



# QUARTERLY PERFORMANCE REPORT

CITY OF FRESNO RETIREMENT  
SYSTEMS

DECEMBER 31, 2023

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# FOURTH QUARTER 2023 SUMMARY

- **The US economy expanded (in real terms) at an annual rate of 3.3% in the fourth quarter.**
- **On November 1, the Fed's rate setting group agreed to hold the key federal funds rate in a target range between 5.25%-to-5.50%.**
- **U.S. equities outperformed developed market equities (Japan, Europe, etc.) .**
- **Fixed income rose during the quarter, and spreads in investment-grade remained steady while high-yield credit spreads narrowed.**
- **Total fund performance net of fees over the past 25 years was 6.9% per year, outperforming the Policy Index and the current 6.75% assumed rate.**
- **Manager selection remains a positive contributor to relative performance long-term.**

# FOURTH QUARTER 2023 SUMMARY

- **In the one-year ended December 31, 2023, the Total Fund returned 13.1%, outperforming the benchmark (net of fees) and ranking in the first quartile of peers.**
  - Outperformance was primarily driven by positive manager selection in fixed income and real assets.
- **Over the most recent quarter, the Total Fund returned 7.0%, outperforming relative to the policy benchmark (net of fees) and ranking in the second quartile of peers.**
  - Outperformance was driven by positive manager selection in a number of areas including fixed income, real assets, and international equity.
- **Total Fund volatility remained elevated relative to peers.**

# CAPITAL MARKETS OVERVIEW

**The U.S. economy experienced a “no landing” in 2023** as inflation pressures declined, while consumption and growth defied expectations

The Federal Reserve raised interest rates more than expected this year; **the “long and variable” lag may be longer and more variable today**

**Markets remain anchored to a lower interest rate and inflation environment,** pricing in an aggressive cutting path for the Fed in 2024

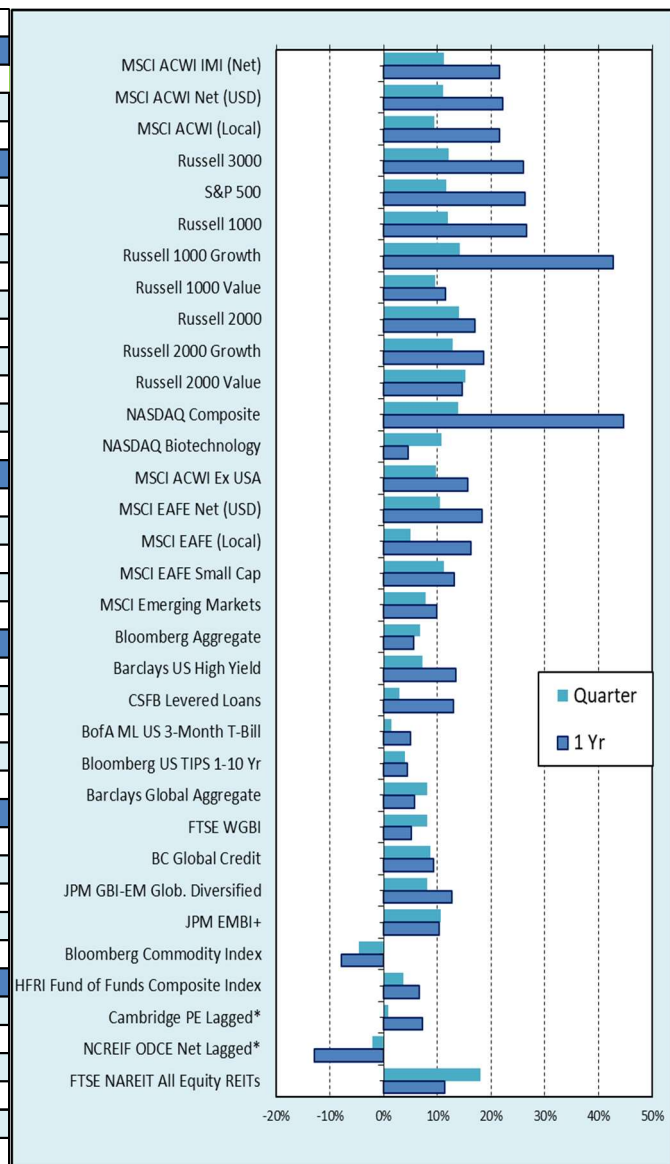
**The Magnificent 7 drove U.S. equity market outperformance in 2023** – surpassing lofty market expectations for revenue and earnings growth

A backdrop of elevated global geopolitical tensions **heightens economic tail risks and introduces uncertainty** for capital markets in 2024

# MARKET ENVIRONMENT

## Q4 2023 OVERVIEW

		Qtr.	1 Yr.	3 Yr.	5 Yr.	10 Yr.
<b>World Equity Benchmarks</b>						
MSCI ACWI IMI (Net)	World with Small Cap	11.14%	21.58%	5.46%	11.49%	7.77%
MSCI ACWI Net (USD)	World W/O Small Cap	11.03%	22.20%	5.75%	11.72%	7.92%
MSCI ACWI (Local)	World (Local Currency)	9.38%	21.61%	7.30%	12.24%	9.04%
<b>Domestic Equity Benchmarks</b>						
Russell 3000	Domestic All Cap	12.07%	25.96%	8.54%	15.16%	11.48%
S&P 500	Large Core	11.69%	26.29%	10.00%	15.69%	12.03%
Russell 1000	Large Core	11.96%	26.53%	8.97%	15.52%	11.80%
Russell 1000 Growth	Large Growth	14.16%	42.68%	8.86%	19.50%	14.86%
Russell 1000 Value	Large Value	9.50%	11.46%	8.86%	10.91%	8.40%
Russell 2000	Small Core	14.03%	16.93%	2.22%	9.97%	7.16%
Russell 2000 Growth	Small Growth	12.75%	18.66%	-3.50%	9.22%	7.16%
Russell 2000 Value	Small Value	15.26%	14.65%	7.94%	10.00%	6.76%
NASDAQ Composite	Large Growth	13.79%	44.64%	6.04%	18.75%	14.80%
NASDAQ Biotechnology	Biotech	10.75%	4.59%	-2.03%	8.26%	6.89%
<b>International Equity Benchmarks</b>						
MSCI ACWI Ex USA	World ex-US	9.75%	15.62%	1.55%	7.08%	3.83%
MSCI EAFE Net (USD)	Int'l Developed	10.42%	18.24%	4.02%	8.16%	4.28%
MSCI EAFE (Local)	Int'l Developed (Local Currency)	4.96%	16.16%	8.64%	9.49%	6.61%
MSCI EAFE Small Cap	Small Cap Int'l	11.14%	13.16%	-0.69%	6.58%	4.80%
MSCI Emerging Markets	Emerging Equity	7.86%	9.83%	-5.08%	3.69%	2.66%
<b>Domestic Fixed Income Benchmarks</b>						
Bloomberg Aggregate	Core Bonds	6.82%	5.53%	-3.31%	1.10%	1.81%
Barclays US High Yield	High Yield	7.16%	13.44%	1.98%	5.37%	4.60%
CSFB Levered Loans	Bank Loans	2.85%	13.04%	5.64%	5.56%	4.44%
BofA ML US 3-Month T-Bill	Cash	1.37%	5.02%	2.15%	1.88%	1.25%
Bloomberg US TIPS 1-10 Yr	Inflation	3.89%	4.36%	0.73%	3.43%	2.31%
<b>Global Fixed Income Benchmarks</b>						
Barclays Global Aggregate	Global Core Bonds	8.10%	5.71%	-5.51%	-0.32%	0.38%
FTSE WGBI	World Gov. Bonds	8.08%	5.19%	-7.18%	-1.39%	-0.31%
BC Global Credit	Global Bonds	8.69%	9.24%	-4.24%	1.36%	1.51%
JPM GBI-EM Glob. Diversified	Em. Mkt. Bonds (Local Currency)	8.07%	12.70%	-3.16%	1.14%	0.09%
JPM EMBI+	Em. Mkt. Bonds	10.54%	10.30%	-7.43%	-0.89%	1.51%
<b>Alternative Benchmarks</b>						
Bloomberg Commodity Index	Commodities	-4.63%	-7.91%	10.76%	7.23%	-1.11%
HFRI Fund of Funds Composite Index	Fund of Hedge Funds	3.65%	6.59%	2.33%	5.19%	3.28%
Cambridge PE Lagged*	Private Equity	0.77%	7.22%	17.59%	14.63%	14.02%
NCREIF ODCE Net Lagged*	Real Estate	-2.10%	-12.88%	6.19%	4.72%	7.19%
FTSE NAREIT All Equity REITs	REIT	17.98%	11.36%	5.70%	7.59%	7.95%
CPI + 2%	Inflation/Real Assets	0.94%	5.36%	7.74%	6.17%	4.84%



\* As of 9/30/2023



# EXECUTIVE SUMMARY

	Market Value (\$)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	15 Yrs (%)	25 Yr (%)	Inception (%)	Inception Date
<b>Total Fund</b>	<b>3,822,690,361</b>	<b>7.0 (38)</b>	<b>13.1 (22)</b>	<b>5.7 (22)</b>	<b>9.8 (9)</b>	<b>8.6 (14)</b>	<b>7.5 (8)</b>	<b>9.6 (4)</b>	<b>6.9 (6)</b>	<b>9.1</b>	<b>Oct-85</b>
<i>Policy Index</i>		6.3 (59)	11.8 (45)	5.1 (35)	8.6 (41)	7.6 (42)	6.7 (36)	8.8 (24)	6.4 (35)	9.1	
<i>60 MSCI World (Gross)/40 CITI WGBI</i>		9.9 (1)	15.5 (4)	0.8 (100)	6.9 (94)	6.5 (90)	5.1 (99)	6.8 (99)	5.2 (100)		
<i>InvMetrics Public DB &gt; \$1 Billion Median</i>		6.6	11.4	4.5	8.3	7.3	6.3	8.4	6.1		
Population		94	85	73	70	69	64	58	36		

## 5 Years Ending December 31, 2023

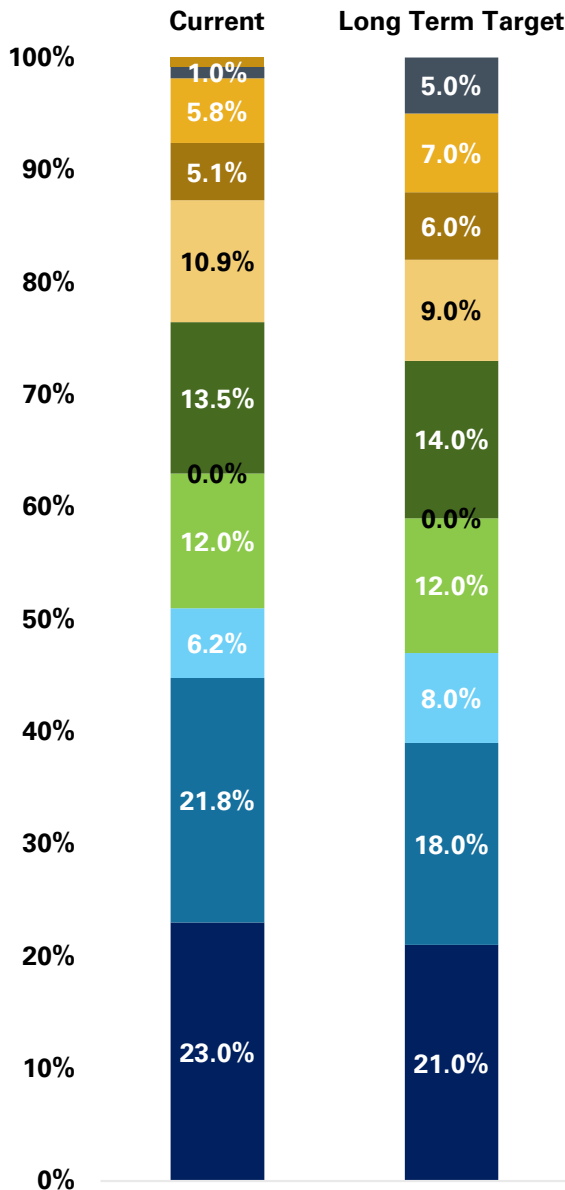
	Return	Standard Deviation	Sharpe Ratio	Sortino Ratio
<b>Total Fund</b>	<b>9.8 (9)</b>	<b>11.3 (62)</b>	<b>0.7 (21)</b>	<b>1.1 (22)</b>
<i>Policy Index</i>	8.6 (41)	11.3 (62)	0.6 (44)	0.9 (39)
<i>60 MSCI World (Gross)/40 CITI WGBI</i>	6.9 (94)	12.8 (88)	0.4 (99)	0.7 (98)

## 7 Years Ending December 31, 2023

	Return	Standard Deviation	Sharpe Ratio	Sortino Ratio
<b>Total Fund</b>	<b>8.6 (14)</b>	<b>10.2 (63)</b>	<b>0.7 (23)</b>	<b>1.0 (24)</b>
<i>Policy Index</i>	7.6 (42)	10.2 (62)	0.6 (45)	0.9 (45)
<i>60 MSCI World (Gross)/40 CITI WGBI</i>	6.5 (90)	11.3 (85)	0.5 (97)	0.7 (96)

- Over the past five years, the Fund returned 9.8% per annum, ranking in the 9th percentile of the Investment Metrics Public Funds > \$1 Billion gross of fee universe. The Fund's return outperformed the actuarial rate of return and outperformed the Policy Index by 1.2%.
- The Fund's volatility was 11.3% which ranks in the 62nd percentile of its peers. The Fund's risk-adjusted performance, as measured by the Sharpe ratio, ranks in the 21st percentile of its peers.
- Over the past three years, the Fund returned 5.7% per annum, outperforming the Policy Index by 0.6% and ranking in the 22nd percentile of its peer group. Over the past three years, the Fund's Sharpe Ratio of 0.4 ranks in the 21st percentile.
- For the year ending June 30, 2023, the Fund returned 13.1%, outperforming the Policy Index by 1.3% and ranking in the 22nd percentile among its peers.

# ASSET ALLOCATION VS. POLICY

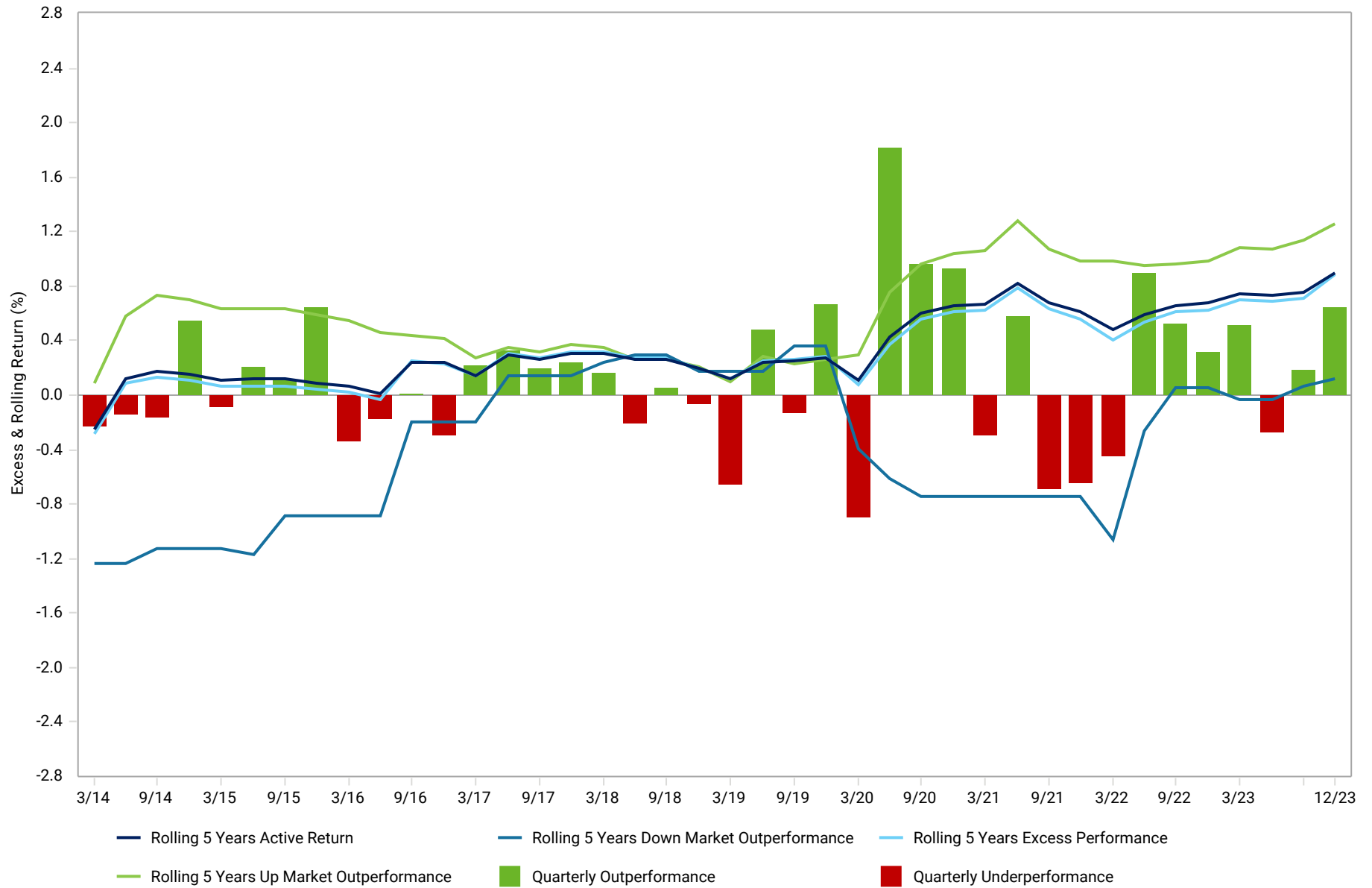


	Current (\$)	Current (%)	Long Term Target (%)	Difference (%)	Policy Range (%)	Within Range
Domestic Equity	878,860,489	23.0	21.0	2.0	13.0 - 30.0	Yes
International Equity	833,243,993	21.8	18.0	3.8	10.0 - 20.0	No*
Private Equity	237,178,051	6.2	8.0	-1.8	0.0 - 10.0	Yes
Core Fixed Income	458,645,990	12.0	12.0	0.0	5.0 - 20.0	Yes
High Yield	-	0.0	0.0	0.0	0.0 - 5.0	Yes
Private Debt	514,382,440	13.5	14.0	-0.5	5.0 - 20.0	Yes
Core Real Estate	414,790,584	10.9	9.0	1.9	5.0 - 15.0	Yes
Value Add/Opportunistic Real Estate	194,285,326	5.1	6.0	-0.9	2.0 - 8.0	Yes
Infrastructure	220,239,710	5.8	7.0	-1.2	2.0 - 10.0	Yes
Diversifying/Thematic	39,418,039	1.0	5.0	-4.0	0.0 - 7.0	Yes
Cash	31,645,739	0.8	0.0	0.8	0.0 - 2.0	Yes
<b>Total</b>	<b>3,822,690,362</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>		

\* The current International Equity exposure is closer to the Pension's interim target of 20%.



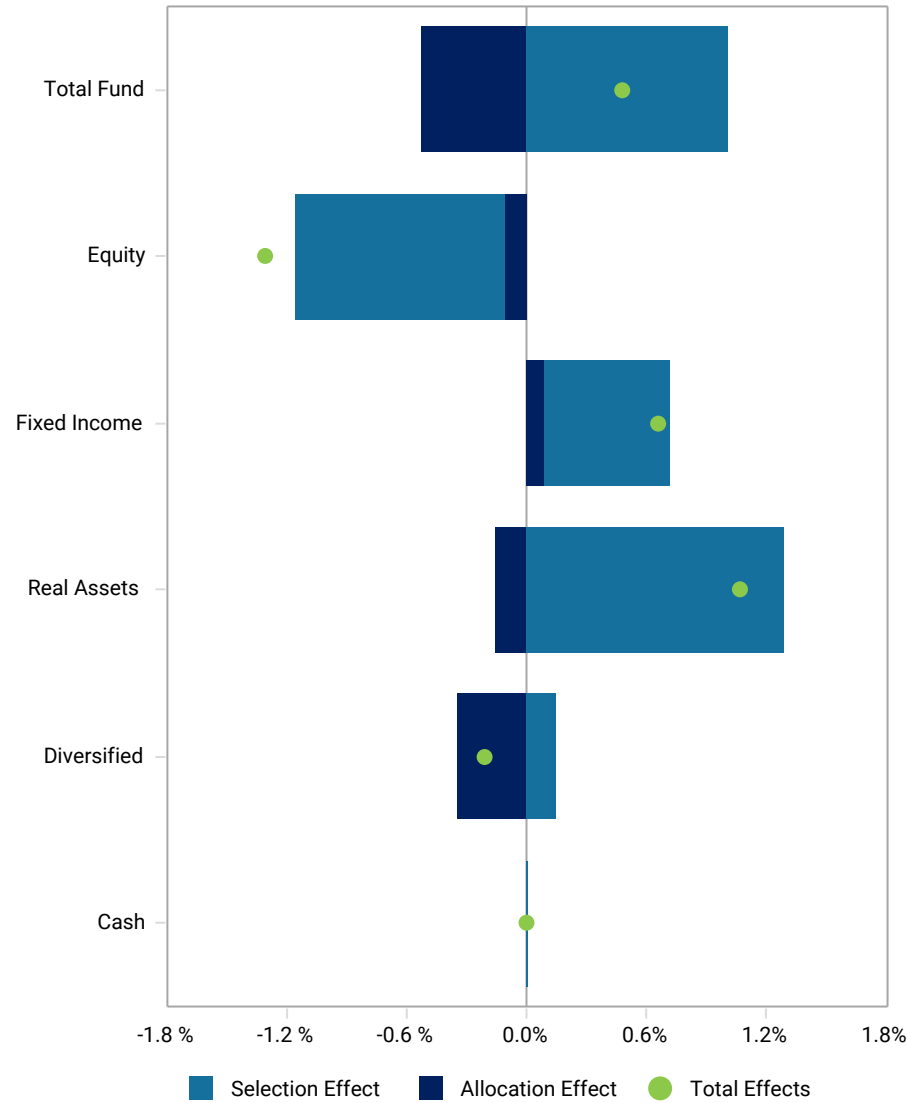
# TOTAL FUND VS. POLICY INDEX





# ATTRIBUTION ANALYSIS

**Attribution Effects**  
3 Years Ending December 31, 2023



**Attribution Summary**  
3 Years Ending December 31, 2023

	Wtd. Actual Return (%)	Wtd. Index Return (%)	Excess Return (%)	Selection Effect (%)	Allocation Effect (%)	Total Effects (%)
Equity	3.8	5.9	-2.1	-1.1	-0.1	-1.3
Fixed Income	3.4	1.1	2.3	0.6	0.1	0.7
Real Assets	11.4	5.1	6.3	1.3	-0.2	1.1
Diversified	7.6	9.6	-2.0	0.1	-0.4	-0.2
Cash	3.1	2.2	0.9	0.0	0.0	0.0
<b>Total Fund</b>	<b>5.6</b>	<b>5.1</b>	<b>0.5</b>	<b>1.0</b>	<b>-0.5</b>	<b>0.5</b>

# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Fund</b>	<b>3,822,690,361</b>	<b>100.0</b>	<b>6.9 (40)</b>	<b>12.9 (25)</b>	<b>5.6 (25)</b>	<b>9.5 (12)</b>	<b>8.3 (15)</b>	<b>7.2 (18)</b>	<b>8.8</b>	<b>Oct-85</b>
<i>Policy Index</i>			<u>6.3</u> (59)	<u>11.8</u> (45)	<u>5.1</u> (35)	<u>8.6</u> (41)	<u>7.6</u> (42)	<u>6.7</u> (36)	<u>9.1</u>	
Over/Under			0.6	1.1	0.5	0.9	0.7	0.5	-0.3	
<i>60 MSCI World (Gross)/40 CITI WGBI</i>			<u>9.9</u> (1)	<u>15.5</u> (4)	<u>0.8</u> (100)	<u>6.9</u> (94)	<u>6.5</u> (90)	<u>5.1</u> (99)		
Over/Under			-3.0	-2.6	4.8	2.6	1.8	2.1		
<i>InvMetrics Public DB &gt; \$1 Billion Median</i>			6.6	11.4	4.5	8.3	7.3	6.3		
<b>Total Equity Composite</b>	<b>1,949,282,533</b>	<b>51.0</b>	<b>10.4</b>	<b>19.7</b>	<b>3.8</b>	<b>11.5</b>	<b>9.9</b>	<b>8.1</b>	<b>8.4</b>	<b>Nov-95</b>
<i>MSCI AC World All Cap Index (Net)</i>			<u>11.1</u>	<u>21.5</u>	<u>5.4</u>	<u>11.5</u>	<u>9.7</u>	<u>7.7</u>		
Over/Under			-0.7	-1.8	-1.6	0.0	0.2	0.4		
<b>Domestic Equity Composite</b>	<b>878,860,489</b>	<b>23.0</b>	<b>12.2</b>	<b>26.0</b>	<b>7.8</b>	<b>14.6</b>	<b>12.0</b>	<b>10.9</b>	<b>10.7</b>	<b>Apr-03</b>
<i>Domestic Equity Index</i>			<u>12.1</u>	<u>26.0</u>	<u>8.8</u>	<u>15.0</u>	<u>12.3</u>	<u>11.1</u>	<u>10.7</u>	
Over/Under			0.1	0.0	-1.0	-0.4	-0.3	-0.2	0.0	
NTAM Russell 3000	878,860,489	23.0	12.2 (31)	26.0 (26)	8.5 (56)	15.2 (33)	13.0 (30)		13.2 (28)	Oct-16
<i>Russell 3000 Index</i>			<u>12.1</u> (34)	<u>26.0</u> (27)	<u>8.5</u> (56)	<u>15.2</u> (33)	<u>12.8</u> (35)		<u>13.0</u> (32)	
Over/Under			0.1	0.0	0.0	0.0	0.2		0.2	
<i>eV US Large Cap Core Equity Median</i>			11.5	21.7	8.9	14.3	12.2		12.3	

Fiscal year end: June 30

# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>International Equity Composite</b>	<b>833,243,993</b>	<b>21.8</b>	<b>11.5</b>	<b>17.3</b>	<b>-1.6</b>	<b>7.6</b>	<b>6.9</b>	<b>4.5</b>		<b>Apr-94</b>
<i>International Equity Index</i>			<u>9.8</u>	<u>16.2</u>	<u>1.9</u>	<u>7.8</u>	<u>7.0</u>	<u>4.4</u>	<u>5.7</u>	
Over/Under			1.7	1.1	-3.5	-0.2	-0.1	0.1		
Baillie Gifford	223,863,458	5.9	14.7 (8)	18.1 (36)	-5.3 (89)	7.6 (63)	7.3 (43)	5.2 (29)	6.6 (35)	Oct-08
<i>MSCI AC World ex USA index</i>			<u>9.8</u> (61)	<u>16.2</u> (51)	<u>2.0</u> (41)	<u>7.6</u> (63)	<u>6.8</u> (56)	<u>4.3</u> (59)	<u>5.4</u> (72)	
Over/Under			4.9	1.9	-7.3	0.0	0.5	0.9	1.2	
<i>eV All ACWI ex-US Equity Median</i>			10.3	16.4	1.5	8.1	7.0	4.5	5.9	
Baillie Gifford Smaller Cos.	53,718,765	1.4	14.0 (20)	16.8 (46)					-11.4 (94)	Jul-21
<i>MSCI EAFE + Canada Small Cap Index</i>			<u>10.7</u> (60)	<u>13.2</u> (69)					<u>-3.5</u> (43)	
Over/Under			3.3	3.6					-7.9	
<i>eV ACWI ex-US Small Cap Equity Median</i>			11.2	15.7					-4.8	
BlackRock ACWI ex US	300,663,281	7.9	9.7 (65)	15.8 (58)	1.6 (49)	7.2 (68)	6.5 (65)	4.0 (69)	4.1 (80)	Mar-11
<i>MSCI AC World ex USA index</i>			<u>9.8</u> (61)	<u>16.2</u> (51)	<u>2.0</u> (41)	<u>7.6</u> (63)	<u>6.8</u> (56)	<u>4.3</u> (59)	<u>4.4</u> (72)	
Over/Under			-0.1	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	
<i>eV All ACWI ex-US Equity Median</i>			10.3	16.4	1.5	8.1	7.0	4.5	5.1	
Principal Global	254,668,460	6.7	10.1 (55)	18.5 (32)	1.1 (54)	8.3 (45)	6.9 (54)	4.5 (52)	5.6 (32)	Sep-08
<i>MSCI AC World ex USA index</i>			<u>9.8</u> (61)	<u>16.2</u> (51)	<u>2.0</u> (41)	<u>7.6</u> (63)	<u>6.8</u> (56)	<u>4.3</u> (59)	<u>4.2</u> (72)	
Over/Under			0.3	2.3	-0.9	0.7	0.1	0.2	1.4	
<i>eV All ACWI ex-US Equity Median</i>			10.3	16.4	1.5	8.1	7.0	4.5	4.9	
Sanctioned Assets	328,596	0.0	13.1	69.5					27.1	Jul-22
<i>MSCI EAFE (Net)</i>			<u>10.4</u>	<u>18.2</u>					<u>16.5</u>	
Over/Under			2.7	51.3					10.6	

International Equity Composite includes \$1,433 from Global Transition Account.



# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							Inception Date
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	
<b>Private Equity</b>	<b>237,178,051</b>	<b>6.2</b>	<b>0.6</b>	<b>3.4</b>	<b>17.7</b>				<b>13.7</b>	<b>Apr-19</b>
Ocean Avenue Fund V, L.P.	4,332,005	0.1	14.9						4.6	Apr-23
Russell 2000 + 3%			14.9						16.4	
Over/Under			0.0						-11.8	
Pantheon Asia Select 2021	10,150,001	0.3	0.0						0.0	Aug-23
Private Equity Index			-3.0						1.6	
Over/Under			3.0						-1.6	
Pantheon PE Fund of 1	181,066,067	4.7	0.4	4.4	17.9				14.1	May-19
Private Equity Index			-3.0	22.0	8.5				10.1	
Over/Under			3.4	-17.6	9.4				4.0	
Pantheon Co-Investment V	29,015,352	0.8	0.1						-17.0	May-23
Private Equity Index			-3.0						2.9	
Over/Under			3.1						-19.9	
Pantheon Co 2022	6,681,062	0.2	1.5	5.0					13.5	Jul-22
Private Equity Index			-3.0	22.0					-2.3	
Over/Under			4.5	-17.0					15.8	
Pantheon Secondary 2023	5,933,564	0.2	2.0						0.7	May-23
Private Equity Index			-3.0						2.9	
Over/Under			5.0						-2.2	
<b>Total Fixed Income Composite</b>	<b>973,028,430</b>	<b>25.5</b>	<b>7.3</b>	<b>12.1</b>	<b>3.4</b>	<b>5.6</b>	<b>5.1</b>	<b>4.8</b>	<b>5.7</b>	<b>Nov-95</b>
Fixed Income Index			4.8	9.4	1.0	4.2	3.6	3.7	5.1	
Over/Under			2.5	2.7	2.4	1.4	1.5	1.1	0.6	
<b>Core Fixed Composite</b>	<b>458,645,990</b>	<b>12.0</b>	<b>7.5</b>	<b>7.5</b>	<b>-2.3</b>	<b>2.0</b>	<b>2.2</b>	<b>2.6</b>	<b>3.6</b>	<b>Apr-03</b>
Blmbg. U.S. Aggregate Index			6.8	5.5	-3.3	1.1	1.3	1.8	3.2	
Over/Under			0.7	2.0	1.0	0.9	0.9	0.8	0.4	
Dodge & Cox	232,381,226	6.1	7.6 (6)	8.2 (2)	-1.4 (3)	3.1 (1)	2.8 (1)	3.2 (2)	4.2 (4)	Jan-03
Blmbg. U.S. Aggregate Index			6.8 (51)	5.5 (72)	-3.3 (68)	1.1 (83)	1.3 (79)	1.8 (76)	3.2 (77)	
Over/Under			0.8	2.7	1.9	2.0	1.5	1.4	1.0	
eV US Core Fixed Inc Median			6.8	5.9	-3.1	1.4	1.5	2.0	3.5	
PGIM	226,264,764	5.9	7.5 (6)	6.7 (11)	-3.2 (62)	1.3 (69)	1.4 (64)	2.0 (56)	3.4 (53)	Apr-03
Blmbg. U.S. Aggregate Index			6.8 (51)	5.5 (72)	-3.3 (68)	1.1 (83)	1.3 (79)	1.8 (76)	3.2 (77)	
Over/Under			0.7	1.2	0.1	0.2	0.1	0.2	0.2	
eV US Core Fixed Inc Median			6.8	5.9	-3.1	1.4	1.5	2.0	3.4	

# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							Inception Date
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	
<b>Private Credit</b>	<b>514,382,440</b>	<b>13.5</b>	<b>7.0</b>	<b>16.8</b>	<b>12.7</b>	<b>10.1</b>	<b>9.8</b>	<b>9.2</b>	<b>Sep-15</b>	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>	<u>3.2</u>	<u>6.1</u>	<u>6.0</u>	<u>6.2</u>		
Over/Under			2.0	3.4	9.5	4.0	3.8	3.0		
Crescent Capital	27,717,089	0.7	3.8	12.9	10.1	8.7	8.5	7.9	Sep-15	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>	<u>3.2</u>	<u>6.1</u>	<u>6.0</u>	<u>6.2</u>		
Over/Under			-1.2	-0.5	6.9	2.6	2.5	1.7		
Arcmont Euro Private Debt	129,343,499	3.4	5.4	19.6				13.5	Apr-21	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>				<u>3.9</u>		
Over/Under			0.4	6.2				9.6		
Arcmont Co-Investments	9,000,001	0.2	0.0					0.0	Jul-23	
<i>Private Credit Index</i>			<u>5.0</u>					<u>7.1</u>		
Over/Under			-5.0					-7.1		
Monroe Capital	225,792,588	5.9	3.2	12.1	10.7	9.2	9.3	9.9	Apr-16	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>	<u>3.2</u>	<u>6.1</u>	<u>6.0</u>	<u>6.1</u>		
Over/Under			-1.8	-1.3	7.5	3.1	3.3	3.8		
PIMCO COF II	38,260,885	1.0	80.8	124.0	42.3	25.3	21.7	21.2	Aug-16	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>	<u>3.2</u>	<u>6.1</u>	<u>6.0</u>	<u>6.1</u>		
Over/Under			75.8	110.6	39.1	19.2	15.7	15.1		
PIMCO COF III	84,268,378	2.2	2.7	5.3	21.5			27.9	May-20	
<i>Private Credit Index</i>			<u>5.0</u>	<u>13.4</u>	<u>3.2</u>			<u>5.5</u>		
Over/Under			-2.3	-8.1	18.3			22.4		

# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Real Assets</b>	<b>829,315,620</b>	<b>21.7</b>	<b>-0.4</b>	<b>-0.3</b>	<b>11.4</b>	<b>7.5</b>	<b>7.1</b>	<b>8.9</b>	<b>9.4</b>	<b>Jan-96</b>
<b>Private Real Estate Composite</b>	<b>194,285,326</b>	<b>5.1</b>	<b>1.0</b>	<b>1.1</b>	<b>12.2</b>	<b>8.8</b>	<b>10.8</b>	<b>11.5</b>	<b>9.9</b>	<b>Jan-96</b>
NCREIF ODCE			<u>-4.8</u>	<u>-12.0</u>	<u>4.9</u>	<u>4.2</u>	<u>5.3</u>	<u>7.3</u>	<u>8.4</u>	
Over/Under			5.8	13.1	7.3	4.6	5.5	4.2	1.5	
Oaktree Value Add	9,069,102	0.2	-3.4	-15.8	1.8	4.2	9.9		9.8	Dec-16
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>	<u>4.4</u>	<u>5.4</u>		<u>5.6</u>	
Over/Under			1.4	-3.9	-3.3	-0.2	4.5		4.2	
PCCP Value Add	19,164,816	0.5	-5.2	-16.0	9.7	9.1	11.4		13.0	Oct-16
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>	<u>4.4</u>	<u>5.4</u>		<u>5.5</u>	
Over/Under			-0.4	-4.1	4.6	4.7	6.0		7.5	
PIMCO Bravo III	47,452,870	1.2	9.7	11.9	13.4	9.1	10.0		9.7	Nov-16
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>	<u>4.4</u>	<u>5.4</u>		<u>5.6</u>	
Over/Under			14.5	23.8	8.3	4.7	4.6		4.1	
Alidade Capital V	4,010,937	0.1	-17.8	-37.8					-29.5	Dec-21
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>					<u>1.1</u>	
Over/Under			-13.0	-25.9					-30.6	
Artemis AREPF III	16,131,149	0.4	-2.1	-0.3	21.4	11.7			11.7	Jan-19
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>	<u>4.4</u>			<u>4.4</u>	
Over/Under			2.7	11.6	16.3	7.3			7.3	
Brookfield SREP III	54,405,022	1.4	0.4	8.1	14.3				7.6	May-19
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>				<u>4.4</u>	
Over/Under			5.2	20.0	9.2				3.2	
Blue Vista BVREP V	16,182,119	0.4	-0.1	0.9	24.5				12.0	Mar-20
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>	<u>5.1</u>				<u>4.3</u>	
Over/Under			4.7	12.8	19.4				7.7	
Kayne Anderson VI	27,869,311	0.7	1.2	8.6					3.6	Nov-21
NCREIF ODCE + 1%			<u>-4.8</u>	<u>-11.9</u>					<u>1.0</u>	
Over/Under			6.0	20.5					2.6	
Tristan	52,239,475	1.4	4.5						4.5	Oct-23
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net)			<u>-5.0</u>						<u>-5.0</u>	
Over/Under			9.5						9.5	

# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Core Real Estate</b>	<b>414,790,584</b>	<b>10.9</b>	<b>-1.7</b>	<b>-7.2</b>	<b>8.2</b>	<b>5.6</b>	<b>5.9</b>	<b>7.3</b>		<b>Jan-96</b>
JP Morgan RE	132,798,805	3.5	-7.4	-14.7	2.0	2.0	3.3	5.4	7.7	Jan-96
<i>NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net)</i>			<u>-5.0</u>	<u>-12.7</u>	<u>4.0</u>	<u>3.3</u>	<u>4.4</u>	<u>6.3</u>	<u>7.4</u>	
Over/Under			-2.4	-2.0	-2.0	-1.3	-1.1	-0.9	0.3	
CFRSR-Carlyle CPI Fund	229,752,304	6.0	0.5	-3.6	12.8				10.9	Jul-20
<i>NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net)</i>			<u>-5.0</u>	<u>-12.7</u>	<u>4.0</u>				<u>3.8</u>	
Over/Under			5.5	9.1	8.8				7.1	
<b>Infrastructure</b>	<b>220,239,710</b>	<b>5.8</b>	<b>0.9</b>	<b>12.4</b>	<b>6.6</b>	<b>6.1</b>			<b>5.8</b>	<b>Oct-18</b>
<i>CPI + 4% (Unadjusted)</i>			<u>0.6</u>	<u>7.5</u>	<u>9.8</u>	<u>8.2</u>			<u>7.9</u>	
Over/Under			0.3	4.9	-3.2	-2.1			-2.1	
Grain Communications IV	242	0.0							0.0	Dec-23
<i>CPI + 4% (Unadjusted)</i>									<u>0.2</u>	
Over/Under									-0.2	
JP Morgan IIF	113,953,125	3.0	0.0	13.4	5.9	6.1			5.8	Oct-18
<i>CPI + 4% (Unadjusted)</i>			<u>0.6</u>	<u>7.5</u>	<u>9.8</u>	<u>8.2</u>			<u>7.9</u>	
Over/Under			-0.6	5.9	-3.9	-2.1			-2.1	
Ullico UIF	106,286,343	2.8	2.0	11.5	7.9	6.4			6.3	Dec-18
<i>CPI + 4% (Unadjusted)</i>			<u>0.6</u>	<u>7.5</u>	<u>9.8</u>	<u>8.2</u>			<u>8.1</u>	
Over/Under			1.4	4.0	-1.9	-1.8			-1.8	
<b>Multi Asset</b>	<b>39,418,039</b>	<b>1.0</b>	<b>1.9</b>	<b>9.4</b>					<b>18.5</b>	<b>Dec-21</b>
<b>Alternative Credit</b>	<b>39,418,039</b>	<b>1.0</b>	<b>1.9</b>	<b>7.1</b>					<b>2.3</b>	<b>Jul-22</b>
Cloverlay	10,892,470	0.3	-2.5						-2.3	Jul-23
Sixth Street TAO	28,525,569	0.7	3.7	9.6					3.8	Jul-22

Grain Communications IV funded in December.



# TOTAL FUND PERFORMANCE DETAIL NET-OF-FEES

	Allocation		Performance (%)							
	Market Value (\$)	% of Portfolio	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Cash &amp; Equivalents Composite</b>	<b>31,645,739</b>	<b>0.8</b>	<b>0.9</b>	<b>4.7</b>	<b>3.1</b>	<b>2.4</b>	<b>2.1</b>	<b>1.6</b>	<b>1.8</b>	<b>Oct-03</b>
<i>90 Day U.S. Treasury Bill</i>			<u>1.4</u>	<u>5.0</u>	<u>2.2</u>	<u>1.9</u>	<u>1.7</u>	<u>1.2</u>	<u>1.4</u>	
Over/Under			-0.5	-0.3	0.9	0.5	0.4	0.4	0.4	
Investment Cash	30,814,767	0.8							0.0	Dec-23
<i>90 Day U.S. Treasury Bill</i>									<u>0.5</u>	
Over/Under									-0.5	
Payroll Account	297,878	0.0	1.2	5.0	1.8	1.6	1.6	1.2	1.9	Apr-99
<i>90 Day U.S. Treasury Bill</i>			<u>1.4</u>	<u>5.0</u>	<u>2.2</u>	<u>1.9</u>	<u>1.7</u>	<u>1.2</u>	<u>1.8</u>	
Over/Under			-0.2	0.0	-0.4	-0.3	-0.1	0.0	0.1	
Operating Funds	533,094	0.0	1.2	5.0	1.6	1.5	1.5	1.1	1.5	Oct-03
<i>90 Day U.S. Treasury Bill</i>			<u>1.4</u>	<u>5.0</u>	<u>2.2</u>	<u>1.9</u>	<u>1.7</u>	<u>1.2</u>	<u>1.4</u>	
Over/Under			-0.2	0.0	-0.6	-0.4	-0.2	-0.1	0.1	

Fiscal year end: June 30

Composite rankings are used for Total Equity Composite (InvMetrics Public DB US Eq), Domestic Equity Composite (InvMetrics Public DB Total Eq), International Equity Composite (InvMetrics Public DB ex- US Eq), International Developed Equity Composite (InvMetrics Public DB Dev Mkt ex-US), International Emerging Markets Equity (InvMetrics Public DB Emg Mkt Eq), Total Fixed Income (InvMetrics Public DB Total Fix Inc), Core Fixed Composite (InvMetrics Public DB US Fix Inc), High Yield Composite (InvMetrics Public DB US Fix Inc) and Total Real Estate (InvMetrics Public DB Real Estate Pub+Priv).

Manager rankings are used for Large Cap Equity Composite (eA US Large Cap Equity), Small Cap Equity Composite (eA US Small Cap Equity), ACWI ex US Equity Composite (eA ACWI ex-US Equity), EAFE Equity Composite (eA All EAFE Equity) and Public Real Estate Composite (eA US REIT).

Investment Cash funded in December.





# APPENDIX

# CALENDAR YEAR INDEX PERFORMANCE

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Dec	QTD	YTD
<b>S&amp;P 500</b>	32.4%	13.7%	1.4%	12.0%	21.8%	-4.4%	31.5%	18.4%	28.7%	-18.1%	4.5%	11.7%	26.3%
<b>Russell 1000</b>	33.1%	13.2%	0.9%	12.1%	21.7%	-4.8%	31.4%	21.0%	26.5%	-19.1%	4.9%	12.0%	26.5%
<b>Russell 2000</b>	38.8%	4.9%	-4.4%	21.3%	14.6%	-11.0%	25.5%	20.0%	14.8%	-20.4%	12.2%	14.0%	16.9%
<b>Russell 2500</b>	36.8%	7.1%	-2.9%	17.6%	16.8%	-10.0%	27.8%	20.0%	18.2%	-18.4%	10.7%	13.4%	17.4%
<b>MSCI EAFE</b>	22.8%	-4.9%	-0.8%	1.0%	25.0%	-13.8%	22.0%	7.8%	11.3%	-14.5%	5.3%	10.4%	18.2%
<b>MSCI EM</b>	-2.6%	-2.2%	-14.9%	11.2%	37.3%	-14.6%	18.4%	18.3%	-2.5%	-20.1%	3.9%	7.9%	9.8%
<b>MSCI ACWI</b>	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	26.6%	16.3%	18.5%	-18.4%	4.8%	11.0%	22.2%
<b>Private Equity</b>	12.6%	22.3%	14.6%	10.4%	10.3%	21.0%	13.1%	17.2%	45.0%	-9.3%	-	-	2.2%
<b>BBG TIPS</b>	-8.6%	3.6%	-1.4%	4.7%	3.0%	-1.3%	8.4%	11.0%	6.0%	-11.8%	2.7%	4.7%	3.9%
<b>BBG Municipal</b>	-2.6%	9.1%	3.3%	0.2%	5.4%	1.3%	7.5%	5.2%	1.5%	-8.5%	2.3%	7.9%	6.4%
<b>BBG Muni High Yield</b>	-5.5%	13.8%	1.8%	3.0%	9.7%	4.8%	10.7%	4.9%	7.8%	-13.1%	3.0%	9.2%	9.2%
<b>BBG US Corporate HY</b>	7.4%	2.5%	-4.5%	17.1%	7.5%	-2.1%	14.3%	7.1%	5.3%	-11.2%	3.7%	7.2%	13.4%
<b>BBG US Agg Bond</b>	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	7.5%	-1.5%	-13.0%	3.8%	6.8%	5.5%
<b>BBG Global Agg</b>	-2.6%	0.6%	-3.2%	2.1%	7.4%	-1.2%	6.8%	9.2%	-4.7%	-16.2%	4.2%	8.1%	5.7%
<b>BBG Long Treasuries</b>	-12.7%	25.1%	-1.2%	1.3%	8.5%	-1.8%	14.8%	17.7%	-4.6%	-29.3%	8.6%	12.7%	3.1%
<b>BBG US Long Credit</b>	-6.6%	16.4%	-4.6%	10.2%	12.2%	-6.8%	23.4%	13.3%	-1.2%	-25.3%	7.3%	13.7%	10.7%
<b>BBG US STRIPS 20+ Yr</b>	-21.0%	46.4%	-3.7%	1.4%	13.7%	-4.1%	20.9%	24.0%	-5.2%	-39.6%	12.9%	18.9%	1.1%
<b>JPM GBI-EM Global Div</b>	-9.0%	-5.7%	-14.9%	9.9%	15.2%	-6.2%	13.5%	2.7%	-8.7%	-11.7%	3.2%	8.1%	12.7%
<b>JPM EMBI Glob Div</b>	-5.3%	7.4%	1.2%	10.2%	10.3%	-4.3%	15.0%	5.3%	-1.8%	-17.8%	4.7%	9.2%	11.1%
<b>CS Hedge Fund</b>	9.7%	4.1%	-0.7%	1.2%	7.1%	-3.2%	9.3%	6.4%	8.2%	1.1%	-	1.3%	5.1%
<b>BBG Commodity</b>	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-11.2%	7.7%	-3.1%	27.1%	16.1%	-2.7%	-4.6%	-7.9%
<b>Alerian Midstream</b>	-	16.4%	-37.3%	33.8%	-2.4%	-13.3%	24.0%	-23.4%	38.4%	21.5%	-0.5%	6.4%	14.0%
<b>FTSE NAREIT Equity REITs</b>	2.5%	30.1%	3.2%	8.5%	5.2%	-4.6%	26.0%	-8.0%	43.2%	-24.4%	9.9%	16.2%	13.7%

\*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag  
Source: FactSet, Barclays, Thomson One



# TRAILING ANNUAL INDEX PERFORMANCE

Equity							
	Dec-23	QTD	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI	4.8%	11.0%	22.2%	22.2%	5.7%	11.7%	7.9%
S&P 500	4.5%	11.7%	26.3%	26.3%	10.0%	15.7%	12.0%
Russell 1000	4.9%	12.0%	26.5%	26.5%	9.0%	15.5%	11.8%
Russell 2000	12.2%	14.0%	16.9%	16.9%	2.2%	10.0%	7.2%
Russell 2500	10.7%	13.4%	17.4%	17.4%	4.2%	11.7%	8.4%
MSCI EAFE	5.3%	10.4%	18.2%	18.2%	4.0%	8.2%	4.3%
MSCI EM	3.9%	7.9%	9.8%	9.8%	-5.1%	3.7%	2.7%

Credit							
	Dec-23	QTD	YTD	1 YR	3 YR	5 YR	10 YR
BBG Global Agg	4.2%	8.1%	5.7%	5.7%	-5.5%	-0.3%	0.4%
BBG US Agg	3.8%	6.8%	5.5%	5.5%	-3.3%	1.1%	1.8%
BBG Credit	4.2%	8.2%	8.2%	8.2%	-3.2%	2.4%	2.8%
BBG US HY	3.7%	7.2%	13.4%	13.4%	2.0%	5.4%	4.6%
BBG Muni	2.3%	7.9%	6.4%	6.4%	-0.4%	2.3%	3.0%
BBG Muni HY	3.0%	9.2%	9.2%	9.2%	0.8%	3.5%	5.0%
BBG TIPS	2.7%	4.7%	3.9%	3.9%	-1.0%	3.2%	2.4%
BBG 20+ STRIPS	12.9%	18.9%	1.1%	1.1%	-16.6%	-2.8%	3.1%
BBG Long Treasuries	8.6%	12.7%	3.1%	3.1%	-11.4%	-1.2%	2.3%
BBG Long Credit	7.3%	13.7%	10.7%	10.7%	-6.5%	2.7%	3.9%
BBG Govt/Credit 1-3 Yr	1.2%	2.7%	4.6%	4.6%	0.1%	1.5%	1.3%
JPM EMBI Glob Div	4.7%	9.2%	11.1%	11.1%	-3.6%	1.7%	3.2%
JPM GBI-EM Glob Div	3.2%	8.1%	12.7%	12.7%	-3.2%	1.1%	0.1%

Real Assets							
	Dec-23	QTD	YTD	1 YR	3 YR	5 YR	10 YR
BBG Commodity	-2.7%	-4.6%	-7.9%	-7.9%	10.8%	7.2%	-1.1%
Alerian Midstream Index	-0.5%	6.4%	14.0%	14.0%	24.2%	12.8%	4.2%
NAREIT Composite Index	8.8%	17.6%	11.5%	11.5%	5.4%	7.1%	7.7%



Source: S&P, MSCI, Russell, Bloomberg, JPM, Alerian, FTSE, FactSet

# GLOSSARY OF INVESTMENT TERMINOLOGY— RISK STATISTICS

- **Alpha**
  - Measures the relationship between the fund performance and the performance of another fund or benchmark index and equals the excess return while the other fund or benchmark index is zero.
- **Alpha Jensen**
  - The average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. Also known as the abnormal return or the risk adjusted excess return.
- **Annualized Excess Return over Benchmark**
  - Annualized fund return minus the annualized benchmark return for the calculated return.
- **Annualized Return**
  - A statistical technique whereby returns covering periods greater than one year are converted to cover a 12 month time span.
- **Beta**
  - Measures the volatility or systematic risk and is equal to the change in the fund's performance in relation to the change in the assigned index's performance.
- **Information Ratio**
  - A measure of the risk adjusted return of a financial security, asset, or portfolio.  
**Formula:**  
*(Annualized Return of Portfolio - Annualized Return of Benchmark) / Annualized Standard Deviation (Period Portfolio Return - Period Benchmark Return). To annualize standard deviation, multiply the deviation by the square root of the number of periods per year where monthly returns per year equals 12 and quarterly returns is four periods per year.*
- **R-Squared**
  - Represents the percentage of a fund's movements that can be explained by movements in an index. R-Squared values range from 0 to 100. An R-Squared of 100 denotes that all movements of a fund are completely explained by movements in the index.
- **Sharpe Ratio**
  - A measure of the excess return or risk premium per unit of risk in an investment asset or trading strategy.  
**Formula:**  
*(Annualized Return of Portfolio - Annualized Return of Risk Free) / Annualized Standard Deviation (Portfolio Returns)*
- **Sortino Ratio**
  - A method to differentiate between good and bad volatility in the Sharpe Ratio. The differentiation of up and down volatility allows the calculation to provide a risk adjusted measure of a security or fund's performance without upward price change penalties.  
**Formula:**  
*Calculation Average (X-Y) / Downside Deviation (X-Y) \* 2*  
*Where X = Return Series X Y = Return Series Y which is the risk free return (91 day T-bills)*
- **Standard Deviation**
  - The standard deviation is a statistical term that describes the distribution of results. It is a commonly used measure of volatility of returns of a portfolio, asset class, or security. The higher the standard deviation the more volatile the returns are.  
**Formula:**  
*(Annualized Return of Portfolio - Annualized Arithmetic Average of the Portfolio Returns) Squared / The number of periods - 1*

# GLOSSARY OF INVESTMENT TERMINOLOGY— RISK STATISTICS

## ▪ Tracking Error

- Tracking error, also known as residual risk, is a measure of the degree to which a portfolio tracks its benchmark. It is also a measure of consistency of excess returns. Tracking error is computed as the annualized standard deviation of the difference between a portfolio's return and that of its benchmark.

### **Formula:**

*Tracking Error = Standard Deviation (X-Y) \*  $\sqrt{\text{# of periods per year}}$*   
*Where X = periods portfolio return and Y = the period's BM return*  
*For monthly returns, the periods per year = 12*  
*For quarterly returns, the periods per year = 4*

## ▪ Treynor Ratio

- A risk-adjusted measure of return based on systematic risk. Similar to the Sharpe ratio with the difference being the Treynor ratio uses beta as the measurement of volatility.

### **Formula:**

*(Portfolio Average Return - Average Return of Risk-Free Rate)/Portfolio Beta*

## ▪ Up/Down Capture Ratio

- A measure of what percentage of a market's returns is "captured" by a portfolio. For example, if the market declines 10% over some period, and the manager declines only 9%, then his or her capture ratio is 90%. In down markets, it is advantageous for a manager to have as low a capture ratio as possible. For up markets, the higher the capture ratio the better. Looking at capture ratios can provide insight into how a manager achieves excess returns. A value manager might typically have a lower capture ratio in both up and down markets, achieving excess returns by protecting on the downside, whereas a growth manager might fall more than the overall market in down markets, but achieve above-market returns in a rising market.

### **Upside Capture:**

*Total Return (Fund Returns) / Total Returns (BM Return) when Period Benchmark Return is  $> = 0$*

### **Downside Capture:**

*Total Return (Fund Returns) / Total Returns (BM Return) when Benchmark Return  $< 0$*

Source: InvestorForce



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