

Wilshire



Wilshire Advisors

Executive Summary of Investment Performance

As of December 31, 2023

IMRF Performance Summary

- IMRF market value as of December 2023: \$52.2 billion
- IMRF total fund return for 4Q 2023: 7.67% vs the Total Fund Benchmark return of 6.91%
- U.S. equity markets posted positive returns for the quarter, ending the year on a strong note
- IMRF U.S. Equity Portfolio outperformed the benchmark during the quarter, returning 12.66% versus 11.99%
- International equity markets were also up for the quarter, despite a mild recession in the Eurozone and an increasingly negative outlook in China
- IMRF International Equity Portfolio outperformed the benchmark during the quarter, returning 10.25% versus 9.75%
- Fixed income markets were positive as yields fell and credit spreads tightened
- IMRF Fixed Income Portfolio outperformed the benchmark during the quarter, returning 6.41% versus 6.27%
- All asset class allocations remain within the rebalancing range in the Investment Policy

Performance referenced above is Net of Fees.

Market Commentary

U.S. Equity

The U.S. stock market was up 12.1% for the fourth quarter and is up 26.1% for the past 12 months. The best performing sectors were real estate (+18.0%) and information technology (+17.0%). The worst performing – and only negative – sector was energy (-6.8%). From a size perspective, small-cap outperformed large-cap by 160 basis points. Large growth stocks outperformed large value during the third quarter and led by 35% for all of 2023.

One possible recession metric that is widely considered in the investing arena is the spread between long- and short-term Treasury bond yields. When this spread turns negative – known as an inverted yield curve – a recession typically follows. During the past 60+ years, there is really only one instance (in 1966) that such conditions did not precede a recession. Currently, the curve is inverted to a degree not seen since the early 1980's recession that was driven by high inflation and high unemployment. The Federal Reserve Bank of New York has a model that converts the term spread to a probability of recession during the next twelve months, which stands at 68%.

Non-U.S. Equity

The eurozone likely fell into a mild recession in 2023 and recent data suggests that conditions are not improving. Business activity declined in December as new orders fell and job cuts were reported. Germany, the eurozone's largest economy, continues to suffer due to high energy prices and interest rate hikes. The outlook in China is complicated with recent data showing contraction in the factory and services sectors.

Fixed Income

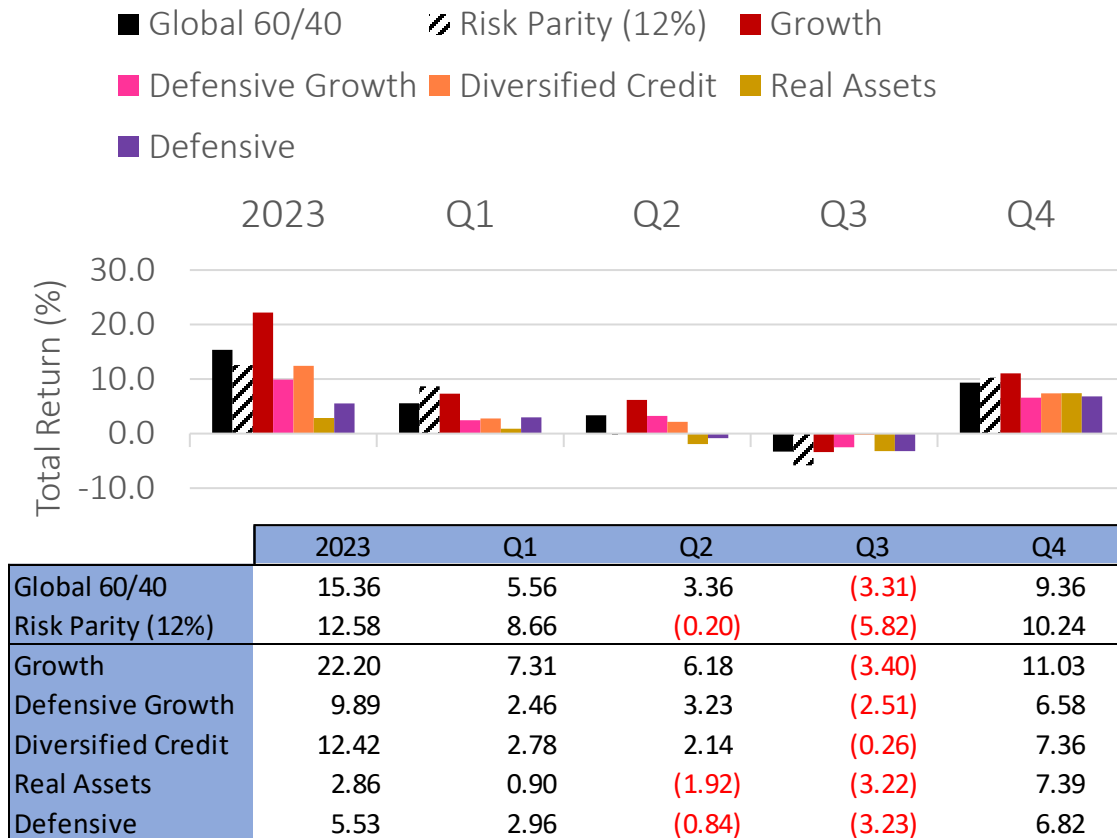
The U.S. Treasury yield curve was down across the maturity spectrum during the quarter, and to a greater degree in the long end of the curve. Credit spreads were down, as well, during the quarter. The FOMC left the overnight rate unchanged, targeting a range of 5.25% to 5.50%. During a recent speech, Fed Chair Jerome Powell reiterated the central bank's intent to be cautious, "Having come so far and so quickly, the FOMC is moving carefully forward, as the risks of under- and over-tightening are becoming more balanced.

December 2023 Asset Class Assumptions

	EQUITY						FIXED INCOME / CREDIT						REAL ASSETS						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit	Dev ex-US Bond (Hdg)	Real Estate US RES	Global RES	Private RE	Comdty	Real Assets	US CPI
Compound Return (%)	5.00	6.00	6.25	6.35	5.60	8.65	3.80	4.75	4.70	4.15	5.90	8.40	2.85	5.60	5.75	6.30	6.05	6.90	2.25
Arithmetic Return (%)	6.35	7.50	9.20	8.00	6.95	12.35	3.80	4.85	5.15	4.30	6.35	9.15	2.95	7.00	7.00	7.20	7.20	7.65	2.25
Risk (%)	17.00	18.00	26.00	19.00	17.05	29.65	0.75	4.70	9.85	6.00	10.00	12.75	4.00	17.50	16.45	13.90	16.00	12.60	1.75
Cash Yield (%)	1.45	3.10	2.50	2.95	2.00	0.00	3.80	5.10	5.25	4.35	9.20	4.95	3.65	3.90	3.90	2.50	3.80	3.40	0.00
Growth Factor Exposure	8.00	8.00	8.00	8.00	8.00	14.00	0.00	-0.90	-2.40	-3.00	4.00	5.10	-1.00	6.00	6.00	3.50	0.00	2.70	0.00
Inflation Factor Exposure	-3.00	0.00	5.00	1.40	-1.35	-3.75	0.00	-2.55	-6.85	2.50	-1.00	-1.50	-3.00	1.00	1.80	1.00	12.00	5.25	1.00
CORRELATIONS																			
US Stock	1.00																		
Dev ex-US Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-US Stock	0.84	0.95	0.89	1.00															
Global Stock	0.95	0.91	0.84	0.94	1.00														
Private Equity	0.72	0.63	0.61	0.67	0.73	1.00													
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.06	0.00	1.00												
Core Bond	0.28	0.13	0.00	0.08	0.20	0.30	0.18	1.00											
LT Core Bond	0.31	0.15	0.01	0.11	0.24	0.31	0.11	0.94	1.00										
TIPS	-0.05	0.00	0.15	0.06	-0.01	-0.03	0.20	0.60	0.48	1.00									
High Yield Bond	0.54	0.39	0.49	0.46	0.53	0.31	-0.10	0.24	0.32	0.05	1.00								
Private Credit	0.67	0.55	0.57	0.59	0.67	0.44	0.00	0.24	0.30	0.00	0.75	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.16	0.17	0.26	0.10	0.67	0.65	0.39	0.26	0.22	1.00						
US RE Securities	0.57	0.47	0.44	0.49	0.56	0.49	-0.05	0.17	0.22	0.10	0.56	0.61	0.05	1.00					
Global RE Securities	0.63	0.56	0.54	0.59	0.64	0.55	-0.05	0.17	0.21	0.11	0.60	0.67	0.04	0.97	1.00				
Private Real Estate	0.55	0.45	0.45	0.49	0.54	0.50	-0.05	0.19	0.25	0.09	0.57	0.62	0.05	0.78	0.77	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.28	0.00	-0.03	-0.03	0.25	0.29	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.61	0.62	0.66	0.68	0.66	0.56	-0.03	0.24	0.26	0.32	0.64	0.69	0.05	0.78	0.83	0.76	0.62	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	0.00	-0.08	0.05	0.04	0.05	0.44	0.21	1.00

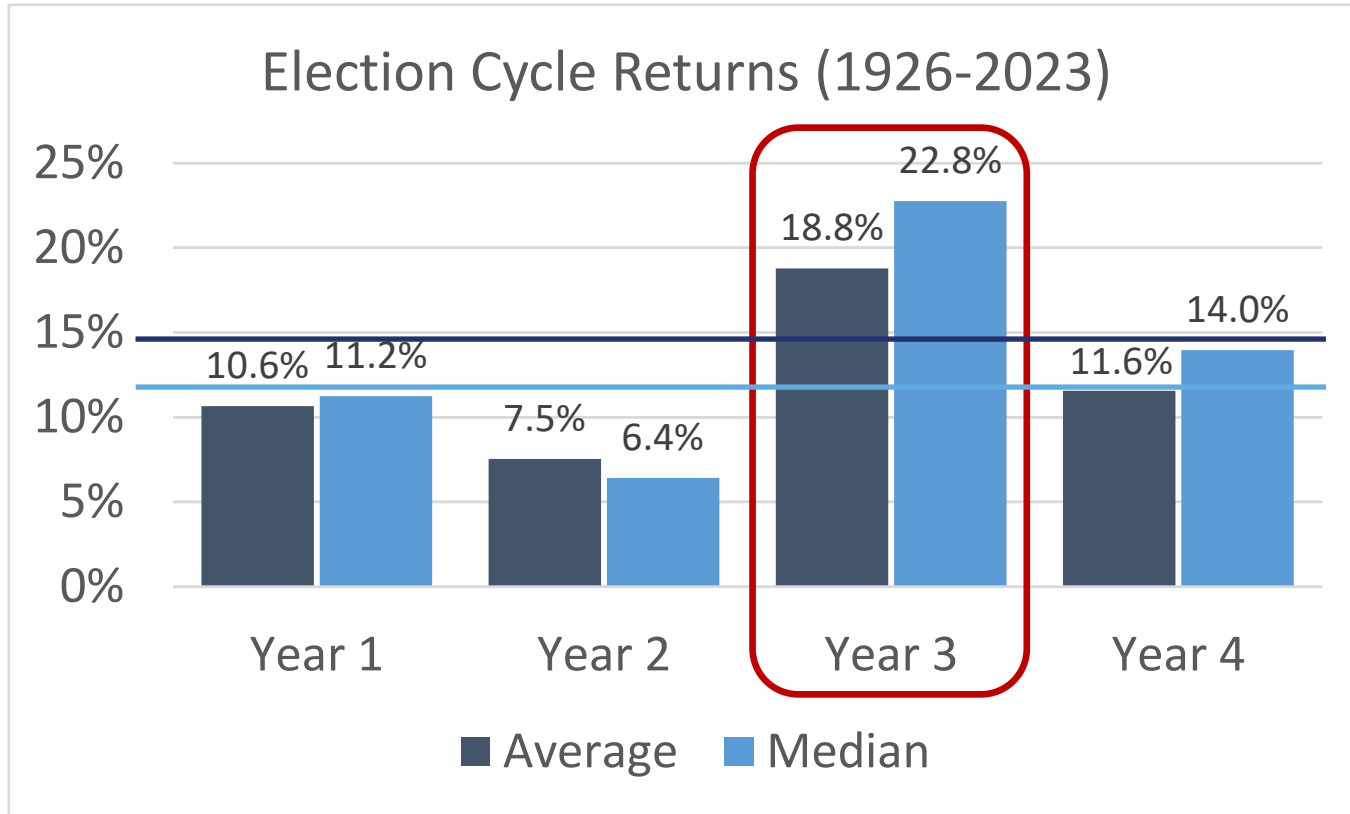
Thematic Return Stacks

Asset Allocation & Thematic Returns



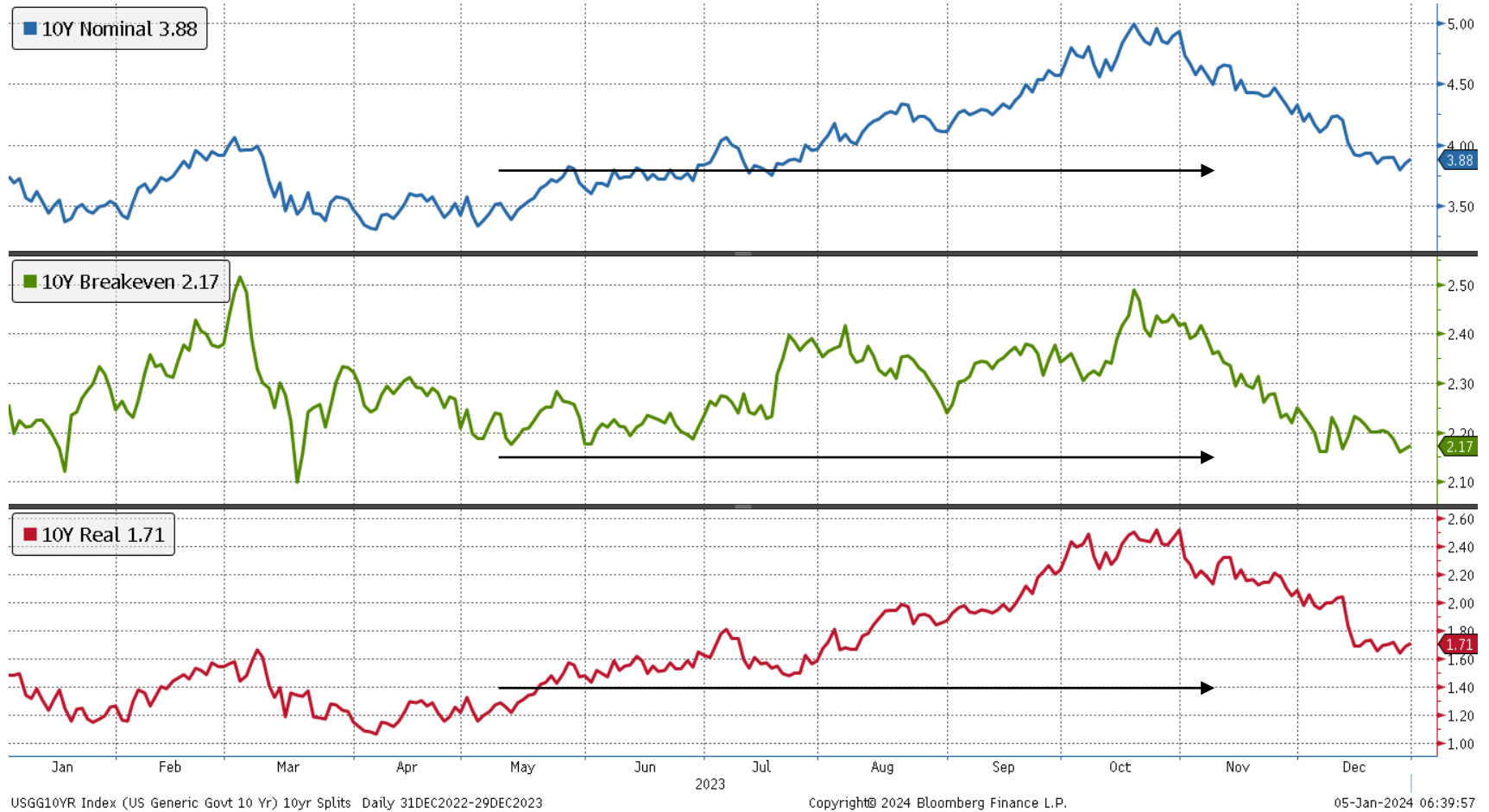
Data Source: Wilshire, Bloomberg

Election Cycles



Data Source: Wilshire Compass

Yield Whiplash



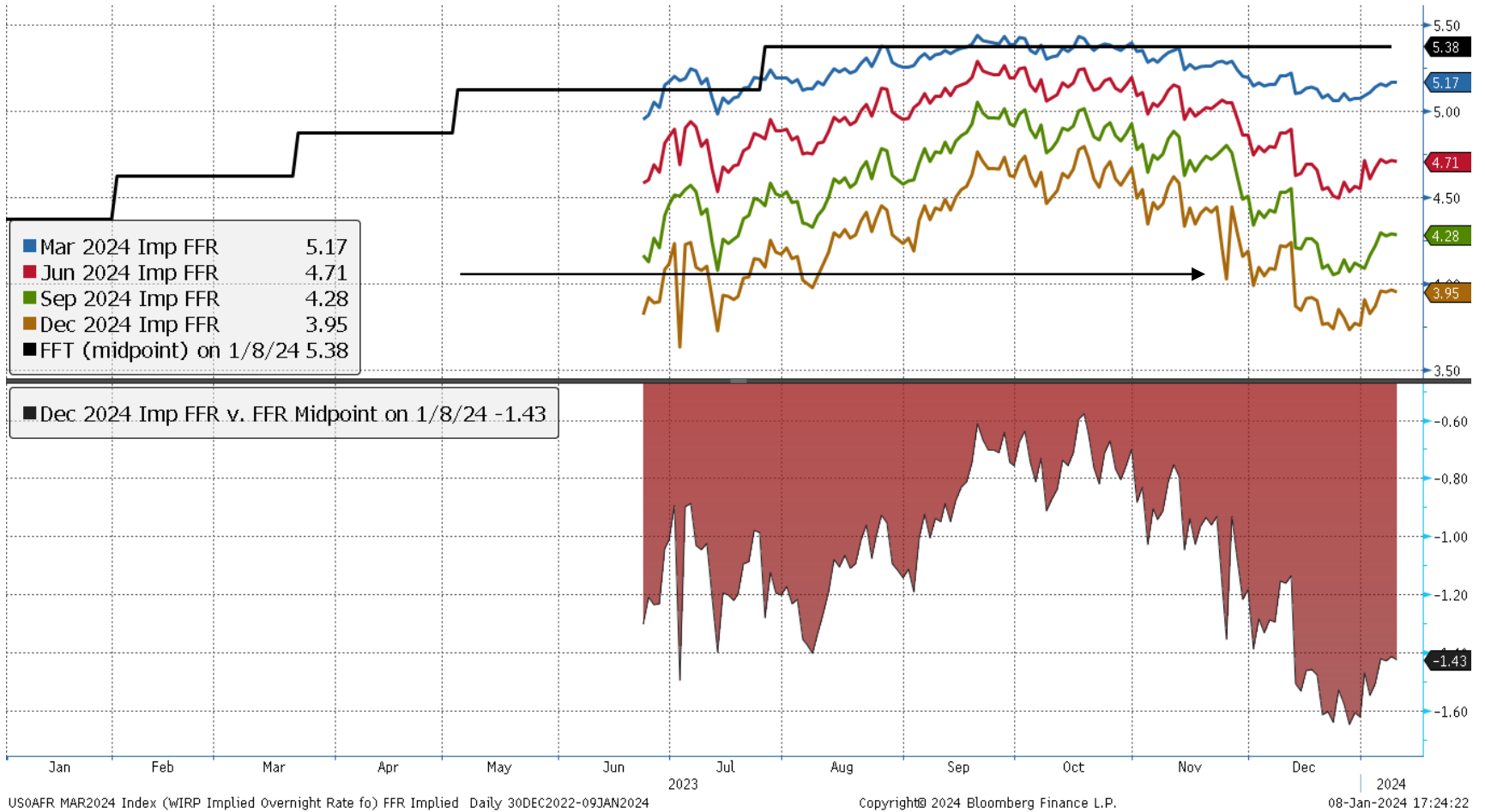
Data Source: Bloomberg

Fed Pivot: Hinting at “Mission Accomplished”



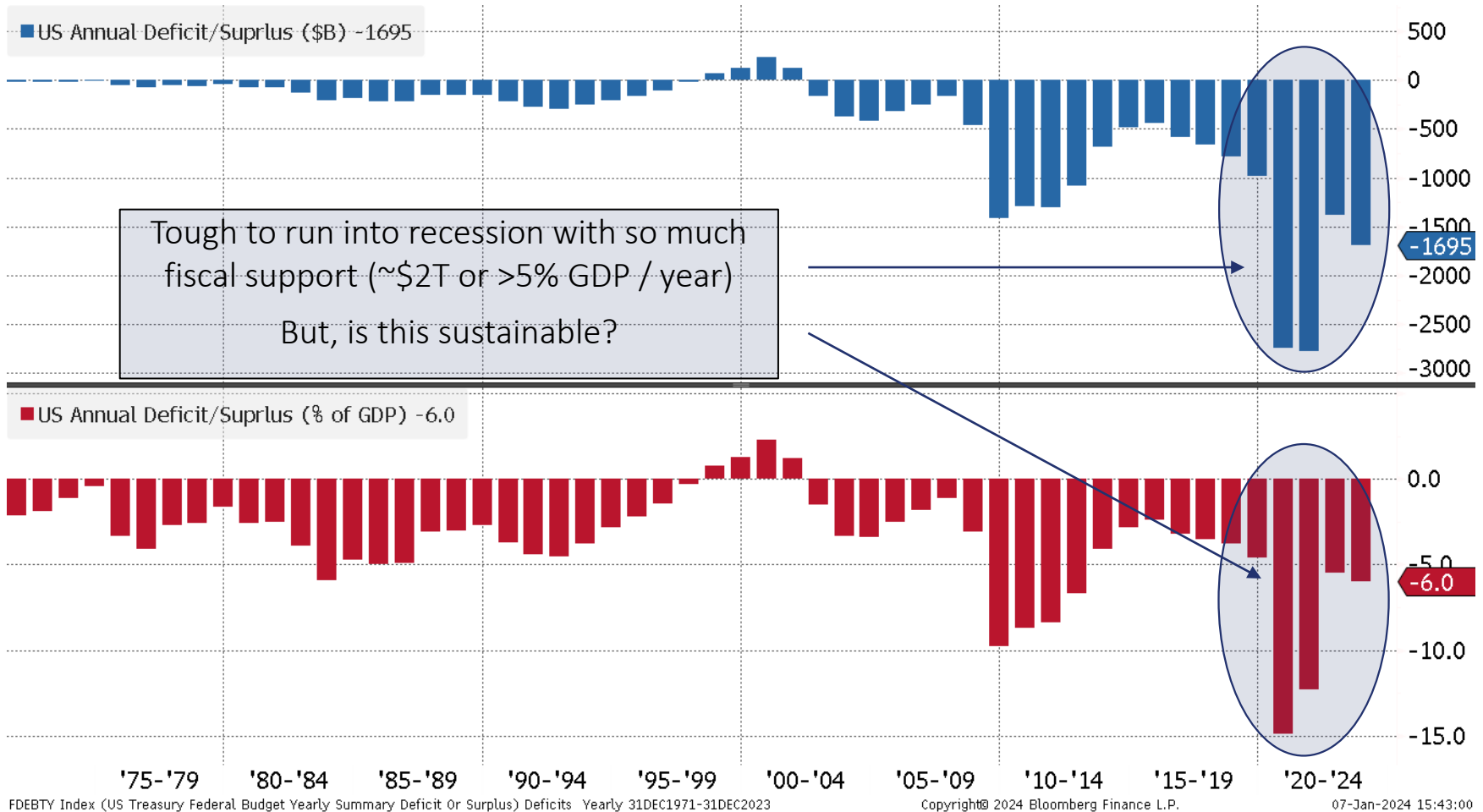
Data Source: Bloomberg

Markets Expect More in Rate Cuts



Data Source: Bloomberg

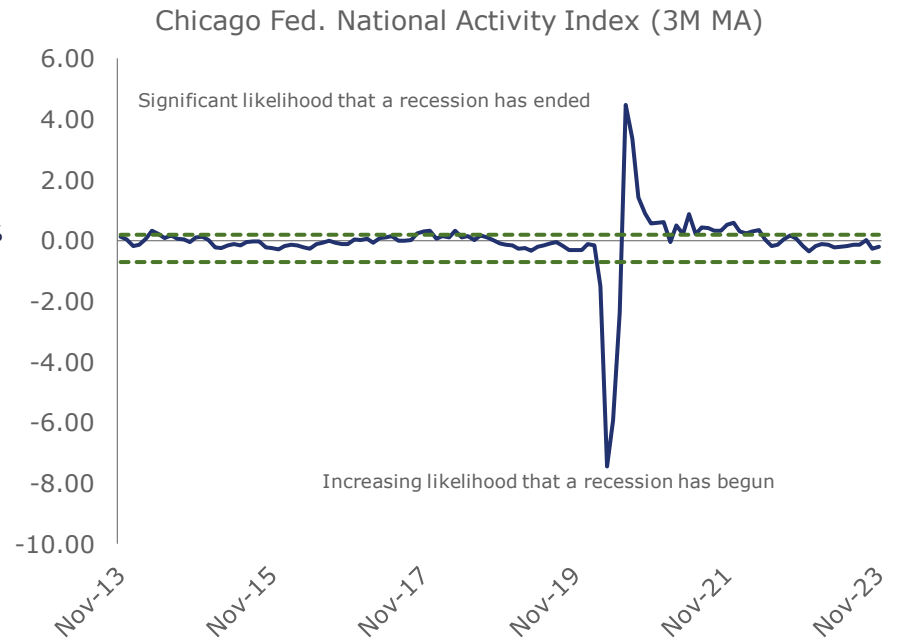
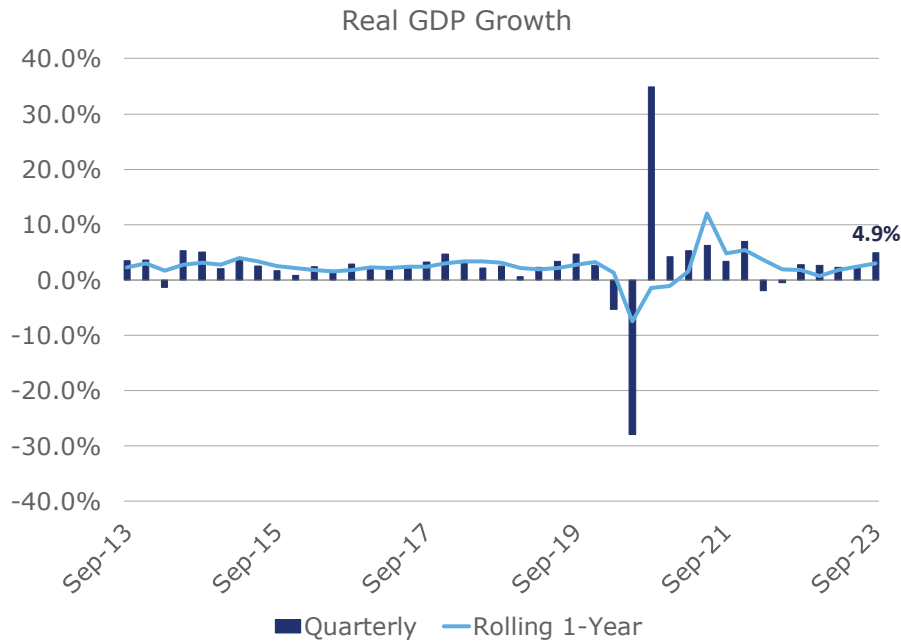
Recession Risks: How Did We All Get It So Wrong?



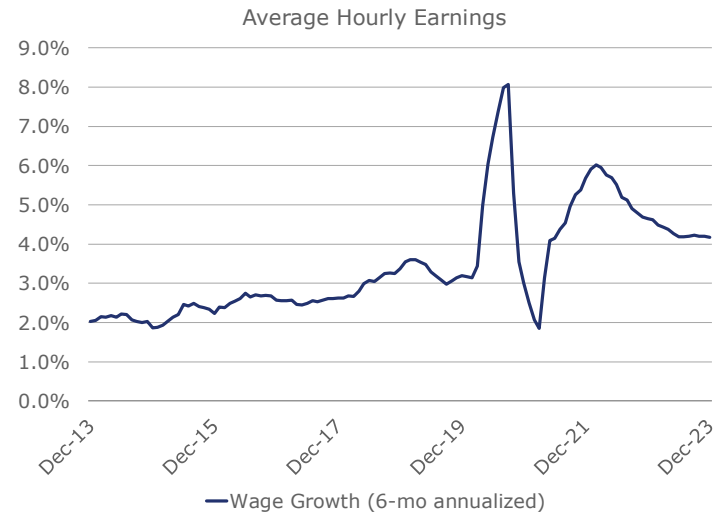
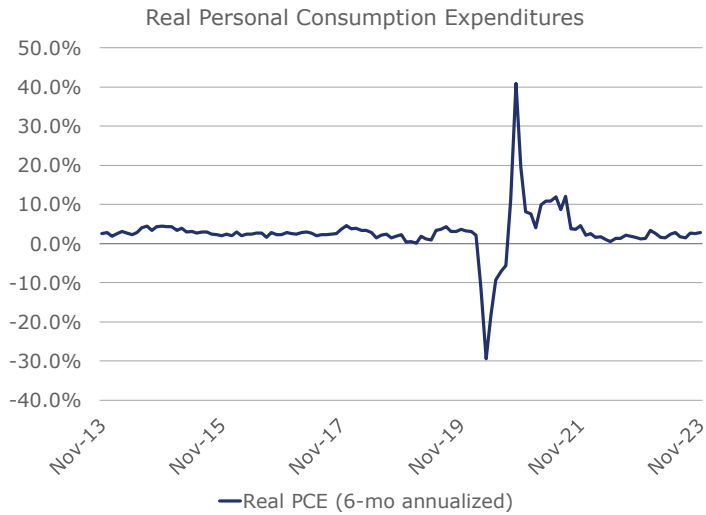
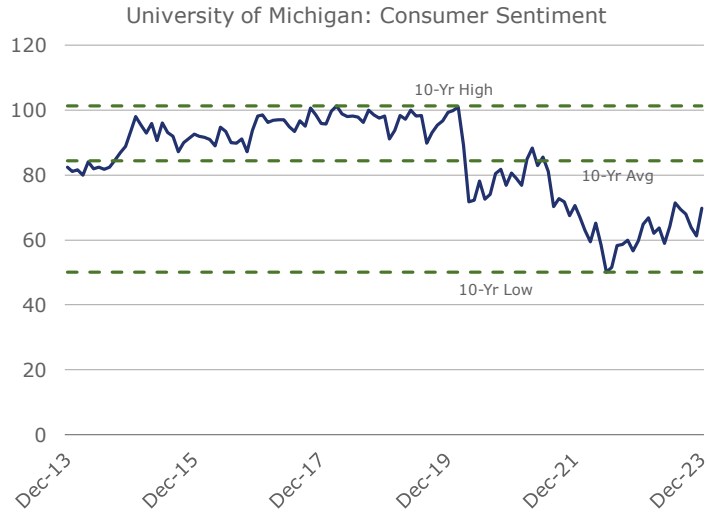
Data Source: Bloomberg

Economic/Market Activity

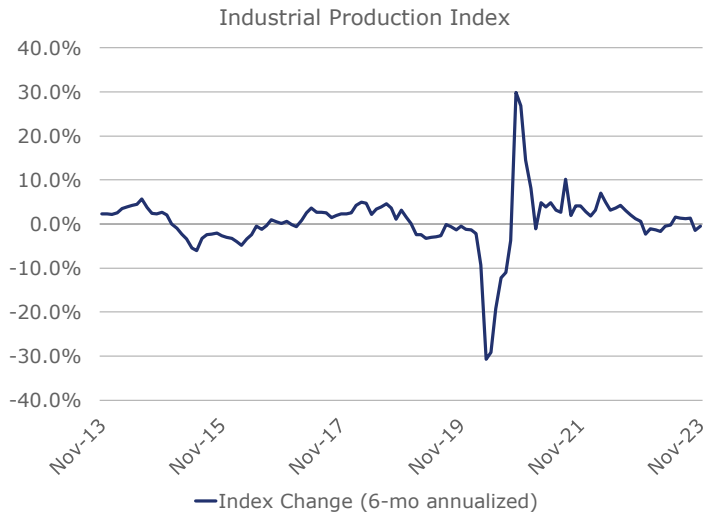
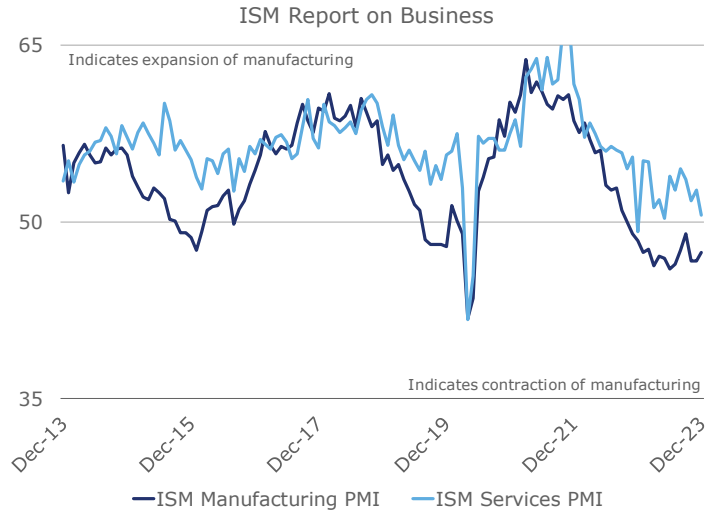
Economic Growth



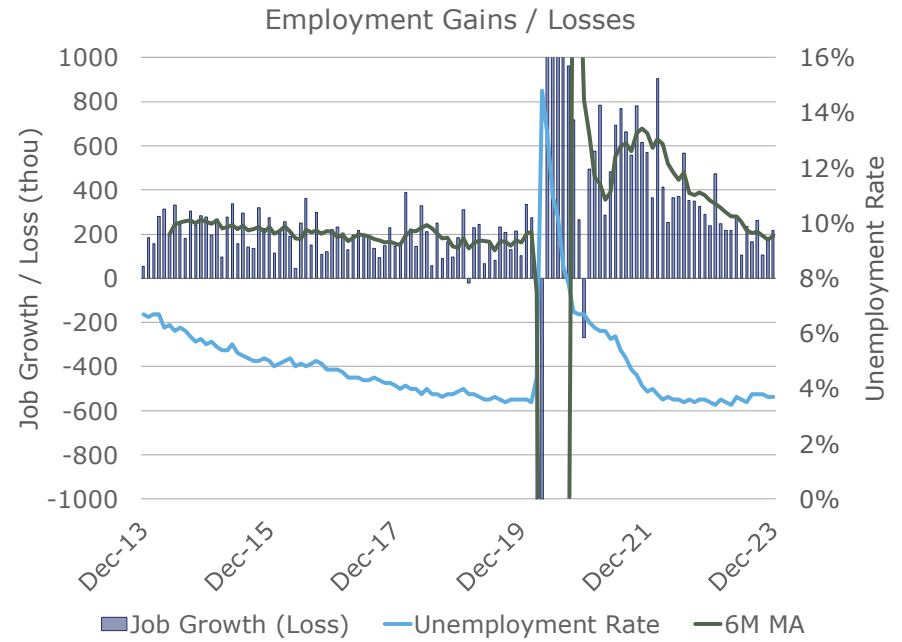
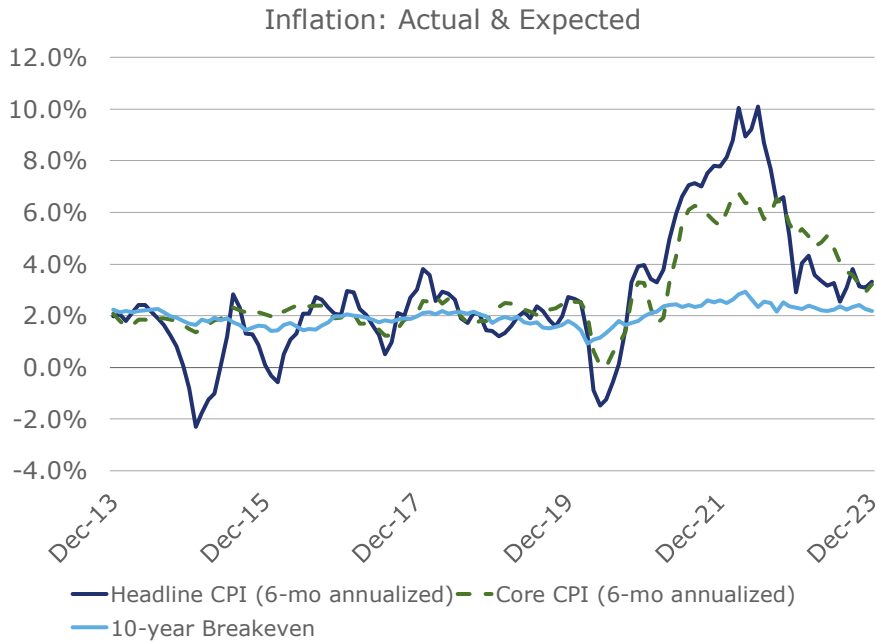
Consumer Activity



Business Activity



Inflation and Employment

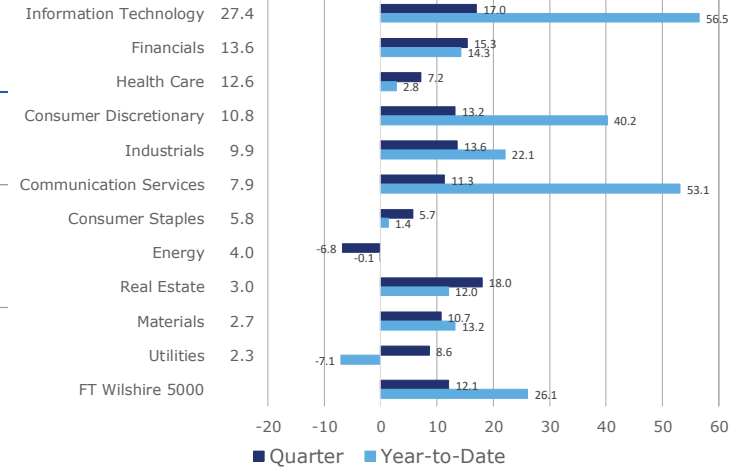


Data Sources: Bloomberg

U.S. Equity Market

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	12.1	26.1	26.1	9.0	15.4	11.7
Wilshire U.S. Large Cap	11.9	27.3	27.3	9.5	15.9	12.2
Wilshire U.S. Small Cap	13.5	19.5	19.5	5.5	12.0	8.7
Wilshire U.S. Large Growth	14.7	46.1	46.1	8.7	19.2	n/a
Wilshire U.S. Large Value	9.1	11.1	11.1	10.0	12.2	n/a
Wilshire U.S. Small Growth	12.9	21.8	21.8	0.6	11.6	n/a
Wilshire U.S. Small Value	14.2	17.2	17.2	10.3	12.1	n/a
Wilshire REIT Index	16.3	16.1	16.1	7.5	7.6	7.7
MSCI USA Min. Vol. Index	7.8	9.8	9.8	6.5	10.3	10.4
FTSE RAFI U.S. 1000 Index	11.2	16.1	16.1	12.3	14.3	10.4

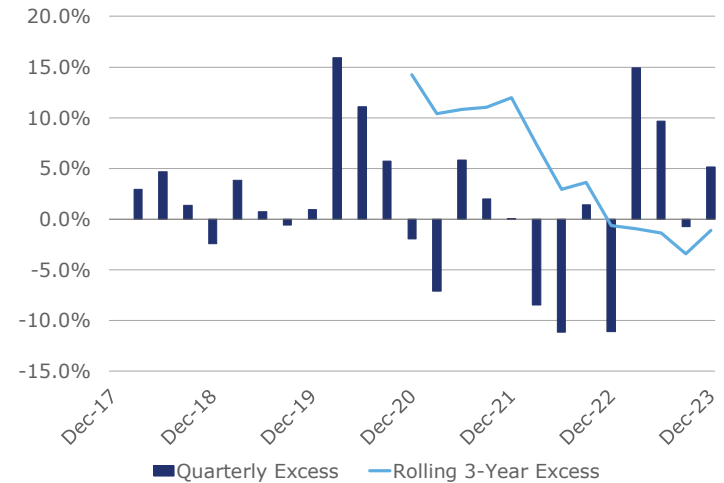
U.S. Sector Weight and Return (%)



Large Cap vs Small Cap



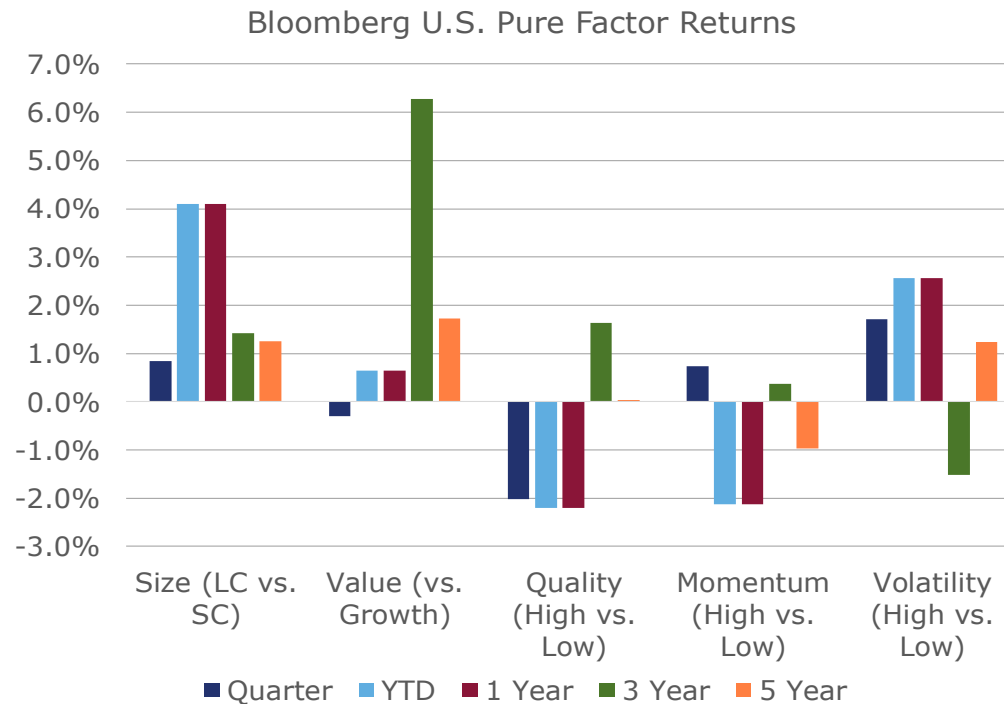
Large Growth vs Large Value



Data Sources: Bloomberg, Wilshire Atlas

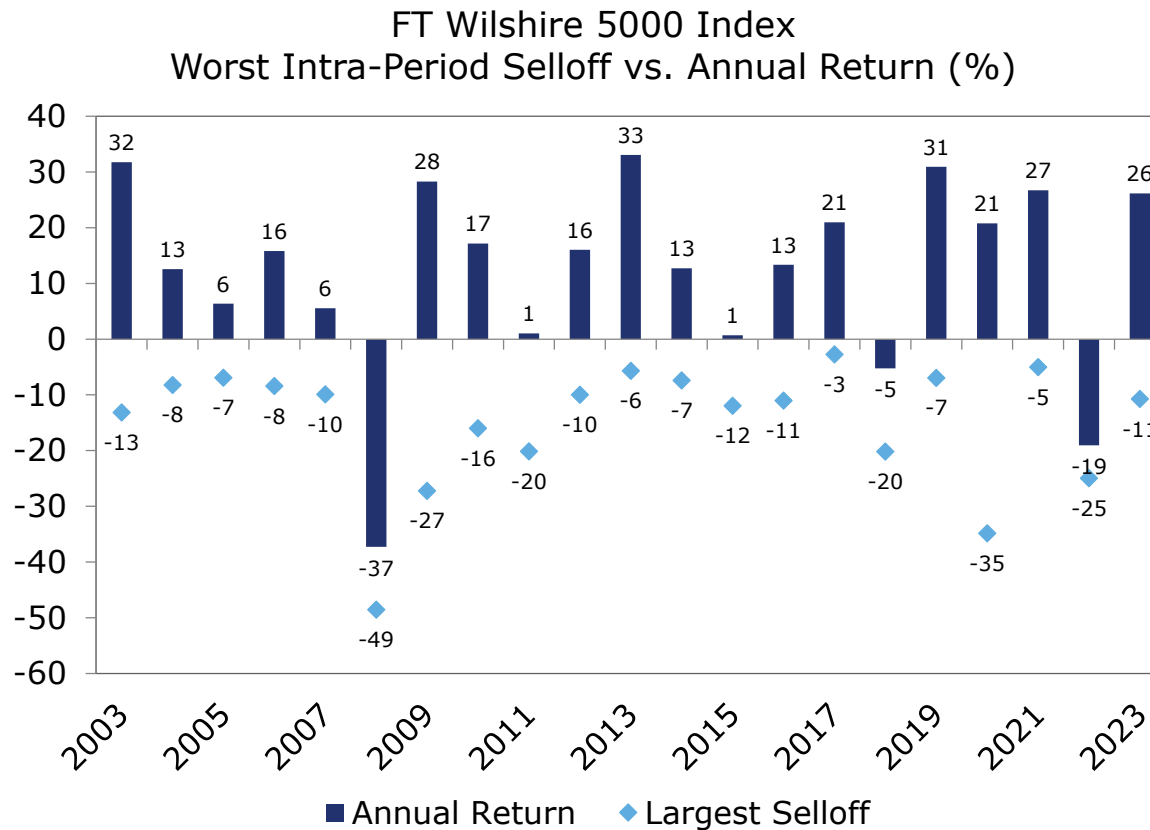
U.S. Factor Returns

- Factor returns represent the contribution from large cap, value, etc. stocks within Bloomberg's Portfolio & Risk Analytics module
- Large cap and high volatility have mostly outperformed this year



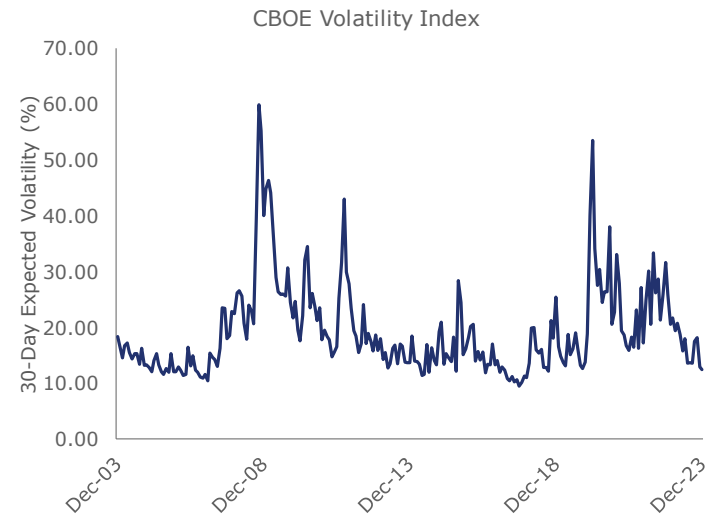
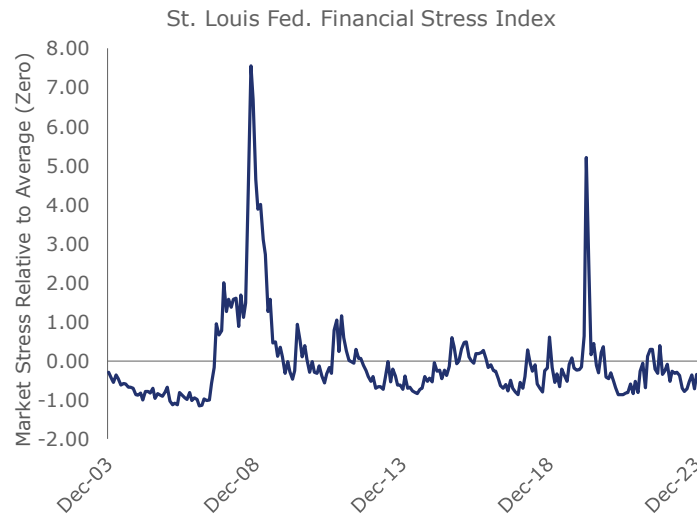
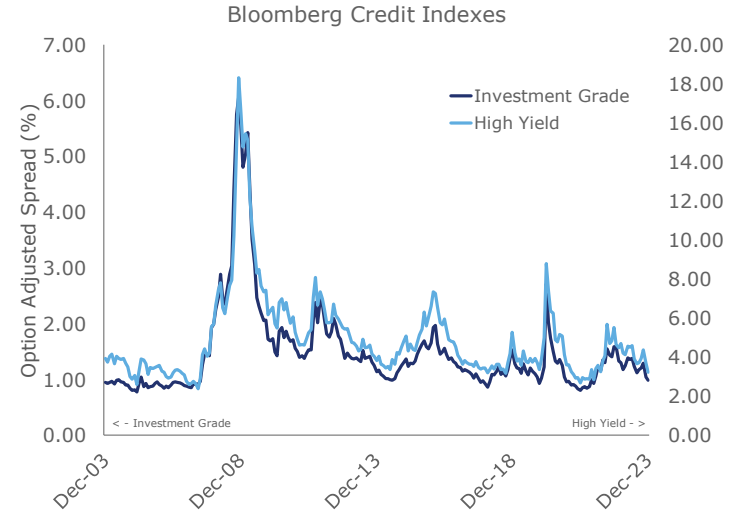
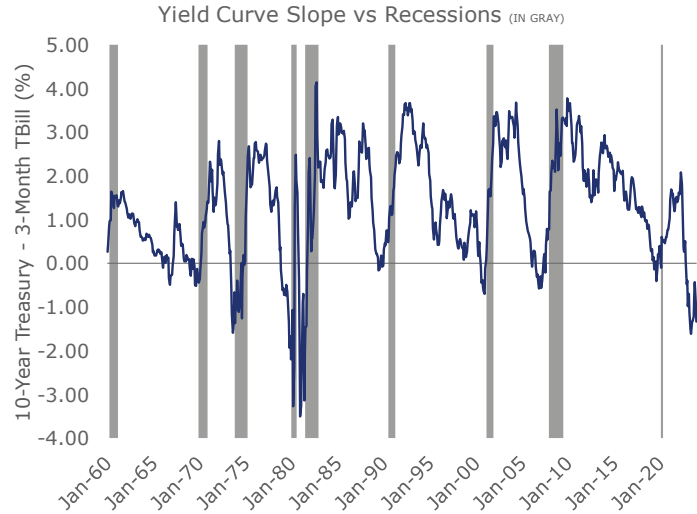
Annual Equity Market Selloffs

U.S. equity suffered a meaningful selloff in Feb.-Mar. but generally rebounded strongly from 2022



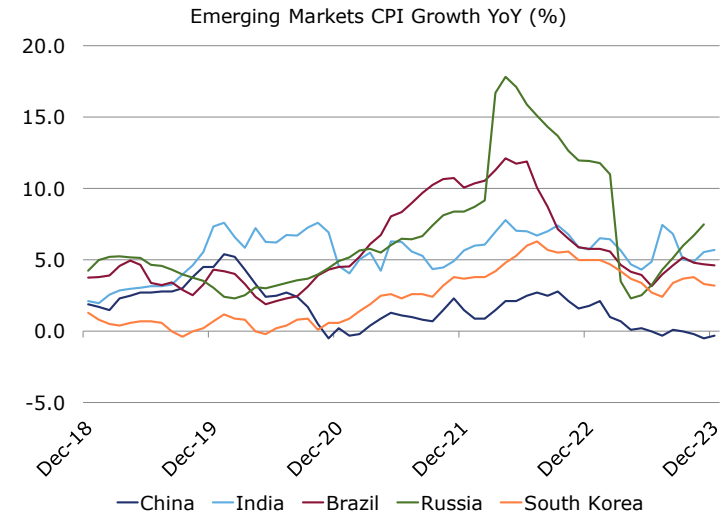
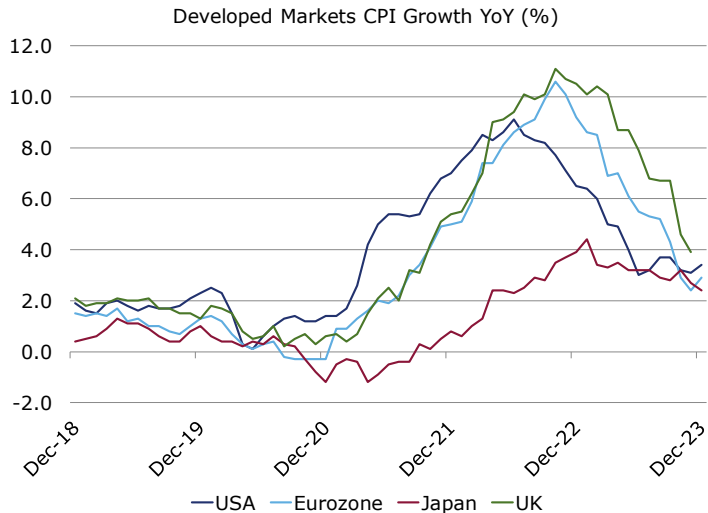
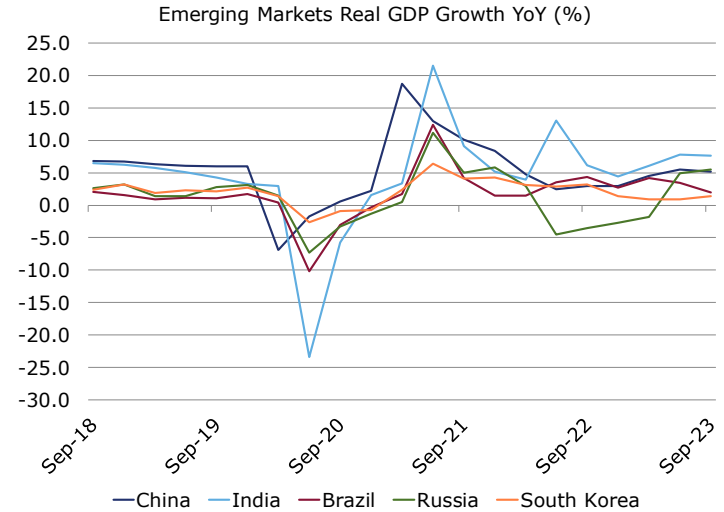
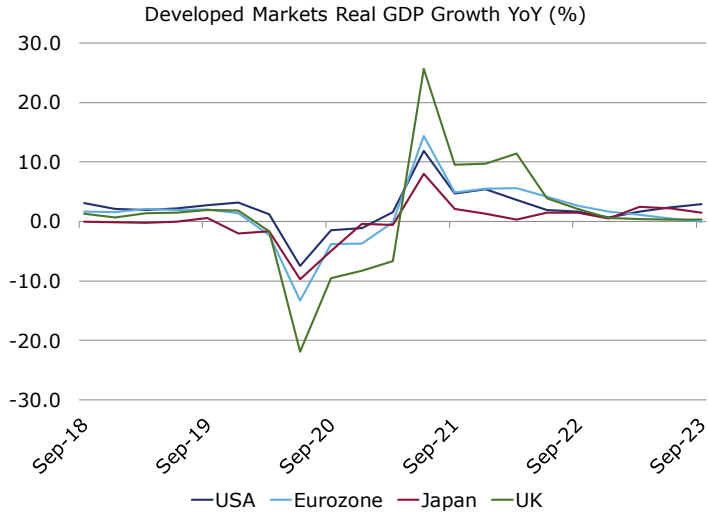
Data Sources: Wilshire Web, Bloomberg

Risk Monitor



Data Sources: Bloomberg

Non-U.S. Growth and Inflation

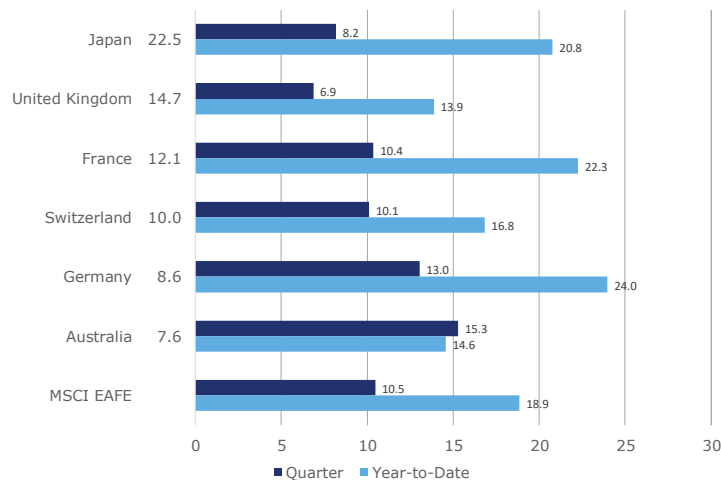


Data Sources: Bloomberg

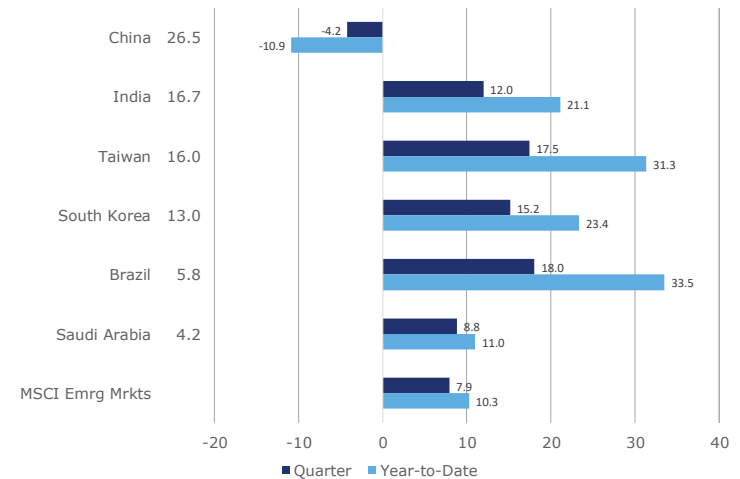
Non-U.S. Equity Market

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	9.8	16.2	16.2	2.0	7.6	4.3
MSCI EAFE (\$G)	10.5	18.9	18.9	4.5	8.7	4.8
MSCI Emerging Markets (\$G)	7.9	10.3	10.3	-4.7	4.1	3.0
MSCI Frontier Markets (\$G)	7.6	12.5	12.5	-1.1	1.6	0.9
MSCI ACWI ex-US Growth (\$G)	11.2	14.4	14.4	-2.4	7.8	4.9
MSCI ACWI ex-US Value (\$G)	8.7	18.1	18.1	6.4	7.2	3.8
MSCI ACWI ex-US Small (\$G)	10.2	16.2	16.2	2.0	8.4	5.3
MSCI ACWI Minimum Volatility	6.6	8.4	8.4	3.8	7.1	7.5
MSCI EAFE Minimum Volatility	7.3	12.4	12.4	1.1	4.1	4.7
FTSE RAFI Developed ex-US	9.5	19.0	19.0	7.7	8.8	4.5
MSCI EAFE LC (G)	5.0	16.8	16.8	9.2	10.0	7.1
MSCI Emerging Markets LC (G)	5.6	10.3	10.3	-2.1	5.8	5.6

Developed Markets Weight and Return (%)



Emerging Markets Weight and Return (%)

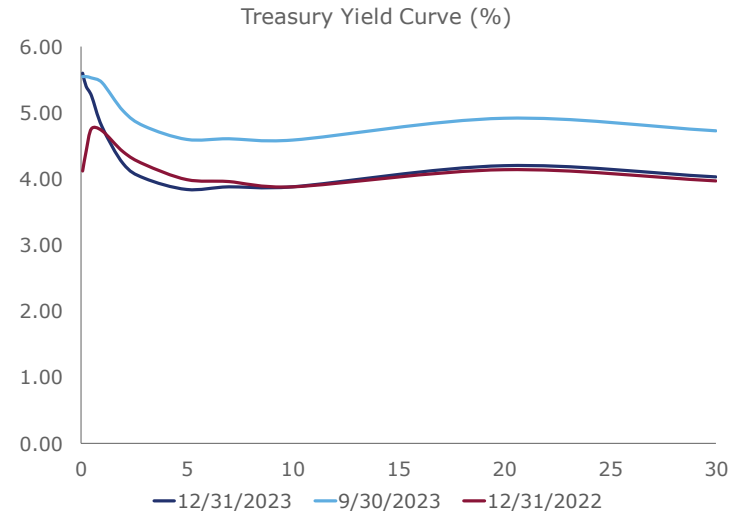
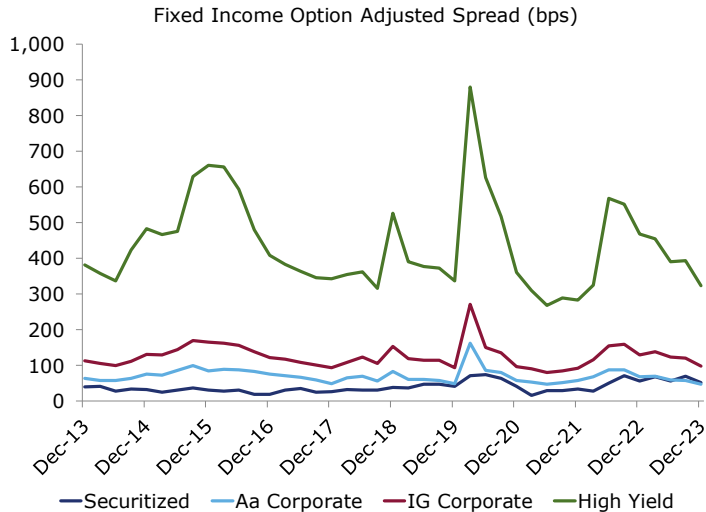


Data Sources: Bloomberg

U.S. Fixed Income

As of 12/31/2023	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	4.5	6.2	6.8	5.5	5.5	-3.3	1.1	1.8
Bloomberg Treasury	4.1	6.2	5.7	4.1	4.1	-3.8	0.5	1.3
Bloomberg Gov't-Rel.	4.6	5.3	5.5	5.8	5.8	-2.4	1.4	2.0
Bloomberg Securitized	4.7	5.8	7.3	5.1	5.1	-2.8	0.4	1.4
Bloomberg Corporate	5.1	7.1	8.5	8.5	8.5	-3.3	2.6	3.0
Bloomberg LT Gov't/Credit	4.7	14.3	13.2	7.1	7.1	-8.7	1.1	3.2
Bloomberg LT Treasury	4.1	15.7	12.7	3.1	3.1	-11.4	-1.2	2.3
Bloomberg LT Gov't-Rel.	5.2	11.8	11.2	8.9	8.9	-6.1	1.5	3.5
Bloomberg LT Corporate	5.2	13.1	14.0	10.9	10.9	-6.6	2.9	3.9
Bloomberg U.S. TIPS *	3.9	7.3	4.7	3.9	3.9	-1.0	3.2	2.4
Bloomberg High Yield	7.6	3.2	7.2	13.4	13.4	2.0	5.4	4.6
S&P/LSTA Leveraged Loan	9.4	0.3	2.9	13.3	13.3	5.8	5.8	4.4
Treasury Bills	5.2	0.3	1.4	5.1	5.1	2.1	1.9	1.3

* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

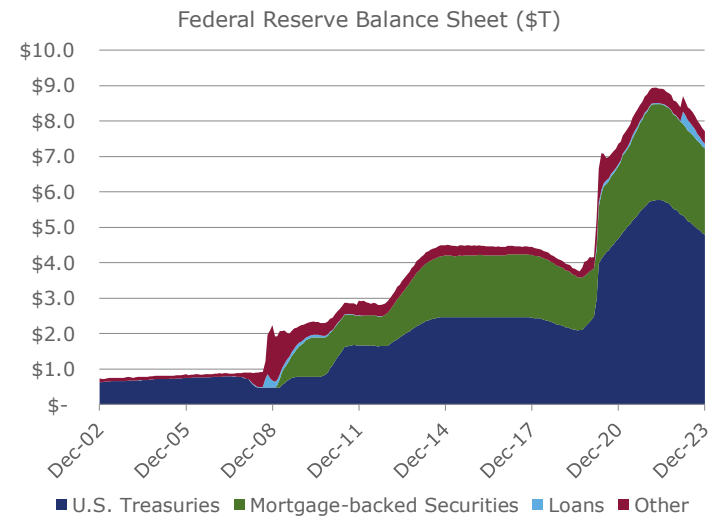
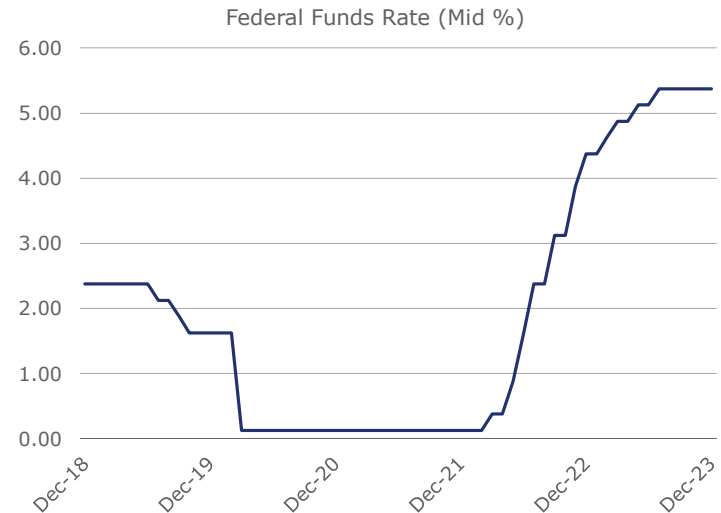


Data Sources: Bloomberg

Federal Reserve

- The Federal Open Market Committee has left their overnight rate unchanged since July of 2023
- QE4 was larger than the 3 phases of quantitative easing – combined – following the global financial crisis
- The Fed’s balance sheet has begun to shrink again during the past nine months

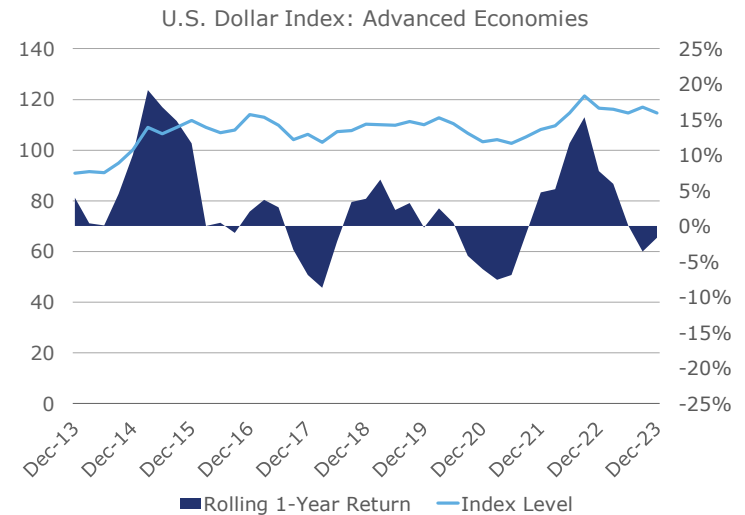
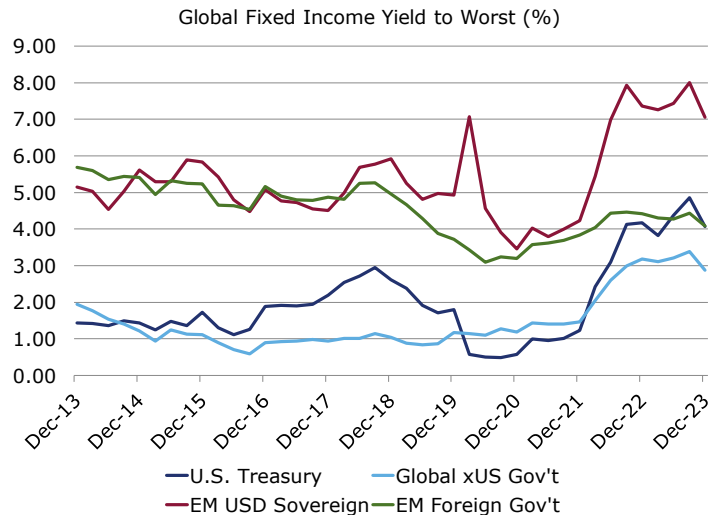
	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020	3/15/2022	\$4,779



Non-U.S. Fixed Income

As of 12/31/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Developed Markets						
Bloomberg Global Aggregate xUS	9.2	5.7	5.7	-7.2	-1.6	-0.8
Bloomberg Global Aggregate xUS *	5.4	8.3	8.3	-1.2	1.5	2.8
Bloomberg Global Inflation Linked xUS	11.9	7.4	7.4	-8.7	-1.4	-0.2
Bloomberg Global Inflation Linked xUS *	7.6	5.3	5.3	-4.5	0.4	3.3
Emerging Markets (Hard Currency)						
Bloomberg EM USD Aggregate	8.1	9.1	9.1	-3.1	1.8	3.0
Emerging Markets (Foreign Currency)						
Bloomberg EM Local Currency Gov't	7.0	6.9	6.9	-1.2	2.1	1.3
Bloomberg EM Local Currency Gov't *	3.9	8.6	8.6	1.4	3.1	3.0
Euro vs. Dollar	4.4	3.1	3.1	-3.3	-0.8	-2.2
Yen vs. Dollar	5.9	-7.0	-7.0	-9.9	-4.9	-2.9
Pound vs. Dollar	4.4	5.4	5.4	-2.3	0.0	-2.6

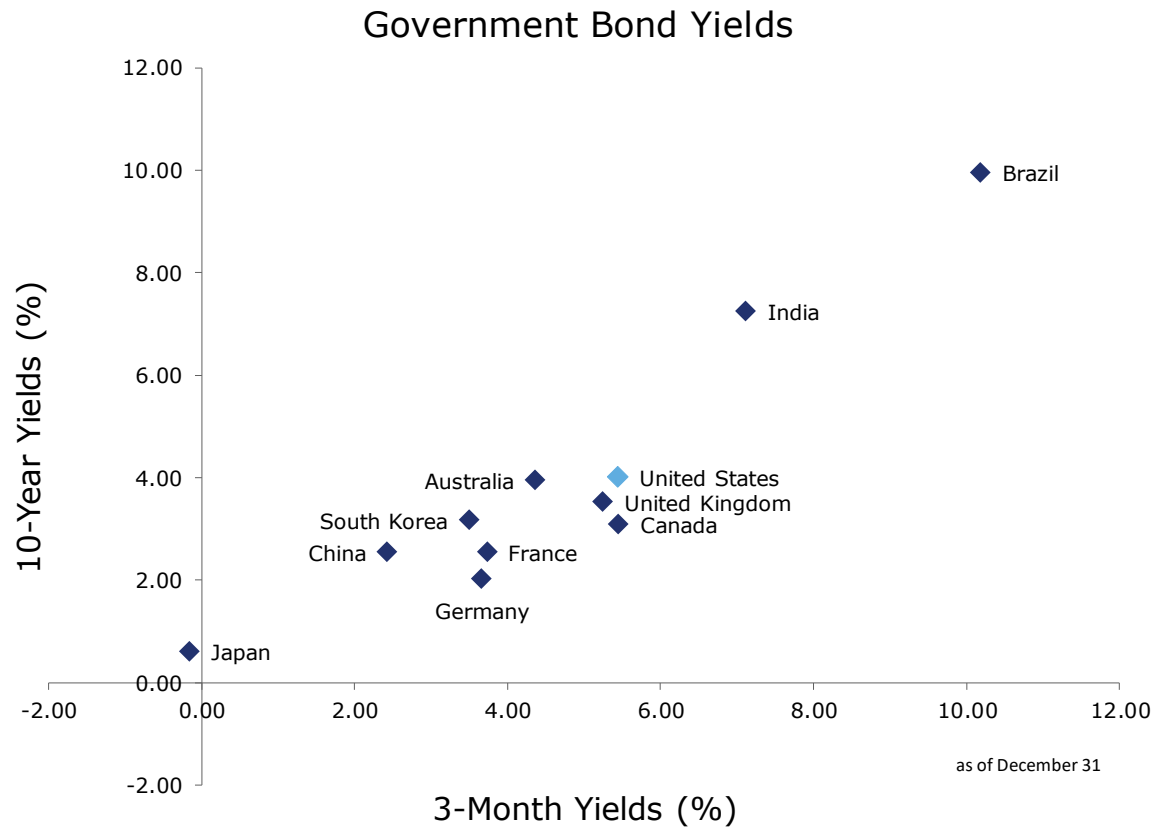
* Returns are reported in terms of local market investors, which removes currency effects.



Data Sources: Bloomberg

Global Interest Rates

Short-term rates have turned positive in most larger countries; longer-term rates near 4.0% in the U.K. and Australia

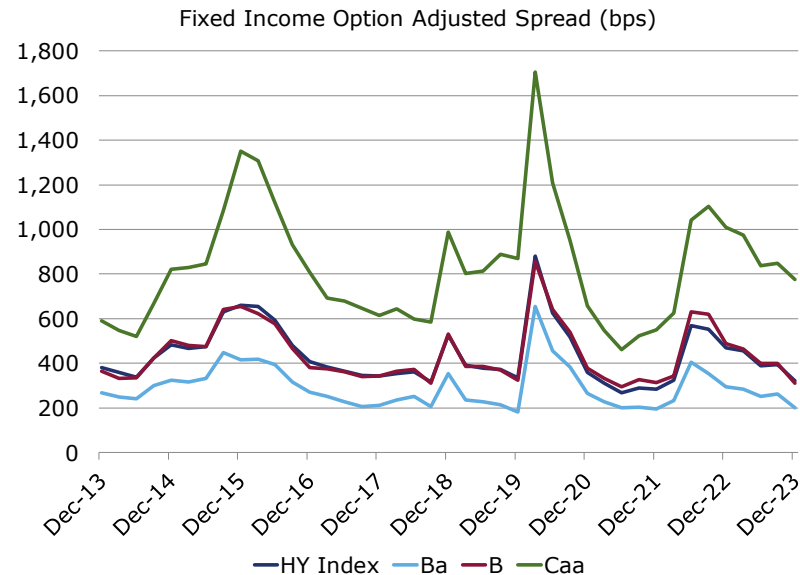


Data Sources: Bloomberg

High Yield Bond Market

As of 12/31/2023

	YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield	7.6	7.2	13.4	13.4	2.0	5.4	4.6
S&P LSTA Leveraged Loan	9.4	3.2	13.2	13.2	5.2	5.8	4.0
High Yield Quality Distribution	Weight						
Ba U.S. High Yield	46.1%	6.3	7.4	11.6	11.6	1.4	5.8
B U.S. High Yield	41.1%	7.5	7.0	13.8	13.8	2.3	5.1
Caa U.S. High Yield	11.7%	12.1	6.9	19.8	19.8	2.9	4.1
Ca to D U.S. High Yield	1.1%	15.3	5.1	16.4	16.4	5.5	-4.0



Data Sources: Bloomberg

Asset Class Performance

Asset Class Returns - Best to Worst

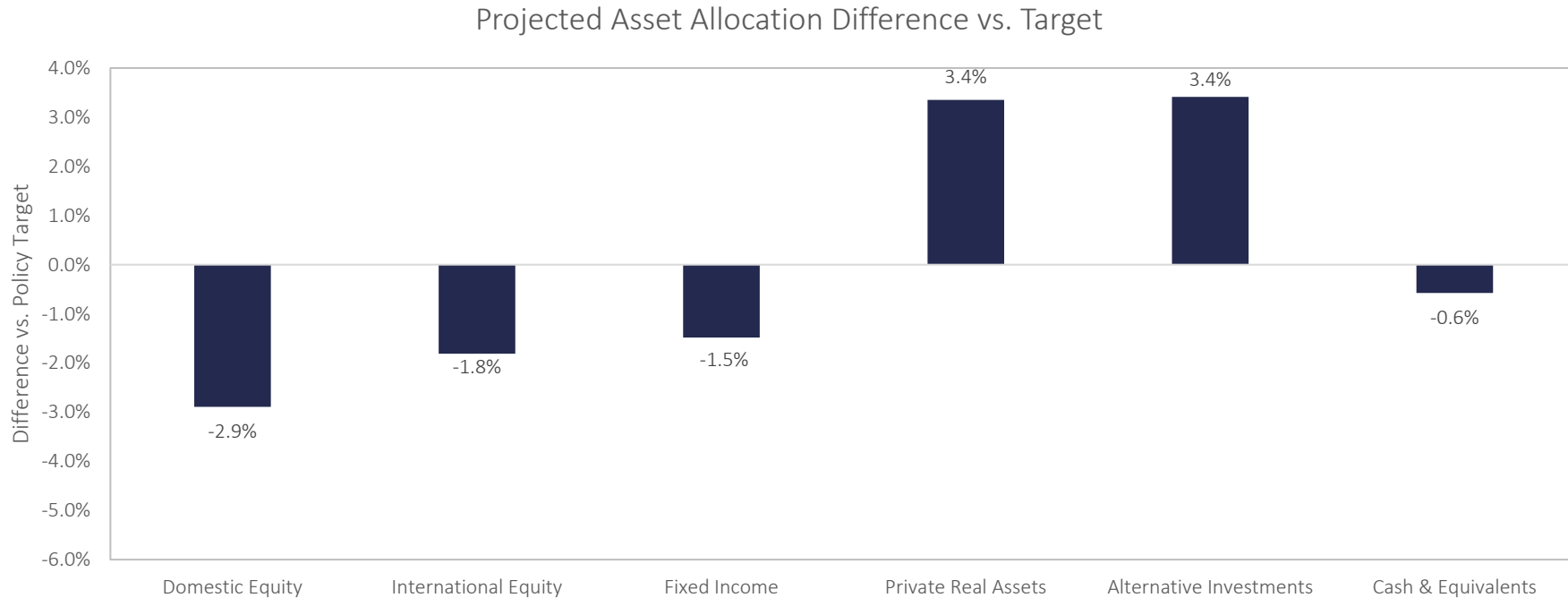
2018	2019	2020	2021	2022	2023 YTD	Annualized 5-Year as of 12/23
T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 26.1%	U.S. Equity 15.4%
Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 18.9%	Developed 8.7%
U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	REITs 16.1%	REITs 7.6%
High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	High Yield 13.4%	Commodities 6.1%
REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 10.3%	High Yield 5.4%
U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	Core Bond 5.5%	Emrg Mrkts 4.1%
Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	T-Bills 5.1%	U.S. TIPS 3.2%
Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	U.S. TIPS 3.9%	T-Bills 1.9%
Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -1.3%	Core Bond 1.1%

Data Sources: Bloomberg Note: Developed asset class is developed equity markets ex-U.S., ex-Canada

Total Fund

Projected Deviations from the Benchmark

As of December 31, 2023



- Includes committed, but unfunded amounts for Real Assets (\$2.17 billion) and Alternatives (\$2.93 billion). Assumes Real Assets and Alternatives allocations are fully funded as of month-end.
- Assumes that outstanding commitments are funded from a basket of public markets asset classes (Domestic Equity, International Equity and/or Fixed Income) that best reflects the expectations of risk, yield and regional allocations of the asset class.

Alternatives Proxy: 60% Domestic Equity, 40% International Equity

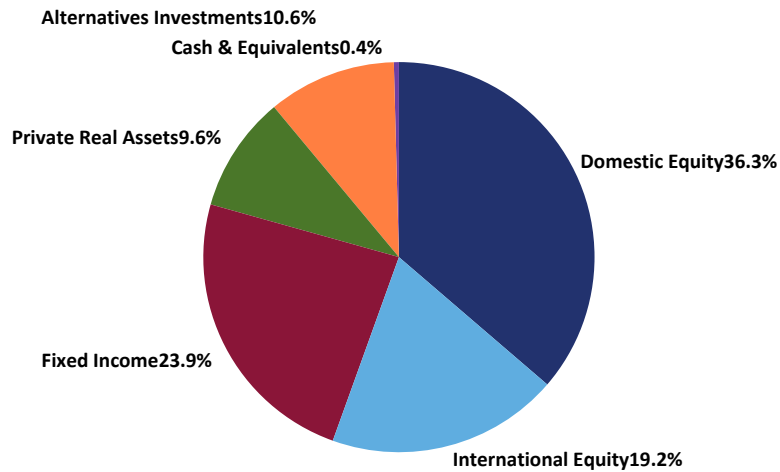
Real Assets Proxy: 50% Domestic Equity, 30% International Equity, 20% Fixed Income

Asset Allocation

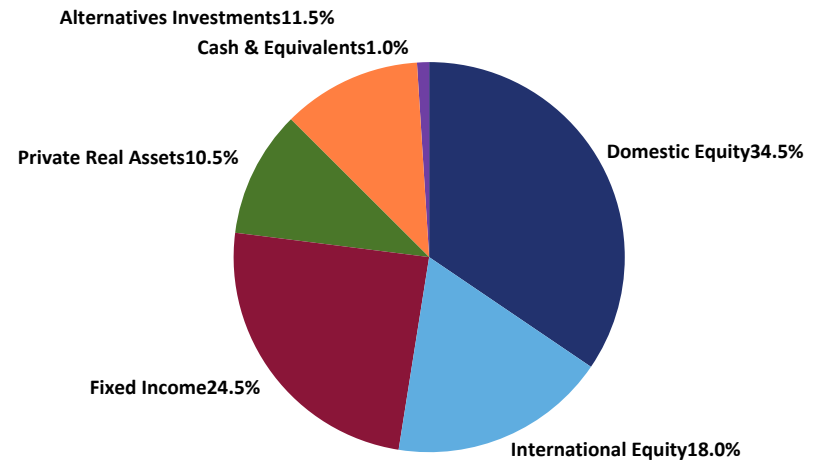
Total Fund

Periods Ended As of December 31, 2023

Actual Allocation



Target Allocation

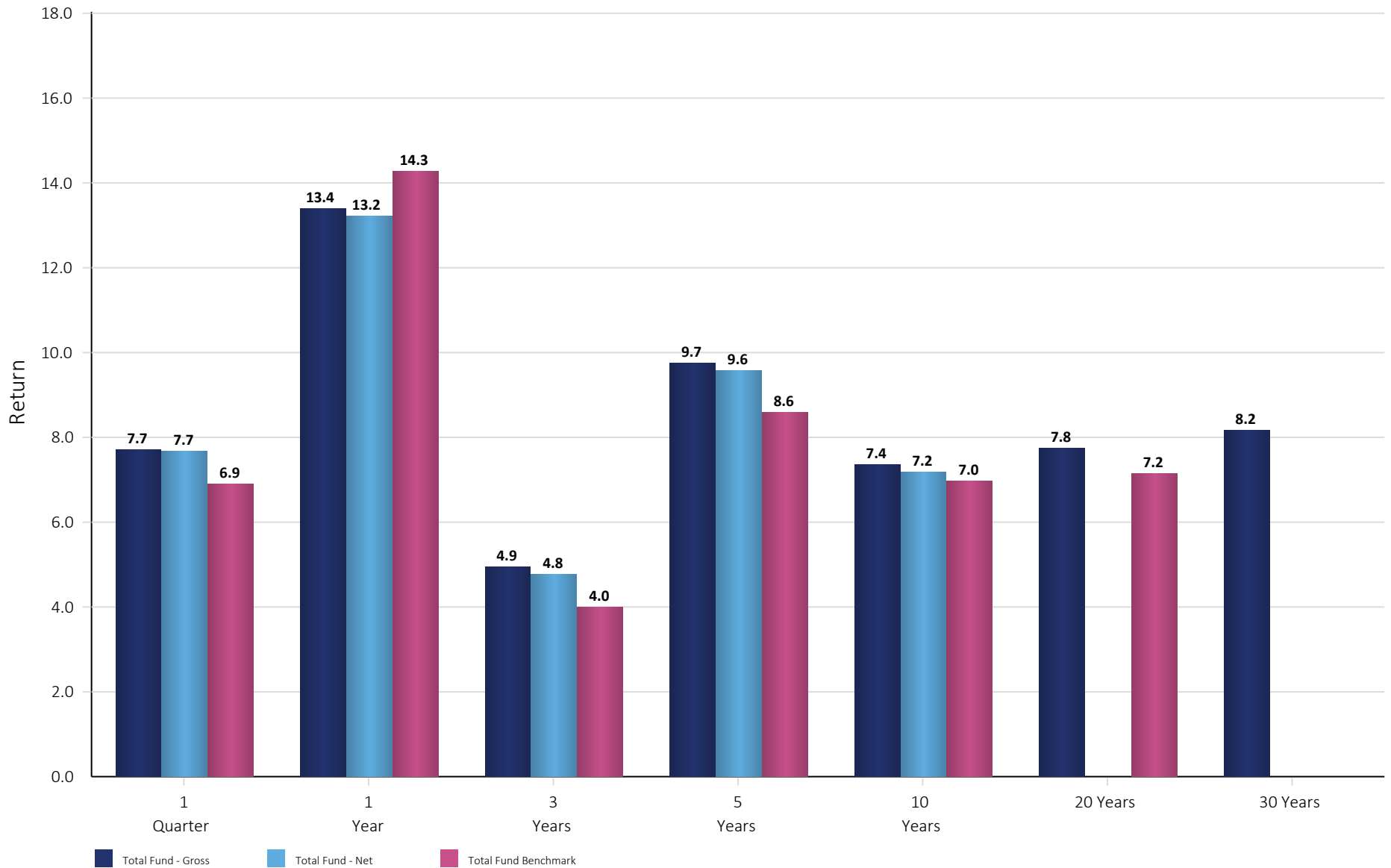


	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	52,219	100.0	100.0	0.0	
Domestic Equity	18,963	36.3	34.5	1.8	948
International Equity	10,017	19.2	18.0	1.2	617
Fixed Income	12,463	23.9	24.5	-0.6	-331
Private Real Assets	5,021	9.6	10.5	-0.9	-462
Alternatives Investments	5,533	10.6	11.5	-0.9	-472
Cash & Equivalents	221	0.4	1.0	-0.6	-301

Comparative Performance

Total Fund - Gross

Periods Ended December 31, 2023

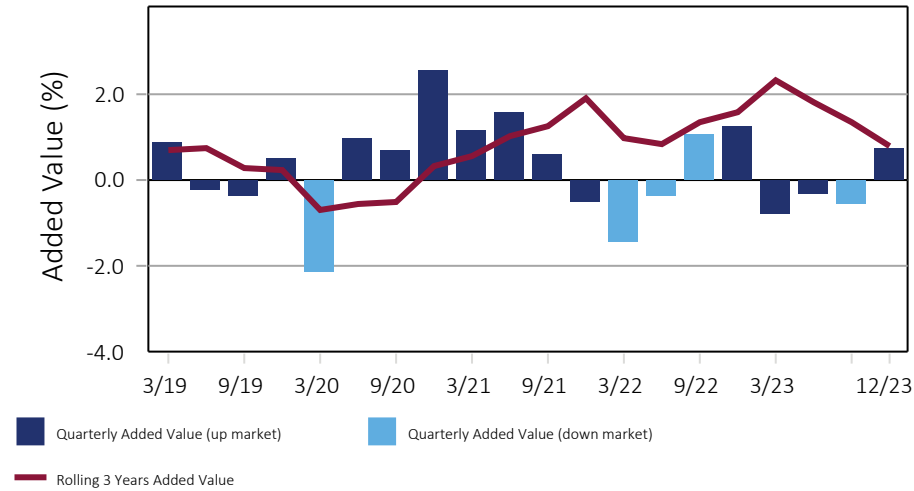


Composite Performance Summary

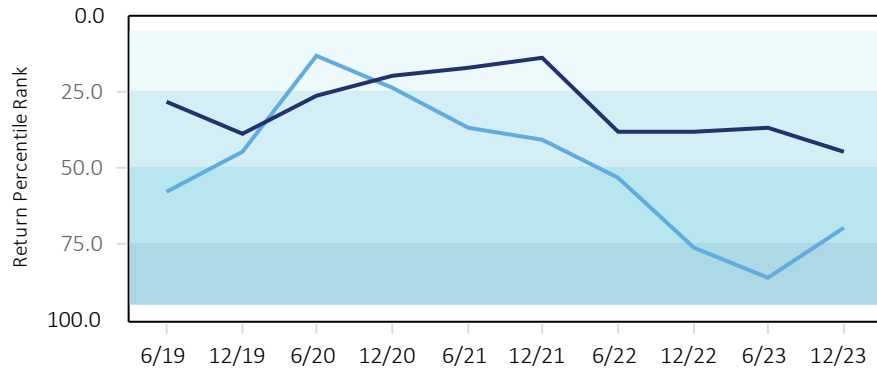
Total Fund

Periods Ended December 31, 2023

Added Value History

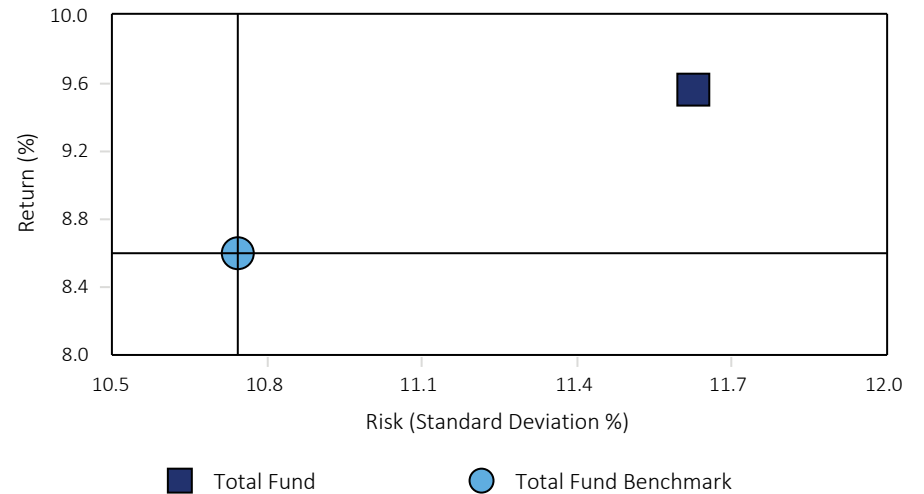


Rolling Percentile Rank : All Public Plans > \$1B - Total Fund



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— Total Fund	10	3 (30%)	7 (70%)	0 (0%)	0 (0%)
— Total Fund Benchmark	10	2 (20%)	3 (30%)	3 (30%)	2 (20%)

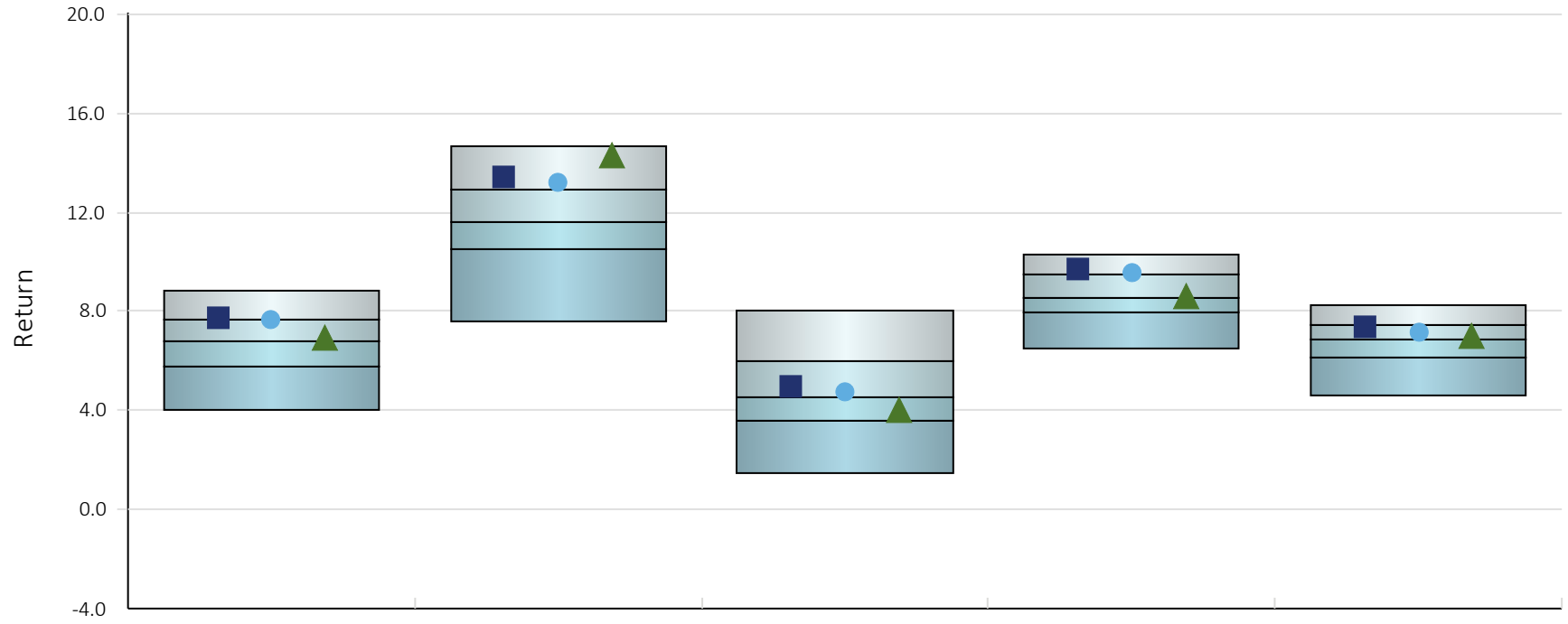
Risk and Return 01/01/19 - 12/31/23



Plan Sponsor Peer Group Analysis

Total Fund vs All Public Plans > \$1B-Total Fund(Gross)

Periods Ended December 31, 2023



	QTD	1 Year	3 Years	5 Years	10 Years
■ Total Fund	7.72 (23)	13.42 (16)	4.94 (43)	9.74 (16)	7.38 (28)
● Total Fund - Net	7.67 (25)	13.24 (21)	4.78 (45)	9.57 (23)	7.18 (37)
▲ Total Fund Benchmark	6.91 (47)	14.28 (9)	4.00 (70)	8.60 (49)	6.99 (44)
5th Percentile	8.87	14.66	8.01	10.33	8.23
1st Quartile	7.67	12.91	6.02	9.48	7.44
Median	6.81	11.62	4.54	8.57	6.85
3rd Quartile	5.76	10.48	3.60	7.99	6.12
95th Percentile	4.05	7.60	1.44	6.53	4.62
Population	157	147	134	130	123

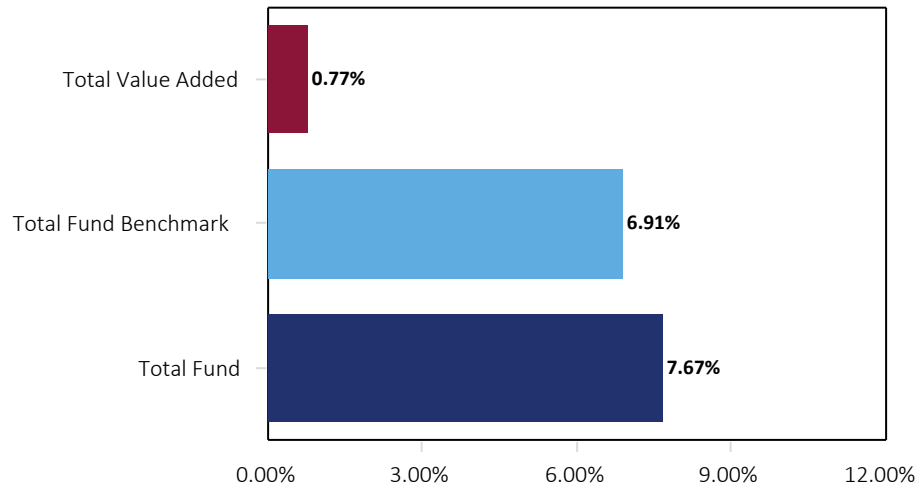
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI ACWI ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1.0% 90 Day US Treasury Bill.

Total Fund Attribution

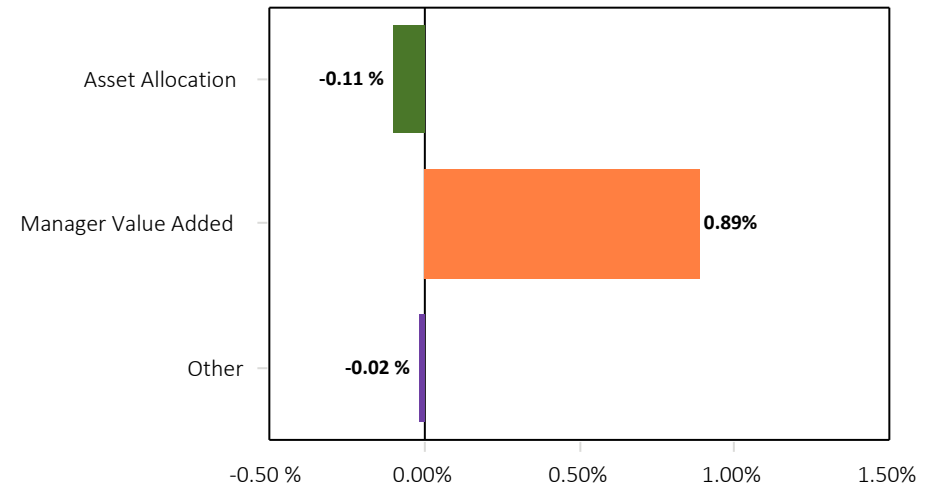
Total Fund

1 Quarter Ending December 31, 2023

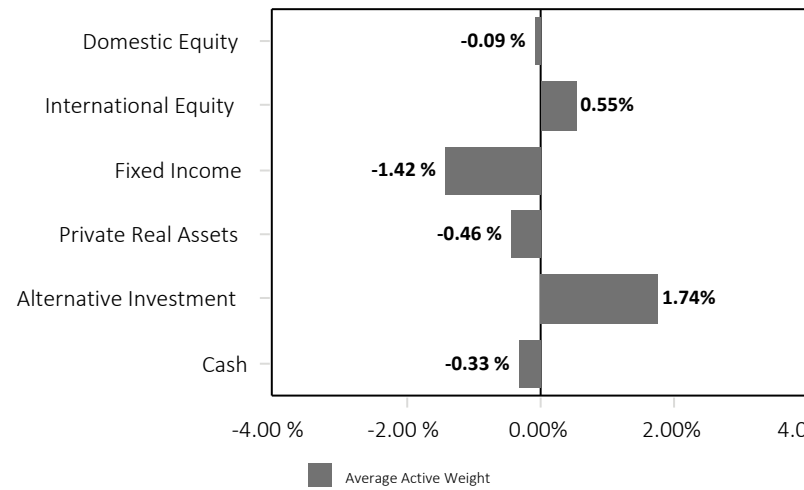
Total Fund Performance



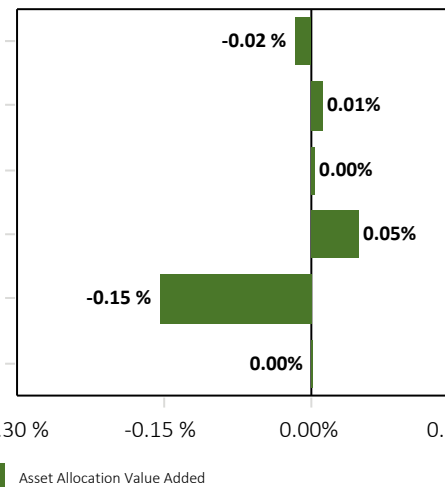
Total Value Added:0.77%



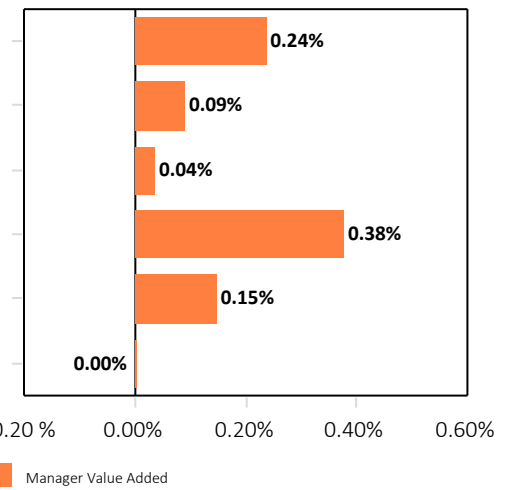
Asset Class Under or Overweighting



Asset Allocation Value Added:-0.11 %



Total Manager Value Added:0.89%



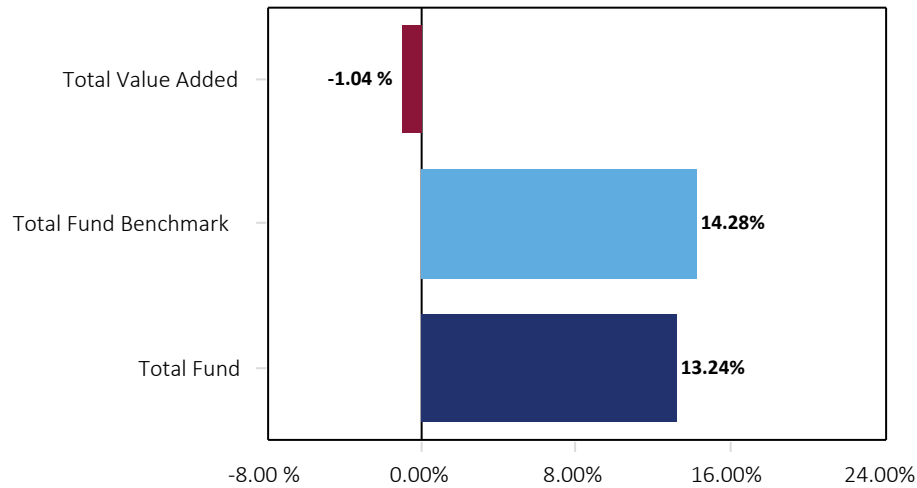
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI ACWI ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1.0% 90 Day US Treasury Bill.

Total Fund Attribution

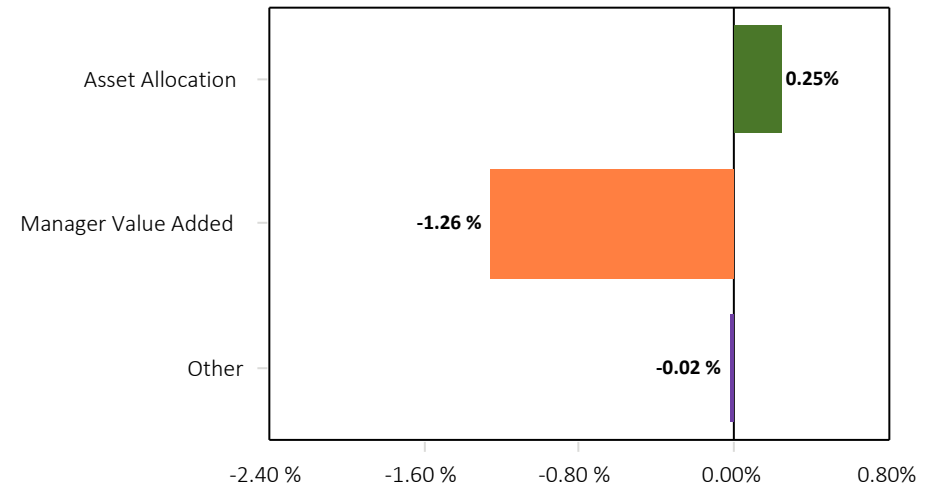
Total Fund

Year To Date Ending December 31, 2023

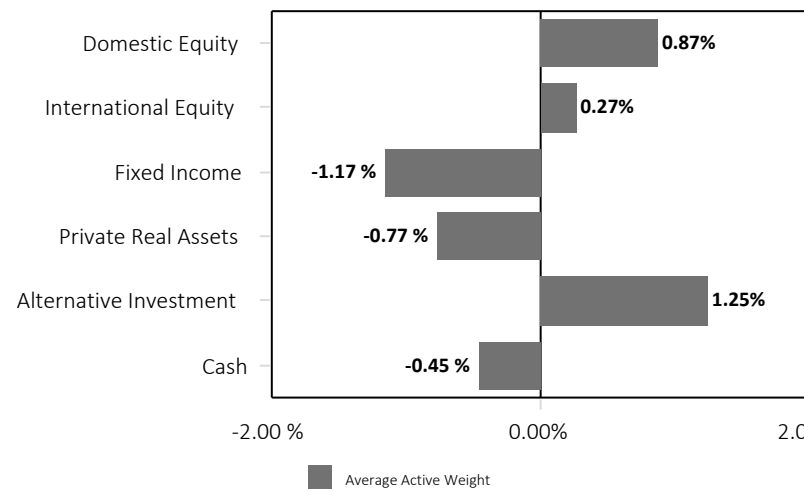
Total Fund Performance



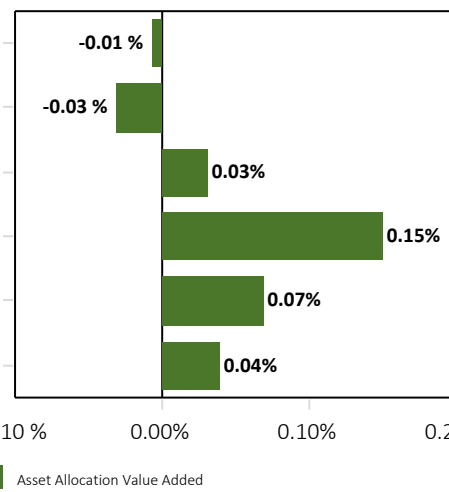
Total Value Added:-1.04 %



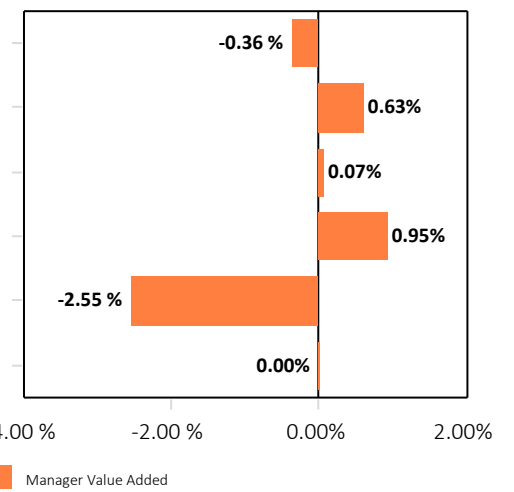
Asset Class Under or Overweighting



Asset Allocation Value Added:0.25%



Total Manager Value Added:-1.26 %



Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI ACWI ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1.0% 90 Day US Treasury Bill.

Asset Class Returns

Periods Ended December 31, 2023

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Total Fund	7.72	13.42	4.94	9.74	7.38	7.77	8.17	9.65	1/1/1982
Total Fund - Net	7.67	13.24	4.78	9.57	7.18				
Total Fund Benchmark	6.91	14.28	4.00	8.60	6.99	7.17			
Domestic Equity	12.70	23.30	7.59	14.46	10.59	9.73	10.23	11.61	1/1/1982
Domestic Equity - Net	12.66	23.10	7.42	14.27	10.37				
Custom Benchmark (U.S. Equity)	11.99	24.16	8.32	15.02	11.40	9.74	10.02		
U.S. Equity IMRF Custom Benchmark	12.18	21.36	7.65	13.80					
International Equity	10.38	19.64	2.56	8.67	5.10	6.76	6.66	7.58	9/1/1986
International Equity - Net	10.25	19.22	2.20	8.29	4.74				
MSCI AC World ex USA (Net)	9.75	15.62	1.55	7.08	3.83	5.68			
International Equity IMRF Custom Benchmark	9.65	15.11	0.95	6.81					
Fixed Income	6.44	7.62	-1.88	2.22	2.66	4.06	5.00	7.44	1/1/1982
Fixed Income - Net	6.41	7.53	-1.96	2.12	2.53				
Custom Benchmark (Fixed Income)	6.27	7.26	-2.26	1.76	2.14	3.34	4.53	6.92	
Fixed Income IMRF Custom Benchmark	6.27	7.27	-2.18	1.85					
Private Real Assets	-0.94	-3.43						1.78	3/1/2022
Private Real Assets - Net	-0.96	-3.50						1.71	
Custom Benchmark (Private Real Assets)	-4.72	-11.80						-3.29	
Real Estate	-0.94	-4.15	9.32	8.37	9.46	7.76	7.80	5.81	5/1/1985
Real Estate - Net	-0.96	-4.21	9.25	8.31	9.43				
Blended Benchmark (Real Estate)	-5.00	-12.73	4.01	3.34	6.33	6.61	6.84	7.21	
Agriculture	-10.10	-8.09	-0.62	-0.65	3.29	7.07		5.98	10/1/1997
NCREIF Farmland Index	2.27	4.96	7.46	6.04	7.30	12.28		10.96	

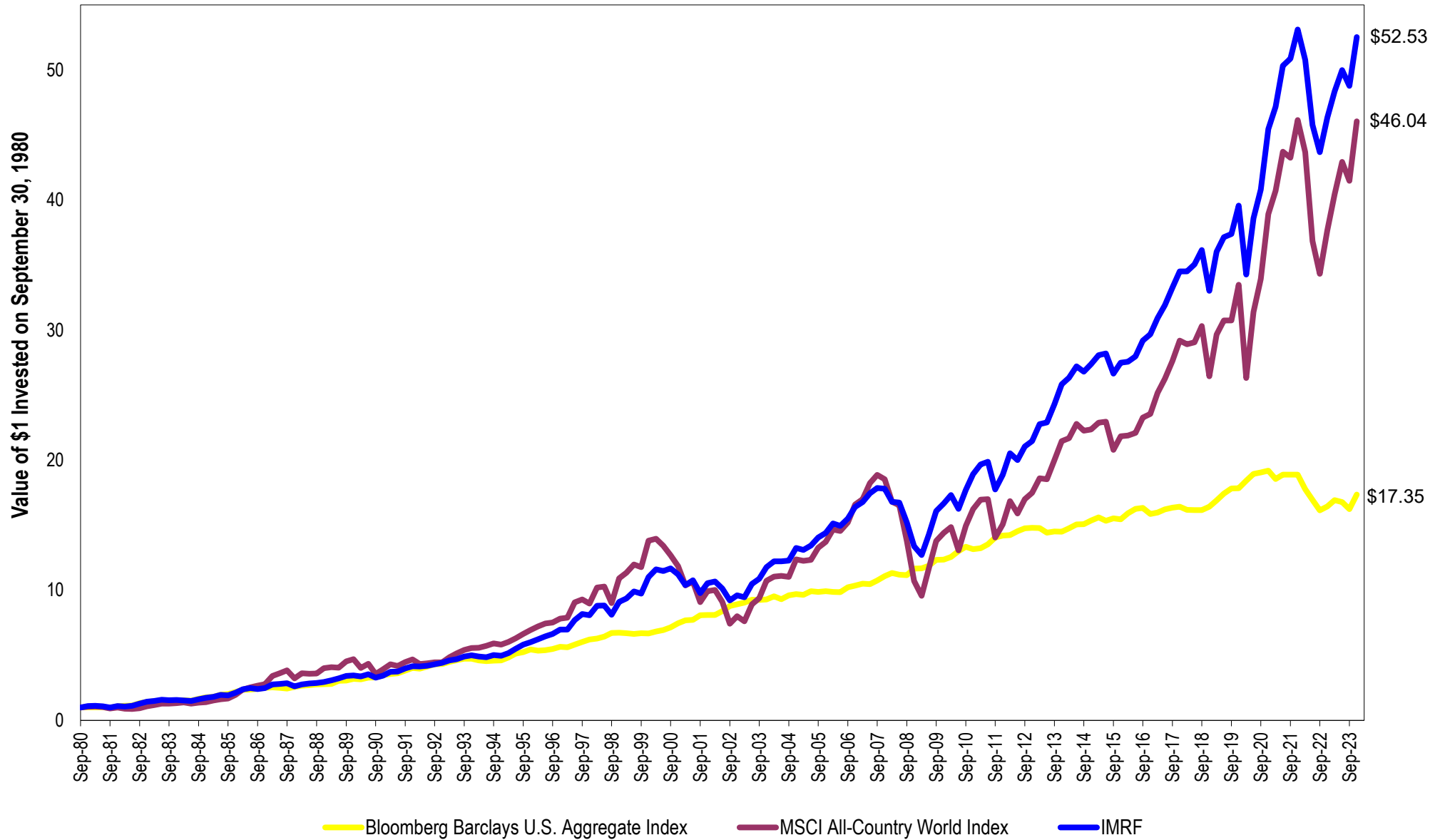
Benchmark definitions on next page.

Asset Class Returns

Periods Ended December 31, 2023

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Timberland	19.96	26.14	11.16	7.71	5.16	4.76	6.83	7.61	10/1/1992
NCREIF Timberland Index	4.34	9.45	10.50	6.62	5.77	7.07	7.45	8.54	
Unlisted Infrastructure	4.98	16.38	13.25	13.04				12.77	4/1/2018
Blended Benchmark (Unlisted Infrastructure)	0.64	7.49	8.71	8.82				8.85	
Alternatives Investments	-0.71	2.60	16.19	14.04	12.29	10.36	12.63	11.31	2/1/1986
Alternatives Investments - Net	-0.71	2.60	16.18	14.02	12.12				
Custom Benchmark (Alternative Investments)	-2.42	25.15	3.77	5.83	7.40	9.16	11.01	11.83	
Private Equity	-0.57	2.61	18.56	16.36	14.90	13.25	15.30	13.54	2/1/1986
Blended Benchmark (Private Equity)	-2.75	25.61	3.45	5.63	7.30	9.11			
Cash	1.38	5.23	3.61	3.40	2.20	1.35	3.05	3.77	7/1/1986
90 Day U.S. Treasury Bill	1.37	5.02	2.15	1.88	1.24	1.43	2.40	3.13	

Growth of a Dollar - As of December 31, 2023



Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Domestic Equity	17,421,960,223	35.61	18,963,163,934	36.31
Large Cap Growth	3,671,652,397	7.51	3,905,033,702	7.48
Sands Capital	1,493,207,838	3.05	1,622,066,233	3.11
Xponance Russell 1000 G	2,178,444,558	4.45	2,282,967,469	4.37
Large Cap Value	3,718,608,823	7.60	3,997,619,272	7.66
Dodge & Cox	1,453,210,778	2.97	1,592,736,148	3.05
LSV Asset	881,270,598	1.80	958,100,125	1.83
NTGI S&P 500 Value	1,384,127,447	2.83	1,446,783,000	2.77
Large Cap Pass. Core	1,807,388,988	3.69	2,027,158,869	3.88
NTGI MarketCap Idx.	1,807,388,988	3.69	2,027,158,869	3.88
Factor Diversity Strategies	2,600,919,247	5.32	2,914,652,001	5.58
U.S. Large Cap FDP-GSAM	2,600,919,247	5.32	2,914,652,001	5.58
Quantitative Factor Strategies	2,253,058,652	4.61	2,476,788,086	4.74
Quantitative US Equity - SciBeta	2,253,058,652	4.61	2,476,788,086	4.74
Small Cap Multi-Factor Strategies	525,082,421	1.07	602,960,519	1.15
U.S. Small Cap Equity Multi-Factor - S&P	525,082,421	1.07	602,960,519	1.15
Small Cap Growth	705,095,382	1.44	706,587,169	1.35
Frontier Capital	705,095,382	1.44	706,587,169	1.35

Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Small Cap Value	847,578,353	1.73	881,915,398	1.69
Channing	311,325,915	0.64	345,665,089	0.66
William Blair Small Cap Value	536,252,438	1.10	536,250,310	1.03
Domestic Equity Transition		0.00		0.00
Transition Account		0.00		0.00
Public Real Assets	1,292,575,962	2.64	1,450,448,918	2.78
Brookfield	377,521,053	0.77	424,096,197	0.81
Cohen & Steers	915,054,909	1.87	1,026,352,721	1.97
International Equity	9,086,988,649	18.57	10,016,813,612	19.18
Intl Large Cap Growth	1,467,600,896	3.00	1,653,772,166	3.17
EARNEST Part. Intl	621,968,278	1.27	688,997,764	1.32
William Blair	845,632,618	1.73	964,774,402	1.85
Intl Large Cap Value	1,451,222,023	2.97	1,591,964,060	3.05
Brandes Investment	681,964,158	1.39	754,863,387	1.45
Mondrian	635,457,463	1.30	691,175,397	1.32
Lazard	133,800,402	0.27	145,925,276	0.28
Intl Large Cap Core	4,402,136,441	9.00	5,539,537,538	10.61
Arrowstreet Capital	1,151,647,418	2.35	1,236,164,883	2.37
Brown Capital	514,570,302	1.05	611,589,781	1.17
GlobeFlex Capital	847,542,158	1.73	912,975,211	1.75
Xponance Intl EQ	95,100,133	0.19	104,689,348	0.20
Transition Account		0.00		0.00
Progress Intl Equity	404,313	0.00	421,171	0.00
NTGI ACWI ex US Index Fund	1,792,872,117	3.66	2,673,697,143	5.12

Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Intl All Cap Developed	156,484,142	0.32	173,689,567	0.33
Ativo International	156,484,142	0.32	173,689,567	0.33
International Small Cap	523,931,467	1.07	593,575,147	1.14
Franklin Templeton	212,710,550	0.43	236,392,705	0.45
William Blair IntSC	311,220,917	0.64	357,182,442	0.68
Emerging Mkt Equity	1,085,613,681	2.22	464,275,133	0.89
Genesis Investment Management, LLP.	656,943,512	1.34	9,929,267	0.02
Arrowstreet EME	428,670,168	0.88	454,345,866	0.87

Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Fixed Income	11,827,497,798	24.18	12,462,936,175	23.87
Domestic Fixed Core	3,598,085,618	7.35	3,819,686,373	7.31
Attucks Fixed Income	85,715,652	0.18	91,931,715	0.18
Brandes FI Core	321,989,643	0.66	339,802,730	0.65
EARNEST Partners	856,081,884	1.75	904,584,091	1.73
Garcia Hamilton	904,020,901	1.85	972,000,396	1.86
Ramirez Asset Management	499,762,611	1.02	526,037,048	1.01
Xponance Yield Advantage Agg.	930,514,928	1.90	985,330,393	1.89
Domestic Fixed Passive Core	2,671,109,907	5.46	2,851,200,182	5.46
NTGI Blmbg Agg.	1,087,683,213	2.22	1,161,369,064	2.22
BlackRock US Debt I	1,583,426,694	3.24	1,689,831,118	3.24
Domestic Fixed Core Plus	2,804,053,279	5.73	2,981,693,196	5.71
LM Capital Group FI	808,516,661	1.65	850,849,565	1.63
Progress Inv. FI	1,107	0.00		0.00
Loop Capital Management	550,549,779	1.13	586,811,374	1.12
Western Asset	901,000,896	1.84	965,808,111	1.85
Longfellow Core Plus	543,984,836	1.11	578,224,146	1.11
Bank Loans	1,675,840,950	3.43	1,686,188,968	3.23
Barings Global Loan Fund	1,675,840,950	3.43	1,686,188,968	3.23
Emerging Markets Debt	306,142	0.00	333,489	0.00
Standish-Mellon EMD	306,142	0.00	333,489	0.00
High Yield	1,078,101,901	2.20	1,123,833,967	2.15
MacKay Shields	1,078,101,901	2.20	1,123,833,967	2.15

Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Private Real Assets	4,868,443,851	9.95	5,021,464,490	9.62
Real Estate	4,415,589,874	9.03	4,478,141,361	8.58
Real Estate Core Cmp	2,223,995,974	4.55	2,190,937,105	4.20
TA Assoc. Buckhead	893,469,458	1.83	913,362,289	1.75
Barings Euro Core Property	130,429,781	0.27	132,355,045	0.25
Blackstone Property Euro	179,161,923	0.37	182,626,570	0.35
INVESCO Core Real Estate	229,091,981	0.47	213,383,622	0.41
INVESCO European real estate	55,234,684	0.11	54,905,426	0.11
AEW Core Property Tr	260,736,803	0.53	248,566,122	0.48
CBRE Core Partners	299,094,514	0.61	274,719,455	0.53
JPM Strategic Property Fund	176,776,830	0.36	171,018,576	0.33
RE Non-Core Cmp	2,191,593,901	4.48	2,287,204,256	4.38
Artemis MWBE Spruce	350,929,713	0.72	382,620,064	0.73
Franklin T. EMREFF	2,399,442	0.00	1,066,392	0.00
Security Capital	86,284,757	0.18	99,527,333	0.19
Dune II	8,015,136	0.02	6,961,990	0.01
Non-Core Real Estate Funds	1,465,007,405	2.99	1,510,403,888	2.89
Non-Core Intl Real Estate	278,885,547	0.57	286,554,736	0.55
Almanac ARS V	71,901	0.00	69,853	0.00
Agriculture	265,175,062	0.54	238,379,349	0.46
Premiere Partners IV	265,175,062	0.54	238,379,349	0.46
Timberland	63,824,685	0.13	70,365,782	0.13
Forest Investment	63,824,685	0.13	70,365,782	0.13
Unlisted Infrastructure	123,854,230	0.25	234,577,998	0.45
Unlisted Infrastructure Funds	123,854,230	0.25	234,577,998	0.45

Investment Manager Asset Allocation

Periods Ended December 31, 2023

	Sep-2023		Dec-2023	
	\$	%	\$	%
Alternatives Investments	5,525,047,421	11.29	5,533,343,691	10.60
Absolute Return	70,938	0.00	54,766	0.00
Aurora Investment	70,938	0.00	54,766	0.00
Private Equity	5,347,119,662	10.93	5,281,362,992	10.11
Abbott S/A Comp.	502,074,896	1.03	494,830,619	0.95
Muller Monroe MPEFF		0.00		0.00
Pantheon S/A Comp.	418,026,500	0.85	418,490,497	0.80
Private Equity Fund - Domestic	3,516,042,669	7.19	3,403,253,000	6.52
Private Equity Fund - International	666,378,302	1.36	696,520,029	1.33
Oakbrook Opportunities Fund	244,597,294	0.50	268,268,848	0.51
Private Credit	177,856,821	0.36	251,925,933	0.48
Private Credit Fund - Domestic	177,856,821	0.36	249,394,707	0.48
Private Credit Fund - International		0.00	2,531,226	0.00
Cash & Equivalents	192,527,968	0.39	221,036,725	0.42
Total Fund	48,922,465,910	100.00	52,218,758,627	100.00

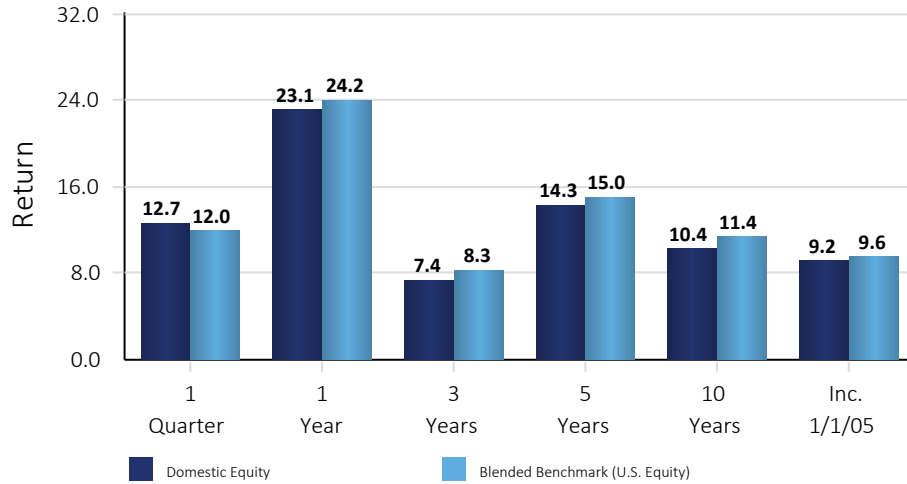
Domestic Equity

Composite Performance Summary

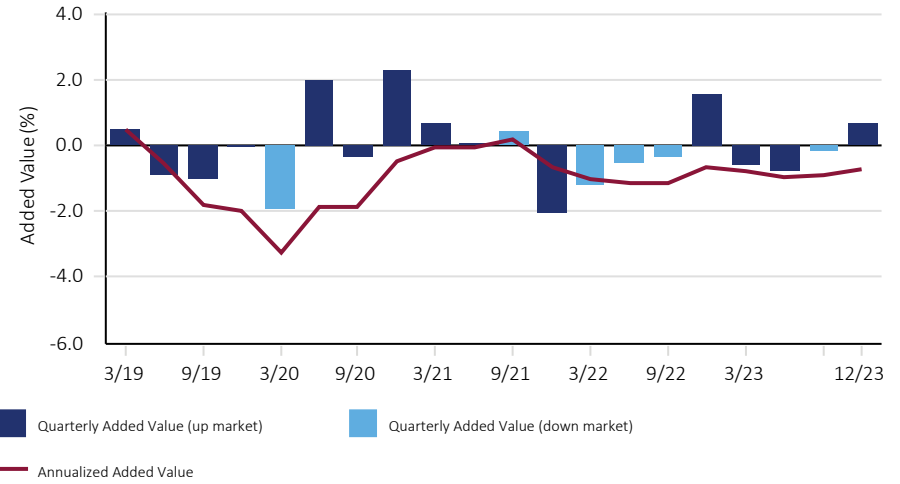
Domestic Equity

Periods Ended December 31, 2023

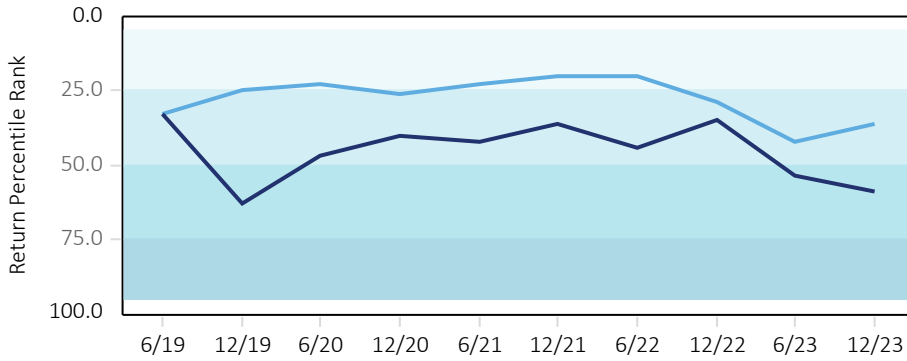
Comparative Performance



Added Value History

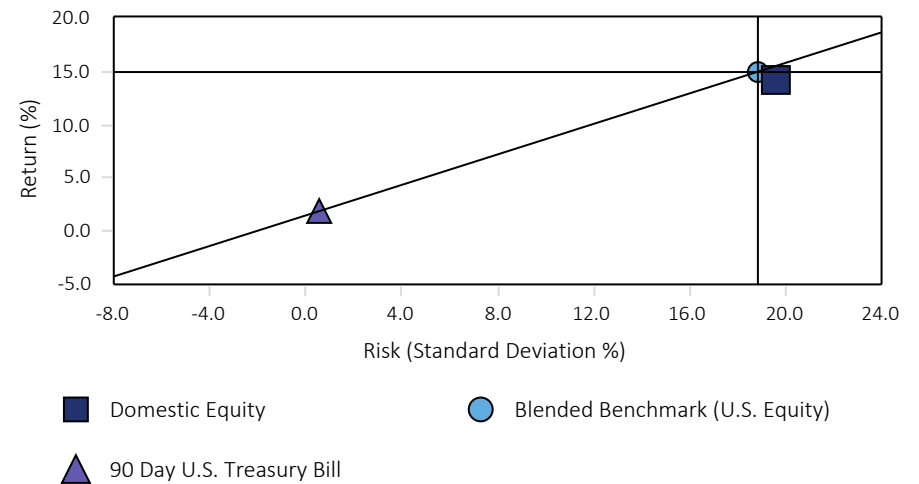


Rolling Percentile Rank: All Public Plans > \$1B-US Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— Domestic Equity	10	0 (0%)	7 (70%)	3 (30%)	0 (0%)
— Benchmark	10	5 (50%)	5 (50%)	0 (0%)	0 (0%)

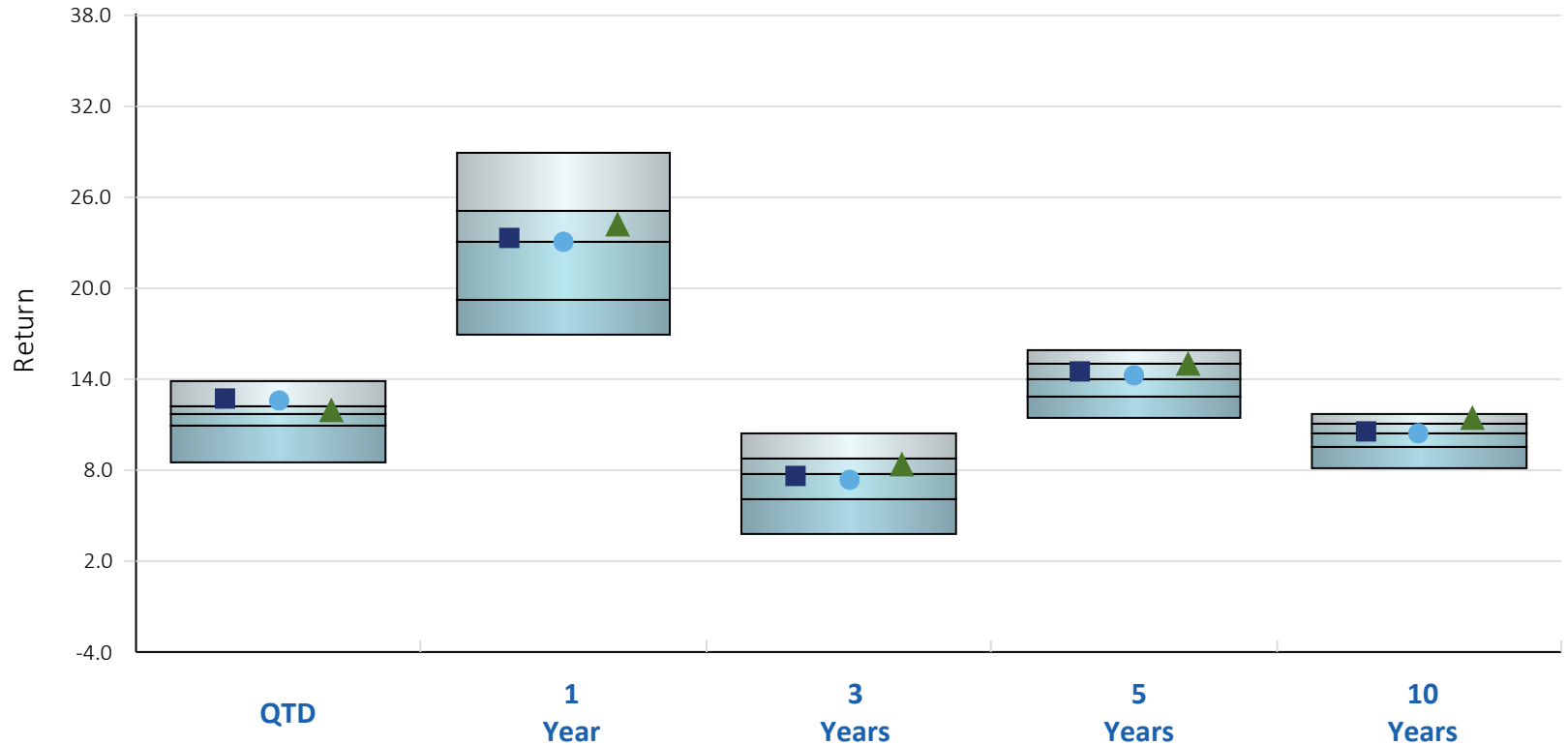
Risk and Return 01/1/19 - 12/31/23



Plan Sponsor Peer Group Analysis

Domestic Equity vs All Public Plans > \$1B-US Equity Segment(Gross)

Periods Ended December 31, 2023



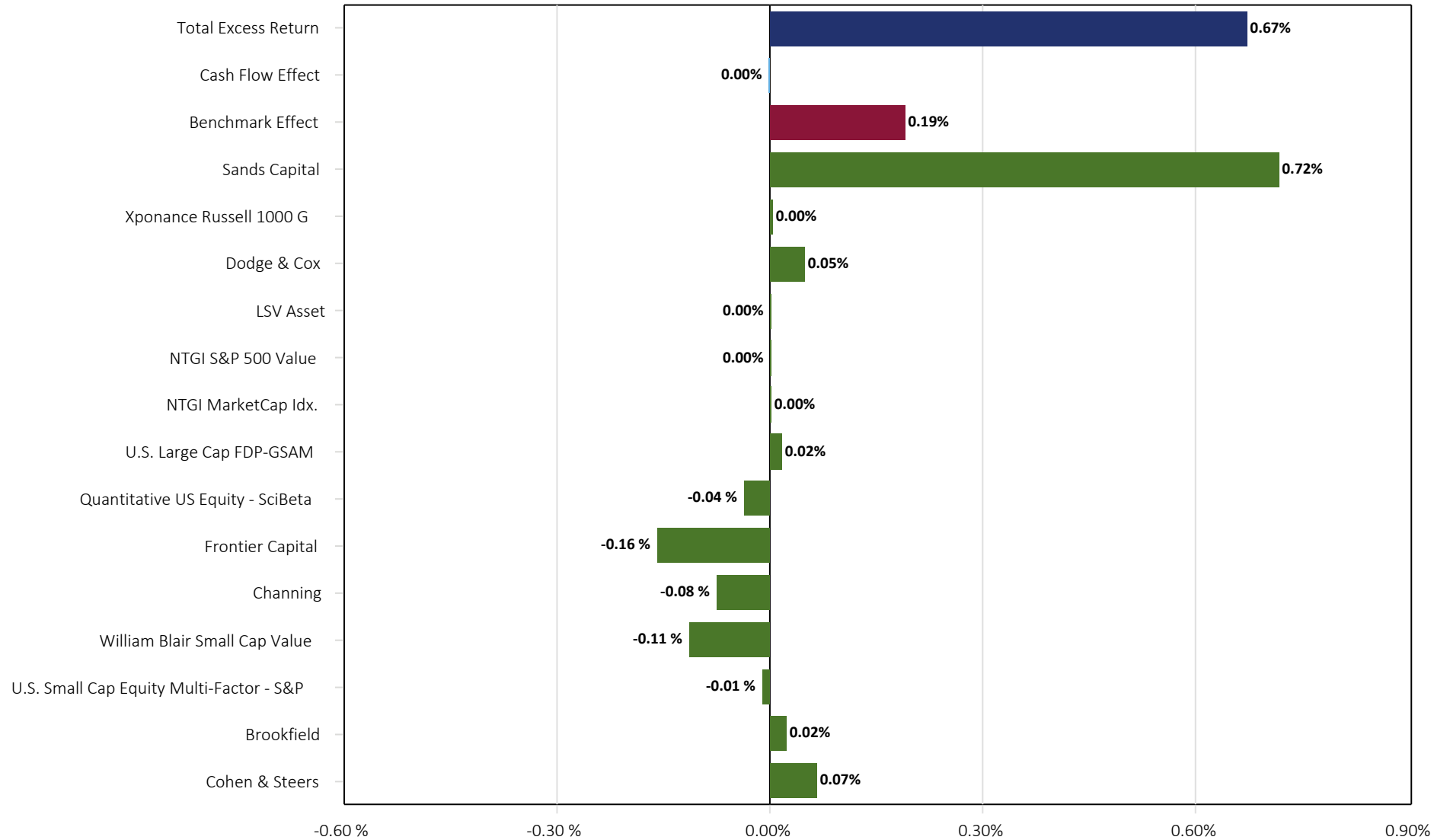
	QTD	1 Year	3 Years	5 Years	10 Years
■ Domestic Equity	12.70 (12)	23.30 (46)	7.59 (58)	14.46 (32)	10.59 (36)
● Domestic Equity - Net	12.66 (13)	23.10 (50)	7.42 (59)	14.27 (38)	10.37 (50)
▲ Blended Benchmark (U.S. Equity)	11.99 (35)	24.16 (43)	8.32 (36)	15.02 (24)	11.40 (13)
5th Percentile	13.86	28.93	10.49	15.90	11.74
1st Quartile	12.22	25.16	8.71	14.99	11.05
Median	11.67	23.03	7.77	14.03	10.37
3rd Quartile	10.89	19.28	6.08	12.88	9.57
95th Percentile	8.56	16.95	3.78	11.41	8.08
Population	53	51	49	43	37

Asset Class Attribution

Domestic Equity

Periods Ended 1 Quarter Ending December 31, 2023

1 Quarter



Performance

Domestic Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Domestic Equity	18,963,163,934	12.70	23.30	7.59	14.46	10.59	11.61	1/1/1982
Domestic Equity - Net		12.66	23.10	7.42	14.27	10.37		
Blended Benchmark (U.S. Equity)		11.99	24.16	8.32	15.02	11.40		
Russell 3000 Index		12.07	25.96	8.54	15.16	11.48	11.58	
U.S. Equity IMRF Custom Benchmark		12.18	21.36	7.65	13.80			
Large Cap Equity	12,844,463,843	13.56	28.38	7.80	15.26	11.49	11.40	1/1/1982
Large Cap Equity - Net		13.53	28.26	7.71	15.16	11.37		
Russell 1000 Index		11.96	26.53	8.97	15.52	11.80	11.74	
Large Cap Growth	3,905,033,702	17.57	46.62	5.40	18.29	13.72	12.31	1/1/1982
Large Cap Growth - Net		17.54	46.48	5.30	18.18	13.59		
LCG Blended Benchmark*		14.16	42.68	8.86	19.50	14.86		
Russell 1000 Growth Index		14.16	42.68	8.86	19.50	14.86	11.73	
Xponance Russell 1000 G	2,282,967,469	14.20	42.70	8.87	19.49		14.65	10/1/2018
Xponance Russell 1000 G - Net		14.19	42.68	8.85	19.47		14.63	
Russell 1000 Growth Index		14.16	42.68	8.86	19.50		14.65	
Sands Capital	1,622,066,233	22.54	52.36	-6.46	13.37	11.14	11.72	11/1/2003
Sands Capital - Net		22.47	52.03	-6.68	13.12	10.89		
LCG Blended Benchmark*		14.16	42.68	8.86	19.50	14.86	11.40	
Russell 1000 Growth Index		14.16	42.68	8.86	19.50	14.86	11.44	

* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.

** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.

Performance

Domestic Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Large Cap Value	3,997,619,272	11.27	18.25	12.76	13.19	9.90	10.40	10/1/1982
Large Cap Value - Net		11.23	18.07	12.59	13.03	9.73		
LCV Blended Benchmark**		9.50	11.46	8.86	10.91	8.40		
Russell 1000 Value Index		9.50	11.46	8.86	10.91	8.40	11.47	
Dodge & Cox	1,592,736,148	10.14	18.05	13.25	14.09	10.70	10.15	9/1/2003
Dodge & Cox - Net		10.07	17.78	13.01	13.85	10.47		
LCV Blended Benchmark**		9.50	11.46	8.86	10.91	8.40	8.38	
Russell 1000 Value Index		9.50	11.46	8.86	10.91	8.40	8.51	
LSV Asset	958,100,125	9.56	13.87	11.60	11.66	9.16	10.59	2/1/2003
LSV Asset - Net		9.47	13.60	11.33	11.39	8.90		
LCV Blended Benchmark**		9.50	11.46	8.86	10.91	8.40	9.11	
Russell 1000 Value Index		9.50	11.46	8.86	10.91	8.40	9.11	
NTGI S&P 500 Value	1,446,783,000	13.63	22.31	13.07	14.15	10.07	6.95	8/1/1999
NTGI S&P 500 Value - Net		13.63	22.30	13.06	14.14	10.06		
S&P 500 Value		13.63	22.23	13.10	14.11	10.01	6.92	
Large Cap Pass. Core	2,027,158,869	12.16	26.10	8.47	15.08	11.46	11.30	1/1/1985
Large Cap Pass. Core - Net		12.16	26.10	8.46	15.07	11.45		
Dow Jones U.S. Total Stock Market Index		12.13	26.06	8.43	15.05	11.40		
NTGI MarketCap Idx.	2,027,158,869	12.16	26.10	8.47	15.08	11.46	11.10	2/1/1985
NTGI MarketCap Idx. - Net		12.16	26.10	8.46	15.07	11.45		
Dow Jones U.S. Total Stock Market Index		12.13	26.06	8.43	15.05	11.40		

* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.

** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.

Performance

Domestic Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Factor Diversity Strategies	2,914,652,001	12.06	25.74	8.82			11.85	8/18/2020
U.S. Large Cap FDP-GSAM	2,914,652,001	12.06	25.74	8.82			11.85	8/18/2020
U.S. Large Cap FDP-GSAM - Net		12.06	25.70	8.78			11.80	
Solactive GBS U.S. 1000 Index		11.95	26.72	8.75			11.72	
GSAM Active Beta US. Large Cap FDC Index		12.02	25.69	8.83			11.82	
Quantitative Factor Strategies	2,476,788,086	9.93	14.92	8.82			9.50	9/17/2019
Quantitative US Equity - SciBeta	2,476,788,086	9.93	14.92	8.82			9.50	9/17/2019
Quantitative US Equity - SciBeta - Net		9.92	14.87	8.76			9.34	
SciBeta US Hi-Fctr-Intst Div Multi-Beta Multi-Strat Index		10.19	13.87	7.75			8.54	

* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.

** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.

Performance

Domestic Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Small Cap	2,191,463,087	11.29	18.82	9.38	13.85	8.72	11.97	7/1/1988
Small Cap Composite - Net		11.17	18.08	8.68	13.15	8.10		
Russell 2000 Index		14.03	16.93	2.22	9.97	7.16	9.13	
Small Cap Multi-Factor Strategies	602,960,519	14.83					4.07	8/1/2023
U.S. Small Cap Equity Multi-Factor - S&P	602,960,519	14.83					4.07	8/1/2023
U.S. Small Cap Equity Multi-Factor - S&P		14.83					4.07	
S&P SmallCap 600 QVML Top 90% Multi-Factor Index		14.93					4.14	
S&P SmallCap 600 Index		15.12					3.73	
Small Cap Growth	706,587,169	8.77	24.23	4.74	15.93	10.41	12.90	7/1/1988
Small Cap Growth - Net		8.58	22.86	3.61	14.85	9.61		
Russell 2000 Growth Index		12.75	18.66	-3.50	9.22	7.16	7.87	
Frontier Capital	706,587,169	8.77	24.23	4.44	16.47	11.26	13.25	8/1/1988
Frontier Capital - Net		8.58	22.86	3.33	15.29	10.39		
Russell 2000 Growth Index		12.75	18.66	-3.50	9.22	7.16	7.95	
Small Cap Value	881,915,398	11.15	16.04	11.93	13.01	8.38	11.58	9/1/1989
Small Cap Value - Net		11.00	15.43	11.42	12.47	7.85		
Russell 2000 Value Index		15.26	14.65	7.94	10.00	6.76	9.69	
Channing	345,665,089	11.03	20.91	6.71	12.43	7.75	10.01	7/1/2011
Channing - Net		10.88	20.30	6.19	11.88	7.23	9.43	
Russell 2000 Value Index		15.26	14.65	7.94	10.00	6.76	8.52	

* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.

** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.

Performance

Domestic Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
William Blair Small Cap Value	536,250,310	11.21	11.67	9.27	11.66	8.64	10.99	5/1/1999
Inv. Couns. Maryland - Net		11.07	11.07	8.75	11.10	8.10		
Russell 2000 Value Index		15.26	14.65	7.94	10.00	6.76	8.77	
Public Real Assets	1,450,448,918	12.21	5.49	6.42	8.12		6.01	8/1/2017
Public Real Assets - Net		12.13	5.16	6.07	7.72		5.62	
Public Real Assets Benchmark***		10.97	3.56	4.75	6.32		4.15	
Brookfield	424,096,197	12.34	10.28	10.07	9.05		5.71	8/1/2017
Brookfield - Net		12.22	9.82	9.58	8.53		5.21	
Dow Jones Brookfield Global Infrastructure Composi		11.19	6.23	6.69	6.82		3.76	
Cohen & Steers	1,026,352,721	12.16	3.63	5.27	7.96		6.37	8/1/2017
Cohen & Steers - Net		12.09	3.35	4.96	7.60		6.01	
FTSE Global Core Infrastructure 50/50 Index (Net)		10.85	2.21	3.76	6.04		4.32	

* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.

** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.

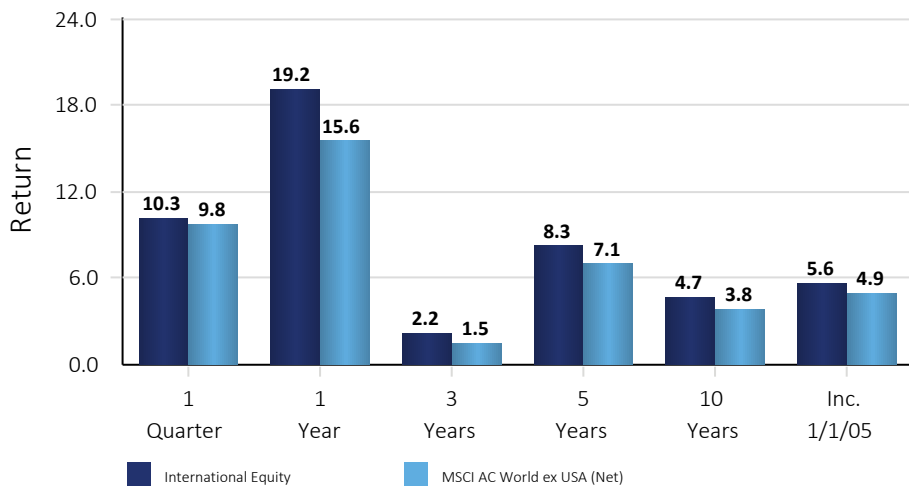
International Equity

Composite Performance Summary

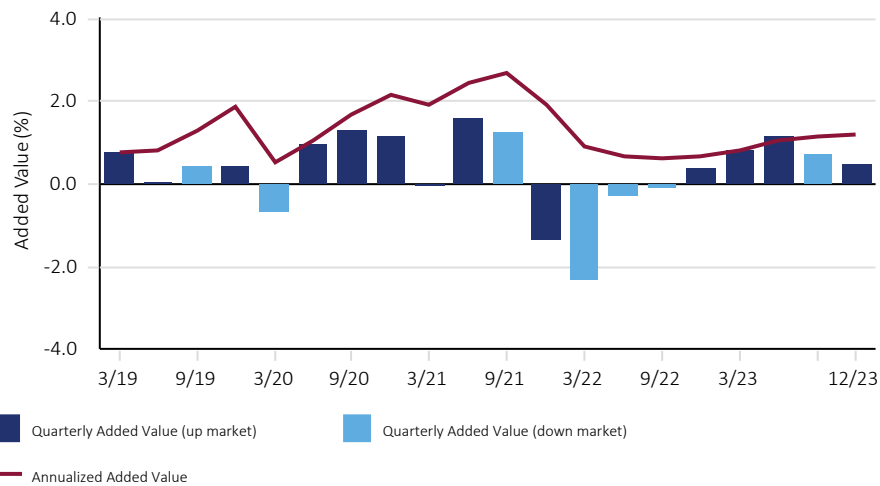
International Equity

Periods Ended December 31, 2023

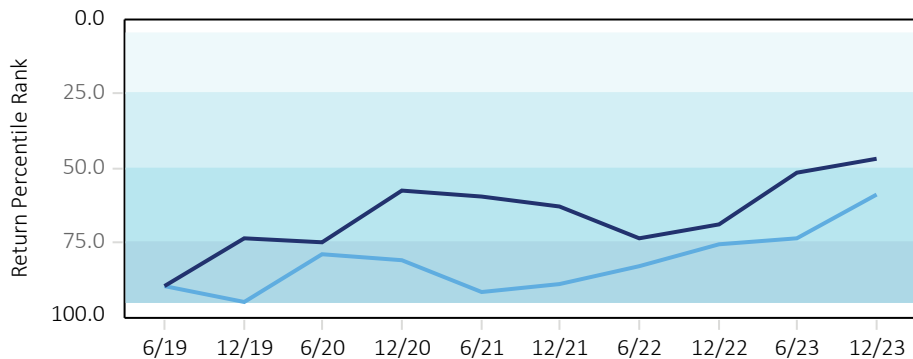
Comparative Performance



Added Value History

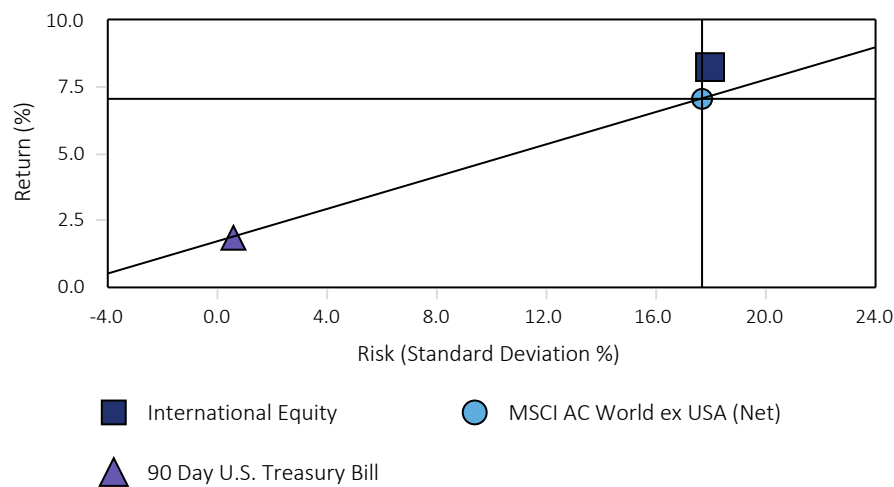


Rolling Percentile Rank: All Public Plans > \$1B-Intl. Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
International Equity	10	0 (0%)	1 (10%)	8 (80%)	1 (10%)
Benchmark	10	0 (0%)	0 (0%)	2 (20%)	8 (80%)

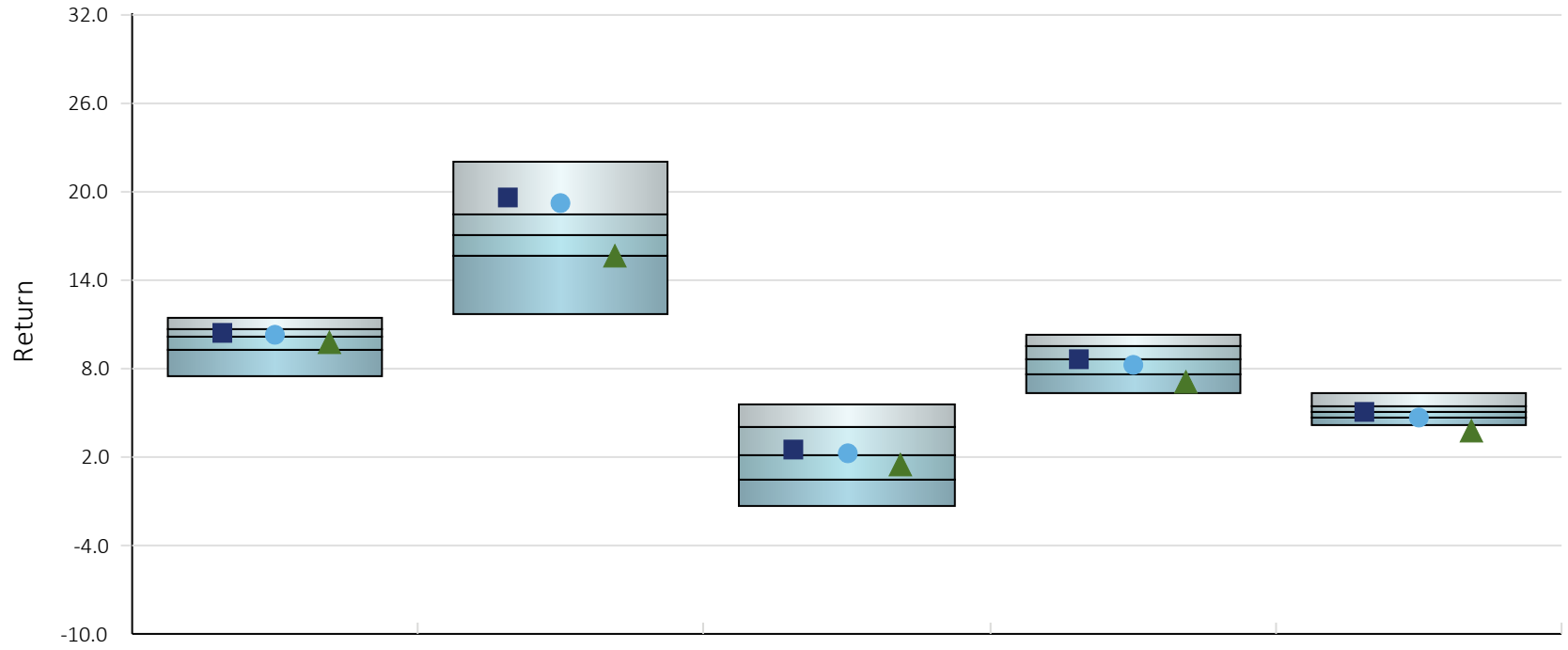
Risk and Return 01/1/19 - 12/31/23



Plan Sponsor Peer Group Analysis

International Equity vs All Public Plans > \$1B-Intl. Equity Segment(Gross)

Periods Ended December 31, 2023



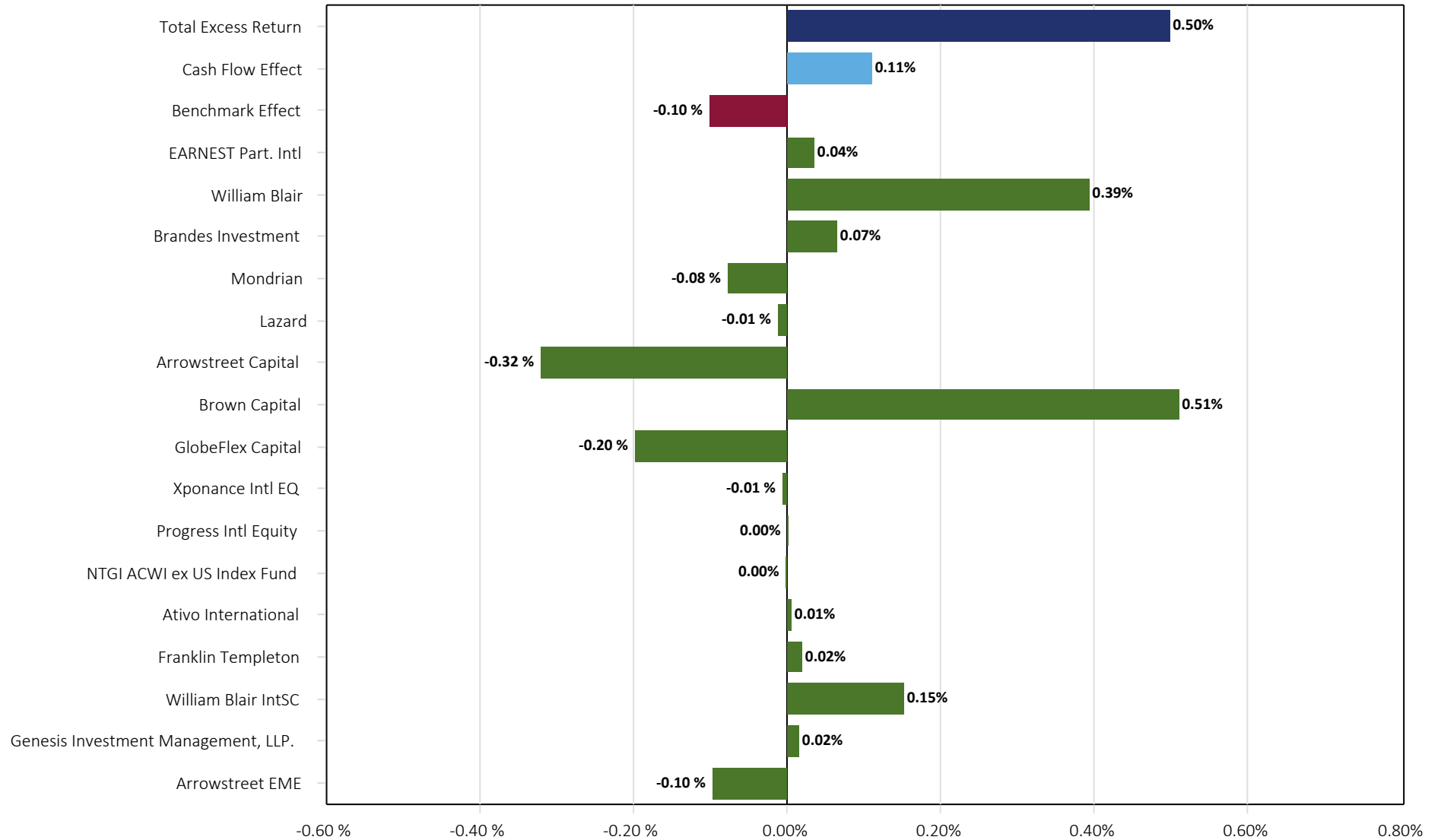
	QTD	1 Year	3 Years	5 Years	10 Years
■ International Equity	10.38 (41)	19.64 (10)	2.56 (38)	8.67 (51)	5.10 (50)
● International Equity - Net	10.25 (46)	19.22 (15)	2.20 (47)	8.29 (62)	4.74 (70)
▲ MSCI AC World ex USA (Net)	9.75 (61)	15.62 (76)	1.55 (59)	7.08 (85)	3.83 (99)
5th Percentile	11.49	22.08	5.60	10.31	6.28
1st Quartile	10.73	18.43	4.06	9.52	5.48
Median	10.17	17.02	2.15	8.68	5.09
3rd Quartile	9.29	15.70	0.41	7.60	4.68
95th Percentile	7.51	11.76	-1.33	6.40	4.12
Population	52	51	50	46	41

Asset Class Attribution

International Equity

Periods Ended 1 Quarter Ending December 31, 2023

1 Quarter



Performance

International Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
International Equity	10,016,813,612	10.38	19.64	2.56	8.67	5.10	7.58	9/1/1986
International Equity - Net		10.25	19.22	2.20	8.29	4.74		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83		
International Equity IMRF Custom Benchmark		9.65	15.11	0.95	6.81			
Intl Large Cap Equity	8,785,273,764	10.35	20.43	4.55	9.45	5.48	7.70	9/1/1986
Intl LargeCap Equity - Net		10.25	20.10	4.26	9.14	5.19		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83		
Intl Large Cap Grwth	1,653,772,166	12.69	18.82	1.31	10.47	5.59	8.23	9/1/2002
Intl Large Cap Grwth - Net		12.42	18.28	0.94	10.11	5.27		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	6.79	
EARNEST Part. Intl	688,997,764	10.78	21.30	7.63	10.79	5.55	8.94	10/1/2004
EARNEST Part. Intl - Net		10.28	20.58	7.27	10.49	5.30		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	5.65	
MSCI AC World ex USA Growth (Net)		11.12	14.03	-2.67	7.49	4.55	6.10	
William Blair	964,774,402	14.09	17.11	-2.38	10.38	5.74	9.09	10/1/2002
William Blair - Net		13.99	16.71	-2.75	9.98	5.35		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	7.38	
MSCI AC World ex USA Growth (Net)		11.12	14.03	-2.67	7.49	4.55	7.39	
Intl Large Cap Val.	1,591,964,060	9.70	25.62	8.19	8.50	5.04	8.41	10/1/1995
Intl Large Cap Val. - Net		9.62	25.26	7.87	8.17	4.68		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	5.16	

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Brandes Investment	754,863,387	10.69	32.15	12.46	9.97	5.75	8.86	1/1/1996
Brandes Investment - Net		10.64	31.90	12.23	9.74	5.51		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	5.08	
MSCI AC World ex USA Value		8.51	18.13	6.51	7.03	3.55		
Mondrian	691,175,397	8.77	20.80	5.38	7.39	4.62	5.54	4/1/2012
Mondrian - Net		8.65	20.33	4.99	6.97	4.16	5.07	
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	4.95	
MSCI AC World ex USA Value		8.51	18.13	6.51	7.03	3.55	4.83	
Lazard	145,925,276	9.06	17.77	2.43	7.63	4.27	5.97	4/1/2012
Lazard - Net		8.99	17.48	2.20	7.38	3.91	5.54	
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	4.95	
MSCI AC World ex USA Value		8.51	18.13	6.51	7.03	3.55	4.83	
Intl Large Cap Active Core	2,865,840,395	9.84	22.15	5.99	10.95	7.03	5.99	2/1/2008
Intl Large Cap Active Core - Net		9.73	21.71	5.54	10.42	6.50		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	3.02	
Arrowstreet Capital	1,236,164,883	7.34	23.32	9.46	14.85	9.09	7.34	3/1/2008
Arrowstreet Capital - Net		7.22	22.78	8.97	14.33	8.59	6.84	
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	2.85	
Brown Capital	611,589,781	18.86	31.79	-0.08	8.99	6.00	7.59	10/1/2004
Brown Capital - Net		18.78	31.48	-0.56	8.43	5.25		
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	5.65	

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
GlobeFlex Capital	912,975,211	7.73	15.51	6.78	8.84	5.86	5.37	3/1/2006
GlobeFlex Capital - Net		7.64	15.14	6.42	8.43	5.46	4.94	
MSCI AC World ex USA (Net)		9.75	15.62	1.55	7.08	3.83	3.99	
Xponance Intl EQ	104,689,348	10.09	18.09				3.03	2/1/2021
Xponance Intl EQ - Net		9.90	17.36				2.42	
MSCI EAFE (Net)		10.42	18.24				4.52	
Progress Intl Equity*	421,171							
Intl Large Cap Passive Core	2,673,697,143	9.76	15.57	2.80	7.56	4.19	4.07	2/1/2000
Intl Large Cap Passive Core - Net		9.76	15.57	2.80	7.56	4.19		
International Large Cap Passive Core Benchmark		9.75	15.62	2.32	7.10	3.77	3.67	
NTGI ACWI ex US Index Fund	2,673,697,143	9.76	15.57				-0.04	10/1/2021
NTGI ACWI ex US Index Fund - Net		9.76	15.57				-0.05	
MSCI AC World ex USA (Net)		9.75	15.62				-0.50	
Intl All Cap Developed	173,689,567	11.00	20.23	4.17			6.24	2/1/2019
Intl All Cap Developed - Net		10.85	19.64	3.65			5.73	
MSCI EAFE + Canada (Net)		10.51	17.94	4.42			7.09	
Ativo International	173,689,567	11.00	20.23	4.17			6.23	2/1/2019
Ativo International - Net		10.85	19.64	3.65			5.73	
MSCI EAFE + Canada (Net)		10.51	17.94	4.42			7.09	
Intl Small Cap Eqty	593,575,147	13.32	18.16	-2.37	8.33	4.80	4.84	12/1/2005
Intl Small Cap Eqty - Net		13.09	17.29	-3.10	7.53	4.01		
MSCI AC World ex USA Small Cap (Net)		10.12	15.66	1.49	7.89	4.88	5.93	
Custom Benchmark (Intl Small Cap)		10.12	15.66	1.49	7.89	4.88	5.37	

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Franklin Templeton	236,392,705	11.14	18.45	1.21	7.26	4.77	5.68	8/1/2011
Franklin Templeton - Net		10.92	17.62	0.49	6.49	4.01	4.92	
MSCI AC World ex USA Small Cap (Net)		10.12	15.66	1.49	7.89	4.88	5.01	
William Blair IntSC	357,182,442	14.81	17.96	-4.48	9.12	4.80	7.83	9/1/2010
William Blair IntSC - Net		14.57	17.07	-5.22	8.29	3.99	7.01	
MSCI AC World ex USA Small Cap (Net)		10.12	15.66	1.49	7.89	4.88	6.51	
Custom Benchmark (Intl Small Cap)		10.12	15.66	1.49	7.89	4.88	6.73	
Emerging Mkt Equity	464,275,133	7.47	12.91	-6.86	4.41	3.08	7.89	2/1/1992
Emerging Mkt Equity - Net		7.15	12.08	-7.43	3.79	2.47		
MSCI Emerging Markets Index		7.93	10.26	-4.71	4.08	3.05	6.35	
Genesis Investment Management, LLP.**	9,929,267	5.88	7.11	-8.49	3.31	2.54	8.49	5/1/2004
Genesis Investment Management, LLP - Net		5.07	5.69	-9.22	2.58	1.87		
MSCI Emerging Markets Index		7.93	10.26	-4.71	4.08	3.05	7.29	
Arrowstreet EME	454,345,866	5.99					14.24	3/1/2023
Arrowstreet EME - Net		5.99					14.24	
MSCI Emerging Markets IMI (Net)		8.02					10.39	

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.

** Genesis is NOF NAV commingled fund.

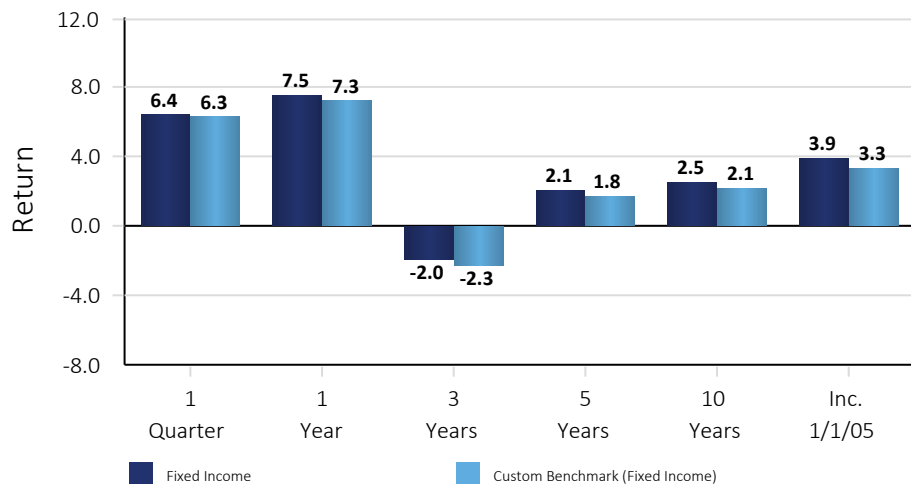
Fixed Income

Composite Performance Summary

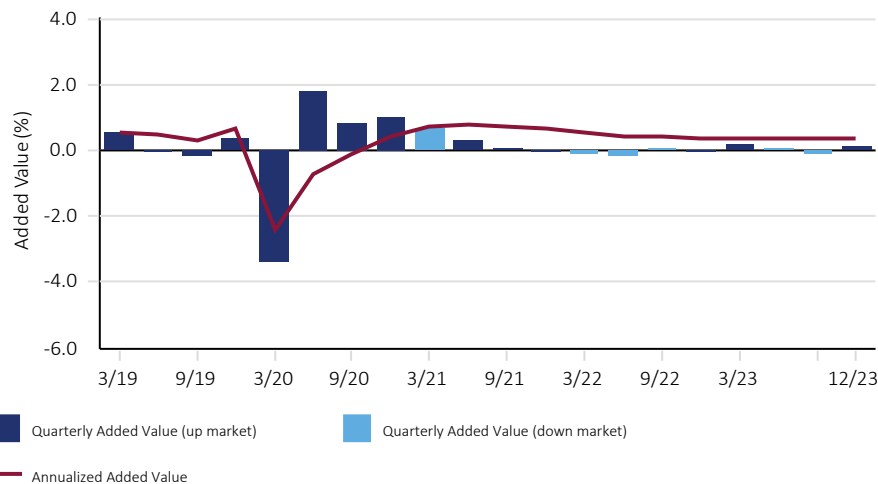
Fixed Income

Periods Ended December 31, 2023

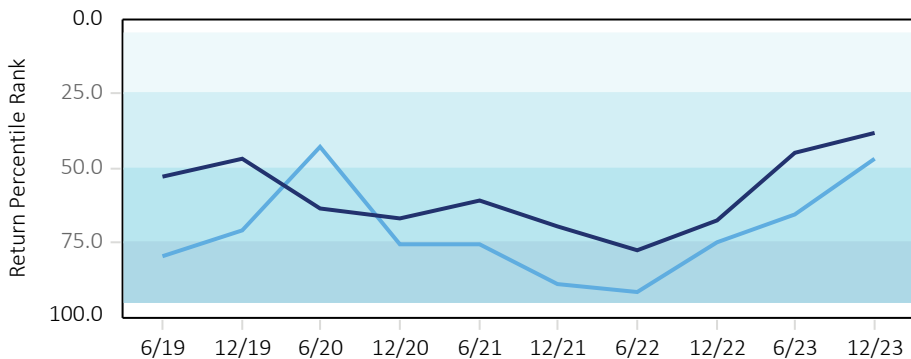
Comparative Performance



Added Value History

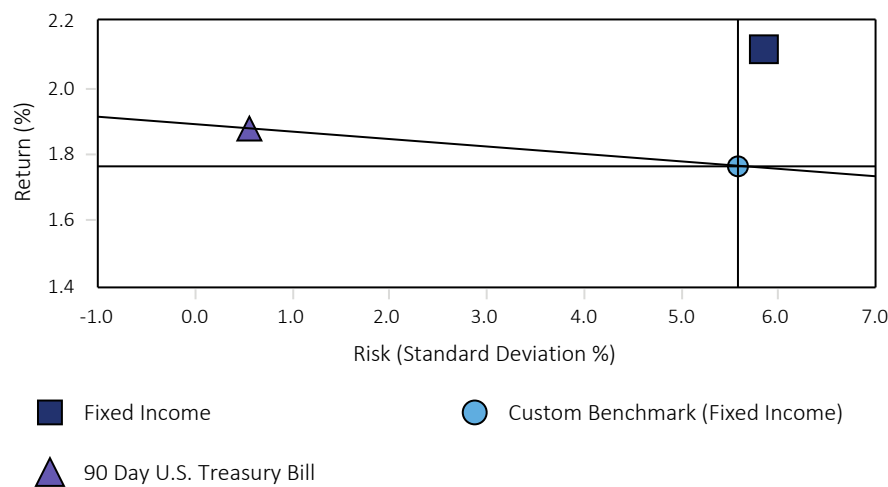


Rolling Percentile Rank: All Public Plans > \$1B-US Fixed Income Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Fixed Income	10	0 (0%)	3 (30%)	6 (60%)	1 (10%)
Benchmark	10	0 (0%)	2 (20%)	3 (30%)	5 (50%)

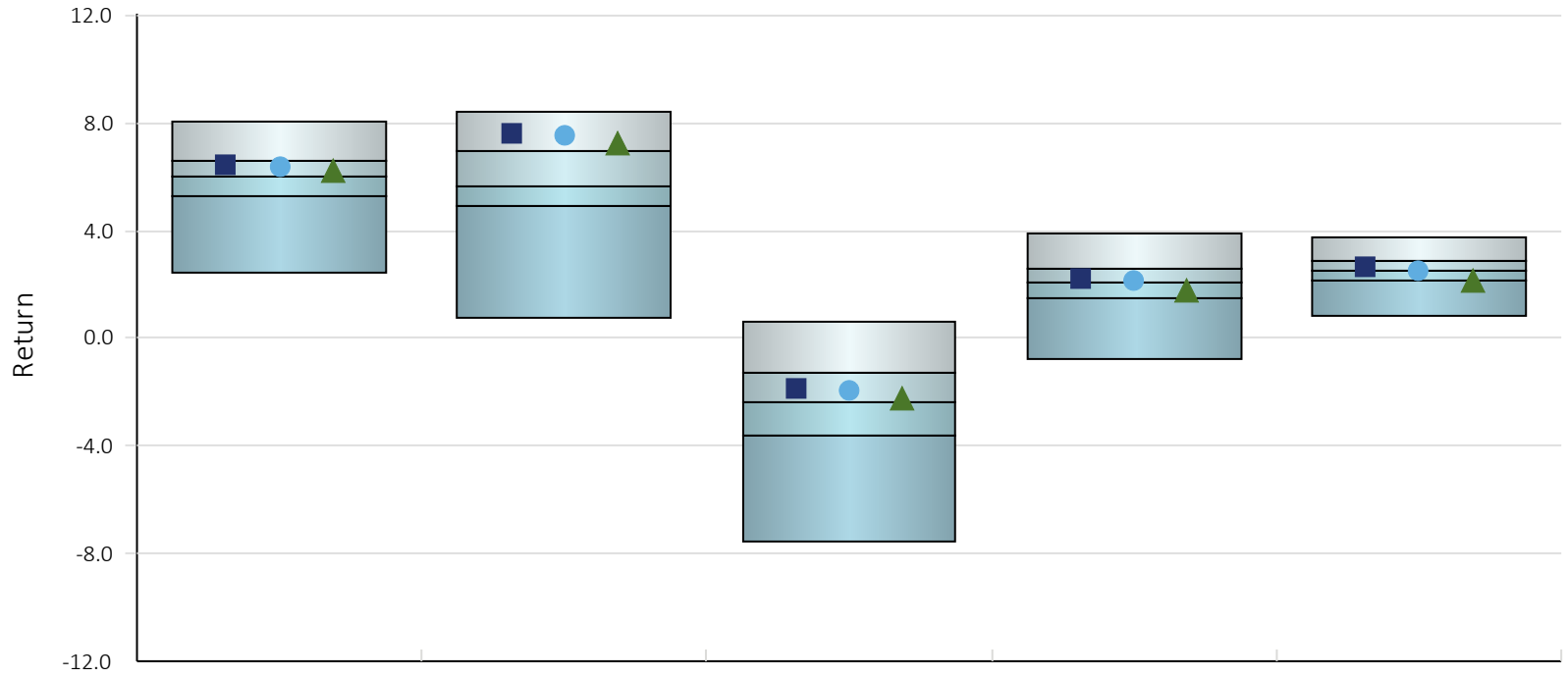
Risk and Return 01/1/19 - 12/31/23



Plan Sponsor Peer Group Analysis

Fixed Income vs All Public Plans > \$1B-US Fixed Income Segment(Gross)

Periods Ended December 31, 2023



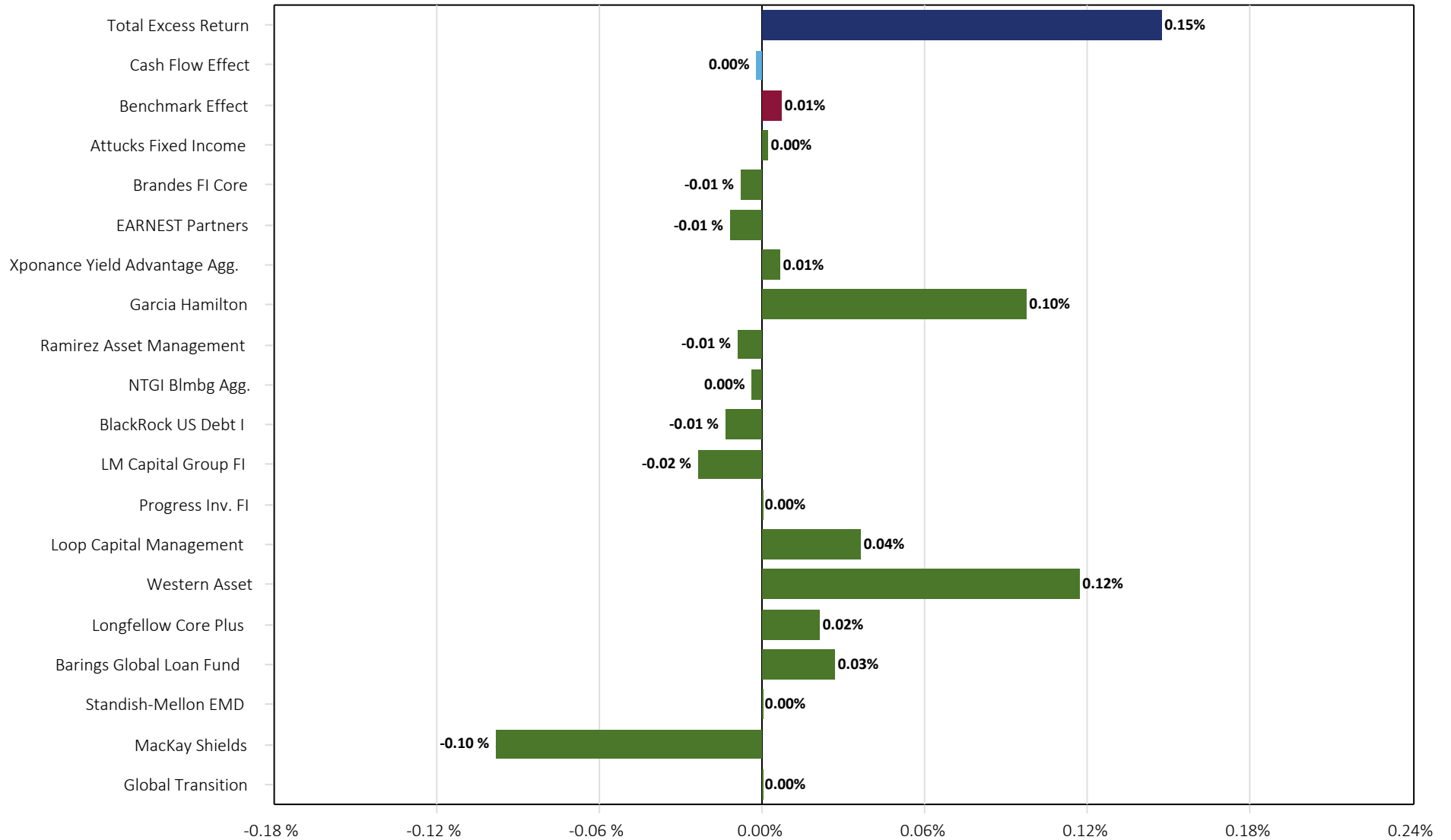
	QTD	1 Year	3 Years	5 Years	10 Years
■ Fixed Income	6.44 (35)	7.62 (16)	-1.88 (36)	2.22 (42)	2.66 (36)
● Fixed Income - Net	6.41 (35)	7.53 (16)	-1.96 (38)	2.12 (45)	2.53 (48)
▲ Custom Benchmark (Fixed Income)	6.27 (41)	7.26 (18)	-2.26 (47)	1.76 (62)	2.14 (76)
5th Percentile	8.08	8.44	0.64	3.94	3.76
1st Quartile	6.59	6.98	-1.25	2.60	2.90
Median	5.99	5.62	-2.40	2.05	2.49
3rd Quartile	5.32	4.92	-3.62	1.49	2.15
95th Percentile	2.43	0.73	-7.52	-0.74	0.82
Population	55	53	51	45	40

Asset Class Attribution

Fixed Income

Periods Ended 1 Quarter Ending December 31, 2023

1 Quarter



Performance

Fixed Income

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Fixed Income	12,462,936,175	6.44	7.62	-1.88	2.22	2.66	7.44	1/1/1982
Fixed Income - Net		6.41	7.53	-1.96	2.12	2.53		
Custom Benchmark (Fixed Income)		6.27	7.26	-2.26	1.76	2.14	6.92	
Fixed Income IMRF Custom Benchmark		6.27	7.27	-2.18	1.85			
Active Fixed Core	3,819,686,373	7.11	5.91	-2.72	1.50	2.26	3.74	4/1/2001
Active Fixed Core - Net		7.07	5.79	-2.83	1.39	2.13		
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.64	
Attucks Fixed Income	91,931,715	7.24	6.69				-2.82	2/1/2021
Attucks Fixed Income - Net		7.16	6.34				-3.12	
Blmbg. U.S. Aggregate Index		6.82	5.53				-3.17	
Brandes FI Core	339,802,730	6.55	6.22	-2.13	1.65		1.48	3/1/2016
Brandes FI Core - Net		6.54	6.18	-2.16	1.64		1.47	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10		1.22	
EARNEST Partners	904,584,091	6.70	5.74	-2.68	1.42	2.29	3.55	5/1/2005
EARNEST Partners - Net		6.66	5.60	-2.81	1.29	2.13	3.37	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.12	
Xponance Yield Advantage Agg.	985,330,393	6.94	6.49	-2.57	1.77	2.27	3.44	6/1/2005
Xponance Yield Advantage Agg. - Net		6.90	6.35	-2.70	1.64	2.13	3.27	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.07	
Garcia Hamilton	972,000,396	8.11	5.16	-3.07	1.22		1.67	6/1/2015
Garcia Hamilton - Net		8.08	5.08	-3.14	1.14		1.58	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10		1.31	

Loop Capital, Canada, Habacht switched from core to core plus effective 10/01/2010.

* Custom Benchmark is Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Performance

Fixed Income

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Ramirez Asset Management	526,037,048	6.64	6.19	-2.59				
Ramirez Asset Management - Net		6.60	6.04	-2.73			-0.63	5/1/2020
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31			-2.09	
Pass. Core Fixed Income	2,851,200,182	6.74	5.62	-3.28	1.16	1.88	5.13	1/1/1990
Pass. Core Fixed Income - Net		6.74	5.62	-3.29	1.15	1.87		
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	5.11	
BlackRock US Debt I	1,689,831,118	6.72	5.69	-3.27	1.17	1.91	1.85	10/1/2013
BlackRock US Debt I - Net		6.72	5.69	-3.28	1.17	1.91	1.85	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	1.75	
NTGI Blmbg Agg.	1,161,369,064	6.77	5.52	-3.29	1.14	1.85	5.17	2/1/1990
NTGI Blmbg Agg. - Net		6.77	5.51	-3.29	1.14	1.85		
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	5.16	
Core Plus Fixed Income	2,981,693,196	7.50	6.87	-3.02	1.99	2.58	7.27	1/1/1982
Core Plus Fixed Income - Net		7.46	6.72	-3.16	1.83	2.41		
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	6.84	
LM Capital Group FI	850,849,565	6.52	6.25	-2.64	2.32	2.52	3.94	5/1/2005
LM Capital Group FI - Net		6.47	6.08	-2.80	2.15	2.36	3.77	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.12	
Progress Inv. FI								
Loop Capital Management	586,811,374	7.64	7.72	-2.44	1.98	2.82	3.98	5/1/2005
Loop Capital Management - Net		7.60	7.58	-2.57	1.84	2.68	3.85	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.12	

Loop Capital, Canada, Habacht switched from core to core plus effective 10/01/2010.

* Custom Benchmark is Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Performance

Fixed Income

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Western Asset	965,808,111	8.39	7.07	-3.85	1.75	2.71	4.42	11/1/2001
Western Asset - Net		8.35	6.92	-3.98	1.63	2.57		
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31	1.10	1.81	3.40	
Longfellow Core Plus	578,224,146	7.32	6.62	-2.41			-0.51	5/1/2020
Longfellow Core Plus - Net		7.28	6.46	-2.56			-0.65	
Blmbg. U.S. Aggregate Index		6.82	5.53	-3.31			-2.09	
Bank Loans	1,686,188,968	2.88	13.17	5.10	5.08		4.52	8/1/2014
Bank Loans - Net		2.92	13.32	5.19	5.09		4.26	
Barings Custom Benchmark		2.73	13.45	5.76	5.69		4.61	
Barings Global Loan Fund	1,686,188,968	2.88	13.17	5.10	5.08		4.52	8/1/2014
Barings Global Loan Fund - Net		2.92	13.32	5.19	5.09		4.26	
Barings Custom Benchmark*		2.73	13.45	5.76	5.69		4.61	
Emerging Markets Debt	333,489							
Standish-Mellon EMD	333,489							
High Yield	1,123,833,967	6.09	12.58	3.61	6.46	5.59	9.00	4/1/1986
High Yield - Net		6.01	12.24	3.29	6.12	5.24		
ICE BofA U.S. High Yield, Cash Pay Index		7.08	13.40	2.01	5.22	4.51	7.75	
MacKay Shields	1,123,833,967	6.09	12.58	3.61	6.46	5.64	8.09	11/1/2000
MacKay Shields - Net		6.01	12.24	3.29	6.13	5.29		
ICE BofA U.S. High Yield, Cash Pay Index		7.08	13.40	2.01	5.22	4.51	6.80	

Loop Capital, Canada, Habacht switched from core to core plus effective 10/01/2010.

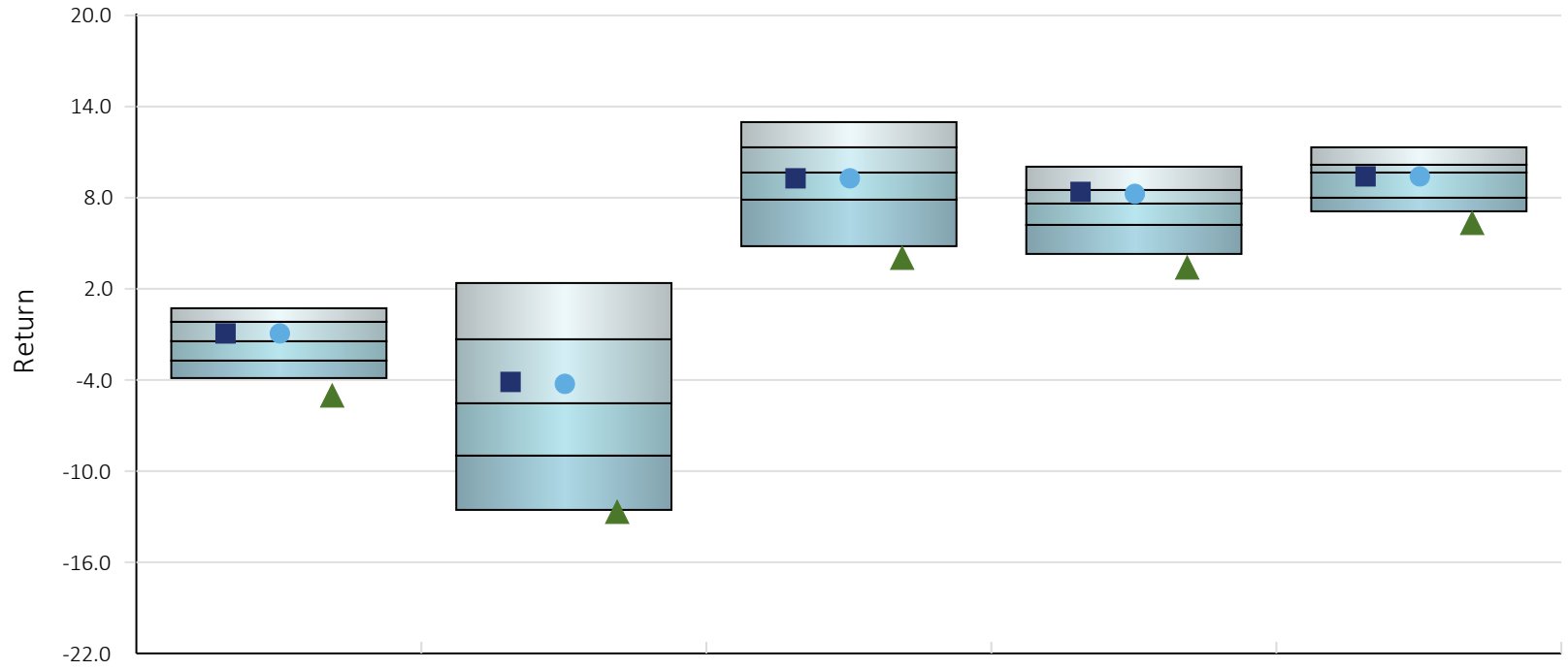
* Custom Benchmark is Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Private Real Assets

Plan Sponsor Peer Group Analysis

Real Estate vs All Public Plans > \$1B-Real Estate Segment(Gross)

Periods Ended December 31, 2023



	QTD	1 Year	3 Years	5 Years	10 Years
■ Real Estate	-0.94 (44)	-4.15 (42)	9.32 (59)	8.37 (34)	9.46 (63)
● Real Estate - Net	-0.96 (44)	-4.21 (43)	9.25 (60)	8.31 (35)	9.43 (63)
▲ Blended Benchmark (Real Estate)	-5.00 (97)	-12.73 (96)	4.01 (99)	3.34 (100)	6.33 (100)
5th Percentile	0.67	2.33	12.93	10.00	11.38
1st Quartile	-0.18	-1.32	11.33	8.53	10.14
Median	-1.42	-5.51	9.62	7.56	9.70
3rd Quartile	-2.67	-9.03	7.89	6.27	8.03
95th Percentile	-3.85	-12.56	4.84	4.26	7.10
Population	43	38	33	25	14

Asset Allocation & Performance

Private Real Assets

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Private Real Assets	5,021,464,490	-0.94	-3.43				1.78	3/1/2022
Private Real Assets- Net		-0.96	-3.50				1.71	
Custom Benchmark (Private Real Assets)		-4.72	-11.80				-3.29	
Real Estate	4,478,141,361	-0.94	-4.15	9.32	8.37	9.46	5.81	5/1/1985
Real Estate - Net		-0.96	-4.21	9.25	8.31	9.43		
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	7.21	
Real Estate Core Cmp	2,190,937,105	-1.13	-5.04	9.42	9.37	9.67	7.70	4/1/1999
TA Assoc. Buckhead	913,362,289	2.65	4.22	18.00	15.84	13.82	11.52	8/1/1995
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	6.78	
Barings Euro Core Property	132,355,045	1.48	-6.37	-2.22	8.80		8.20	3/1/2017
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34		4.33	
Blackstone Property Euro	182,626,570	1.96	-1.17	6.38	8.49		7.32	12/1/2017
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34		4.05	
INVESCO Core Real Estate	213,383,622	-6.33	-12.86	3.84	2.78	6.20	7.21	4/1/2011
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	7.75	
INVESCO European real estate	54,905,426	-1.48	-3.53	-5.42	-0.61		-1.41	4/1/2018
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34		3.83	
AEW Core Property Tr	248,566,122	-3.84	-10.76	5.32	4.38	6.33	6.81	10/1/2013
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	6.47	
CBRE Core Partners	274,719,455	-8.15	-17.70	8.98	7.71	9.14	9.06	12/1/2013
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	6.38	

Returns are time-weighted and are reported net of fee for all real estate managers.

The Blended Benchmark (Real Estate) is currently the NCREIF ODCE VW Net Index. Prior to January 1, 2013, it was the NCREIF Property Index + 1%. Returns prior to January, 2007, reflect those of Consumer Price Index + 5%.

Asset Allocation & Performance

Private Real Assets

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
JPM Strategic Property Fund	171,018,576	-2.60	-10.51	4.90			4.90	1/1/2021
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01			4.01	
RE Non-Core Cmp	2,287,204,256	-0.77	-3.13	9.20	7.25	9.30	10.36	1/1/2010
Artemis MWBE Spruce	382,620,064	-2.16	-5.77	6.25	6.96		4.76	6/1/2016
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34		4.63	
Franklin T. EMREFF	1,066,392	-55.56	-62.85	-37.56	-30.17	-10.13	-7.48	9/1/2011
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	7.46	
Security Capital	99,527,333	16.85	11.98	6.33	8.23	6.91		7/1/1997
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	6.72	
Dune II	6,961,990	2.09	7.56	9.13	3.02	7.72	5.69	2/1/2009
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	6.72	
Non-Core Real Estate Funds	1,510,403,888	-1.44	-2.62	12.37	8.68	10.55	10.32	10/1/2011
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34	6.33	7.41	
Almanac ARS V	69,853							
Non-Core Intl Real Estate	286,554,736	-0.21	-6.78	-1.10	1.46		-1.40	8/1/2014
Blended Benchmark (Real Estate)		-5.00	-12.73	4.01	3.34		6.07	

Returns are time-weighted and are reported net of fee for all real estate managers.

The Blended Benchmark (Real Estate) is currently the NCREIF ODCE VW Net Index. Prior to January 1, 2013, it was the NCREIF Property Index + 1%. Returns prior to January, 2007, reflect those of Consumer Price Index + 5%.

Asset Allocation & Performance

Private Real Assets

Periods Ended December 31, 2023

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Agriculture	238,379,349	-10.10	-8.09	-0.62	-0.65	3.29	5.98	10/1/1997
NCREIF Farmland Index		2.27	4.96	7.46	6.04	7.30	10.96	
Premiere Partners IV	238,379,349	-10.10	-8.09	-0.62	-0.65		1.18	3/1/2015
Timberland	70,365,782	19.96	26.14	11.16	7.71	5.16	7.61	10/1/1992
NCREIF Timberland Index		4.34	9.45	10.50	6.62	5.77	8.54	
Forest Investment	70,365,782	19.96	26.14	11.16	7.71	5.21	7.75	10/1/1992
Blended Benchmark (Timberland)		0.64	7.49	8.24	5.31	5.12	8.32	
Unlisted Infrastructure	234,577,998	4.98	16.38	13.25	13.04		12.77	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		0.64	7.49	8.71	8.82		8.85	
Unlisted Infrastructure Funds	234,577,998	4.98	16.38	13.25	13.04		12.77	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		0.64	7.49	8.71	8.82		8.85	

Returns are time-weighted and are reported net of fee for all real estate managers.

The Blended Benchmark (Real Estate) is currently the NCREIF ODCE VW Net Index. Prior to January 1, 2013, it was the NCREIF Property Index + 1%. Returns prior to January, 2007, reflect those of Consumer Price Index + 5%.

Alternative Investments

Asset Allocation & Performance

Alternatives Investments

Periods Ended December 31, 2023

	Allocation	Performance (%)						
	Market Value \$	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Alternatives Investments	5,533,343,691	-0.71	2.60	16.19	14.04	12.29	11.31	2/1/1986
Custom Benchmark (Alternative Investments)		-2.42	25.15	3.77	5.83	7.40	11.83	
Absolute Return	54,766							
Aurora Investment	54,766							
Private Equity	5,281,362,992	-0.57	2.61	18.56	16.36	14.90	13.54	2/1/1986
Blended Benchmark (Private Equity)		-2.75	25.61	3.45	5.63	7.30		
Abbott S/A Comp.	494,830,619	-0.19	1.97	19.40	16.76	15.09	14.37	6/1/1987
Muller Monroe MPEFF								
Pantheon S/A Comp.	418,490,497	0.82	0.52	16.11	15.56	14.46	11.14	10/1/2000
Private Equity Fund - Domestic	3,403,253,000	-1.97	-0.44	18.55	17.42	16.27	13.97	6/1/2012
Private Equity Fund - International	696,520,029	4.92	23.63	20.97	15.89		1.11	7/1/2015
Oakbrook Opportunities Fund	268,268,848	0.77	2.54	15.32			7.50	6/1/2019
Private Credit	251,925,933	-5.46	1.70	-0.26			-0.98	10/1/2019
Private Credit Fund - Domestic	249,394,707	-5.46	1.69	-0.26			-0.98	10/1/2019
Private Credit Fund - International	2,531,226							12/1/2023

Private Equity and Blended Benchmark (Private Equity) returns are 1 quarter lagged.

Manager Watch List

As of December 31, 2023

Organization

Investment Manager	Asset Class	Effective Date	Resolution
Ativo	International Equity - All Cap	August 2023	

Appendix

Asset Class Returns

Periods Ended December 31, 2023

	Performance (%)										
	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Total Fund	13.42	-12.77	16.82	14.98	19.77	-4.23	16.02	8.01	0.53	6.15	20.20
Total Fund - Net	13.24	-12.90	16.63	14.79	19.57	-4.40	15.78	7.77	0.29	5.90	19.94
Total Fund Benchmark	14.28	-13.26	13.48	13.16	18.68	-3.12	14.37	7.89	1.37	7.33	15.84
Domestic Equity	23.30	-19.12	24.89	22.07	29.23	-6.08	19.83	12.62	0.04	9.81	37.65
Domestic Equity - Net	23.10	-19.25	24.69	21.86	29.00	-6.25	19.59	12.35	-0.22	9.54	37.32
Blended Benchmark (U.S. Equity)	24.16	-18.53	25.66	20.89	31.02	-5.24	21.13	12.74	0.48	12.47	33.47
U.S. Equity IMRF Custom Benchmark	21.36	-18.21	25.68	18.00	29.67	-6.79	18.08	15.43			
International Equity	19.64	-17.86	9.78	13.52	23.76	-14.13	27.95	3.56	-1.90	-2.80	20.24
International Equity - Net	19.22	-18.14	9.37	13.08	23.39	-14.41	27.52	3.21	-2.23	-3.10	19.87
MSCI AC World ex USA (Net)	15.62	-16.00	7.82	10.65	21.51	-14.20	27.19	4.50	-5.66	-3.87	15.29
International Equity IMRF Custom Benchmark	15.11	-16.70	7.30	11.30	21.37	-14.36	27.79	3.92			
Fixed Income	7.62	-11.83	-0.44	7.87	9.50	-0.24	4.82	4.87	0.25	5.97	-0.59
Fixed Income - Net	7.53	-11.90	-0.53	7.75	9.37	-0.39	4.66	4.71	0.10	5.81	-0.75
Blmbg. U.S. Aggregate Index	5.53	-13.01	-1.55	7.51	8.72	0.01	3.54	2.65	0.55	5.97	-2.02
Fixed Income IMRF Custom Benchmark	7.27	-11.98	-0.85	7.29	9.14	-0.08	3.98	3.89			
Private Real Assets	-3.50										
Custom Benchmark (Private Real Assets)	-11.80										
Real Estate	-4.15	11.77	21.95	4.20	9.81	8.36	10.03	8.97	12.54	13.02	10.82
Real Estate - Net	-4.21	11.71	21.88	4.16	9.76	8.36	10.03	8.97	12.46	13.02	10.82
Blended Benchmark (Real Estate)	-12.73	6.54	21.02	0.34	4.39	7.36	6.66	7.79	13.95	11.46	12.90
Agriculture	-8.09	3.98	2.69	4.69	-5.82	0.28	-4.58	-0.47	20.18	24.73	25.68
NCREIF Farmland Index	4.96	9.64	7.83	3.08	4.81	6.74	6.19	7.09	10.35	12.63	20.91
Timberland	26.14	11.94	-2.72	4.51	1.00	-3.62	4.68	-4.58	4.99	12.83	9.14
NCREIF Timberland Index	9.45	12.90	9.17	0.81	1.30	3.21	3.63	2.59	4.97	10.48	9.69
Unlisted Infrastruct	16.38	11.76	11.68	15.90	9.65						
Blended Benchmark (Unlisted Infrastructure)	7.49	9.65	9.00	9.00	9.00						

Benchmark definitions are in the glossary.

Private Equity, Agriculture, Timberland, Unlisted Infrastructure returns shown are gross of fees.

Asset Class Returns

Periods Ended December 31, 2023

	Performance (%)										
	YTD	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Alternatives Investments	2.60	4.39	46.46	12.31	9.48	17.32	12.09	5.32	6.90	11.63	12.11
Alternative Investments - Net	2.60	4.38	46.44	12.27	9.43	17.14	11.91	5.00	6.47	11.16	11.86
Custom Benchmark (Alternative Investments)	25.15	-18.08	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Private Equity	2.61	5.36	54.15	14.50	11.78	21.46	15.61	8.60	8.41	13.72	14.13
Blended Benchmark (Private Equity)	25.61	-19.14	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Cash	5.23	3.18	2.44	2.56	3.59	2.36	1.67	0.63	0.29	0.17	0.11
90 Day U.S. Treasury Bill	5.02	1.46	0.05	0.67	2.28	1.87	0.86	0.25	0.03	0.04	0.05

Benchmark definitions are in the glossary.

Private Equity, Agriculture, Timberland, Unlisted Infrastructure returns shown are gross of fees.

Benchmark Definitions

Account Name	From Date	To Date	Benchmark
Domestic Equity Custom	3/1/2022	Present	93% Russell 3000 Index, 7% FTSE Global Core Infrastructure 50/50 Index (Net)
Benchmark	1/1/2015	2/28/2022	100% Russell 3000 Index
	1/1/1982	12/31/2014	100% Dow Jones US Total Stock Market Index
Real Estate Blended	1/1/2013	Present	100% NCREIF Fund Index-ODCE (VW) (Net)**
Benchmark	1/1/2007	12/31/2012	100% NPI + 1%
	1/1/2005	12/31/2016	100% Consumer Price Index + 5%
Alternatives Custom	3/1/2022	Present	95% MSCI World World Index (Net) 1 Qtr Lagged +3%, 5% S&P LSTA Leveraged Loan 100 Index +2%
Benchmark	7/1/2010	2/28/2022	100% Annualized rate of 9.0%
	1/1/2004	6/30/2010	100% Annualized rate of 12.0%
	1/1/2003	12/31/2003	100% Annualized rate of 13.0%
	2/1/1986	12/31/2002	100% Annualized rate of 15.0%
U.S. Equity IMRF Custom Benchmark			Blend of the U.S. Equity Style benchmarks returns, dollar weighted by the actual allocation at pervious month end.
International Equity IMRF Custom Benchmark			Blend of the the International Equity Style benchmarks returns, dollar weighted by the actual allocation at previous month end.
Fixed Income IMRF Custom Benchmark			Blend of the the Fixed Income Style benchmarks returns, dollar weighted by the actual allocation at previous month end.

**ODCE returns are updated quarterly.

Benchmark Definitions

Account Name	From Date	To Date	Benchmark
Fixed Income Custom Benchmark	3/1/2022	Present	78% Bloomberg U.S. Aggregate, 14% Custom Barings Global Loan Benchmark, 8% ICE BofAML U.S. High Yield Cash Pay Index
	1/1/1976	2/28/2022	100% Bloomberg U.S. Aggregate
Private Real Assets Custom Benchmark	3/1/2022	Present	95% NCREIF Fund Index-ODCE (VW) (Net)**, 5% Consumer Price Index +4%
Unlisted Infrastructure Blended Benchmark	3/1/2022	Present	100% Consumer Price Index +4%
	4/1/2018	2/28/2022	100% Alternatives Custom Benchmark
Private Equity Blended Benchmark	3/1/2022	Present	100% MSCI World World Index (Net) 1 Qtr Lagged +3%
	2/1/1996	2/28/2022	100% Alternatives Custom Benchmark

**ODCE returns are updated quarterly.

Benchmark Definitions

Account Name	From Date	To Date	Benchmark
Total Fund Benchmark			The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset class:
	3/1/2022	Present	35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18% MSCI AC World ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.
	1/1/2021	2/28/2022	39% Russell 3000 Index, 25% Blmbg. Barc. U.S. Aggregate, 15% MSCI AC World ex USA (Net), 10% NCREIF Fund Index-ODCE (VW) (Net), 10% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.
	3/1/2018	12/31/2020	37% Russell 3000 Index, 28% Blmbg. Barc. U.S. Aggregate, 18% MSCI AC World ex USA (Net), 9% NCREIF Fund Index-ODCE (VW) (Net), 7% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.