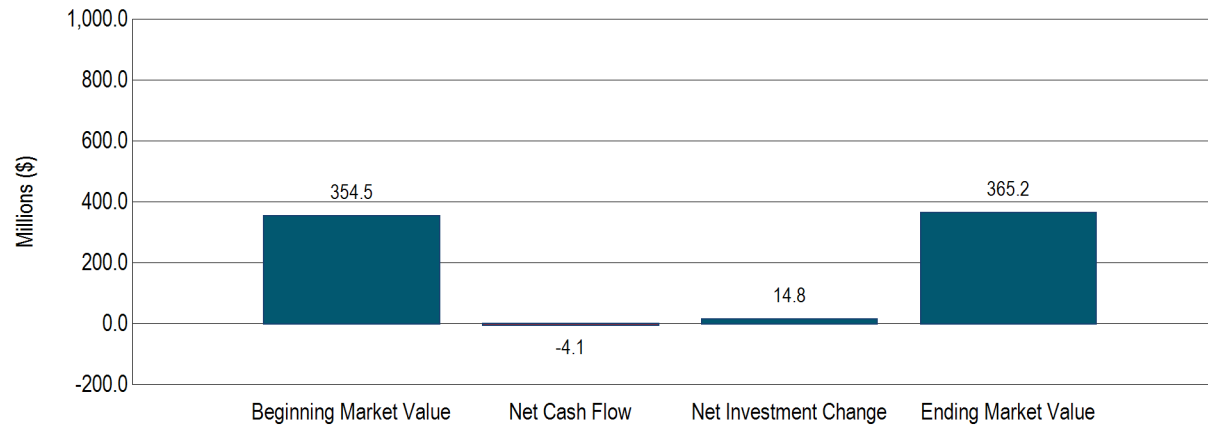
- Equity markets delivered strong returns in Q4, up +6.7% and ending the year up 18.5% (MSCI ACWI). U.S. equities delivered 11.0% during the quarter, while international equities delivered 2.7% and emerging market equities saw a slight loss of -1.3%, on an unhedged currency basis.
- Size and Value factor performance was negative once again during Q4. Large capitalization stocks significantly outperformed small capitalization stocks and Growth beat Value. Tighter monetary conditions and a pullback in some growth stocks has renewed talks of a possible Value rotation.

Risk assets continue to perform strongly, despite rapid global spread of the Omicron variant

**Portfolio Reconciliation**

	Last Three Months	Year-To-Date
Beginning Market Value	\$354,508,144	\$339,009,626
Net Cash Flow	-\$4,142,063	-\$18,475,201
Net Investment Change	\$14,824,163	\$44,655,819
Ending Market Value	\$365,190,244	\$365,190,244

**Change in Market Value  
Last Three Months**



Contributions and withdrawals may include intra-account transfers between managers/funds.

# Total Fund

## Cash Flow by Manager - Last Three Months

Period Ending: December 31, 2021

	Beginning Market Value	Contributions	Withdrawals	Net Cash Flow	Net Investment Change	Ending Market Value
BlackRock Equity Index NL	\$36,833,166	\$0	-\$2,200,000	-\$2,200,000	\$3,990,576	\$38,623,743
INTECH US Adaptive Volatility	\$38,924,211	\$0	-\$2,300,000	-\$2,300,000	\$3,222,574	\$39,846,785
Vanguard Small Cap Index Ins	\$18,668,948	\$0	-\$1,800,000	-\$1,800,000	\$717,716	\$17,586,663
WCM Focused International Growth Fund, L.P.	\$53,096,573	\$0	-\$10,000,000	-\$10,000,000	\$2,876,491	\$45,973,064
Causeway International Value Ins	\$28,219,055	\$0	\$0	\$0	\$262,890	\$28,481,944
Loomis Sayles Core Plus	\$62,849,685	\$0	\$0	\$0	-\$70,459	\$62,779,226
ASB Allegiance Real Estate	\$24,010,887	\$0	\$0	\$0	\$906,362	\$24,917,249
JPMorgan Special Situation Property	\$17,541,406	\$0	-\$63,738	-\$63,738	\$1,324,566	\$18,802,234
IFM Global Infrastructure (US) LP	\$11,314,744	\$0	-\$126,600	-\$126,600	\$410,021	\$11,598,166
JPMorgan IIF ERISA LP	\$7,448,284	\$0	-\$195,209	-\$195,209	\$0	\$7,253,074
Invesco Balanced-Risk Allocation	\$51,830,464	\$10,000,000	\$0	\$10,000,000	\$1,183,426	\$63,013,891
US Bank Checking Account	\$1,215,373	\$11,442,919	-\$8,907,174	\$2,535,744	\$0	\$3,751,117
US Bank Clearing Account	\$2,555,347	\$7,626,180	-\$7,618,439	\$7,740	\$0	\$2,563,087
<b>Total</b>	<b>\$354,508,144</b>	<b>\$29,069,098</b>	<b>-\$33,211,161</b>	<b>-\$4,142,063</b>	<b>\$14,824,163</b>	<b>\$365,190,244</b>

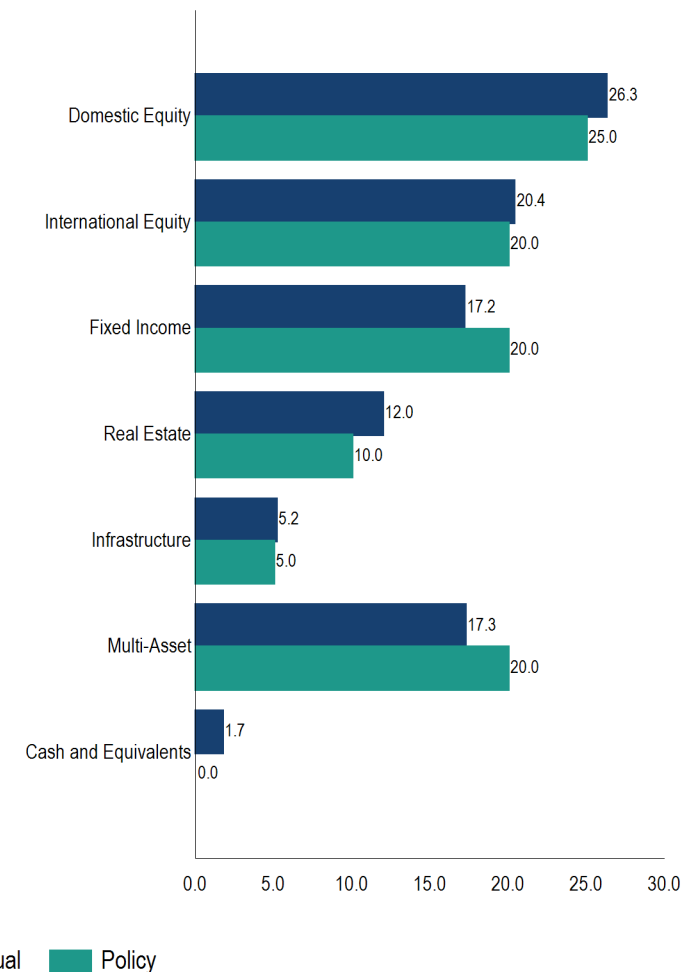
Loomis Sayles Full Discretion liquidated 3/21/2017. Loomis Sayles Core Plus funded 3/21/2017. Parametric liquidated 4/21/2017. Mellon Dynamic liquidated 5/5/2017. Grosvenor Institutional liquidated 4/30/2018. Brandes International Small Cap Equity liquidated 8/31/2019. Invesco Real Estate II liquidated 9/1/2019. Vanguard Small Cap Index Ins replaced PanAgora US Small Cap Core Stock Selector on 4/14/2021.

# Total Fund Executive Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs
<b>Total Fund</b>	<b>365,190,244</b>	<b>100.0</b>	<b>4.2</b>	<b>13.4</b>	<b>14.6</b>	<b>10.4</b>	<b>9.0</b>
<i>Total Fund Policy Index</i>			5.0	12.8	14.6	10.3	8.7
<i>Target Asset Allocation Policy Index</i>			5.2	13.9	15.6	11.2	9.7
<i>InvMetrics Tft-Hrtly DB \$250mm-\$1B Net Rank</i>			48	72	62	63	90
<b>Total Domestic Equity</b>	<b>96,057,191</b>	<b>26.3</b>	<b>8.6</b>	<b>23.6</b>	<b>22.2</b>	<b>15.4</b>	<b>15.0</b>
<i>Dow Jones U.S. Total Stock Market</i>			9.1	25.7	25.7	17.9	16.2
<i>InvMetrics Tft-Hrtly DB US Eq Net Rank</i>			70	80	91	84	70
<b>Total International Equity</b>	<b>74,455,008</b>	<b>20.4</b>	<b>3.9</b>	<b>14.6</b>	<b>21.2</b>	<b>14.5</b>	<b>9.5</b>
<i>Total Public Int'l Equity Benchmark (MSCI ACWI ex US IMI)</i>			1.6	8.5	13.6	9.8	7.6
<i>InvMetrics Tft-Hrtly DB ex-US Eq Net Rank</i>			3	2	2	4	14
<b>Total Fixed Income</b>	<b>62,779,226</b>	<b>17.2</b>	<b>-0.2</b>	<b>-1.1</b>	<b>6.4</b>	<b>4.8</b>	<b>4.6</b>
<i>Total Fixed Income Benchmark (Bloomberg Aggregate)</i>			0.0	-1.5	4.8	3.6	2.9
<i>InvMetrics Tft-Hrtly DB US Fix Inc Net Rank</i>			54	74	3	2	4
<b>Total Real Estate</b>	<b>43,719,483</b>	<b>12.0</b>	<b>5.2</b>	<b>17.3</b>	<b>7.4</b>	<b>6.7</b>	<b>9.2</b>
<i>NCREIF ODCE Net</i>			7.7	21.1	8.2	7.8	9.4
<b>Total Infrastructure</b>	<b>18,851,240</b>	<b>5.2</b>	<b>2.2</b>	<b>11.1</b>	<b>9.3</b>	<b>11.1</b>	<b>8.0</b>
<i>CPI + 5%</i>			2.9	12.4	8.7	8.1	7.2
<b>Total Multi-Asset</b>	<b>63,013,891</b>	<b>17.3</b>	<b>2.4</b>	<b>10.9</b>	<b>12.4</b>	<b>8.2</b>	<b>7.3</b>
<i>60% MSCI ACWI Net/40% FTSE WGBI</i>			3.6	7.8	13.4	10.0	7.6
<i>eV Global Balanced Net Rank</i>			89	54	52	56	70
<b>Total Cash</b>	<b>6,314,205</b>	<b>1.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.8</b>	<b>-0.3</b>

Actual vs Target Allocation (%)



Policy Index: 45% MSCI World, 25% Bloomberg Aggregate, 10% NCREIF-ODCE net, 20%(60% MSCI ACWI Net/40% CITI WGBI). Target Asset Allocation Policy Index: 25% Dow Jones US Total Stock, 20% MSCI ACWI ex US IMI, 20% Bloomberg Aggregate, 10% NCREIF-ODCE, 5% CPI + 5%, and 20% (60% MSCI ACWI Net/40% CITI WGBI). Data prior to 3Q 2015 is from previous consultant.

# Total Fund

## Risk Analysis - 3 & 5 Year (Net of Fees)

Period Ending: December 31, 2021

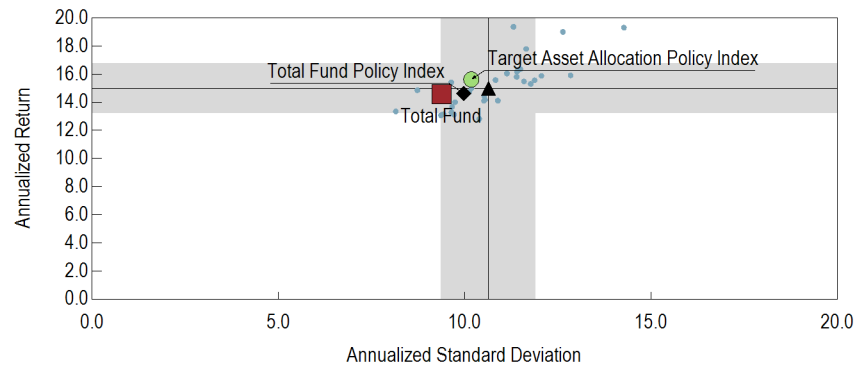
### 3 Year

	Anlzd Standard Deviation	Ann Excess BM Return	Anlzd Alpha	Beta	R-Squared	Up Mkt Capture Ratio	Down Mkt Capture Ratio	Information Ratio	Tracking Error	Sharpe Ratio
Total Fund	9.38%	-0.05%	1.01%	0.93	0.97	93.02%	87.57%	-0.03	1.72%	1.46
Total Fund Policy Index	9.97%	0.00%	0.00%	1.00	1.00	100.00%	100.00%	--	0.00%	1.38
Target Asset Allocation Policy Index	10.18%	0.99%	0.72%	1.02	1.00	104.78%	98.71%	1.43	0.69%	1.45

### 5 Year

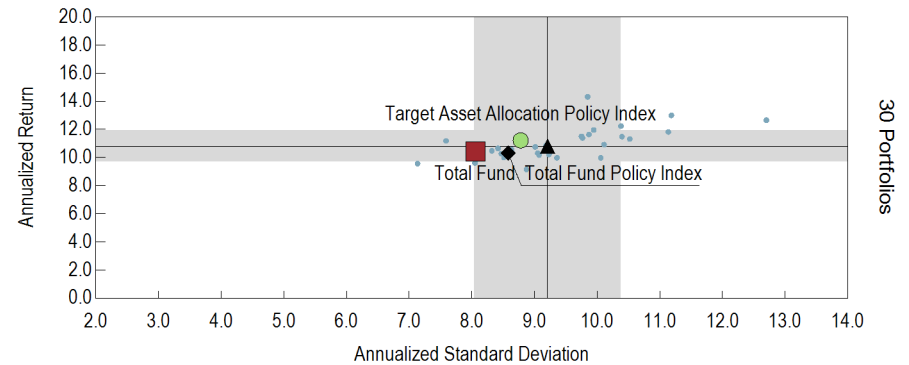
	Anlzd Standard Deviation	Ann Excess BM Return	Anlzd Alpha	Beta	R-Squared	Up Mkt Capture Ratio	Down Mkt Capture Ratio	Information Ratio	Tracking Error	Sharpe Ratio
Total Fund	8.06%	0.15%	0.92%	0.92	0.97	92.08%	86.99%	0.09	1.56%	1.16
Total Fund Policy Index	8.58%	0.00%	0.00%	1.00	1.00	100.00%	100.00%	--	0.00%	1.07
Target Asset Allocation Policy Index	8.78%	0.92%	0.72%	1.02	0.99	106.84%	99.14%	1.29	0.72%	1.15

### 3 Year



- Total Fund
- ◆ Total Fund Policy Index
- Target Asset Allocation Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Tft-Hrtly DB \$250mm-\$1B Net

### 5 Year

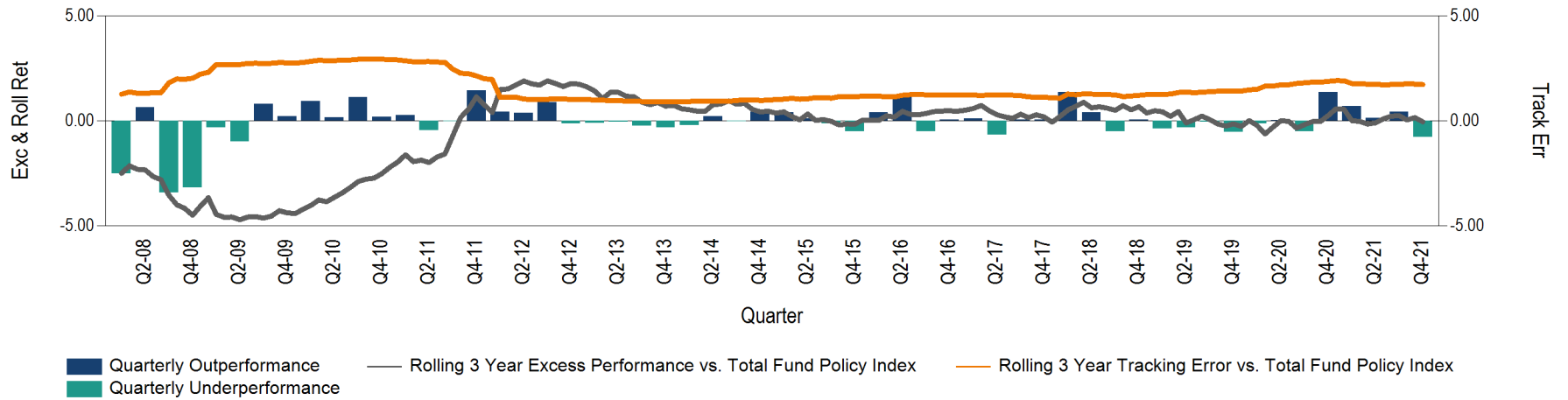


- Total Fund
- ◆ Total Fund Policy Index
- Target Asset Allocation Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Tft-Hrtly DB \$250mm-\$1B Net

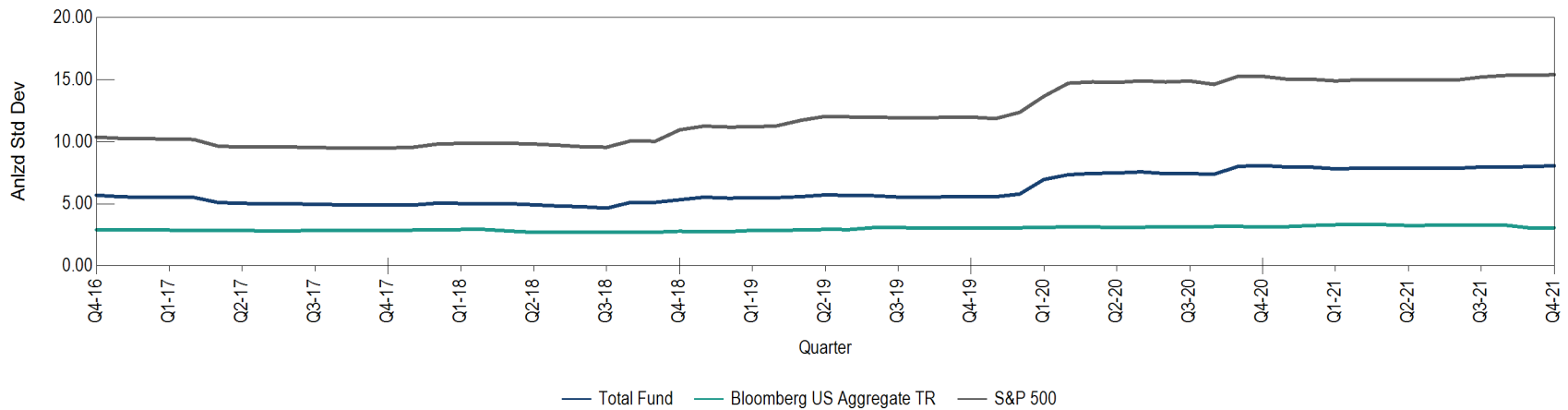
Total Fund  
Rolling Performance Relative to Policy (Net of Fees)

Period Ending: December 31, 2021

Rolling Annualized Excess Performance and Tracking Error



Rolling 5 Year Annualized Standard Deviation



# Total Fund

## Executive Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Fund</b>	<b>365,190,244</b>	<b>100.0</b>	<b>4.2</b>	<b>13.4</b>	<b>14.6</b>	<b>10.4</b>	<b>9.0</b>	<b>13.4</b>	<b>13.3</b>	<b>17.1</b>	<b>-3.3</b>	<b>12.9</b>
<i>Total Fund Policy Index</i>			5.0	12.8	14.6	10.3	8.7	12.8	12.6	18.6	-4.5	13.5
<i>Target Asset Allocation Policy Index</i>			5.2	13.9	15.6	11.2	9.7	13.9	13.9	19.1	-3.2	13.7
<i>InvMetrics Tft-Hrtly DB \$250mm-\$1B Net Rank</i>			48	72	62	63	90	72	18	54	46	67
<b>Domestic Equity</b>	<b>96,057,191</b>	<b>26.3</b>										
BlackRock Equity Index NL	38,623,743	10.6	11.0	28.7	26.1	18.4	16.5	28.7	18.4	31.5	-4.4	21.8
S&P 500			11.0	28.7	26.1	18.5	16.6	28.7	18.4	31.5	-4.4	21.8
<i>eV US Large Cap Core Equity Net Rank</i>			29	29	21	19	10	29	29	28	32	46
INTECH US Adaptive Volatility	39,846,785	10.9	8.4	19.4	18.9	--	--	19.4	14.0	23.4	--	--
Russell 1000			9.8	26.5	26.2	--	--	26.5	21.0	31.4	--	--
<i>eV US Large Cap Core Equity Net Rank</i>			80	92	91	--	--	92	53	91	--	--
Vanguard Small Cap Index Ins	17,586,663	4.8	3.9	17.7	21.3	13.5	14.2	17.7	19.1	27.4	-9.3	16.2
Spliced Vanguard Small Cap Index			3.9	17.7	21.3	13.5	14.1	17.7	19.1	27.3	-9.3	16.2
<i>eV US Small Cap Core Equity Net Rank</i>			80	84	55	45	42	84	32	23	36	32
<b>International Equity</b>	<b>74,455,008</b>	<b>20.4</b>										
WCM Focused International Growth Fund, L.P.	45,973,064	12.6	5.5	17.6	28.6	20.9	--	17.6	33.1	35.7	-7.4	31.1
MSCI ACWI ex USA			1.8	7.8	13.2	9.6	--	7.8	10.7	21.5	-14.2	27.2
<i>eV ACWI ex-US All Cap Growth Eq Net Rank</i>			2	4	15	13	--	4	35	12	1	71
Causeway International Value Ins	28,481,944	7.8	0.9	9.1	11.3	7.4	--	9.1	5.4	20.1	-18.6	27.2
MSCI EAFE			2.7	11.3	13.5	9.5	--	11.3	7.8	22.0	-13.8	25.0
<i>Foreign Large Value MStar MF Rank</i>			72	87	42	34	--	87	22	22	91	14
<b>Fixed Income</b>	<b>62,779,226</b>	<b>17.2</b>										
Loomis Sayles Core Plus	62,779,226	17.2	-0.2	-1.1	6.4	--	--	-1.1	11.3	9.4	-0.4	--
Bloomberg US Aggregate TR			0.0	-1.5	4.8	--	--	-1.5	7.5	8.7	0.0	--
<i>eV US Core Plus Fixed Inc Net Rank</i>			85	78	32	--	--	78	9	63	40	--
<b>Real Estate</b>	<b>43,719,483</b>	<b>12.0</b>										
ASB Allegiance Real Estate	24,917,249	6.8	3.8	13.8	6.0	5.4	--	13.8	1.4	3.1	6.0	2.9
NCREIF ODCE Net			7.7	21.1	8.2	7.8	--	21.1	0.3	4.4	7.4	6.7
JPMorgan Special Situation Property	18,802,234	5.1	7.1	22.3	9.4	9.1	--	22.3	2.0	5.0	9.6	7.9
NCREIF ODCE Net			7.7	21.1	8.2	7.8	--	21.1	0.3	4.4	7.4	6.7

Policy Index: 45% MSCI World, 25% Bloomberg Aggregate, 10% NCREIF-ODCE net, 20%(60% MSCI ACWI Net/40% CITI WGBI). Target Asset Allocation Policy Index: 25% Dow Jones US Total Stock, 20% MSCI ACWI ex US IMI, 20% Bloomberg Aggregate, 10% NCREIF-ODCE, 5% CPI + 5%, and 20% (60% MSCI ACWI Net/40% CITI WGBI). Loomis Sayles Core Plus replaced Loomis Sayles Full Discretion 3/21/2017. Parametric liquidated 4/21/2017. Mellon Dynamic liquidated 5/5/2017. Grosvenor Institutional liquidated 4/30/2018. Brandes International Small Cap Equity liquidated 8/31/2019. Invesco Real Estate II liquidated 9/1/2019. Vanguard Small Cap Index Ins replaced PanAgora US Small Cap Core Stock Selector on 4/14/2021. Data prior to 3Q 2015 is from previous consultant.



Total Fund  
Executive Summary (Net of Fees)

Period Ending: December 31, 2021

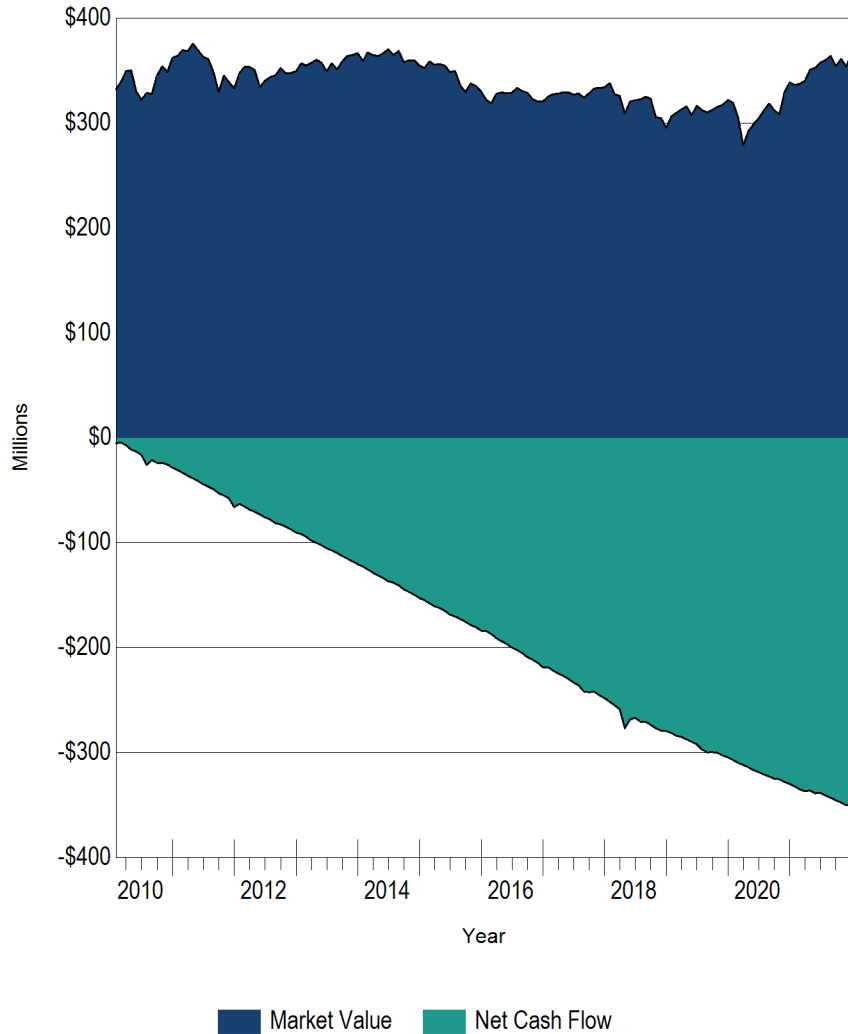
	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Infrastructure</b>	<b>18,851,240</b>	<b>5.2</b>										
IFM Global Infrastructure (US) LP	11,598,166	3.2	3.7	17.4	11.6	14.3	10.1	17.4	3.1	14.6	15.8	21.1
CPI + 5%			2.9	12.4	8.7	8.1	7.2	12.4	6.4	7.4	7.0	7.2
JPMorgan IIF ERISA LP	7,253,074	2.0	0.0	2.6	6.3	7.4	5.6	2.6	8.4	8.0	4.2	14.2
CPI + 5%			2.9	12.4	8.7	8.1	7.2	12.4	6.4	7.4	7.0	7.2
<b>Multi-Asset</b>	<b>63,013,891</b>	<b>17.3</b>										
Invesco Balanced-Risk Allocation	63,013,891	17.3	2.4	10.9	12.4	8.1	6.9	10.9	10.8	15.7	-5.8	10.5
60% MSCI ACWI Net/40% FTSE WGBI			3.6	7.8	13.4	10.0	7.6	7.8	14.5	18.2	-5.8	17.1
FTSE 3-Month T-bill +6%			1.5	6.0	7.0	7.2	6.6	6.0	6.6	8.4	8.0	6.9
eV Global Balanced Net Rank			89	54	52	56	83	54	46	92	22	99
<b>Cash and Equivalents</b>	<b>6,314,205</b>	<b>1.7</b>										
US Bank Checking Account	3,751,117	1.0										
US Bank Clearing Account	2,563,087	0.7										

Policy Index: 45% MSCI World, 25% Bloomberg Aggregate, 10% NCREIF-ODCE net, 20%(60% MSCI ACWI Net/40% CITI WGBI). Target Asset Allocation Policy Index: 25% Dow Jones US Total Stock, 20% MSCI ACWI ex US IMI, 20% Bloomberg Aggregate, 10% NCREIF-ODCE, 5% CPI + 5%, and 20% (60% MSCI ACWI Net/40% CITI WGBI). Loomis Sayles Core Plus replaced Loomis Sayles Full Discretion 3/21/2017. Parametric liquidated 4/21/2017. Mellon Dynamic liquidated 5/5/2017. Grosvenor Institutional liquidated 4/30/2018. Brandes International Small Cap Equity liquidated 8/31/2019. Invesco Real Estate II liquidated 9/1/2019. Vanguard Small Cap Index Ins replaced PanAgora US Small Cap Core Stock Selector on 4/14/2021. Data prior to 3Q 2015 is from previous consultant.

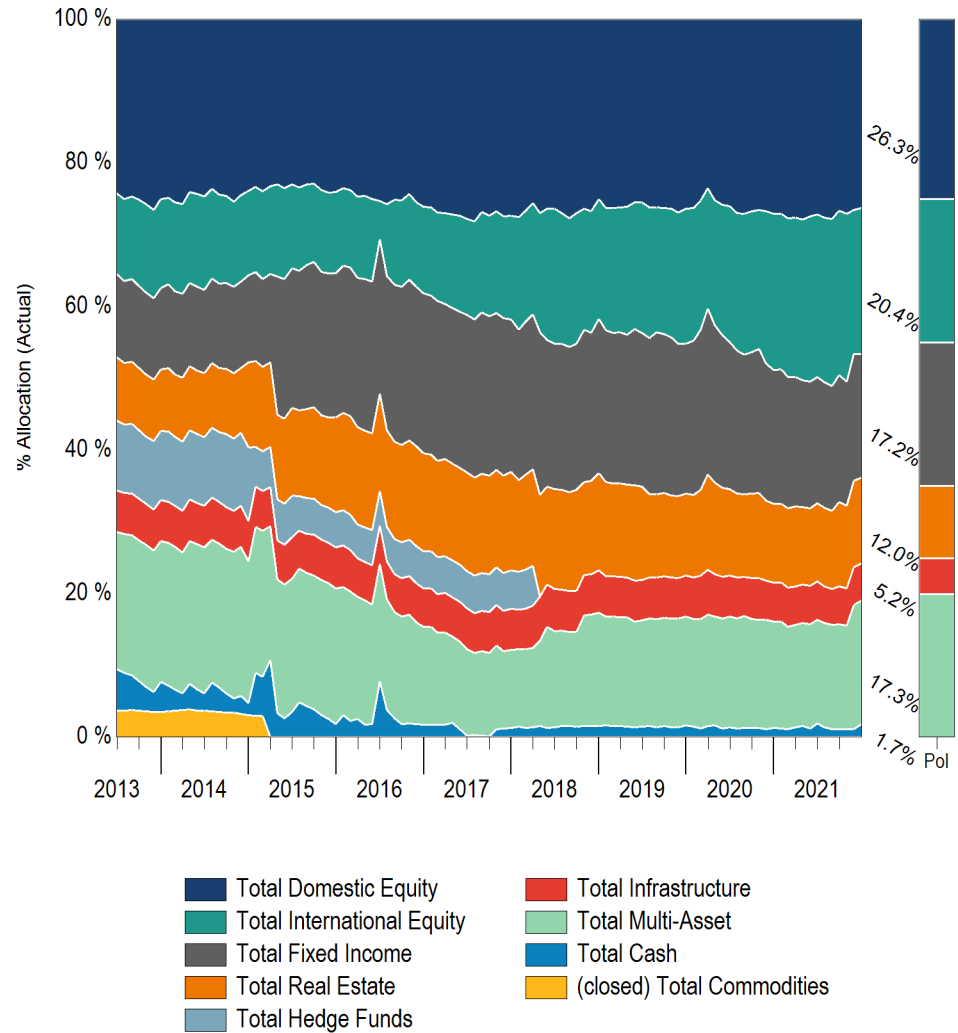
Total Fund  
Asset Allocation History

Period Ending: December 31, 2021

Market Value History



Asset Allocation History

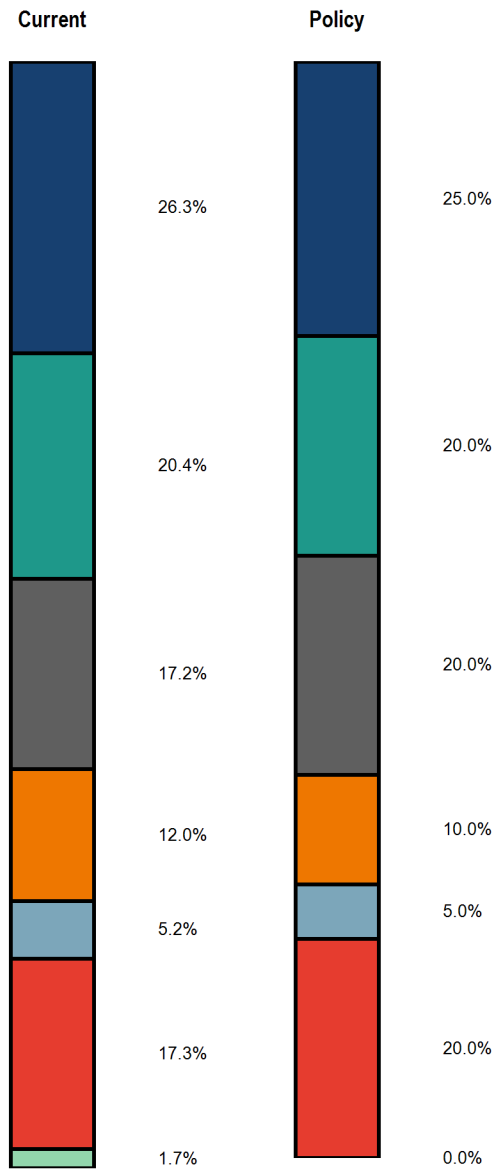


Net cash flow is cumulative.

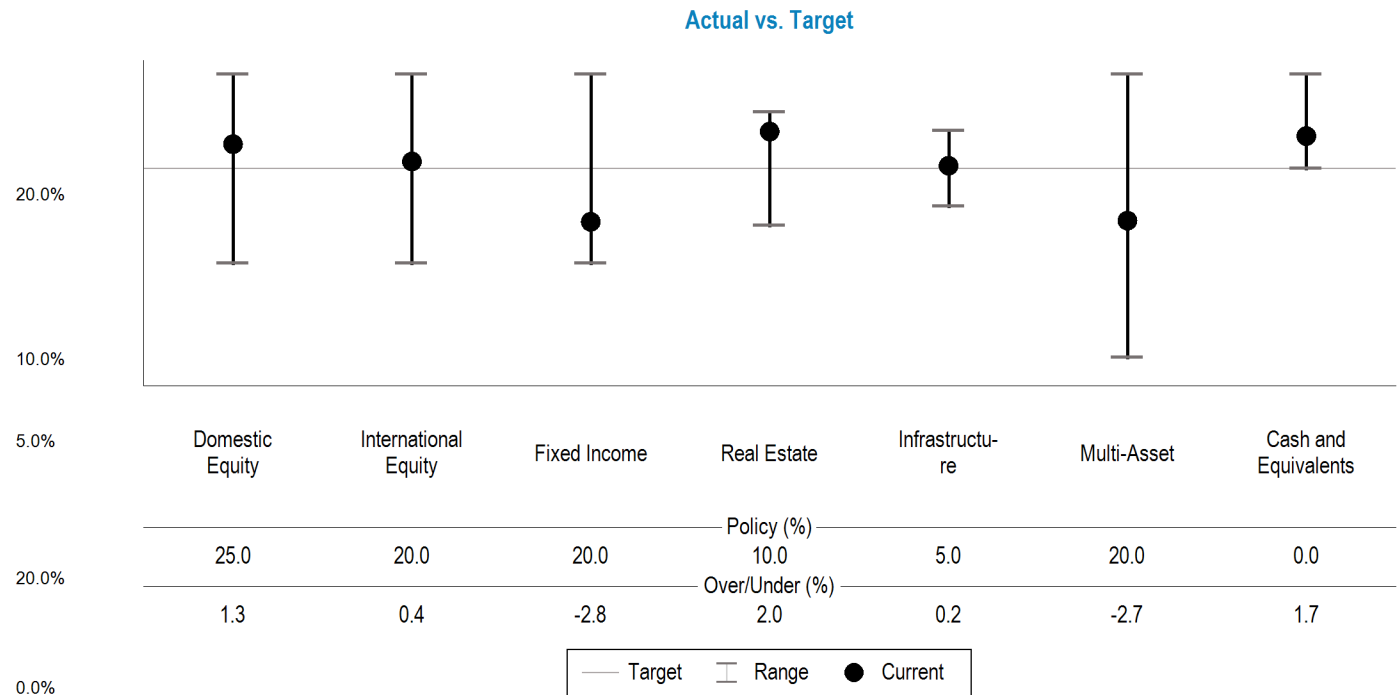
# Total Fund

## Asset Allocation vs. Policy

Period Ending: December 31, 2021



	Current	%	Policy	Difference	Policy Range	Within Range
Domestic Equity	\$96,057,191	26.3%	25.0%	\$4,759,630	20.0% - 30.0%	Yes
International Equity	\$74,455,008	20.4%	20.0%	\$1,416,960	15.0% - 25.0%	Yes
Fixed Income	\$62,779,226	17.2%	20.0%	-\$10,258,823	15.0% - 25.0%	Yes
Real Estate	\$43,719,483	12.0%	10.0%	\$7,200,459	7.0% - 13.0%	Yes
Infrastructure	\$18,851,240	5.2%	5.0%	\$591,728	3.0% - 7.0%	Yes
Multi-Asset	\$63,013,891	17.3%	20.0%	-\$10,024,158	10.0% - 25.0%	Yes
Cash and Equivalents	\$6,314,205	1.7%	0.0%	\$6,314,205	0.0% - 5.0%	Yes
<b>Total</b>	<b>\$365,190,244</b>	<b>100.0%</b>	<b>100.0%</b>			



# Total Fund Investment Fund Fee Analysis

Period Ending: December 31, 2021

Name	Asset Class	Fee Schedule	Market Value	% of Portfolio	Estimated Fee Value	Estimated Fee
BlackRock Equity Index NL	Domestic Equity	0.03% of Assets	\$38,623,743	10.6%	\$11,587	0.03%
INTECH US Adaptive Volatility	Domestic Equity	0.40% of Assets	\$39,846,785	10.9%	\$159,387	0.40%
Vanguard Small Cap Index Ins	Domestic Equity	0.04% of Assets	\$17,586,663	4.8%	\$7,035	0.04%
WCM Focused International Growth Fund, L.P.	International Equity	0.75% of Assets	\$45,973,064	12.6%	\$344,798	0.75%
Causeway International Value Ins	International Equity	0.85% of Assets	\$28,481,944	7.8%	\$242,097	0.85%
Loomis Sayles Core Plus	Fixed Income	0.35% of First 20.0 Mil, 0.25% Thereafter	\$62,779,226	17.2%	\$176,948	0.28%
ASB Allegiance Real Estate	Real Estate	1.25% of First 5.0 Mil, 1.00% of Next 10.0 Mil, 0.90% of Next 60.0 Mil, 0.75% Thereafter	\$24,917,249	6.8%	\$251,755	1.01%
JPMorgan Special Situation Property	Real Estate	1.60% of Assets	\$18,802,234	5.1%	\$300,836	1.60%
IFM Global Infrastructure (US) LP	Infrastructure	0.77% of Assets	\$11,598,166	3.2%	\$89,306	0.77%
JPMorgan IIF ERISA LP	Infrastructure	1.25% of First 50.0 Mil, 1.15% of Next 50.0 Mil, 1.05% Thereafter	\$7,253,074	2.0%	\$90,663	1.25%
Invesco Balanced-Risk Allocation	Multi-Asset	0.38% of First 250.0 Mil, 0.35% of Next 500.0 Mil, 0.33% of Next 250.0 Mil, 0.30% Thereafter	\$63,013,891	17.3%	\$236,302	0.38%
US Bank Checking Account	Cash and Equivalents		\$3,751,117	1.0%		
US Bank Clearing Account	Cash and Equivalents		\$2,563,087	0.7%		
<b>Total</b>			<b>\$365,190,244</b>	<b>100.0%</b>	<b>\$1,910,714</b>	<b>0.52%</b>

Total Fund  
Watch List (Net of Fees)

Period Ending: December 31, 2021

Name	Allocation Group	Status	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6
BlackRock Equity Index NL	Domestic Equity	No Issues	--	--	--	--	--	✓
INTECH US Adaptive Volatility	Domestic Equity	No Issues	R	R	--	--	--	--
Vanguard Small Cap Index Ins	Domestic Equity	No Issues	--	--	--	--	--	✓
WCM Focused International Growth Fund, L.P.	International Equity	No Issues	✓	✓	✓	✓	--	--
Causeway International Value Ins	International Equity	No Issues	R	✓	R	✓	--	--
Loomis Sayles Core Plus	Fixed Income	No Issues	✓	✓	--	--	--	--
ASB Allegiance Real Estate	Real Estate	No Issues	R	--	R	--	--	--
JPMorgan Special Situation Property	Real Estate	No Issues	✓	--	✓	--	--	--
IFM Global Infrastructure (US) LP	Infrastructure	No Issues	✓	--	✓	--	--	--
JPMorgan IIF ERISA LP	Infrastructure	No Issues	R	--	R	--	--	--
Invesco Balanced-Risk Allocation	Multi-Asset	No Issues	R	R	R	R	--	--

Rule 1 - Manager has underperformed the benchmark index for the three year period.

Rule 2 - Manager has underperformed the 50th percentile in the appropriate style universe for the three year period.

Rule 3 - Manager has underperformed the benchmark index for the five year period.

Rule 4 - Manager has underperformed the 50th percentile in the appropriate style universe for the five year period.

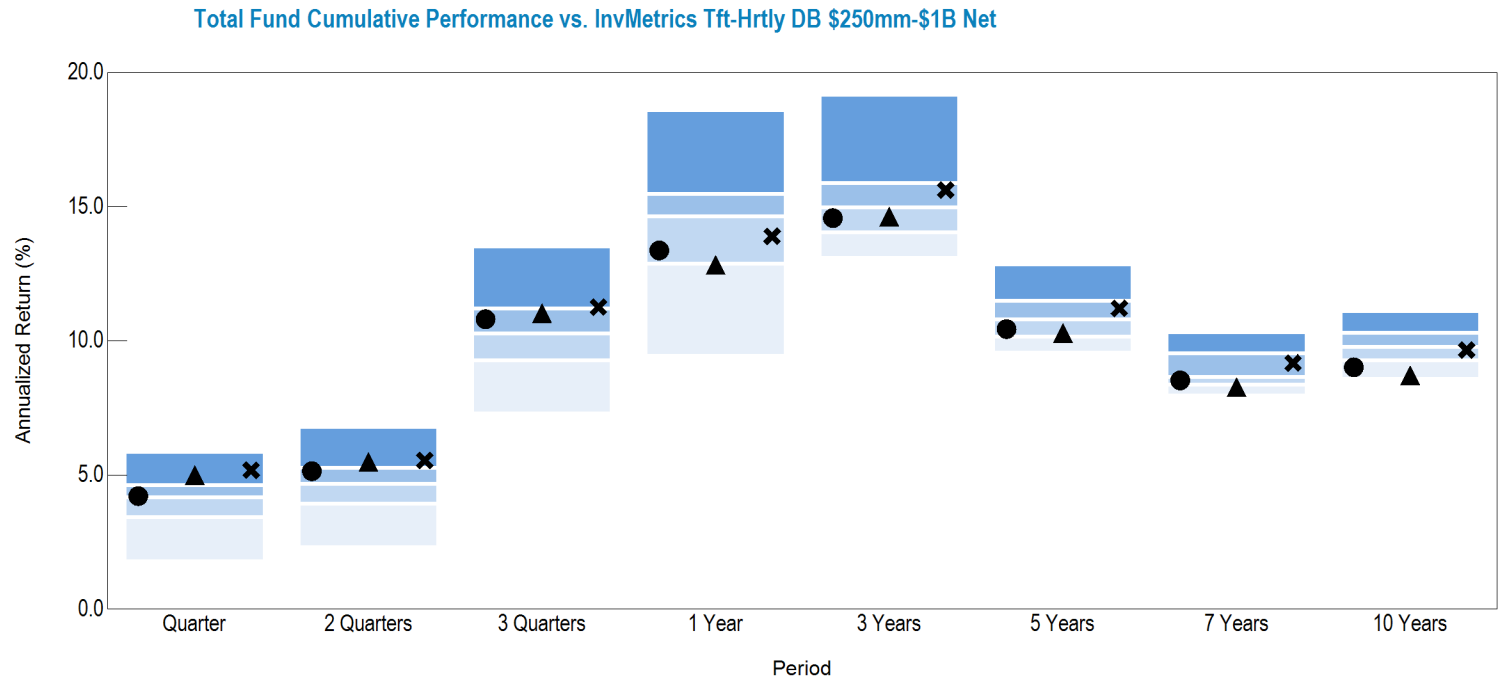
Rule 5 - Fund experiences non-performance related issues including personnel turnover, changes in investment philosophy or drift, excessive asset growth, change in ownership and any other reason that raises concern.

Rule 6 - Index Fund Tracking Error exceeds 0.25% of the appropriate benchmark over the one year period.

Total Fund

Peer Universe Comparison: Cumulative Performance (Net of Fees)

Period Ending: December 31, 2021



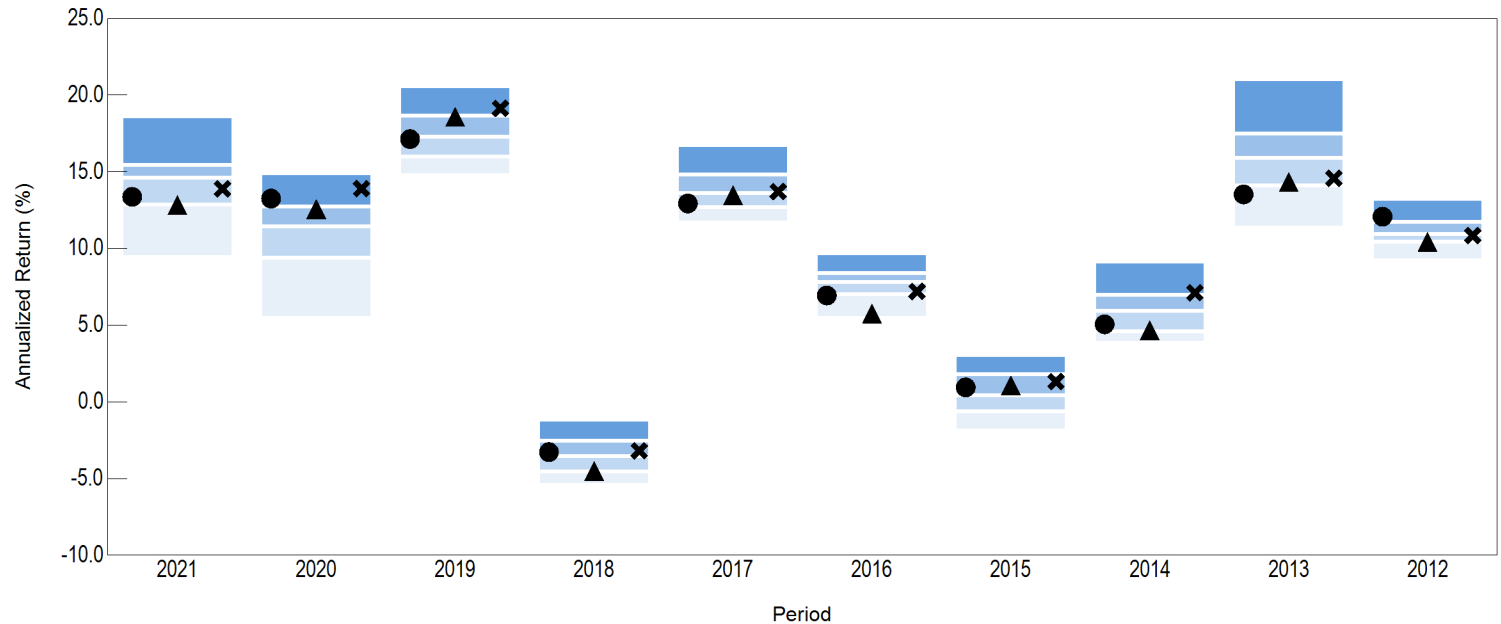
	Return (Rank)															
	Quarter		2 Quarters		3 Quarters		1 Year		3 Years		5 Years		7 Years		10 Years	
5th Percentile	5.9	6.8	13.5	18.6	19.2	12.8	10.3	11.1								
25th Percentile	4.6	5.3	11.2	15.5	15.9	11.5	9.6	10.3								
Median	4.2	4.7	10.3	14.7	15.0	10.8	8.7	9.8								
75th Percentile	3.4	4.0	9.3	12.9	14.0	10.2	8.4	9.3								
95th Percentile	1.8	2.3	7.3	9.5	13.1	9.6	8.0	8.6								
# of Portfolios	32	32	32	32	31	30	28	27								
● Total Fund	4.2	(48)	5.1	(27)	10.8	(37)	13.4	(72)	14.6	(62)	10.4	(63)	8.5	(61)	9.0	(90)
▲ Total Fund Policy Index	5.0	(19)	5.5	(18)	11.0	(28)	12.8	(76)	14.6	(61)	10.3	(67)	8.3	(81)	8.7	(93)
✕ Target Asset Allocation Policy Index	5.2	(9)	5.5	(17)	11.3	(25)	13.9	(66)	15.6	(33)	11.2	(41)	9.2	(35)	9.7	(58)

Total Fund

Peer Universe Comparison: Consecutive Periods (Net of Fees)

Period Ending: December 31, 2021

Total Fund Consecutive Periods vs. InvMetrics Tft-Hrtly DB \$250mm-\$1B Net



	Return (Rank)											
	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012		
5th Percentile	18.6	14.9	20.6	-1.2	16.7	9.7	3.0	9.1	21.0	13.2		
25th Percentile	15.5	12.8	18.7	-2.5	14.9	8.4	1.8	7.0	17.5	11.8		
Median	14.7	11.5	17.3	-3.5	13.6	7.8	0.4	6.0	15.9	11.0		
75th Percentile	12.9	9.4	16.0	-4.5	12.7	7.0	-0.6	4.6	14.2	10.4		
95th Percentile	9.5	5.5	14.8	-5.4	11.7	5.5	-1.9	3.9	11.4	9.3		
# of Portfolios	32	77	86	84	69	56	58	55	49	37		
● Total Fund	13.4 (72)	13.3 (18)	17.1 (54)	-3.3 (46)	12.9 (67)	6.9 (80)	0.9 (38)	5.1 (70)	13.5 (79)	12.1 (20)		
▲ Total Fund Policy Index	12.8 (76)	12.6 (30)	18.6 (28)	-4.5 (75)	13.5 (51)	5.8 (93)	1.1 (37)	4.7 (75)	14.3 (70)	10.4 (79)		
✕ Target Asset Allocation Policy Index	13.9 (66)	13.9 (9)	19.1 (19)	-3.2 (45)	13.7 (46)	7.2 (69)	1.3 (36)	7.1 (21)	14.6 (66)	10.8 (63)		

## Domestic Equity

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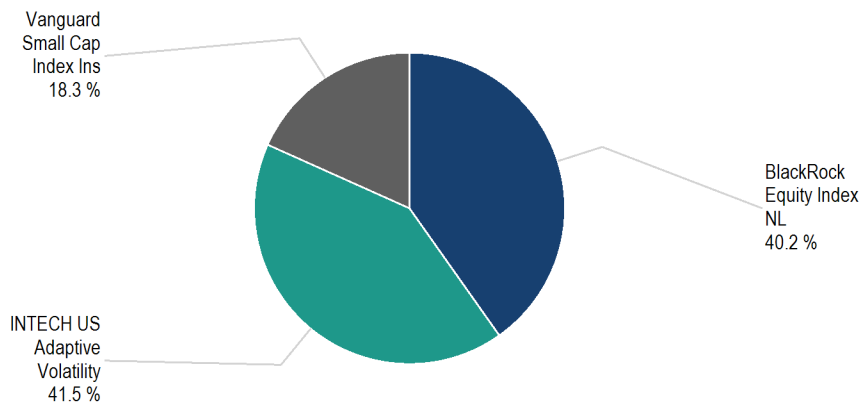


# Total Domestic Equity Performance Summary (Net of Fees)

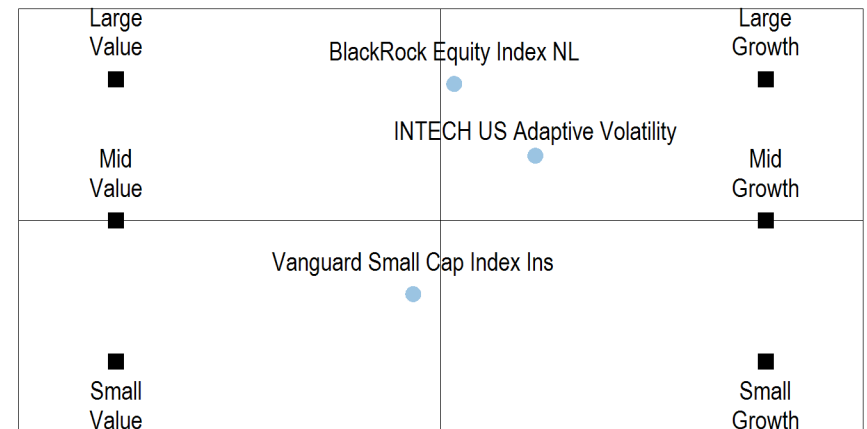
Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Domestic Equity</b>	<b>96,057,191</b>	<b>100.0</b>	<b>8.6</b>	<b>23.6</b>	<b>22.2</b>	<b>15.4</b>	<b>15.0</b>	<b>23.6</b>	<b>15.9</b>	<b>27.2</b>	<b>-5.9</b>	<b>19.4</b>
<i>Dow Jones U.S. Total Stock Market</i>			9.1	25.7	25.7	17.9	16.2	25.7	20.8	30.9	-5.3	21.2
<i>InvMetrics Tff-Hrtly DB US Eq Net Rank</i>			70	80	91	84	70	80	68	89	34	71
<b>Domestic Equity</b>	<b>96,057,191</b>	<b>100.0</b>										
BlackRock Equity Index NL	38,623,743	40.2	11.0	28.7	26.1	18.4	16.5	28.7	18.4	31.5	-4.4	21.8
<i>S&amp;P 500</i>			11.0	28.7	26.1	18.5	16.6	28.7	18.4	31.5	-4.4	21.8
<i>eV US Large Cap Core Equity Net Rank</i>			29	29	21	19	10	29	29	28	32	46
INTECH US Adaptive Volatility	39,846,785	41.5	8.4	19.4	18.9	--	--	19.4	14.0	23.4	--	--
<i>Russell 1000</i>			9.8	26.5	26.2	--	--	26.5	21.0	31.4	--	--
<i>eV US Large Cap Core Equity Net Rank</i>			80	92	91	--	--	92	53	91	--	--
Vanguard Small Cap Index Ins	17,586,663	18.3	3.9	17.7	21.3	13.5	14.2	17.7	19.1	27.4	-9.3	16.2
<i>Spliced Vanguard Small Cap Index</i>			3.9	17.7	21.3	13.5	14.1	17.7	19.1	27.3	-9.3	16.2
<i>eV US Small Cap Core Equity Net Rank</i>			80	84	55	45	42	84	32	23	36	32

**Total Domestic Equity  
Current Allocation**

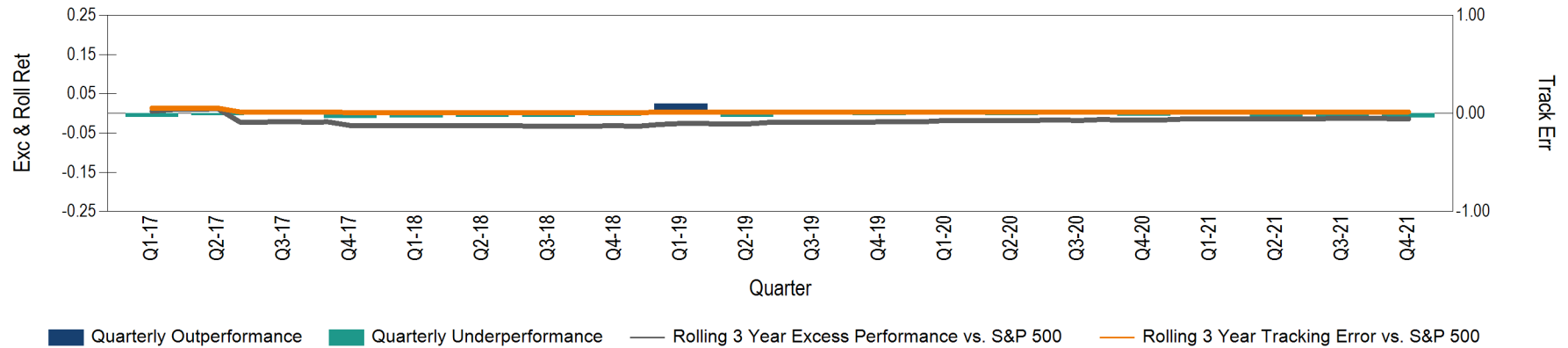


**Domestic Effective Style Map  
3 Years**

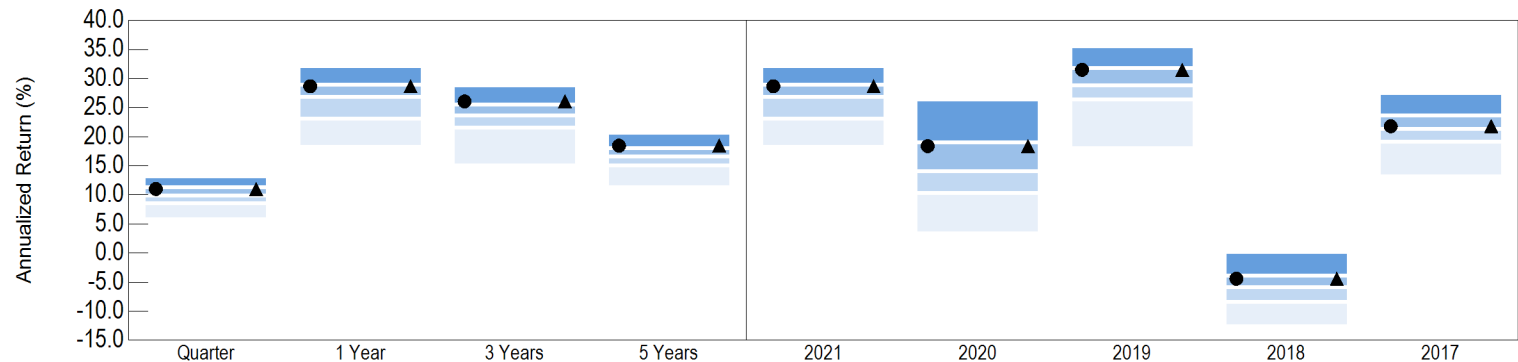


Style map requires 3 years of returns. INTECH US Adaptive Volatility replaced INTECH US Managed Volatility on 8/3/2018.

Rolling Annualized Excess Performance and Tracking Error



BlackRock Equity Index NL vs. eV US Large Cap Core Equity Net Universe

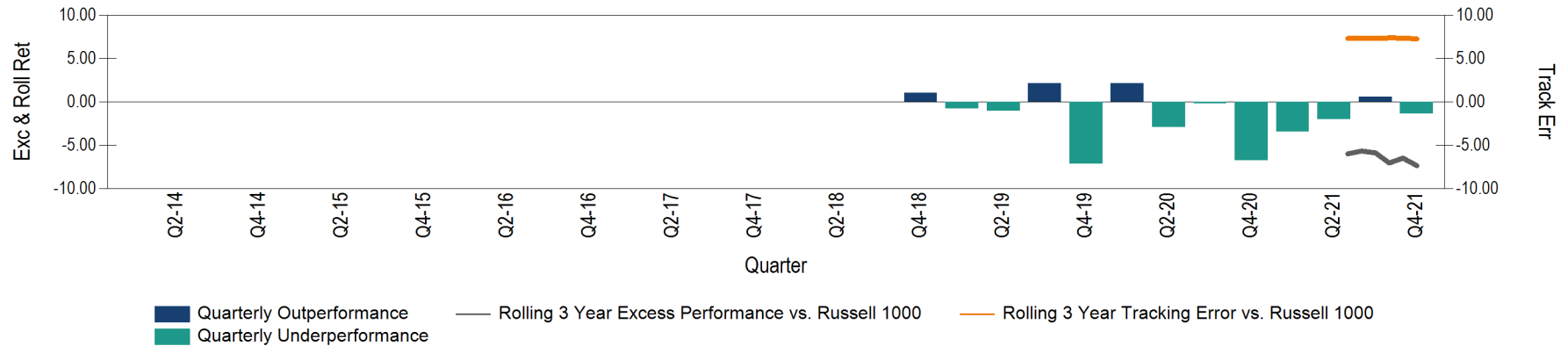


	Quarter	1 Year	3 Years	5 Years	2021	2020	2019	2018	2017
<b>5th Percentile</b>	13.2	32.0	28.8	20.6	32.0	26.4	35.5	0.1	27.4
<b>25th Percentile</b>	11.4	29.0	25.6	18.1	29.0	19.1	31.9	-3.8	23.7
<b>Median</b>	9.9	26.9	23.7	16.7	26.9	14.1	28.9	-5.8	21.4
<b>75th Percentile</b>	8.6	23.1	21.7	15.1	23.1	10.4	26.5	-8.3	19.2
<b>95th Percentile</b>	5.9	18.3	15.1	11.4	18.3	3.5	18.1	-12.5	13.2
<b># of Portfolios</b>	176	176	167	158	176	216	203	189	188
● BlackRock Equity Index NL	11.0 (29)	28.7 (29)	26.1 (21)	18.4 (19)	28.7 (29)	18.4 (29)	31.5 (28)	-4.4 (32)	21.8 (46)
▲ S&P 500	11.0 (29)	28.7 (29)	26.1 (21)	18.5 (19)	28.7 (29)	18.4 (29)	31.5 (28)	-4.4 (32)	21.8 (46)

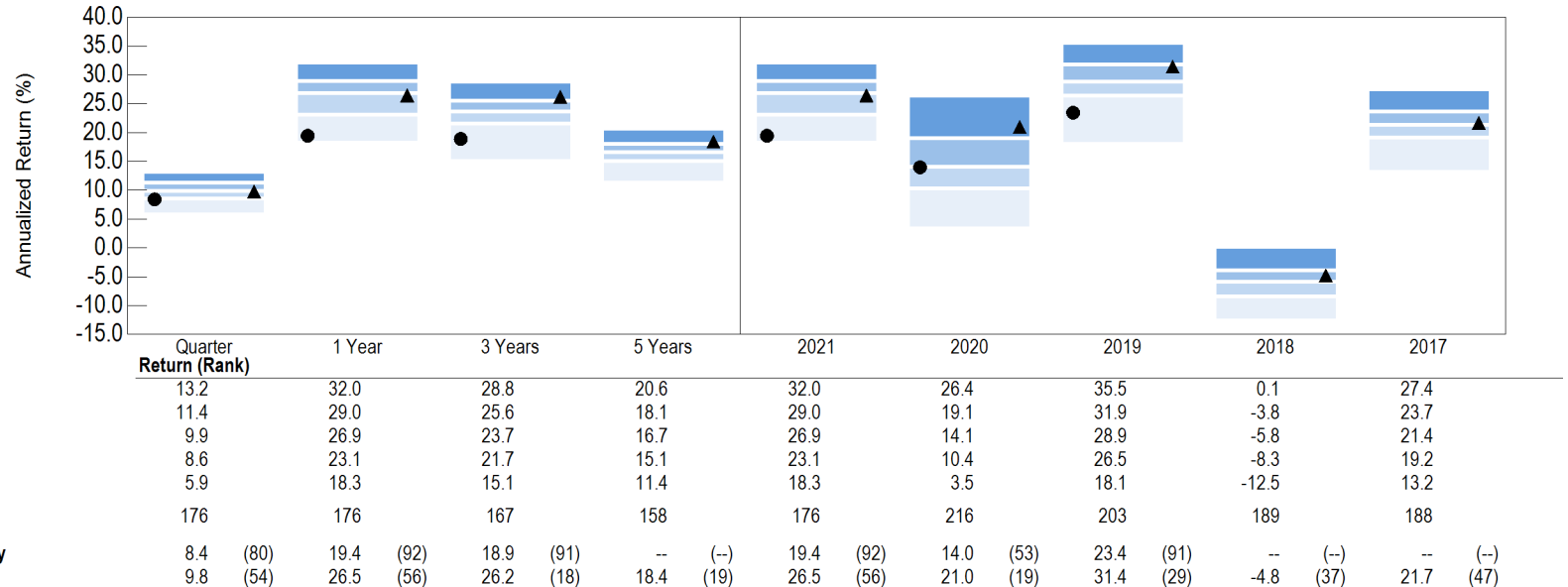
# INTECH US Adaptive Volatility Performance Summary (Net of Fees)

Period Ending: December 31, 2021

### Rolling Annualized Excess Performance and Tracking Error

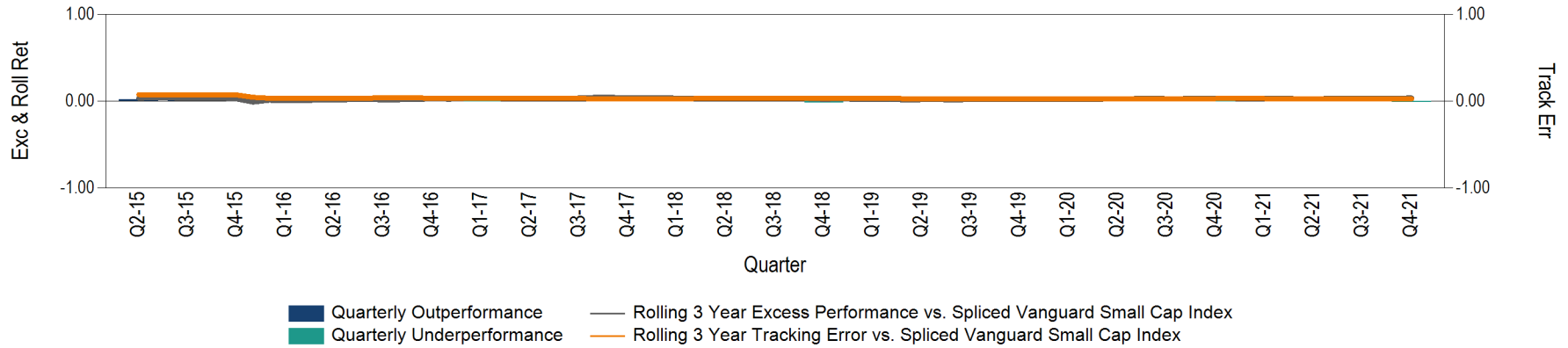


### INTECH US Adaptive Volatility vs. eV US Large Cap Core Equity Net Universe

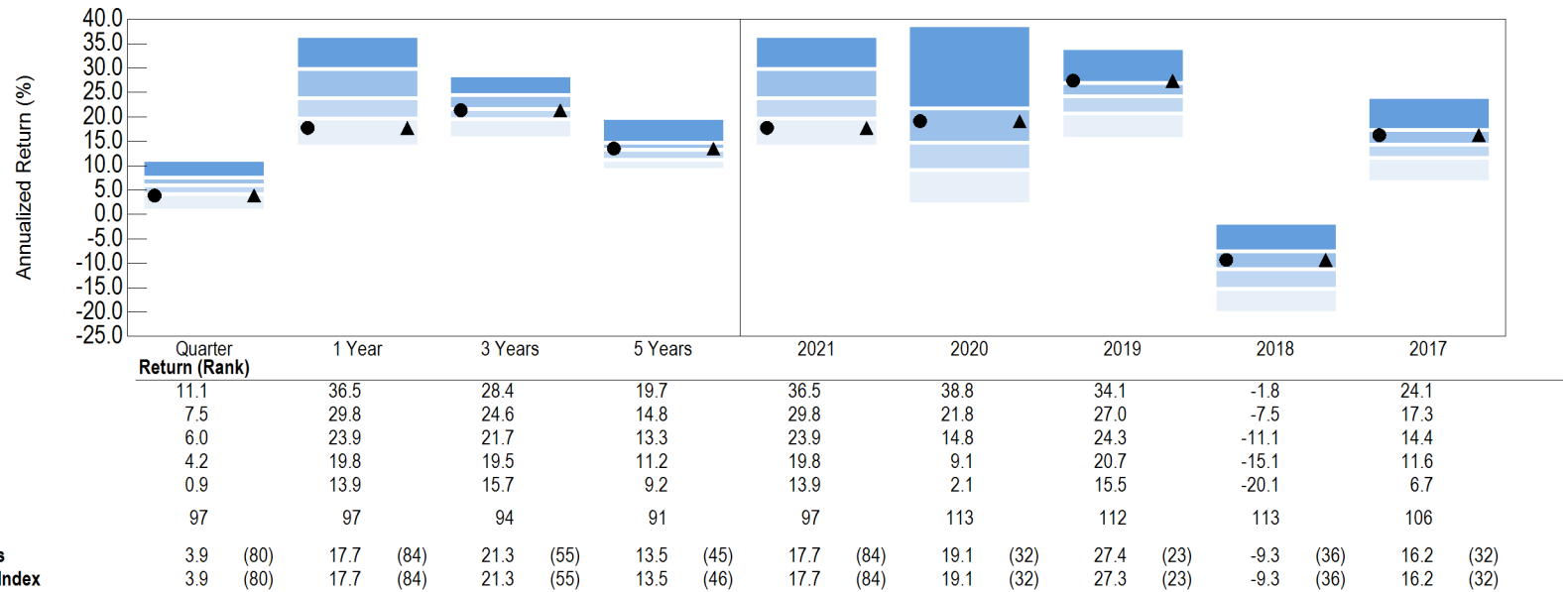


INTECH US Adaptive Volatility replaced INTECH US Managed Volatility on 8/3/2018.

Rolling Annualized Excess Performance and Tracking Error



Vanguard Small Cap Index Ins vs. eV US Small Cap Core Equity Net Universe



## International Equity

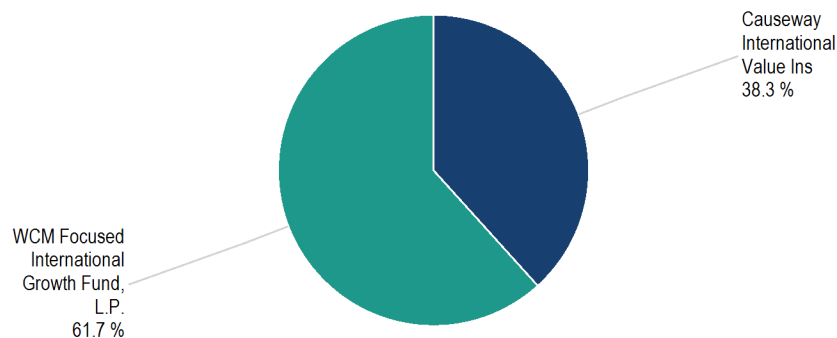
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# Total International Equity Performance Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total International Equity</b>	<b>74,455,008</b>	<b>100.0</b>	<b>3.9</b>	<b>14.6</b>	<b>21.2</b>	<b>14.5</b>	<b>9.5</b>	<b>14.6</b>	<b>21.7</b>	<b>27.8</b>	<b>-13.0</b>	<b>26.6</b>
<i>Total Public Int'l Equity Benchmark (MSCI ACWI ex US IMI)</i>			1.6	8.5	13.6	9.8	7.6	8.5	11.1	21.6	-14.8	27.8
<i>InvMetrics Tft-Hrtly DB ex-US Eq Net Rank</i>			3	2	2	4	14	2	13	10	14	71
<b>International Equity</b>	<b>74,455,008</b>	<b>100.0</b>										
WCM Focused International Growth Fund, L.P.	45,973,064	61.7	5.5	17.6	28.6	20.9	--	17.6	33.1	35.7	-7.4	31.1
<i>MSCI ACWI ex USA</i>			1.8	7.8	13.2	9.6	--	7.8	10.7	21.5	-14.2	27.2
<i>eV ACWI ex-US All Cap Growth Eq Net Rank</i>			2	4	15	13	--	4	35	12	1	71
Causeway International Value Ins	28,481,944	38.3	0.9	9.1	11.3	7.4	--	9.1	5.4	20.1	-18.6	27.2
<i>MSCI EAFE</i>			2.7	11.3	13.5	9.5	--	11.3	7.8	22.0	-13.8	25.0
<i>Foreign Large Value MStar MF Rank</i>			72	87	42	34	--	87	22	22	91	14

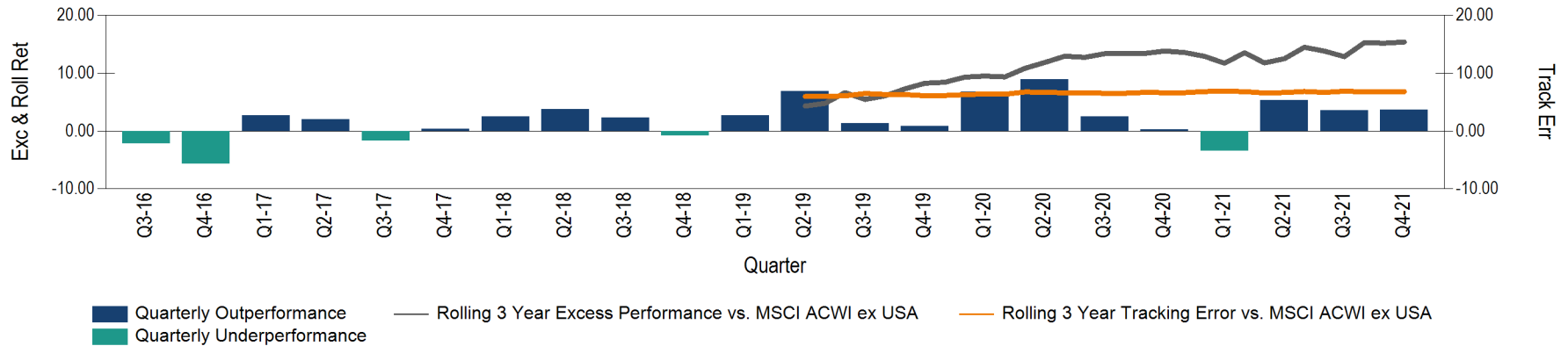
Total International Equity  
Current Allocation



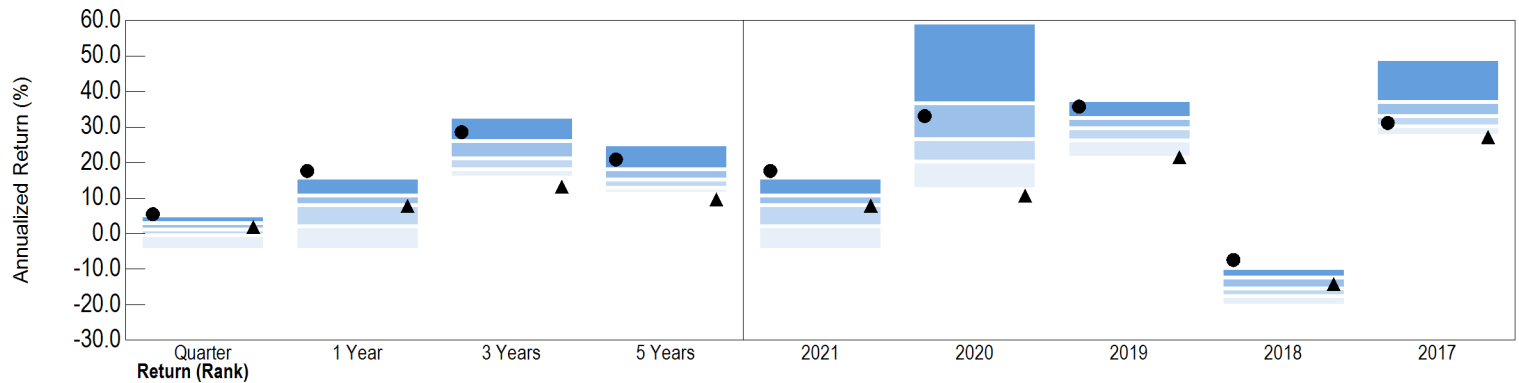
WCM Focused International Growth Fund, L.P.  
Performance Summary (Net of Fees)

Period Ending: December 31, 2021

Rolling Annualized Excess Performance and Tracking Error



WCM Focused International Growth Fund, L.P. vs. eV ACWI ex-US All Cap Growth Eq Net Universe

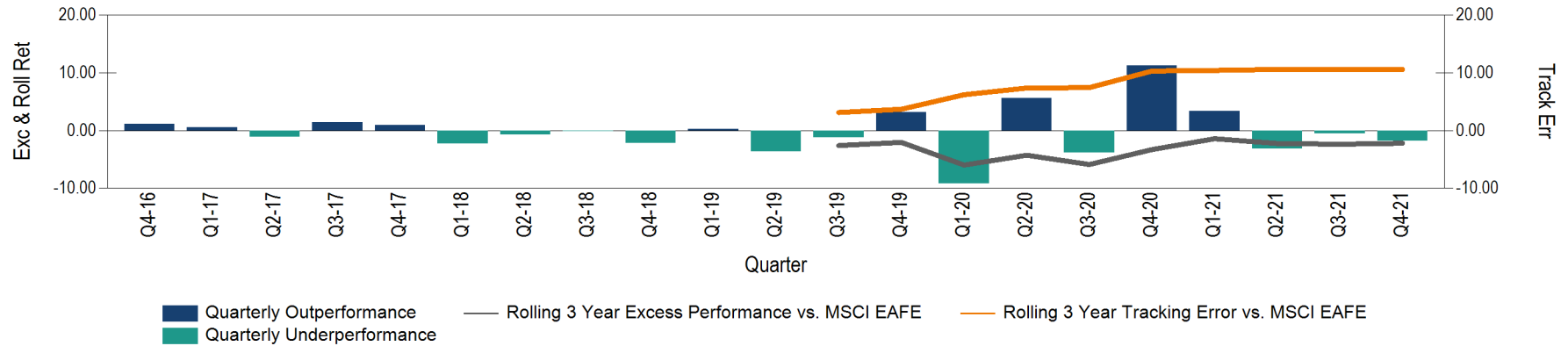


	Quarter	1 Year	3 Years	5 Years	2021	2020	2019	2018	2017
<b>5th Percentile</b>	5.1	15.6	32.8	25.0	15.6	59.4	37.5	-9.7	49.1
<b>25th Percentile</b>	3.1	10.7	26.1	18.2	10.7	36.8	32.7	-12.3	37.2
<b>Median</b>	1.3	8.1	21.2	15.3	8.1	26.7	29.7	-15.3	33.2
<b>75th Percentile</b>	-0.4	2.1	18.2	13.0	2.1	20.3	26.2	-17.5	30.4
<b>95th Percentile</b>	-4.5	-4.6	15.8	11.4	-4.6	12.6	21.5	-20.2	27.5
<b># of Portfolios</b>	32	32	30	27	32	33	32	26	27
● WCM Focused International Growth Fund, L.P.	5.5 (2)	17.6 (4)	28.6 (15)	20.9 (13)	17.6 (4)	33.1 (35)	35.7 (12)	-7.4 (1)	31.1 (71)
▲ MSCI ACWI ex USA	1.8 (41)	7.8 (55)	13.2 (99)	9.6 (99)	7.8 (55)	10.7 (97)	21.5 (96)	-14.2 (49)	27.2 (96)

Causeway International Value Ins  
Performance Summary (Net of Fees)

Period Ending: December 31, 2021

Rolling Annualized Excess Performance and Tracking Error



Causeway International Value Ins vs. Foreign Large Value MStar MF Universe





## Domestic Fixed Income

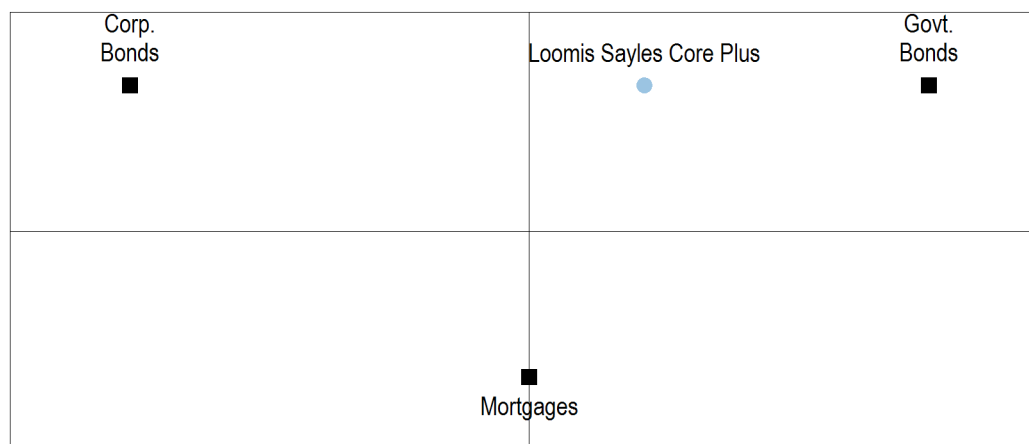
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# Total Fixed Income Performance Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Fixed Income</b>	<b>62,779,226</b>	<b>100.0</b>	<b>-0.2</b>	<b>-1.1</b>	<b>6.4</b>	<b>4.8</b>	<b>4.6</b>	<b>-1.1</b>	<b>11.3</b>	<b>9.4</b>	<b>-0.4</b>	<b>5.6</b>
<i>Total Fixed Income Benchmark (Bloomberg Aggregate)</i>			0.0	-1.5	4.8	3.6	2.9	-1.5	7.5	8.7	0.0	3.5
<i>InvMetrics Tff-Hrtly DB US Fix Inc Net Rank</i>			54	74	3	2	4	74	2	28	75	18
<b>Fixed Income</b>	<b>62,779,226</b>	<b>100.0</b>										
Loomis Sayles Core Plus	62,779,226	100.0	-0.2	-1.1	6.4	--	--	-1.1	11.3	9.4	-0.4	--
<i>Bloomberg US Aggregate TR</i>			0.0	-1.5	4.8	--	--	-1.5	7.5	8.7	0.0	--
<i>eV US Core Plus Fixed Inc Net Rank</i>			85	78	32	--	--	78	9	63	40	--

Fixed Income Style Map  
3 Years

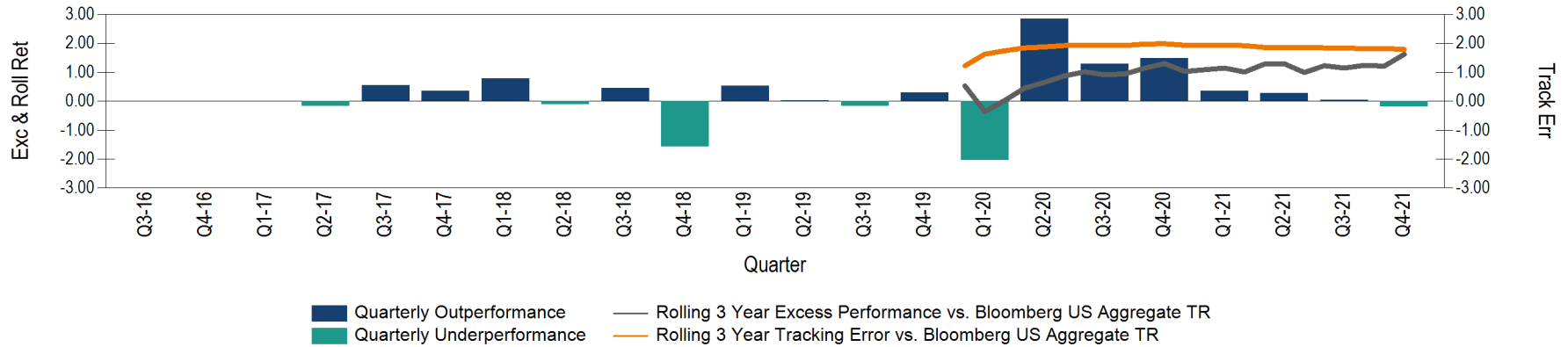


Loomis Sayles Core Plus replaced Loomis Sayles Full Discretion 3/21/2017.

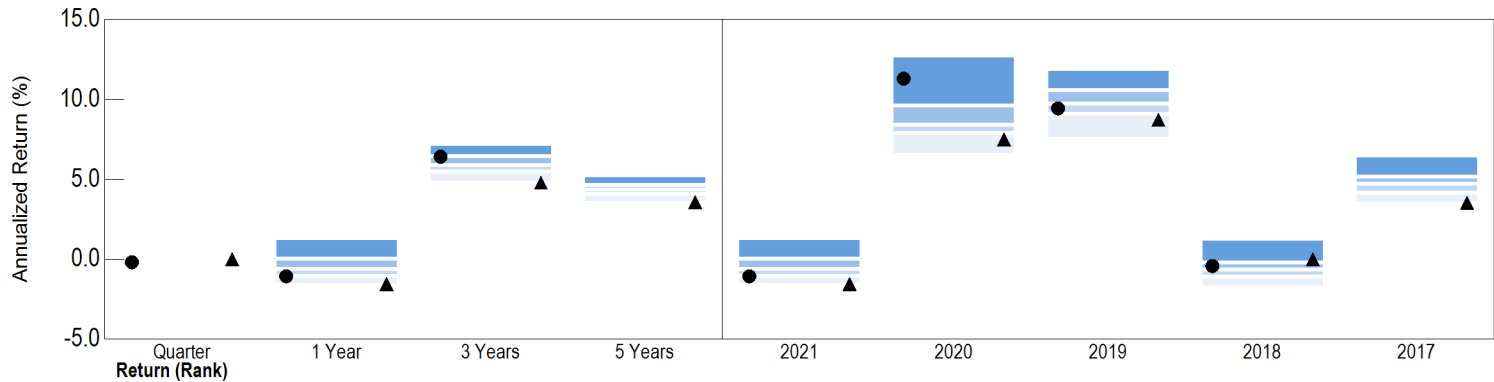
Loomis Sayles Core Plus  
Performance Summary (Net of Fees)

Period Ending: December 31, 2021

Rolling Annualized Excess Performance and Tracking Error



Loomis Sayles Core Plus vs. eV US Core Plus Fixed Inc Net Universe



	Quarter	1 Year	3 Years	5 Years	2021	2020	2019	2018	2017
<b>5th Percentile</b>	0.3	1.3	7.2	5.2	1.3	12.7	11.9	1.3	6.5
<b>25th Percentile</b>	0.1	0.1	6.5	4.7	0.1	9.6	10.6	-0.2	5.2
<b>Median</b>	0.0	-0.6	5.9	4.4	-0.6	8.4	9.8	-0.6	4.7
<b>75th Percentile</b>	-0.1	-1.0	5.5	4.1	-1.0	7.9	9.1	-1.0	4.2
<b>95th Percentile</b>	-0.3	-1.6	4.8	3.6	-1.6	6.6	7.6	-1.7	3.5
<b># of Portfolios</b>	74	74	71	70	74	89	86	77	80
● Loomis Sayles Core Plus	-0.2 (85)	-1.1 (78)	6.4 (32)	-- (--)	-1.1 (78)	11.3 (9)	9.4 (63)	-0.4 (40)	-- (--)
▲ Bloomberg US Aggregate TR	0.0 (42)	-1.5 (93)	4.8 (97)	3.6 (95)	-1.5 (93)	7.5 (84)	8.7 (85)	0.0 (21)	3.5 (95)

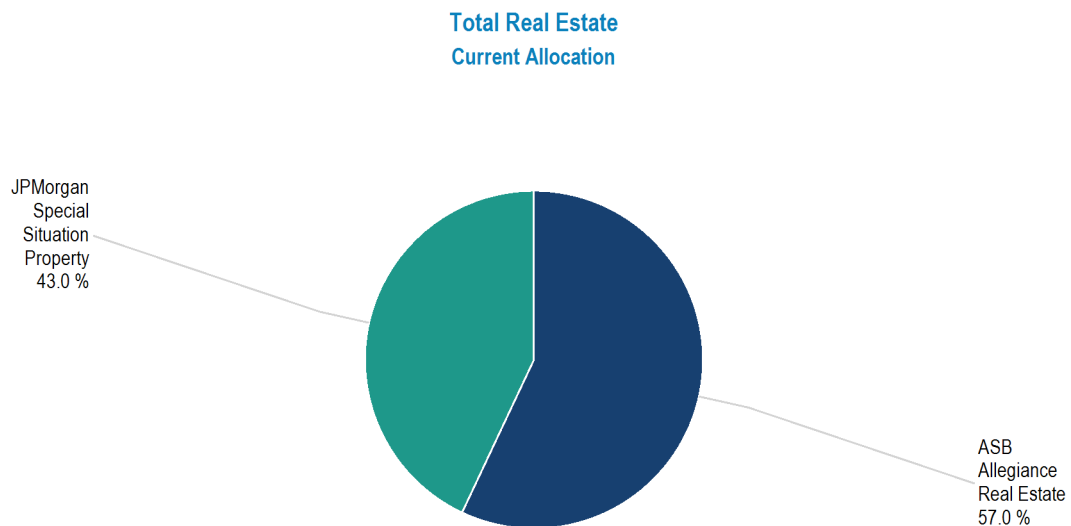
## Alternatives

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# Total Real Estate Performance Summary (Net of Fees)

Period Ending: December 31, 2021

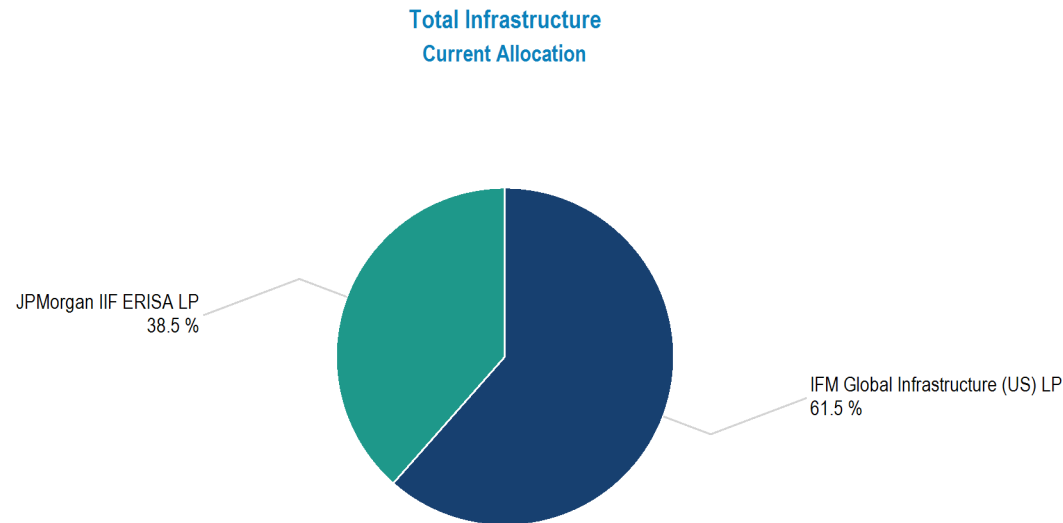
	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Real Estate</b>	<b>43,719,483</b>	<b>100.0</b>	<b>5.2</b>	<b>17.3</b>	<b>7.4</b>	<b>6.7</b>	<b>9.2</b>	<b>17.3</b>	<b>1.7</b>	<b>4.0</b>	<b>7.1</b>	<b>4.2</b>
<i>NCREIF ODCE Net</i>			7.7	21.1	8.2	7.8	9.4	21.1	0.3	4.4	7.4	6.7
<b>Real Estate</b>	<b>43,719,483</b>	<b>100.0</b>										
ASB Allegiance Real Estate	24,917,249	57.0	3.8	13.8	6.0	5.4	--	13.8	1.4	3.1	6.0	2.9
<i>NCREIF ODCE Net</i>			7.7	21.1	8.2	7.8	--	21.1	0.3	4.4	7.4	6.7
JPMorgan Special Situation Property	18,802,234	43.0	7.1	22.3	9.4	9.1	--	22.3	2.0	5.0	9.6	7.9
<i>NCREIF ODCE Net</i>			7.7	21.1	8.2	7.8	--	21.1	0.3	4.4	7.4	6.7



# Total Infrastructure Performance Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Infrastructure</b>	<b>18,851,240</b>	<b>100.0</b>	<b>2.2</b>	<b>11.1</b>	<b>9.3</b>	<b>11.1</b>	<b>8.0</b>	<b>11.1</b>	<b>5.4</b>	<b>11.5</b>	<b>10.2</b>	<b>17.9</b>
<i>CPI + 5%</i>			2.9	12.4	8.7	8.1	7.2	12.4	6.4	7.4	7.0	7.2
<b>Infrastructure</b>	<b>18,851,240</b>	<b>100.0</b>										
IFM Global Infrastructure (US) LP	11,598,166	61.5	3.7	17.4	11.6	14.3	10.1	17.4	3.1	14.6	15.8	21.1
<i>CPI + 5%</i>			2.9	12.4	8.7	8.1	7.2	12.4	6.4	7.4	7.0	7.2
JPMorgan IIF ERISA LP	7,253,074	38.5	0.0	2.6	6.3	7.4	5.6	2.6	8.4	8.0	4.2	14.2
<i>CPI + 5%</i>			2.9	12.4	8.7	8.1	7.2	12.4	6.4	7.4	7.0	7.2



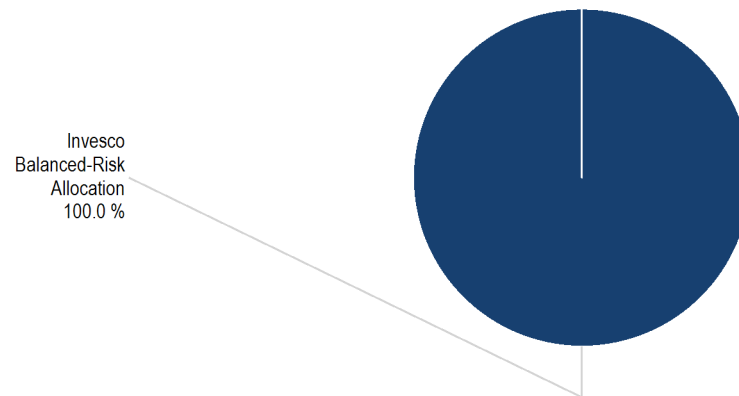
JPM IIF ERISA LP as of 9/30/2021.

Total Multi-Asset  
Performance Summary (Net of Fees)

Period Ending: December 31, 2021

	Market Value	% of Portfolio	3 Mo	1 Yr	3 Yrs	5 Yrs	10 Yrs	2021	2020	2019	2018	2017
<b>Total Multi-Asset</b>	<b>63,013,891</b>	<b>100.0</b>	<b>2.4</b>	<b>10.9</b>	<b>12.4</b>	<b>8.2</b>	<b>7.3</b>	<b>10.9</b>	<b>10.8</b>	<b>15.7</b>	<b>-5.8</b>	<b>10.6</b>
60% MSCI ACWI Net/40% FTSE WGBI			3.6	7.8	13.4	10.0	7.6	7.8	14.5	18.2	-5.8	17.1
eV Global Balanced Net Rank			89	54	52	56	70	54	46	92	22	99
<b>Multi-Asset</b>	<b>63,013,891</b>	<b>100.0</b>										
Invesco Balanced-Risk Allocation	63,013,891	100.0	2.4	10.9	12.4	8.1	6.9	10.9	10.8	15.7	-5.8	10.5
60% MSCI ACWI Net/40% FTSE WGBI			3.6	7.8	13.4	10.0	7.6	7.8	14.5	18.2	-5.8	17.1
FTSE 3-Month T-bill +6%			1.5	6.0	7.0	7.2	6.6	6.0	6.6	8.4	8.0	6.9
eV Global Balanced Net Rank			89	54	52	56	83	54	46	92	22	99

Total Multi-Asset  
Current Allocation

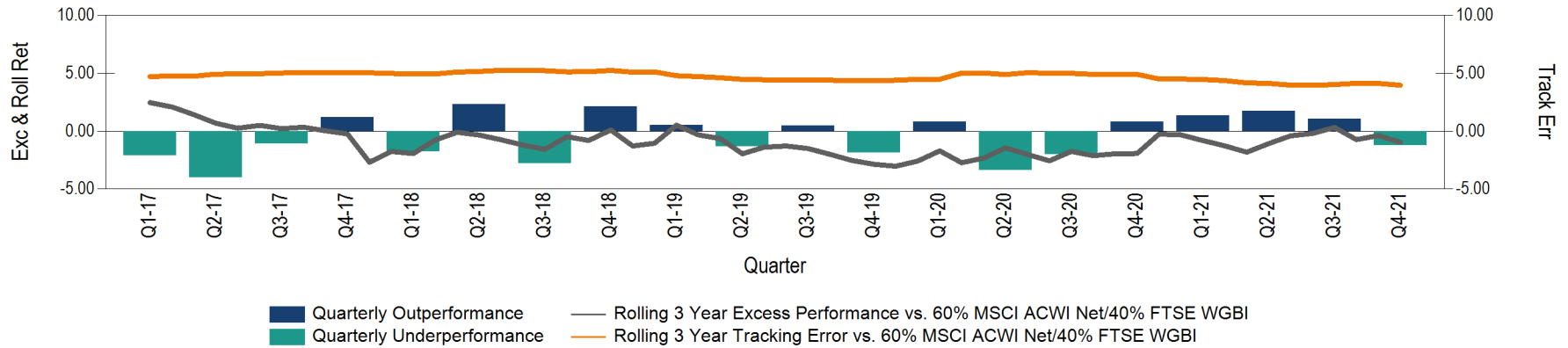


Mellon Dynamic liquidated 5/5/2017.

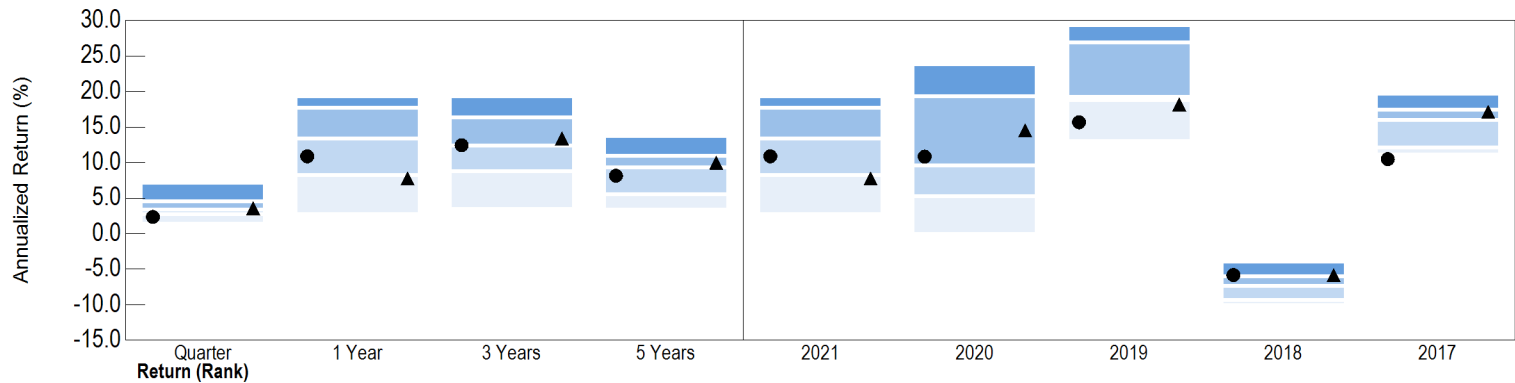
# Invesco Balanced-Risk Allocation Performance Summary (Net of Fees)

Period Ending: December 31, 2021

### Rolling Annualized Excess Performance and Tracking Error



### Invesco Balanced-Risk Allocation vs. eV Global Balanced Net Universe



	Quarter	1 Year	3 Years	5 Years	2021	2020	2019	2018	2017
<b>Return (Rank)</b>									
<b>5th Percentile</b>	7.1	19.3	19.2	13.7	19.3	23.8	29.3	-4.0	19.6
<b>25th Percentile</b>	4.6	17.8	16.4	11.0	17.8	19.4	27.0	-6.0	17.5
<b>Median</b>	3.4	13.5	12.5	9.4	13.5	9.6	19.3	-7.3	16.1
<b>75th Percentile</b>	2.8	8.3	8.8	5.6	8.3	5.4	18.8	-9.3	12.2
<b>95th Percentile</b>	1.4	2.8	3.5	3.4	2.8	0.0	13.1	-10.0	11.1
<b># of Portfolios</b>	12	12	11	11	12	10	9	10	9
<b>● Invesco Balanced-Risk Allocation</b>	2.4 (89)	10.9 (54)	12.4 (52)	8.1 (56)	10.9 (54)	10.8 (46)	15.7 (92)	-5.8 (22)	10.5 (99)
<b>▲ 60% MSCI ACWI Net/40% FTSE WGBI</b>	3.6 (38)	7.8 (92)	13.4 (40)	10.0 (35)	7.8 (92)	14.5 (33)	18.2 (88)	-5.8 (22)	17.1 (29)



**Performance Return Calculations**

Performance is calculated using Modified Dietz and for time periods with large cash flow (generally greater than 10% of portfolio value), Time Weighted Rates of Return (TWRR) methodologies. Monthly returns are geometrically linked and annualized for periods longer than one year.

**Data Source**

Verus is an independent third party consulting firm and calculates returns from best source book of record data. Returns calculated by Verus may deviate from those shown by the manager in part, but not limited to, differences in prices and market values reported by the custodian and manager, as well as significant cash flows into or out of an account. It is the responsibility of the manager and custodian to provide insight into the pricing methodologies and any difference in valuation.

**Illiquid Alternatives**

Due to the inability to receive final valuation prior to report production, closed end funds (including but are not limited to Real Estate, Hedge Funds, Private Equity, and Private Credit) performance is typically reported at a one-quarter lag. Valuation is reported at a one-quarter lag, adjusted for current quarter flow (cash flows are captured real time). Closed end fund performance is calculated using a time-weighted return methodology consistent with all portfolio and total fund performance calculations. For Private Markets, performance reports also include Verus-calculated multiples based on flows and valuations (e.g. DPI and TVPI) and manager-provided IRRs.

**Manager Line Up**

<u>Manager</u>	<u>Fund Incepted</u>	<u>Data Source</u>	<u>Manager</u>	<u>Fund Incepted</u>	<u>Data Source</u>
BlackRock Equity Index NL	4/30/2010	BlackRock	JPMorgan SSP	12/31/2014	JP Morgan
INTECH US Adaptive Volatility	8/3/2018	INTECH	IFM Global Infrastructure (US) LP	1/31/2009	IFM
Vanguard Small Cap Index Ins	4/14/2021	US Bank	JPMorgan IIF ERISA LP	9/30/2010	JP Morgan
WCM Focused International Growth	7/1/2016	WCM	Invesco Balanced-Risk Allocation	1/31/2010	Invesco
Causeway International Value	7/27/2016	US Bank	US Bank Checking Account	N/A	US Bank
Loomis Sayles Core Plus	3/21/2017	Loomis Sayles	US Bank Clearing Account	N/A	US Bank
ASB Allegiance Real Estate	3/31/2015	ASB			

**Policy & Custom Index Composition**

Policy Index:	45% MSCI World, 25% Bloomberg Aggregate, 10% NCREIF-ODCE Net, 20% (60%MSCI ACWI Net/40% CITI WGBI)
Target Asset Allocation Policy:	25% Dow Jones US Total Stock, 20% MSCI ACWI ex US IMI, 20% Bloomberg Aggregate, 10% NCREIF-ODCE, 5% CPI + 5%, and 20% (60%MSCI ACWI Net/40% CITI WGBI).

# Glossary

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**Allocation Effect:** An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

**Alpha:** The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as:  $\text{Portfolio Return} - [\text{Risk-free Rate} + \text{Portfolio Beta} \times (\text{Market Return} - \text{Risk-free Rate})]$ .

**Benchmark R-squared:** Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager.

**Beta:** A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

**Book-to-Market:** The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios.

**Capture Ratio:** A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

**Correlation:** A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

**Excess Return:** A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

**Information Ratio:** A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

**Interaction Effect:** An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

**Portfolio Turnover:** The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

**Price-to-Earnings Ratio (P/E):** Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

**R-Squared:** Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

**Selection Effect:** An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

**Sharpe Ratio:** A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as:  $\text{Portfolio Excess Return} / \text{Portfolio Standard Deviation}$ .

**Sortino Ratio:** Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

**Standard Deviation:** A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

**Style Analysis:** A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

**Style Map:** A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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