

Wilshire



Wilshire Advisors

Executive Summary of Investment Performance

As of June 30, 2024

IMRF's Performance Summary

- IMRF's market value as of June 2024 \$54.0 billion.
- IMRF's total fund return for 2Q 2024: 0.73% vs the Total Fund Benchmark return of 2.28%.
- U.S. equity markets posted positive returns for the quarter, although many sectors performed negatively.
- IMRF's U.S. Equity Portfolio underperformed the benchmark during the quarter, returning 1.01% versus 3.05%.
- International equity markets were mixed for the quarter, with emerging markets outperforming developed.
- IMRF's International Equity Portfolio underperformed the benchmark during the quarter, returning 0.89% versus 0.96%.
- During the quarter, the U.S. Treasury yield curve was up across most of the maturity spectrum and credit spreads were up with high yield bond spreads up 10 basis points after falling below 3% in March.
- IMRF's Fixed Income Portfolio outperformed the benchmark during the quarter, returning 0.49% versus 0.34%.
- 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 3.3% for the second quarter and is up 13.6% for the year-to-date. A majority of sectors were negative, however, with the best performing being technology (+12.5%) and the worst being materials (-5.5%) and industrials (-3.3%). Small-cap underperformed large-cap by 850 basis points while growth stocks generally outperformed value.

As yields began to rise in early 2022, few were immune to the consequences of higher debt service payments, including the U.S. government. Higher rates and the size of the total U.S. debt – currently 120% of annual gross domestic product (GDP) – has resulted in net interest payments rising to equal 13% of the annual U.S. budget, roughly equal to the dollars spent on national defense and Medicare. A recent report by the non-partisan Congressional Budget Office (CBO) projects interest costs to continue to grow as deficits are expected for the next ten years. The CBO forecasts deficits to remain greater than 5% of annual GDP, which would be “more than the 3.7 percent that deficits have averaged over the past 50 years.”

Non-U.S. Equity

New data in England shows that the country has recovered from a mild recession last year, albeit at a tepid pace. Prospects in Germany are dimming due to global trade conflicts that are weighing on the industrial sector. Economic activity in China remains uneven as manufacturing activity fell in June while services slipped to a five-month low. Many expect the Chinese government to offer policy support in the short term.

Fixed Income

The U.S. Treasury yield curve was up across most of the maturity spectrum during the quarter. The 10-year Treasury yield ended the quarter at 4.40%, up 20 basis points. Credit spreads were up during the quarter with high yield bond spreads up 10 basis points after falling below 3% in March. The FOMC left the overnight rate unchanged while their “dot plot” is messaging that the current expectation is for a modest decrease in rates in 2024. Fed Chair Jerome Powell said about rates, “Fortunately, we have a strong economy and we have the ability to approach this question carefully.”

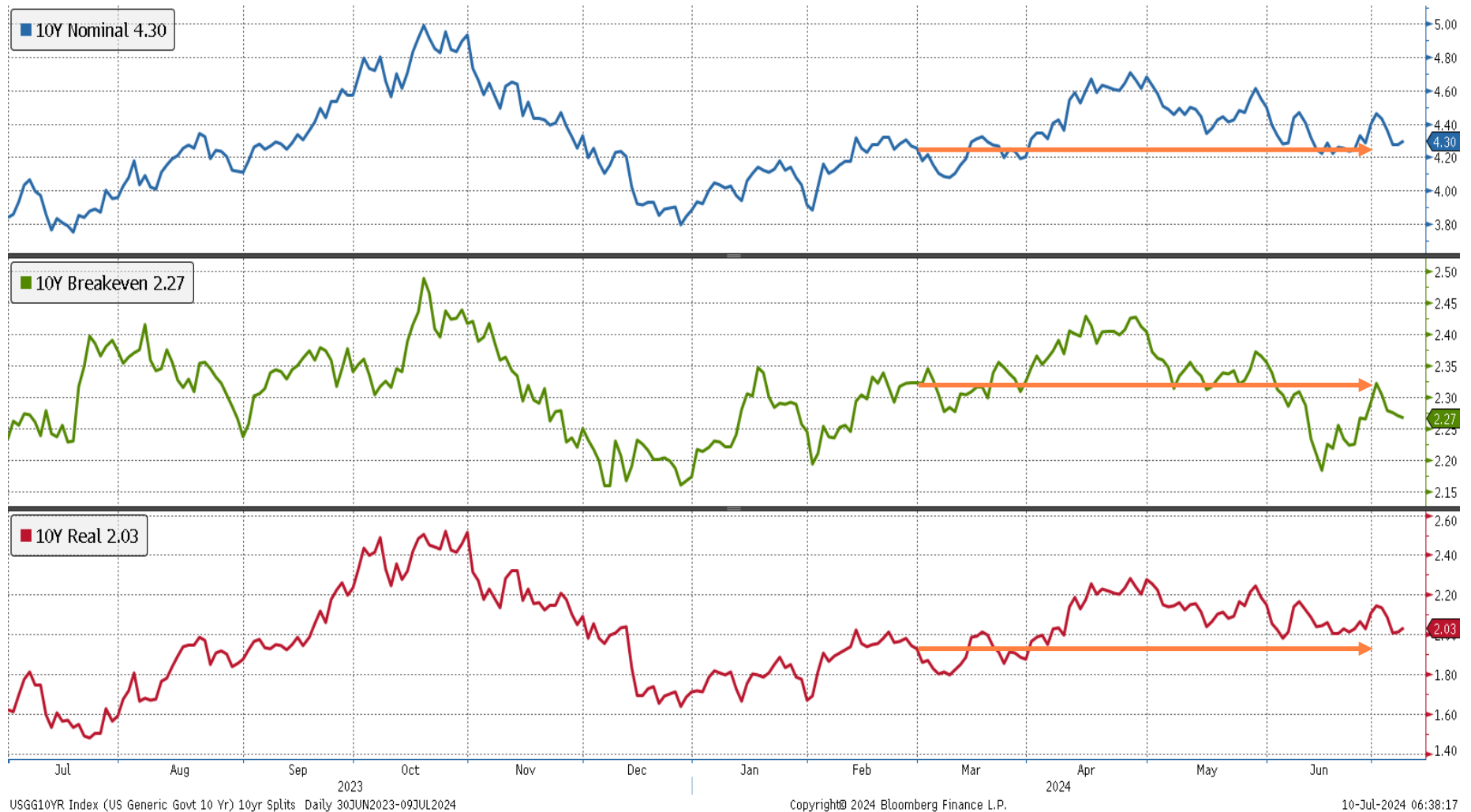
June 2024 Asset Class Assumptions

	Equity						Fixed Income						Dev ex-U.S. Bond (Hdg)	Real Assets					U.S. CPI
	U.S. Stock	Dev ex-U.S. Stock	Emg Stock	Global ex-U.S. Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit		U.S. RES	Global RES	Private RE	Cmdty	Real Assets	
Compound Return (%)	4.50	5.50	5.75	5.85	5.10	7.45	4.00	5.25	5.20	4.60	6.50	8.20	3.20	5.85	6.00	6.25	6.30	7.00	2.30
Arithmetic Return (%)	5.85	7.00	8.75	7.50	6.45	11.20	4.00	5.35	5.65	4.75	6.95	8.95	3.30	7.25	7.25	7.15	7.45	7.75	2.30
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
Yield (%)	1.35	3.00	2.35	2.80	1.90	0.00	4.00	5.65	5.70	4.85	9.90	5.10	4.10	4.15	4.15	2.70	4.00	3.70	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	-1.00	3.00	0.10	-1.85	-4.25	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

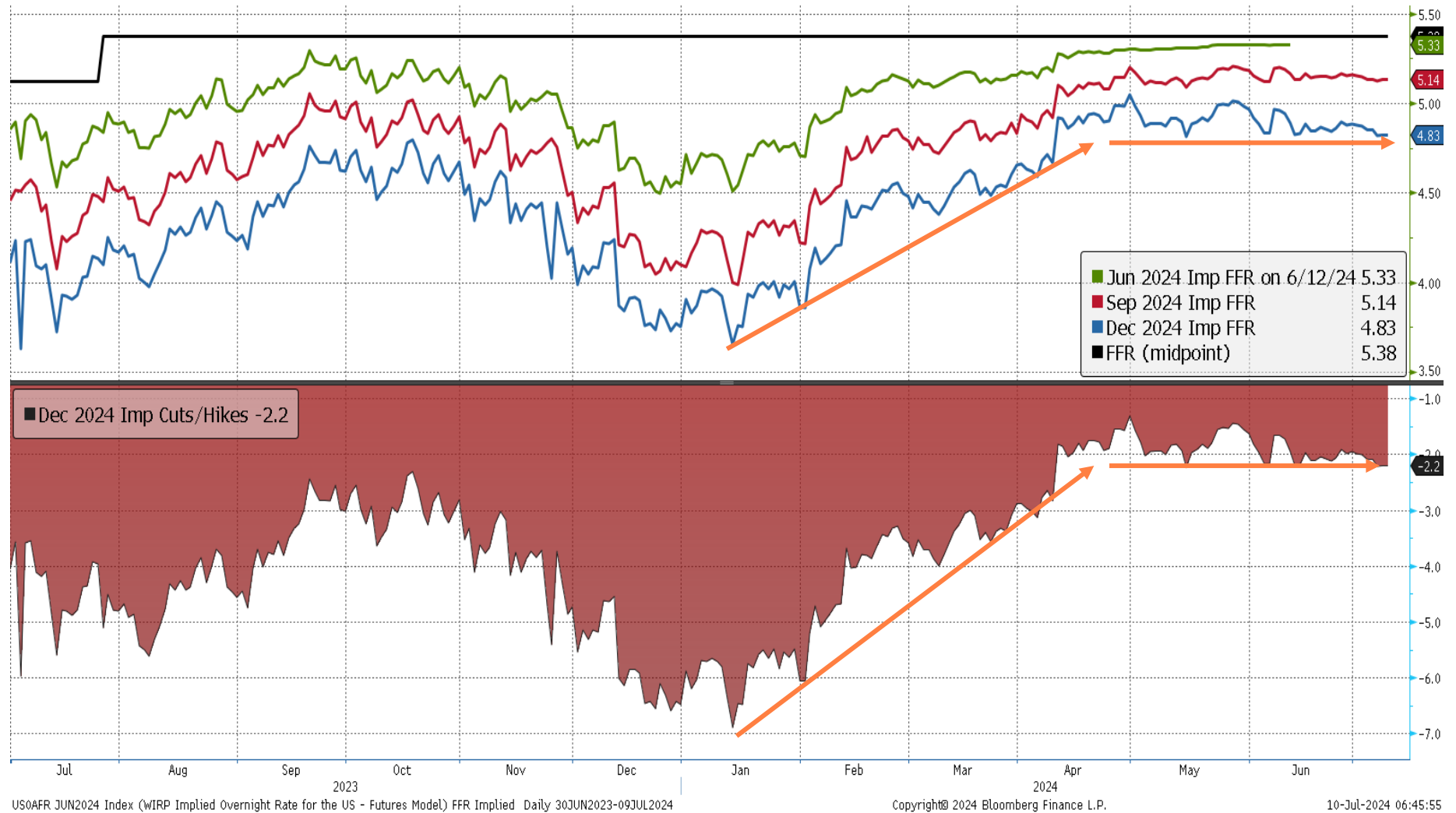
U.S. Stock	1.00																		
Dev ex-U.S. Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-U.S. Stock	0.84	0.95	0.89	1.00															
Global Stock	0.95	0.91	0.84	0.94	1.00														
Private Equity	0.72	0.63	0.61	0.67	0.73	1.00													
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-U.S. 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						
U.S. 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

The Rate Environment



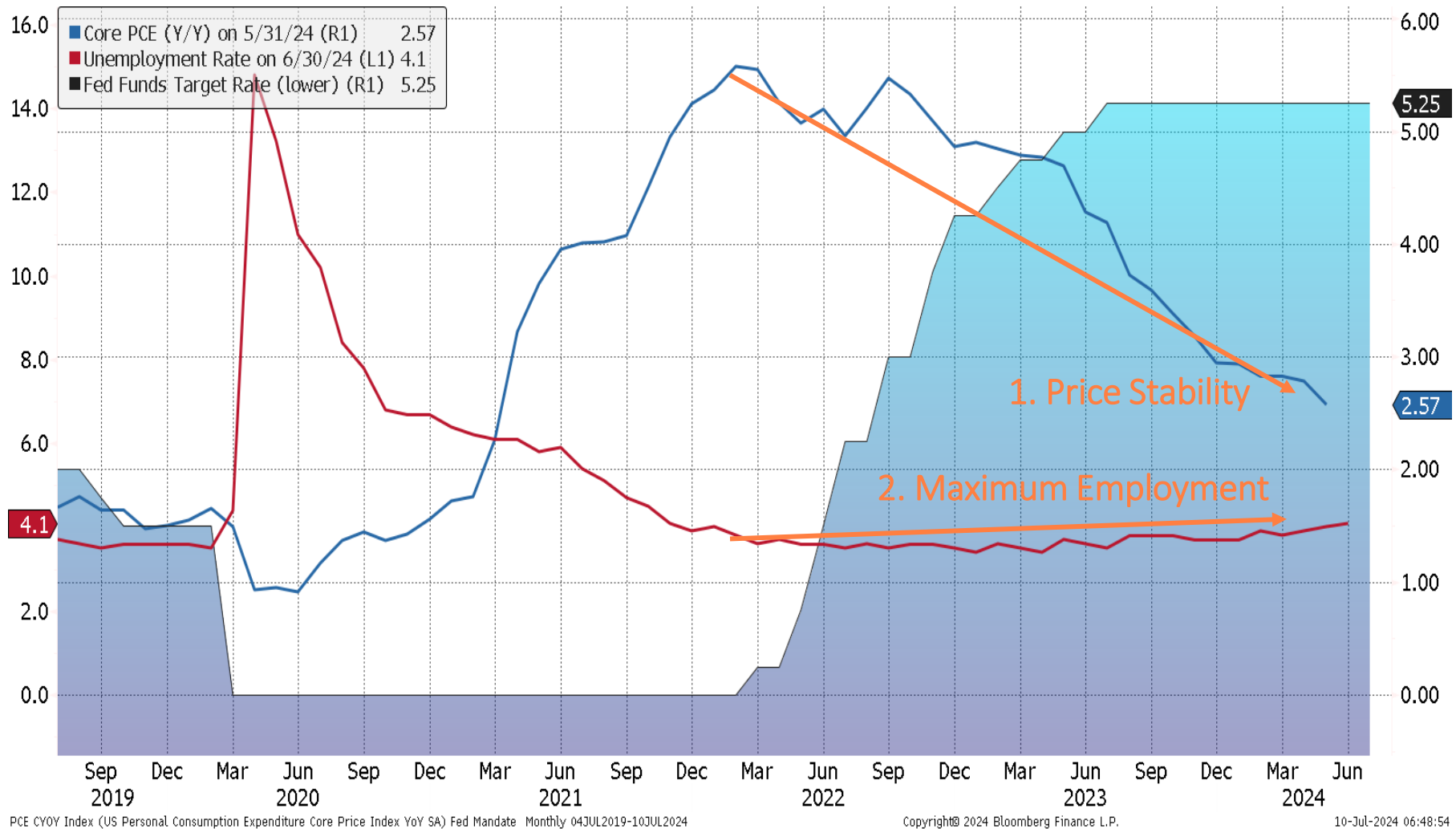
Data Source: Bloomberg

Fed Funds Rate: Market Expectations



Data Source: Bloomberg

Keeping it Simple: Progress on the Fed's Dual Mandate



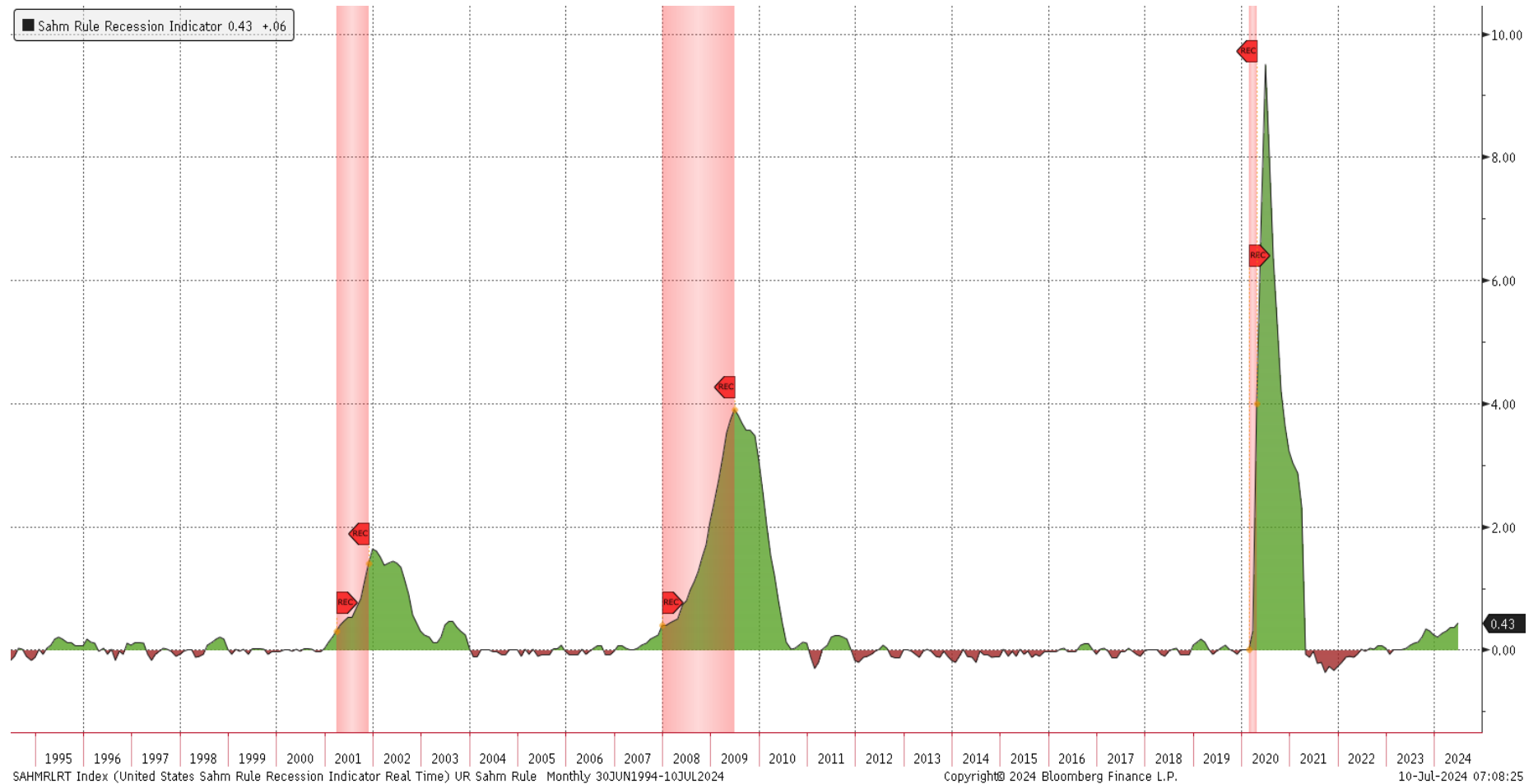
Data Source: Bloomberg

Economic Surprises: Releases Falling Short of Expectations



Data Source: Bloomberg

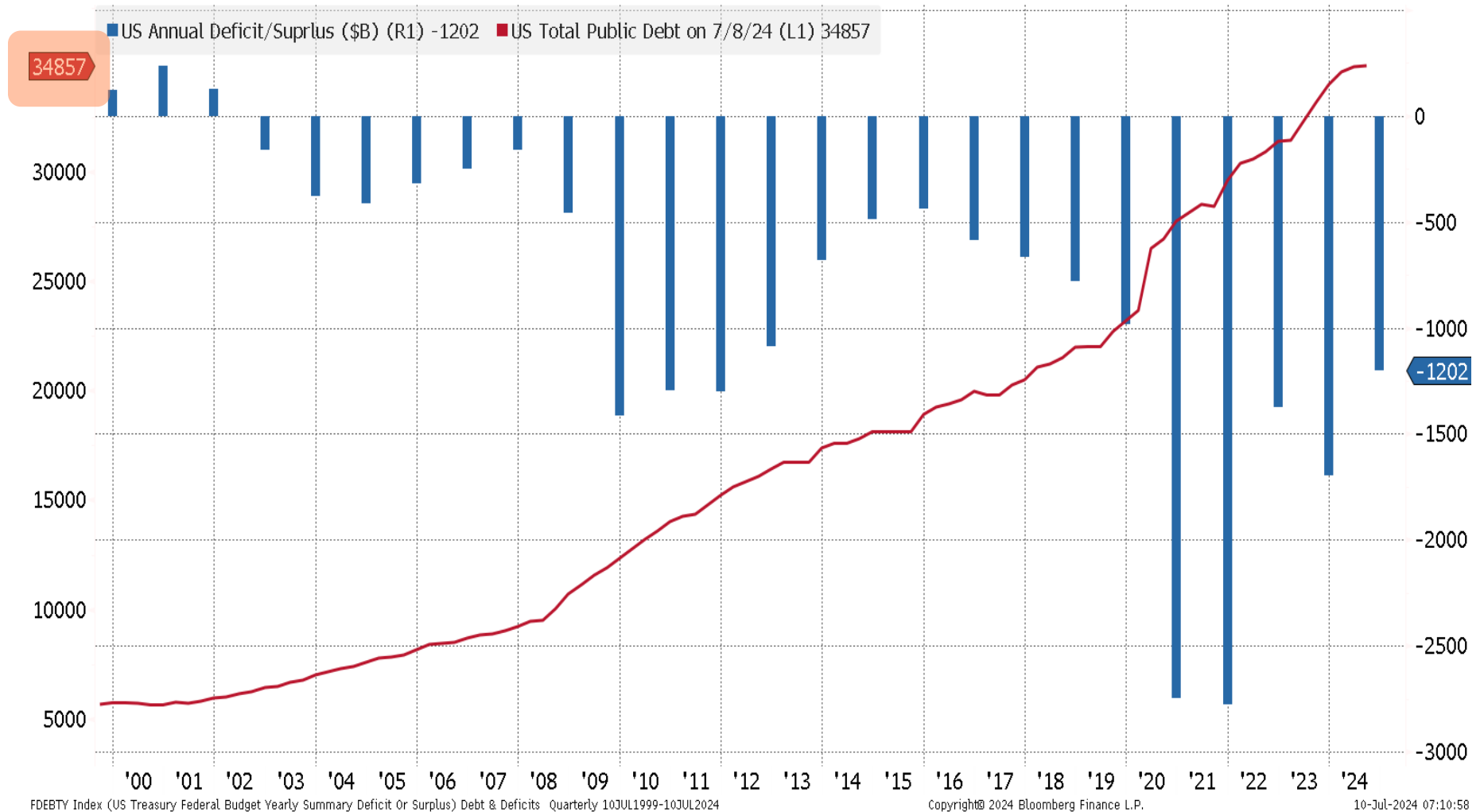
Unemployment: “Not broken, just bent”¹



Data Source: Bloomberg

¹Pink, “Just Give Me a Reason,” The Truth About Love (2012)

Deficits & Debt on an Unsustainable Pace



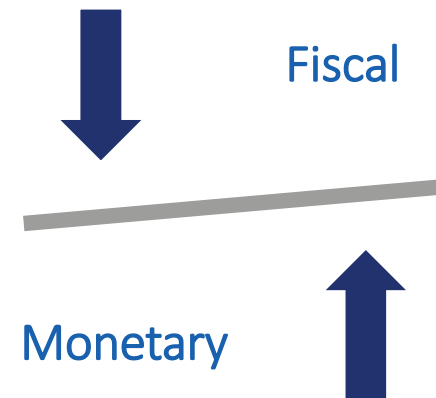
Data Source: Bloomberg

Fiscal Dominance: Complicating Monetary Policy

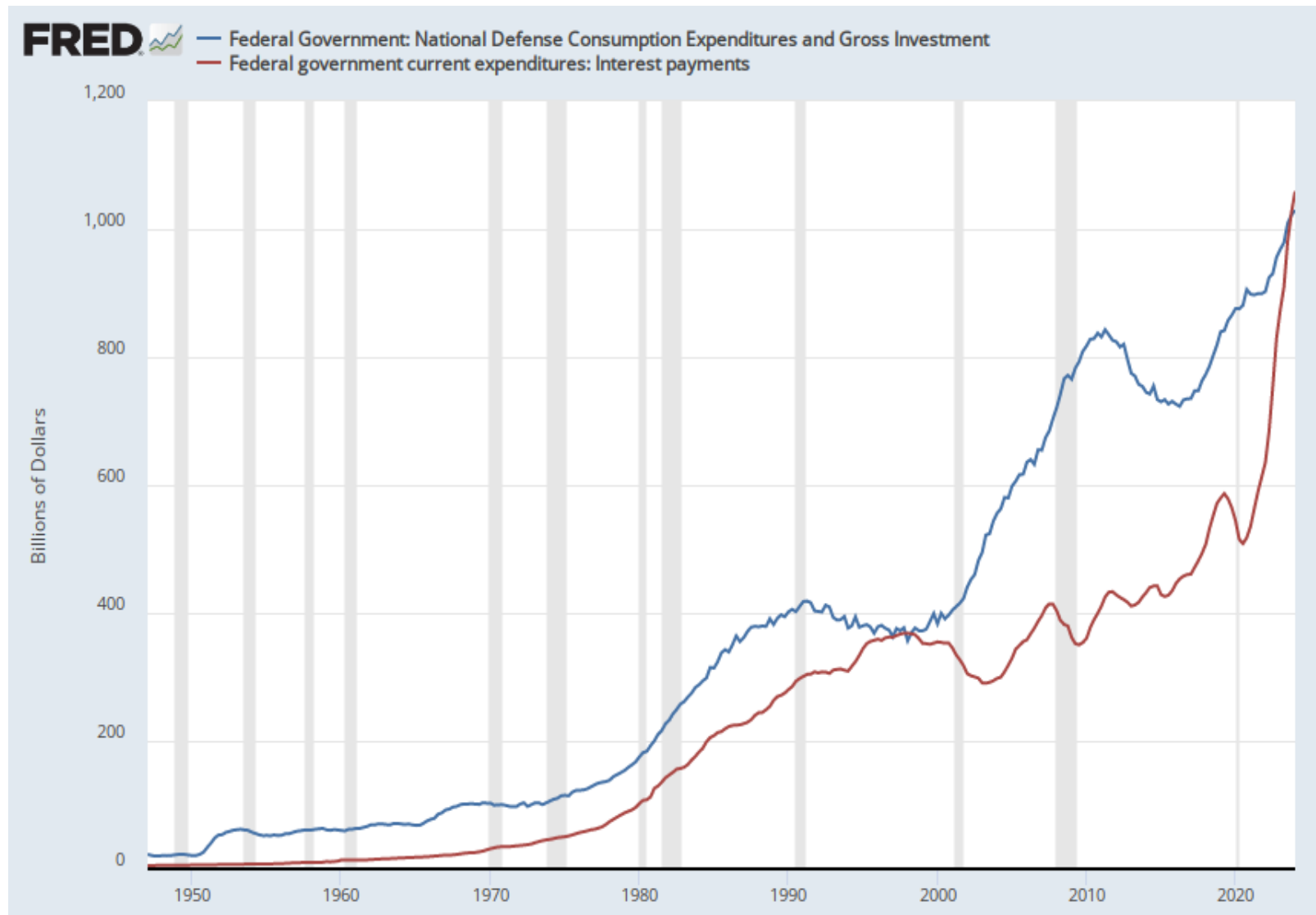
Fiscal Dominance: when a government's debt is sufficiently high to undermine the central bank's influence on inflation

Long-term Risks/Implications

- **Higher Inflation Rates:** potential for higher future inflation rates (as unsustainable debt levels leads to money printing)
- **Higher Interest Rates:** should central bankers be required to battle sustained inflation rates
- **Currency Depreciation:** as investors lose faith in a government's ability to control inflation
- **Budgeting Conflicts/Tradeoffs:** as interest payments required to meet rising debt levels crowds out other spending/investing priorities



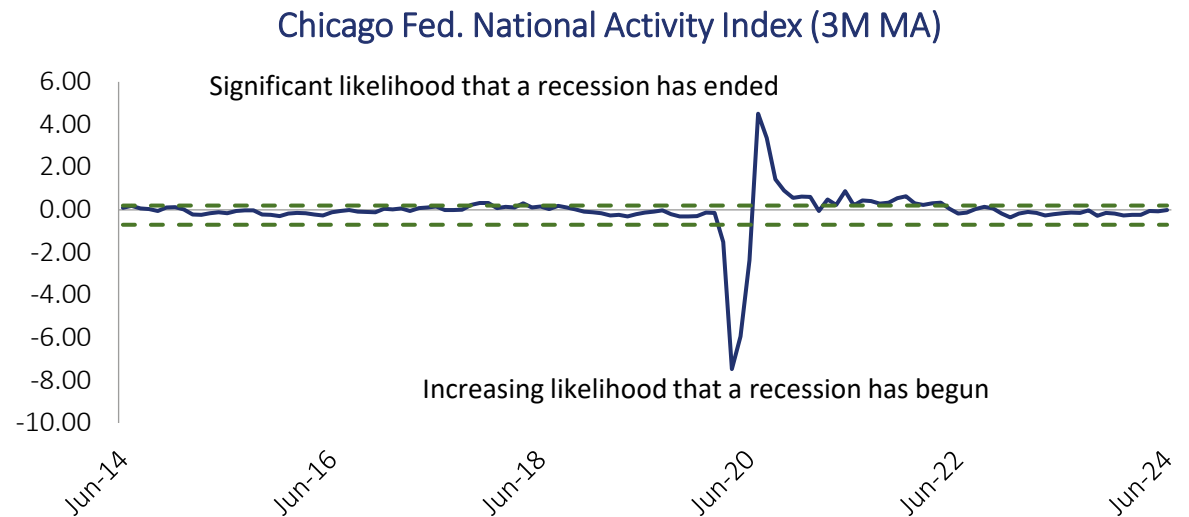
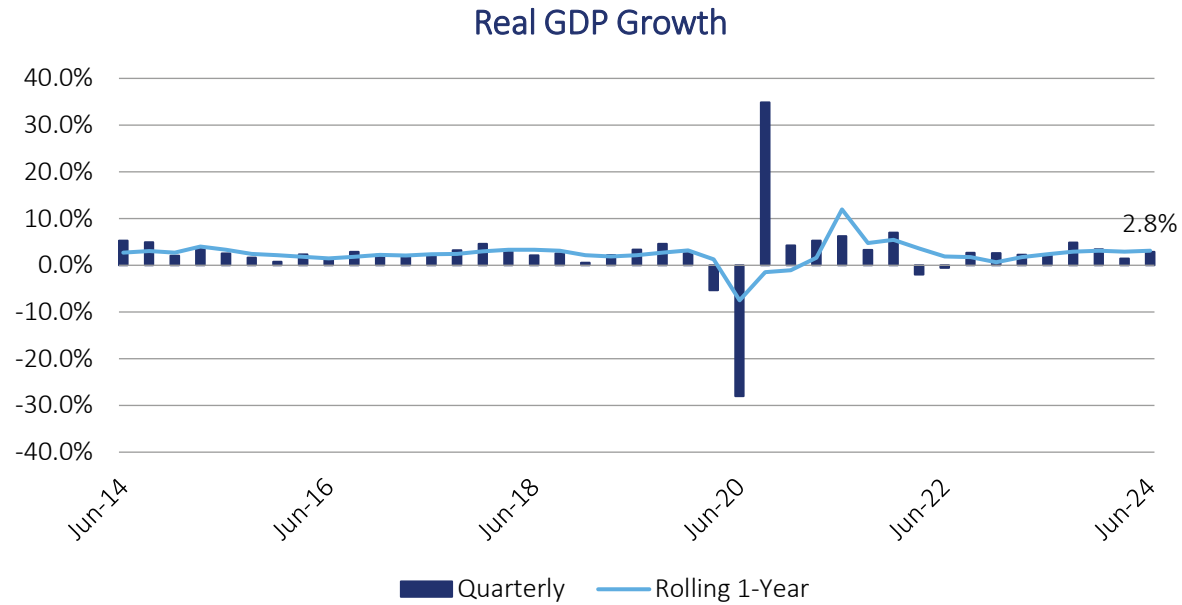
Fiscal Dominance in a Chart



Data Source: U.S. Bureau of Economic Analysis

Economic/Market Activity

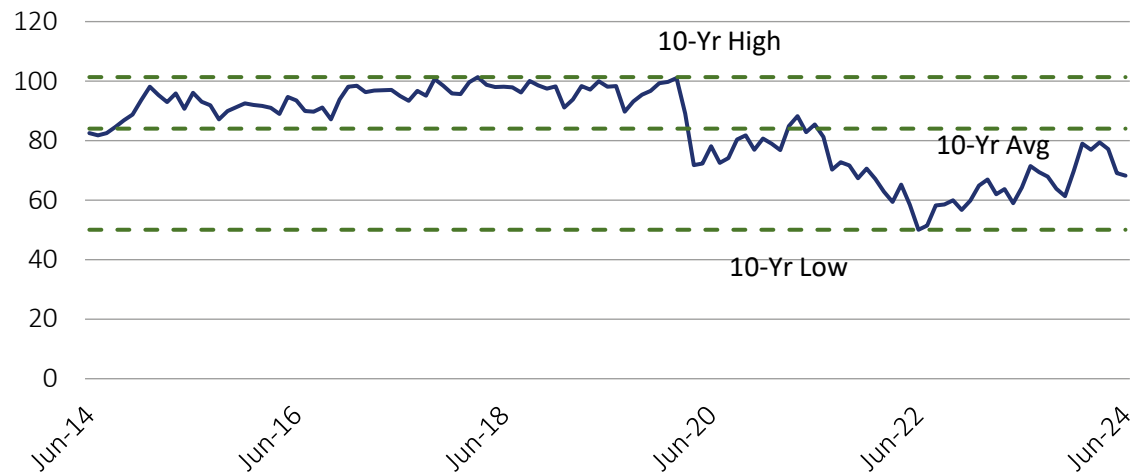
Economic Growth



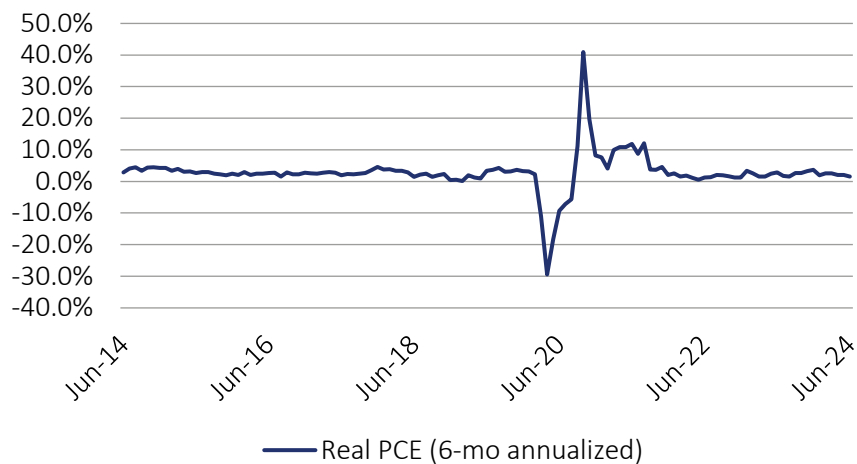
Data Source: Bloomberg

Consumer Activity

University of Michigan: Consumer Sentiment



Real Personal Consumption Expenditures

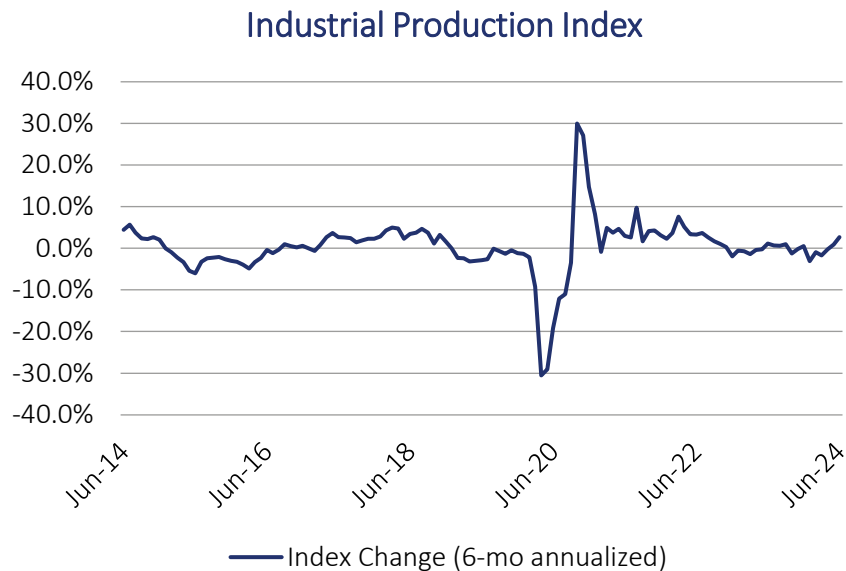
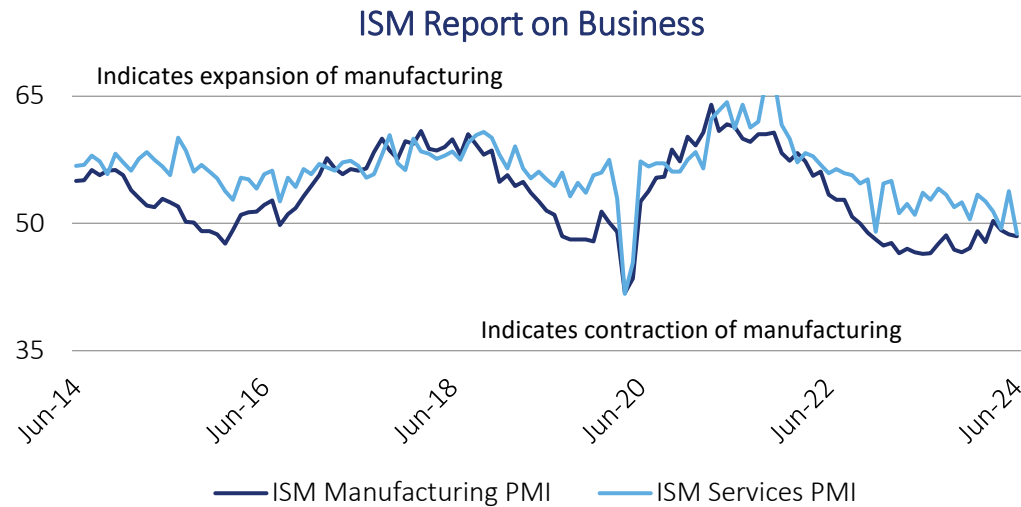


Average Hourly Earnings



Data Source: Bloomberg

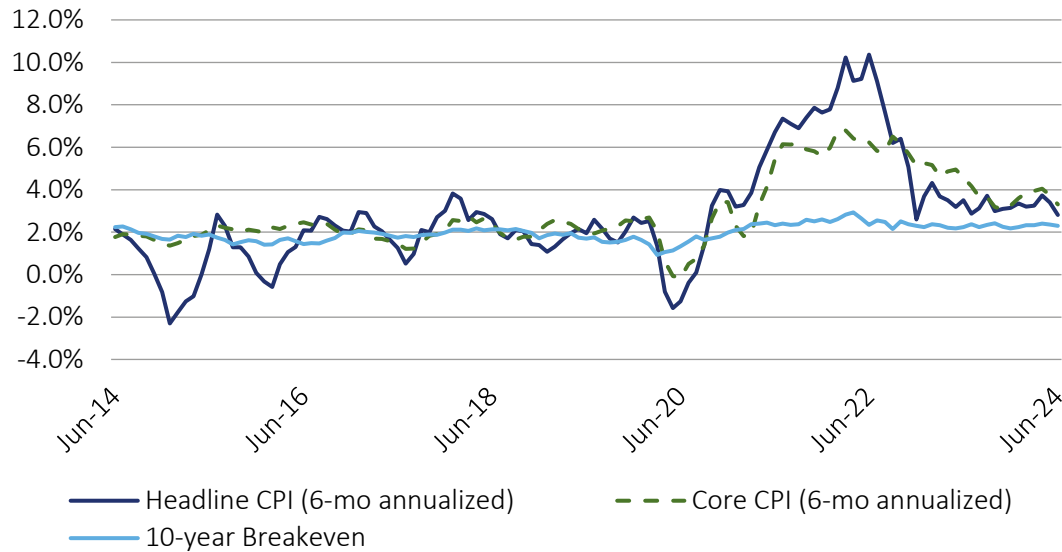
Business Activity



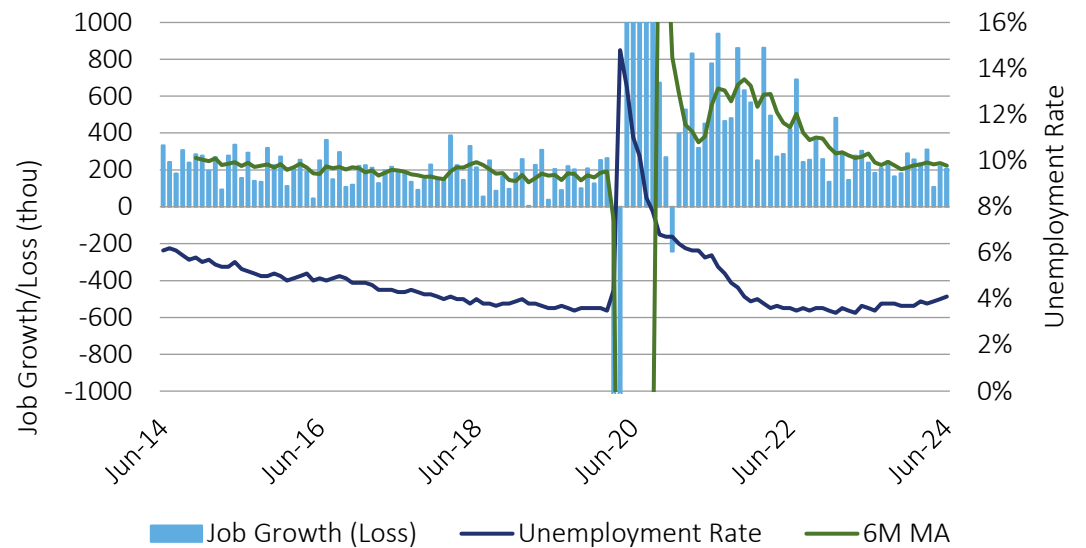
Data Source: Bloomberg

Inflation and Employment

Inflation: Actual & Expected



Employment Gains/Losses

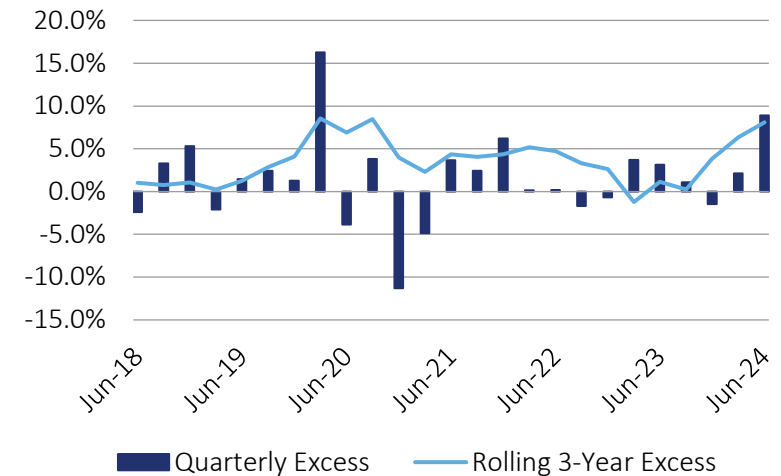


Data Source: Bloomberg

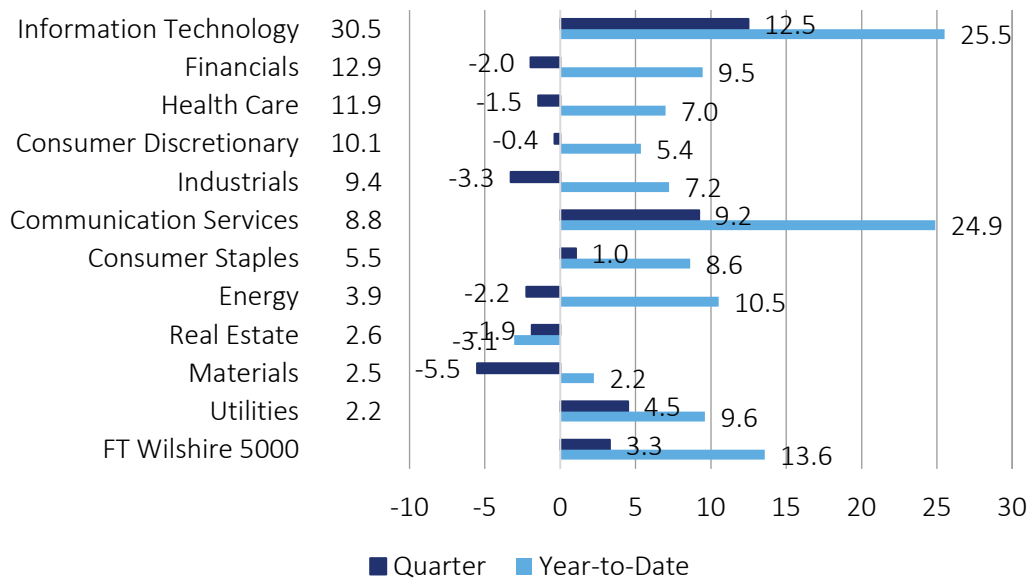
U.S. Equity Market

As of 6/30/2024	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	3.3	13.6	23.2	8.4	14.4	12.4
FT Wilshire U.S. Large Cap	4.4	15.1	24.8	9.6	15.2	12.9
FT Wilshire U.S. Small Cap	-4.1	3.5	12.6	1.4	8.9	8.4
FT Wilshire U.S. Large Growth	9.7	22.7	35.8	11.4	19.5	n/a
FT Wilshire U.S. Large Value	-0.8	7.7	14.3	7.3	10.6	n/a
FT Wilshire U.S. Small Growth	-3.9	4.0	11.3	-1.4	8.0	n/a
FT Wilshire U.S. Small Value	-4.4	3.1	14.0	4.0	9.4	n/a
Wilshire REIT Index	-0.2	-0.3	8.6	0.3	4.0	5.9
MSCI USA Min. Vol. Index	0.8	8.5	14.6	6.2	8.3	10.7
FTSE RAFI U.S. 1000 Index	-0.8	9.1	18.6	8.2	12.9	10.6

Large Cap vs. Small Cap

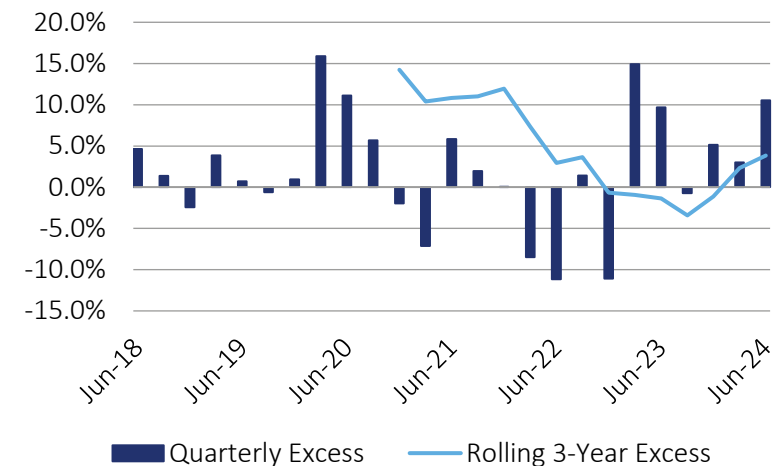


U.S. Sector Weight and Return (%)



Data Sources: Bloomberg, Wilshire Atlas

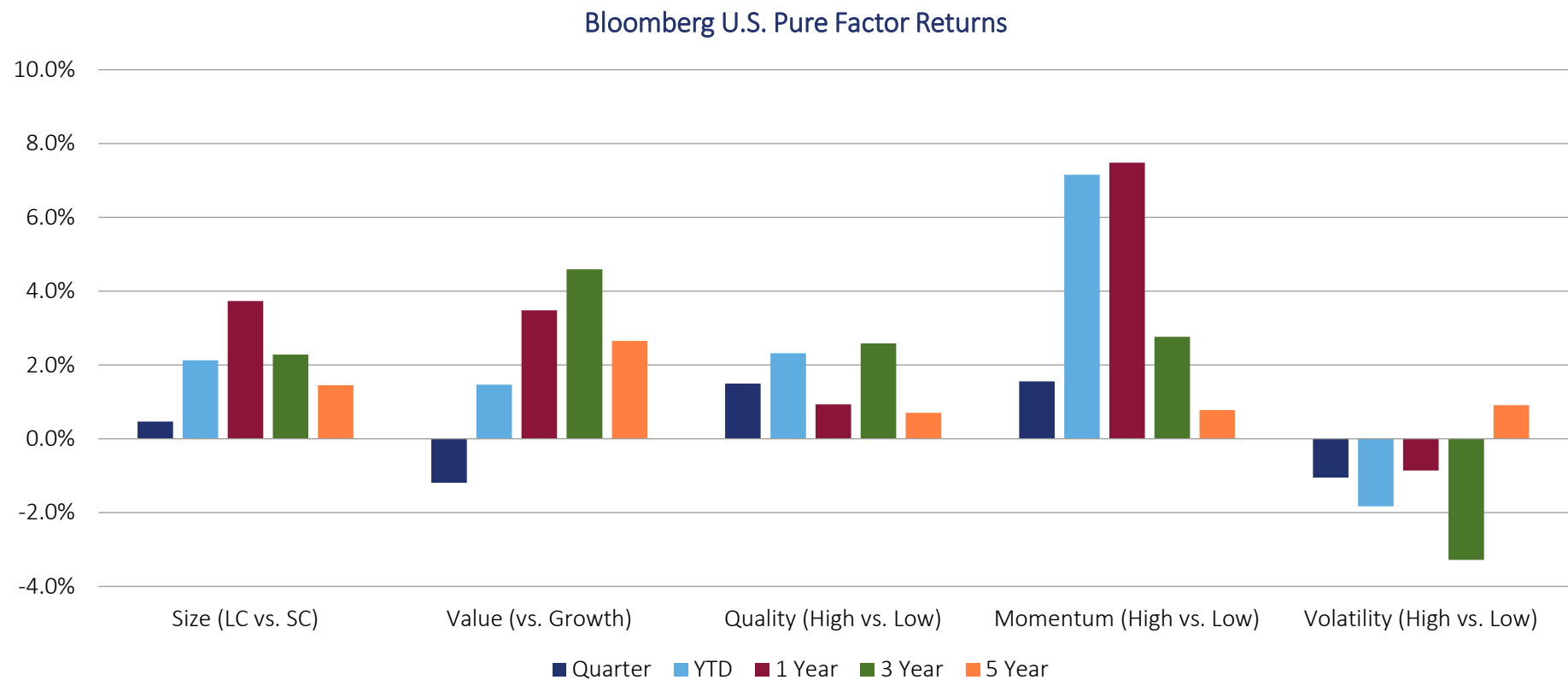
Large Growth vs. Large Value



U.S. Factor Returns

Factor returns represent the contribution from large cap, value, etc. stocks within Bloomberg's Portfolio & Risk Analytics module

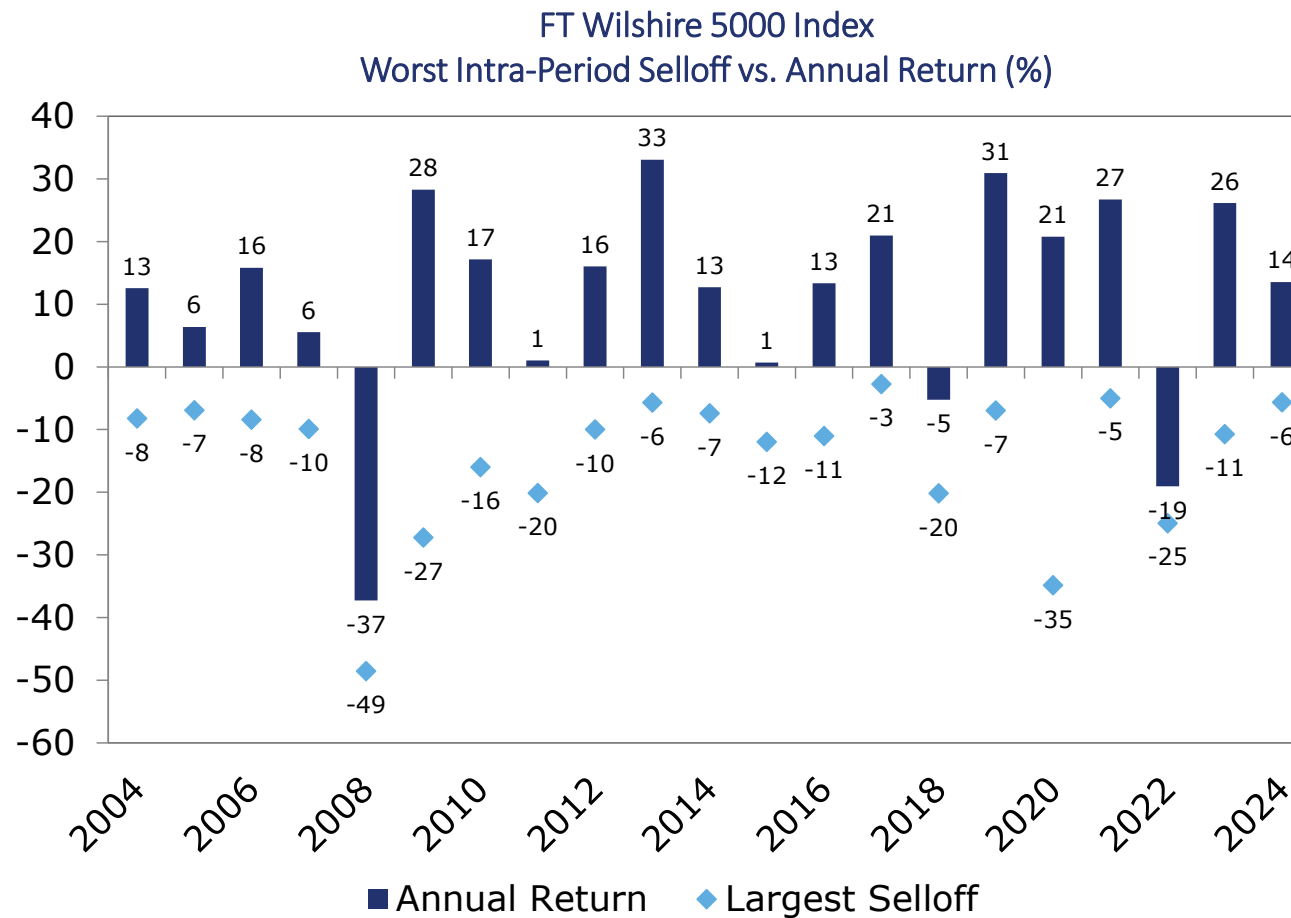
Momentum had a strong quarter while high volatility detracted



Data Source: Bloomberg

Annual Equity Market Selloffs

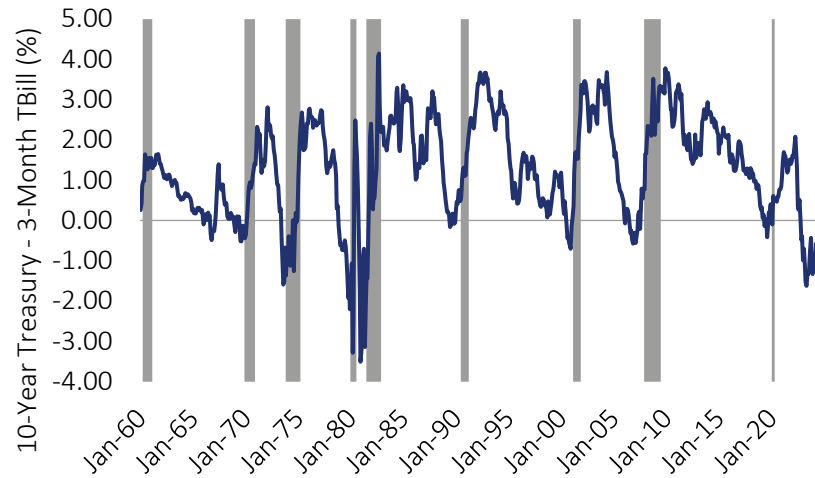
U.S. equity has been fairly tame, so far, during 2024 except for a modest sell-off in April



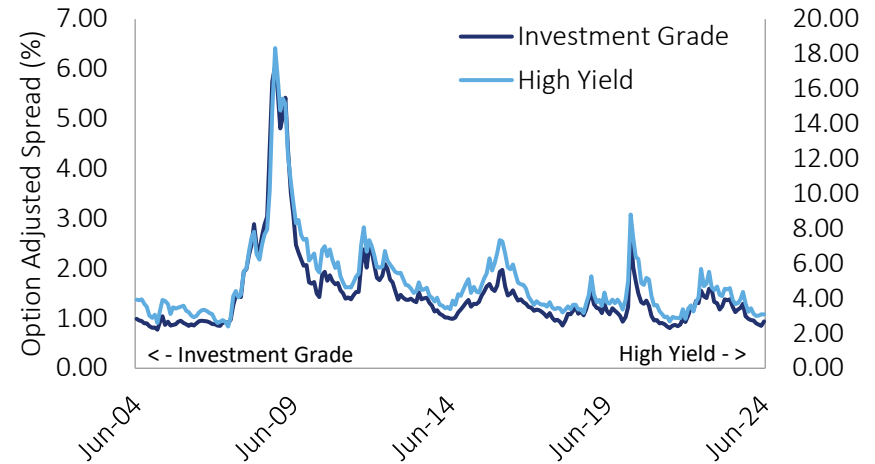
Data Sources: Wilshire Web, Bloomberg

Risk Monitor

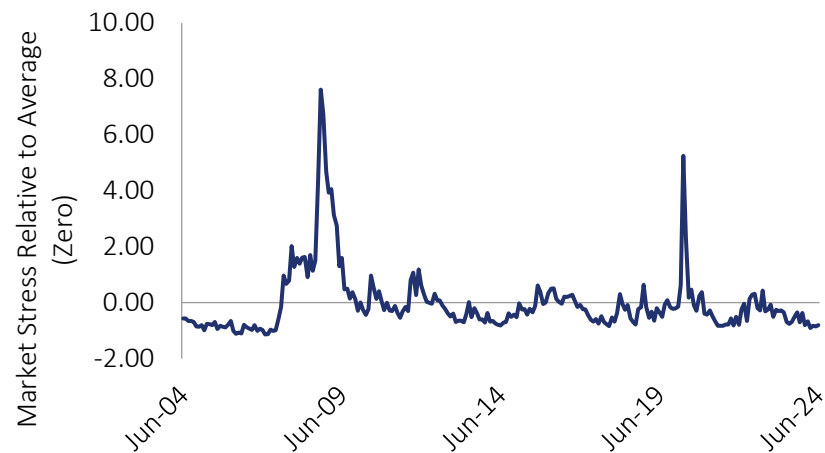
Yield Curve Slope vs Recessions (IN GRAY)



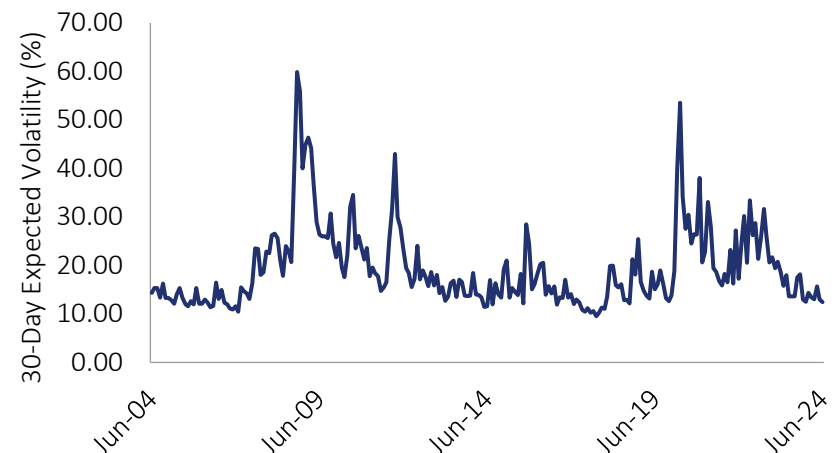
Bloomberg Credit Indexes



St. Louis Fed. Financial Stress Index



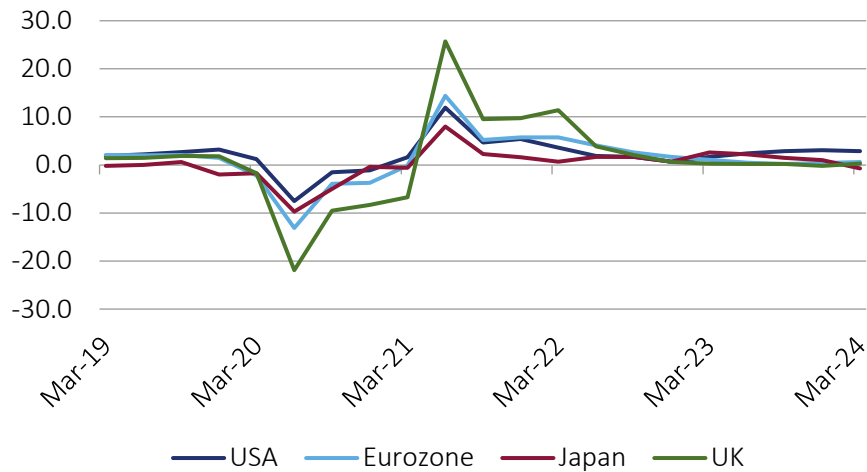
CBOE Volatility Index



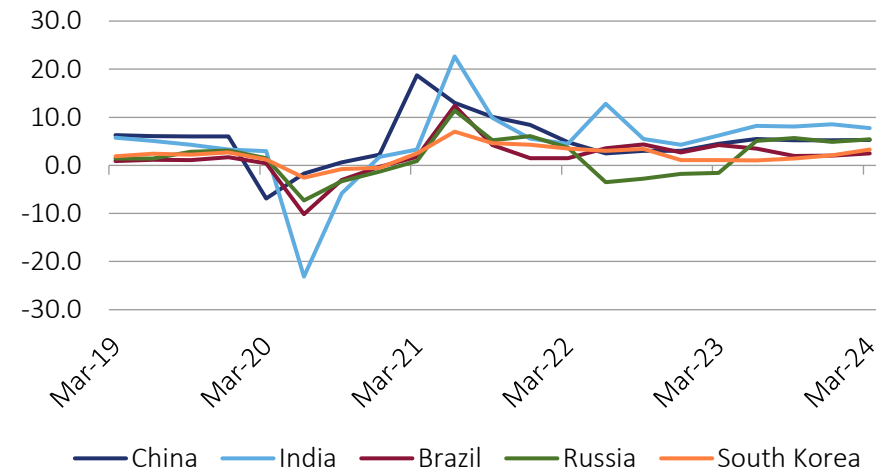
Data Source: Bloomberg

Non-U.S. Growth and Inflation

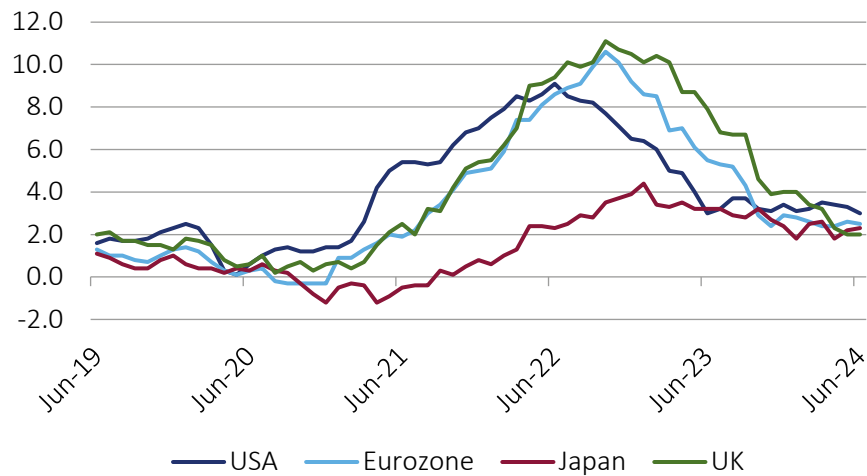
Developed Markets Real GDP Growth YoY (%)



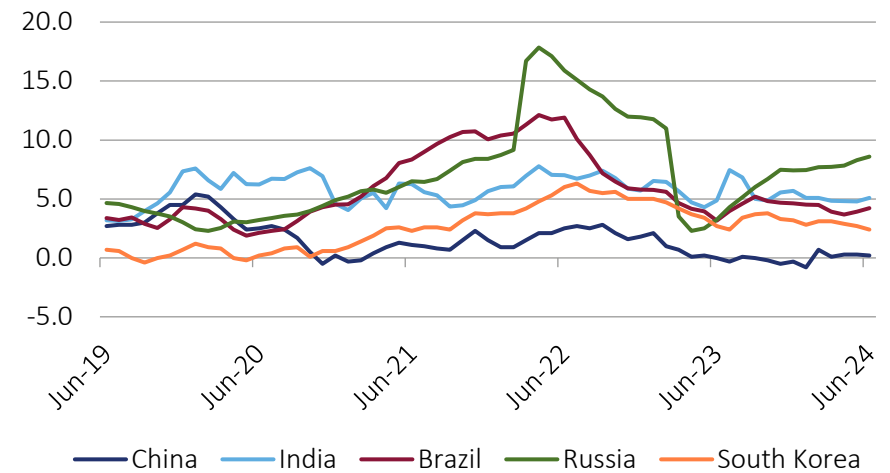
Emerging Markets Real GDP Growth YoY (%)



Developed Markets CPI Growth YoY (%)



Emerging Markets CPI Growth YoY (%)

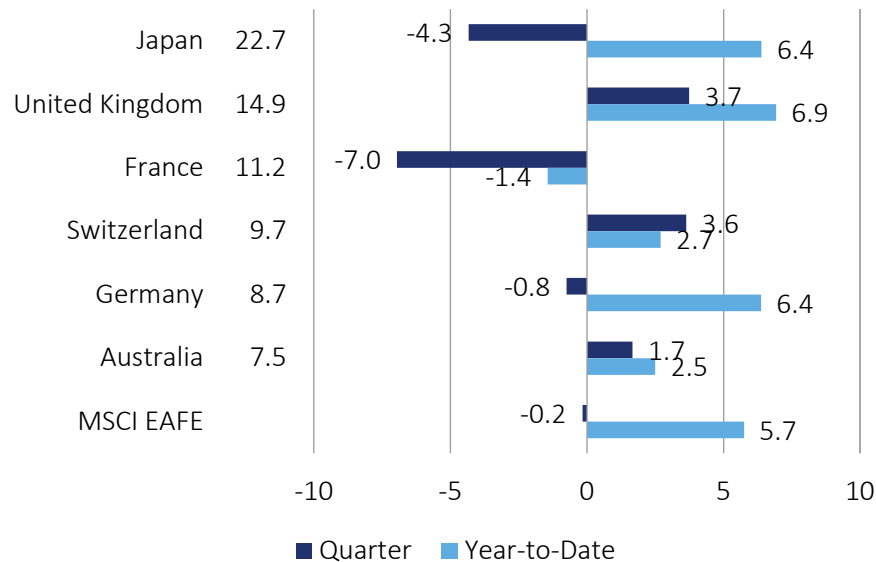


Data Source: Bloomberg

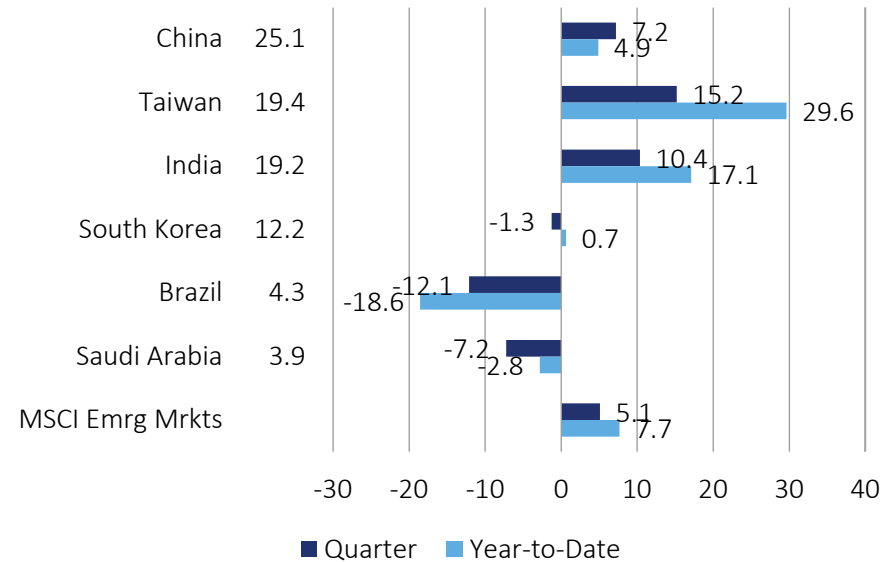
Non-U.S. Equity Market

As of 6/30/2024	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	1.2	6.0	12.2	1.0	6.1	4.3
MSCI EAFE (\$G)	-0.2	5.7	12.1	3.4	7.0	4.8
MSCI Emerging Markets (\$G)	5.1	7.7	13.0	-4.7	3.5	3.2
MSCI Frontier Markets (\$G)	-1.9	3.7	11.3	-0.2	-0.5	-0.5
MSCI ACWI ex-US Growth (\$G)	0.9	6.9	10.2	-2.3	5.8	5.1
MSCI ACWI ex-US Value (\$G)	1.5	5.0	14.3	4.0	6.1	3.6
MSCI ACWI ex-US Small (\$G)	0.8	3.1	11.8	-1.0	6.6	4.9
MSCI ACWI Minimum Volatility	0.5	5.4	9.7	3.2	5.3	7.4
MSCI EAFE Minimum Volatility	-0.2	2.2	6.7	0.3	2.3	4.0
FTSE RAFI Developed ex-US	-0.8	4.8	13.0	4.8	7.6	4.3
MSCI EAFE LC (G)	1.3	11.5	15.7	8.7	9.5	7.9
MSCI Emerging Markets LC (G)	6.3	11.2	16.0	-1.2	6.0	6.2

Developed Markets Weight and Return (%)



Emerging Markets Weight and Return (%)

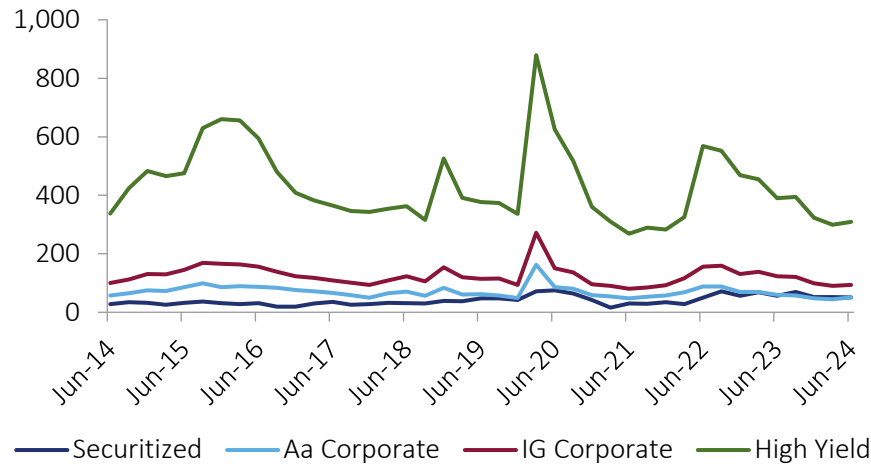


Data Source: Bloomberg

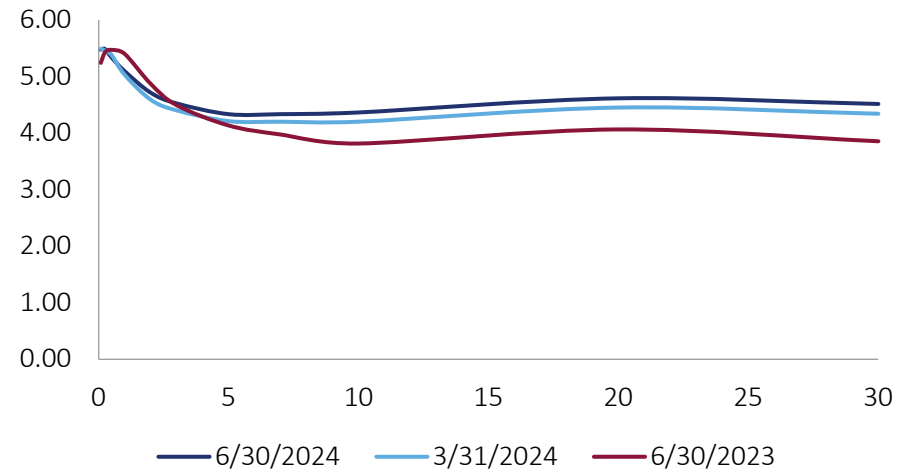
U.S. Fixed Income

As of 6/30/2024	YTW	Dur.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	5.0	6.1	0.1	0.1	2.6	-3.0	-0.2	1.3
Bloomberg Treasury	4.6	5.9	0.1	0.1	1.5	-3.3	-0.7	0.9
Bloomberg Gov't-Rel.	5.1	5.2	0.3	0.3	3.3	-2.1	0.2	1.5
Bloomberg Securitized	5.2	5.9	0.1	0.1	2.4	-2.8	-0.6	1.0
Bloomberg Corporate	5.5	6.9	-0.1	-0.1	4.6	-3.0	0.6	2.3
Bloomberg LT Gov't/Credit	5.2	13.8	-1.7	-1.7	-1.6	-8.5	-2.2	1.6
Bloomberg LT Treasury	4.6	15.1	-1.8	-1.8	-5.6	-10.5	-4.3	0.6
Bloomberg LT Gov't-Rel.	5.7	11.5	-1.1	-1.1	0.7	-6.0	-1.4	2.0
Bloomberg LT Corporate	5.7	12.7	-1.7	-1.7	2.2	-6.9	-0.8	2.5
Bloomberg U.S. TIPS*	4.4	7.2	0.8	0.8	2.7	-1.3	2.1	1.9
Bloomberg High Yield	7.9	3.1	1.1	1.1	10.4	1.6	3.9	4.3
S&P/LSTA Leveraged Loan	9.2	0.3	1.9	1.9	11.1	6.1	5.5	4.6
Treasury Bills	5.3	0.3	1.3	1.3	5.5	3.0	2.2	1.5

Fixed Income Option Adjusted Spread (bps)



Treasury Yield Curve (%)



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

Data Source: Bloomberg

Federal Reserve

The Federal Open Market Committee has left their overnight rate unchanged since July of 2023

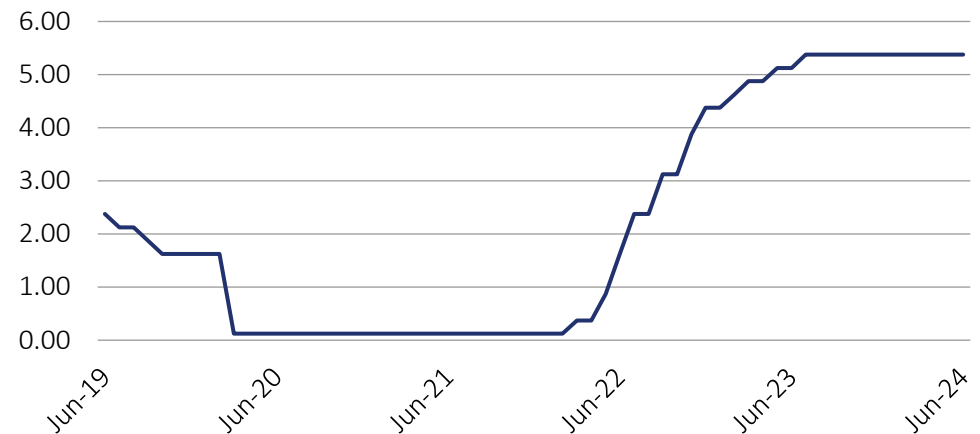
QE4 was larger than the 3 phases of quantitative easing – combined – following the global financial crisis

The Fed's balance sheet has begun to shrink again during the past year

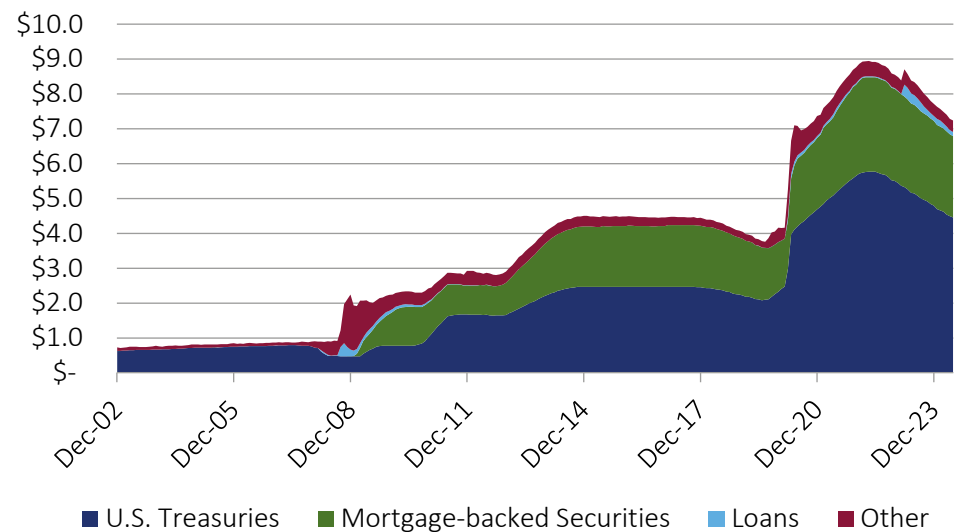
	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020	3/15/2022	\$4,779

Data Source: Bloomberg

Federal Funds Rate (Mid %)



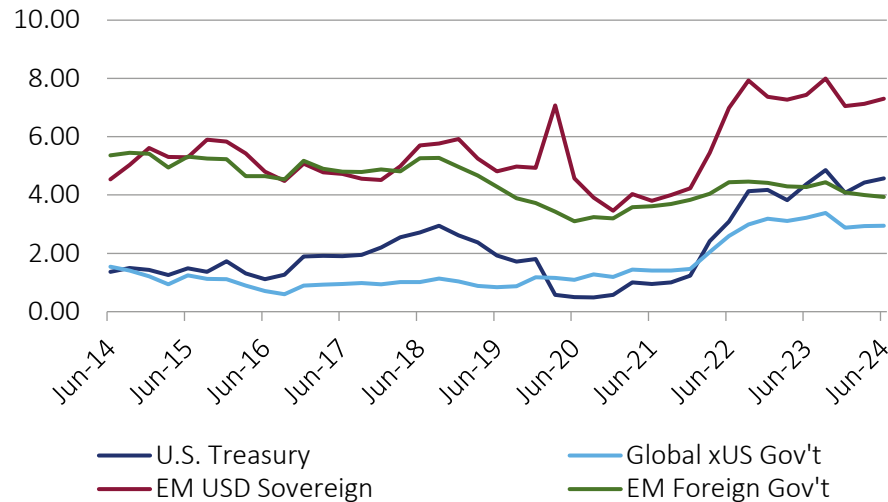
Federal Reserve Balance Sheet (\$T)



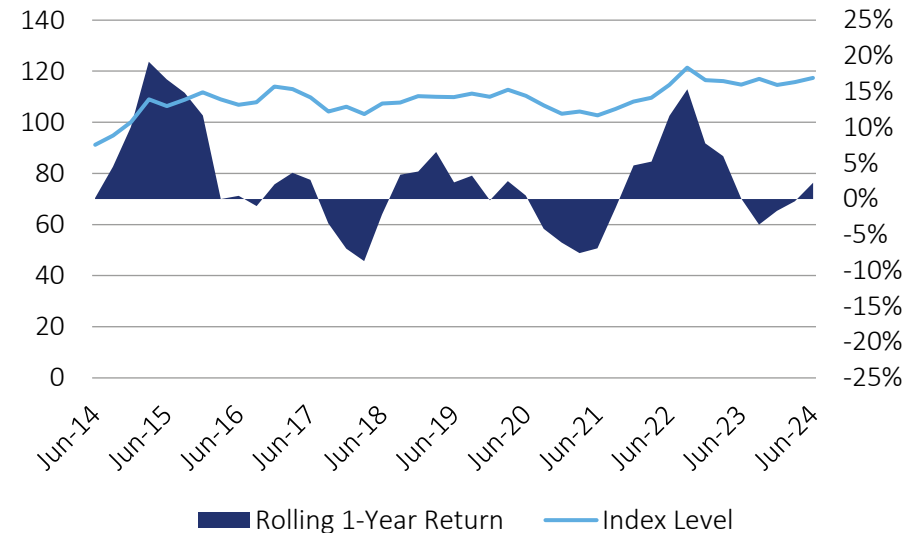
Non-U.S. Fixed Income

As of 6/30/2024	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Developed Markets						
Bloomberg Global Aggregate xUS	-2.1	-5.3	-0.7	-7.5	-3.6	-1.9
Bloomberg Global Aggregate xUS*	0.1	0.7	5.3	-0.5	0.5	2.5
Bloomberg Global Inflation Linked xUS	-2.2	-5.4	-1.6	-9.7	-3.7	-1.5
Bloomberg Global Inflation Linked xUS*	-1.4	-2.3	1.4	-4.9	-1.5	2.5
Emerging Markets (Hard Currency)						
Bloomberg EM USD Aggregate	0.7	2.2	8.0	-2.2	0.5	2.5
Emerging Markets (Foreign Currency)						
Bloomberg EM Local Currency Gov't	-0.2	-1.2	3.8	-1.3	0.7	0.5
Bloomberg EM Local Currency Gov't*	1.8	3.7	8.0	3.0	2.9	3.1
Euro vs. Dollar	-0.7	-3.0	-1.8	-3.3	-1.2	-2.4
Yen vs. Dollar	-5.9	-12.3	-10.3	-11.6	-7.7	-4.5
Pound vs. Dollar	0.2	-0.7	-0.5	-2.9	-0.1	-3.0

Global Fixed Income Yield to Worst (%)



U.S. Dollar Index: Advanced Economies

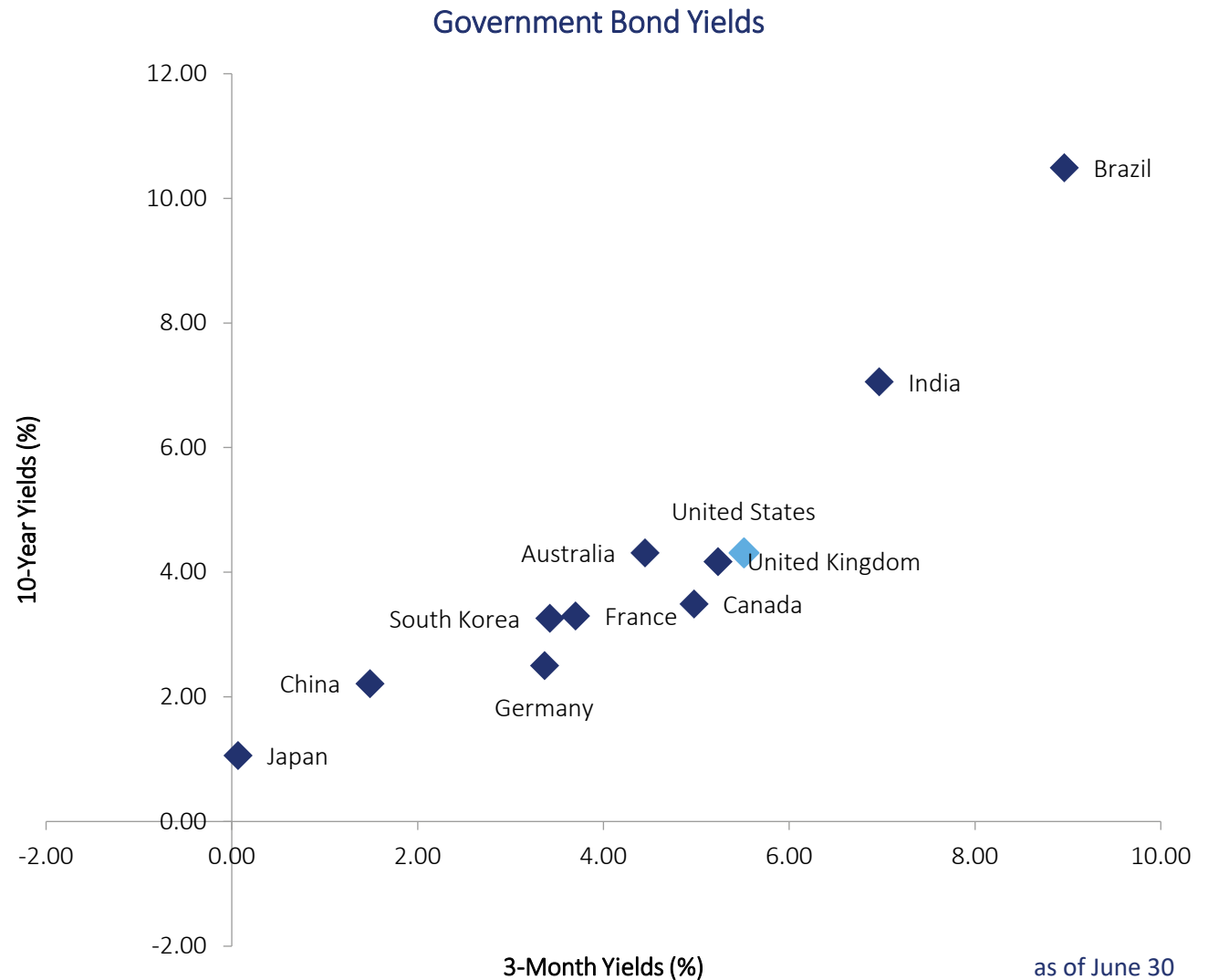


*Returns are reported in terms of local market investors, which removes currency effects.

Data Source: Bloomberg

Global Interest Rates

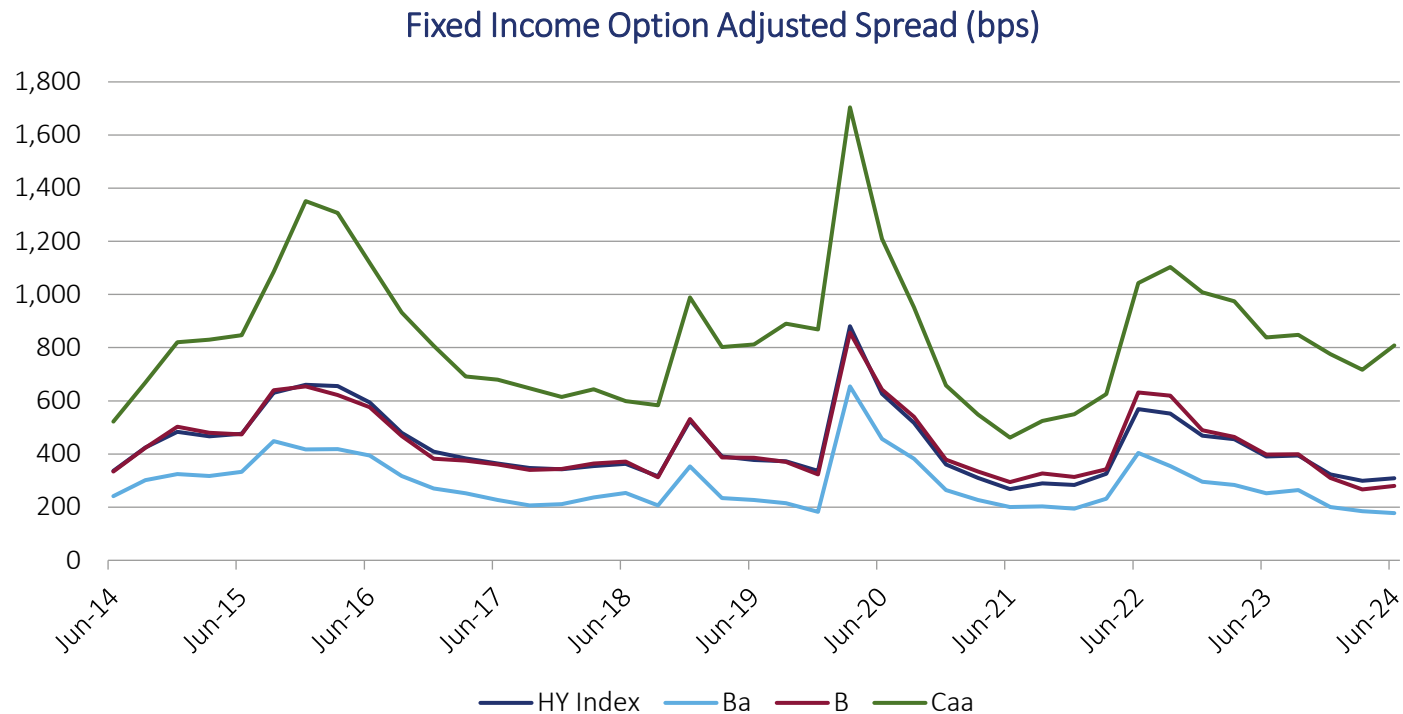
Short-term rates have turned positive in most larger countries; longer-term rates near 4.0% in the U.K. and Australia



Data Source: Bloomberg

High Yield Bond Market

As of 6/30/2024	Weight	YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		7.9	1.1	2.6	10.4	1.6	3.9	4.3
S&P LSTA Leveraged Loan		9.2	2.1	4.1	10.8	5.9	5.2	4.2
High Yield Quality Distribution								
Ba U.S. High Yield	50.6%	6.6	1.3	2.5	9.6	1.3	4.2	4.7
B U.S. High Yield	36.6%	7.7	1.0	2.4	10.5	2.0	3.6	4.0
Caa U.S. High Yield	11.3%	12.8	0.0	2.1	11.9	1.2	3.0	3.6
Ca to D U.S. High Yield	1.5%	22.0	4.7	18.5	28.3	2.6	4.3	-2.1

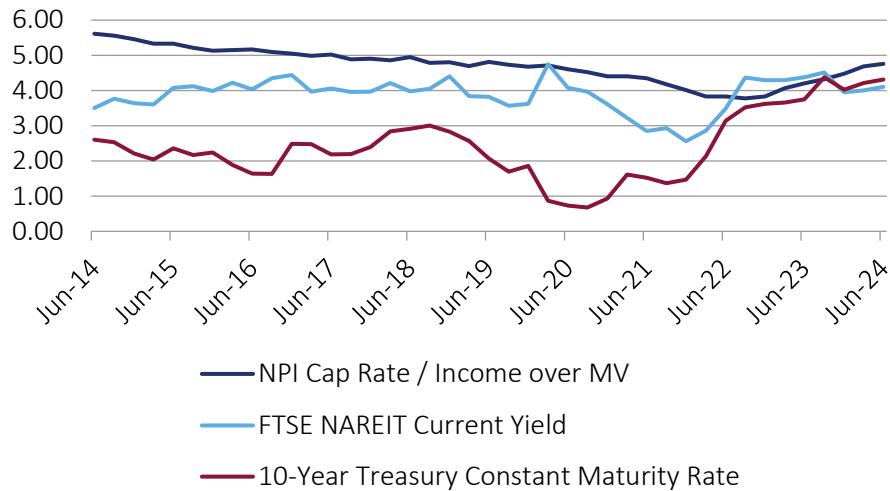


Data Source: Bloomberg

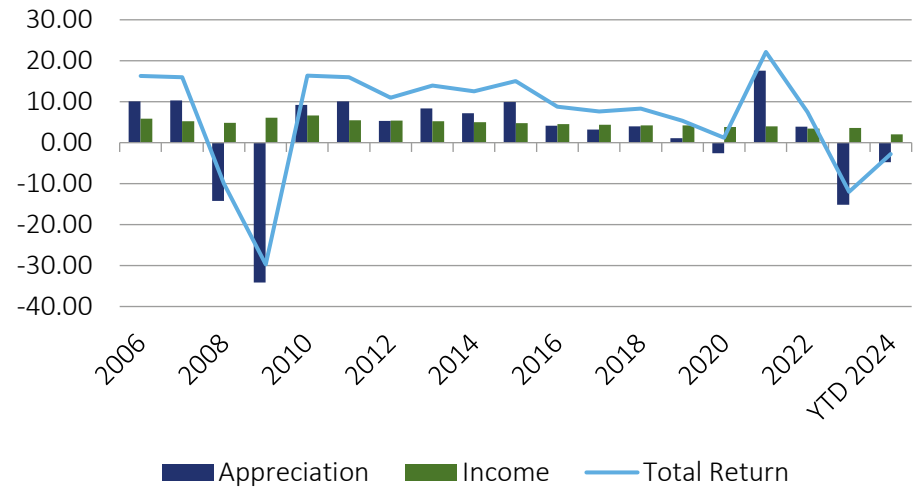
Real Assets

As of 6/30/2024	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg U.S. TIPS	0.8	0.7	2.7	-1.3	2.1	1.9
Bloomberg Commodity Index	2.9	5.1	5.0	5.7	7.2	-1.3
Bloomberg Gold Index	4.9	12.7	20.6	9.1	9.4	5.0
Wilshire Global RESI Index	-1.2	-1.3	8.7	-1.1	2.1	4.3
NCREIF ODCE Fund Index	-0.4	-2.8	-9.3	1.9	3.2	6.4
NCREIF Timberland Index	1.7	3.9	9.9	11.0	7.2	5.9
FTSE Global Core Infrastructure 50/50	1.0	2.8	5.3	3.0	3.9	5.6
Alerian Midstream Energy	5.4	16.1	26.7	16.5	11.3	3.7
Bitcoin	-12.6	45.6	103.7	21.4	40.3	57.8

Real Estate Valuation (%)



NCREIF ODCE Fund Index Return (%)



Data Sources: Bloomberg, National Council of Real Estate Investment Fiduciaries

Asset Class Performance

Asset Class Returns - Best to Worst

Annualized
5-Year
as of 6/24

2019	2020	2021	2022	2023	2024 YTD	
U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 26.1%	U.S. Equity 13.6%	U.S. Equity 14.4%
REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 18.9%	Emrg Mrkts 7.7%	Developed 7.0%
Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	REITs 16.1%	Developed 5.7%	Commodities 6.4%
Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	High Yield 13.4%	T-Bills 1.3%	REITs 4.0%
High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 10.3%	High Yield 1.1%	High Yield 3.9%
Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	Core Bond 5.5%	U.S. TIPS 0.8%	Emrg Mrkts 3.5%
U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	T-Bills 5.1%	Core Bond 0.1%	T-Bills 2.2%
Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	U.S. TIPS 3.9%	REITs -0.3%	U.S. TIPS 2.1%
T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -1.3%	Commodities -2.5%	Core Bond -0.2%

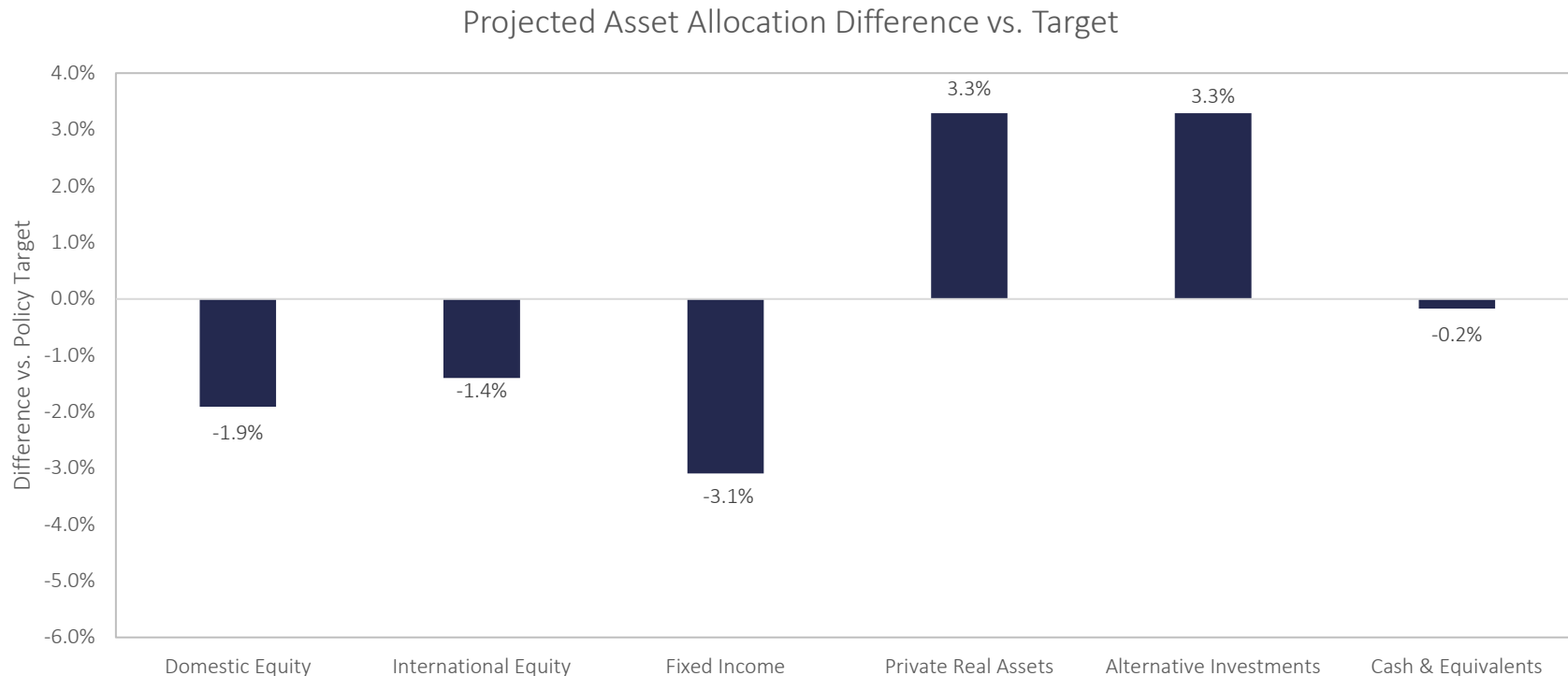
Data Sources: Bloomberg

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

Total Fund

Projected Deviations from the Benchmark

As of June 30, 2024



- Includes committed, but unfunded amounts for Real Assets (\$2.37billion) and Alternatives (\$3.47 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

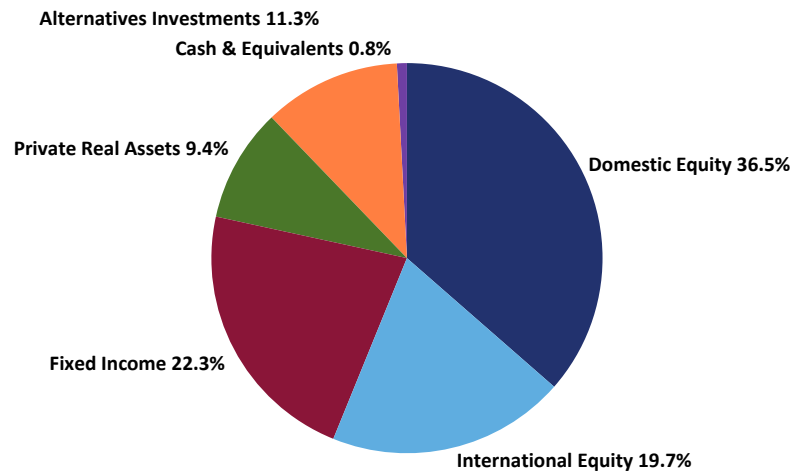
Real Assets Proxy: 50% Domestic Equity, 30% International Equity, 20% Fixed Income

Asset Allocation

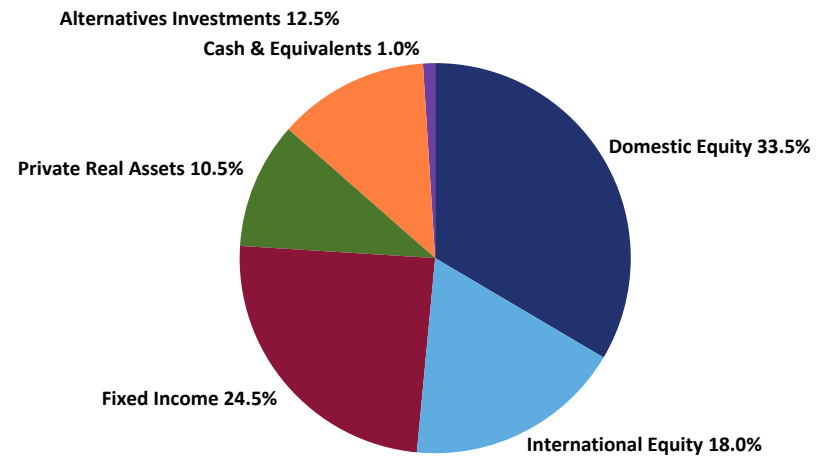
Total Fund

Periods Ended As of June 30, 2024

Actual Allocation



Target Allocation



Domestic Equity International Equity Fixed Income Private Real Assets Alternatives Investments Cash & Equivalents

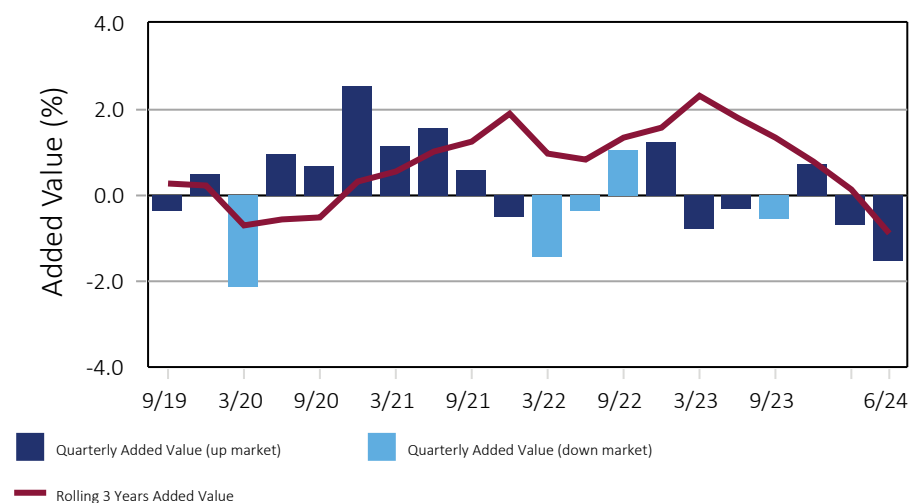
	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	54,044	100.0	100.0	0.0	
Domestic Equity	19,699	36.5	33.5	3.0	1,595
International Equity	10,643	19.7	18.0	1.7	915
Fixed Income	12,041	22.3	24.5	-2.2	-1,199
Private Real Assets	5,083	9.4	10.5	-1.1	-591
Alternatives Investments	6,128	11.3	12.5	-1.2	-627
Cash & Equivalents	448	0.8	1.0	-0.2	-92

Composite Performance Summary

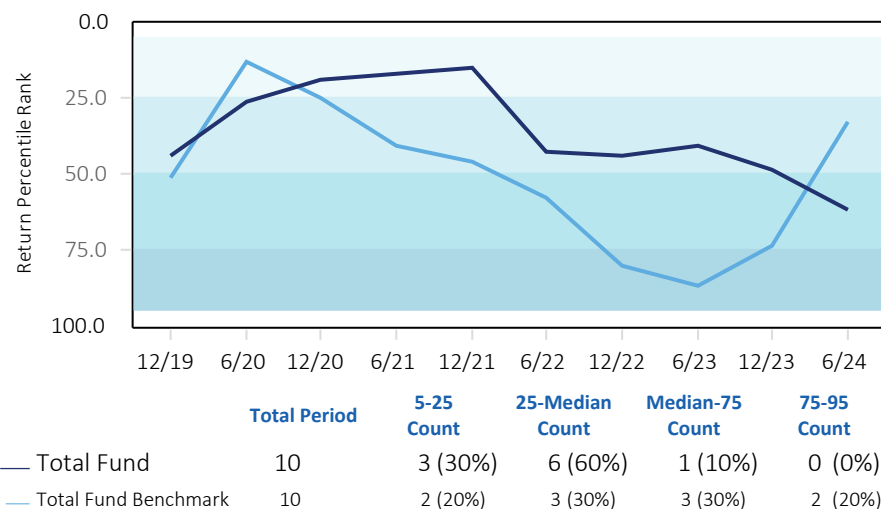
Total Fund

Periods Ended June 30, 2024

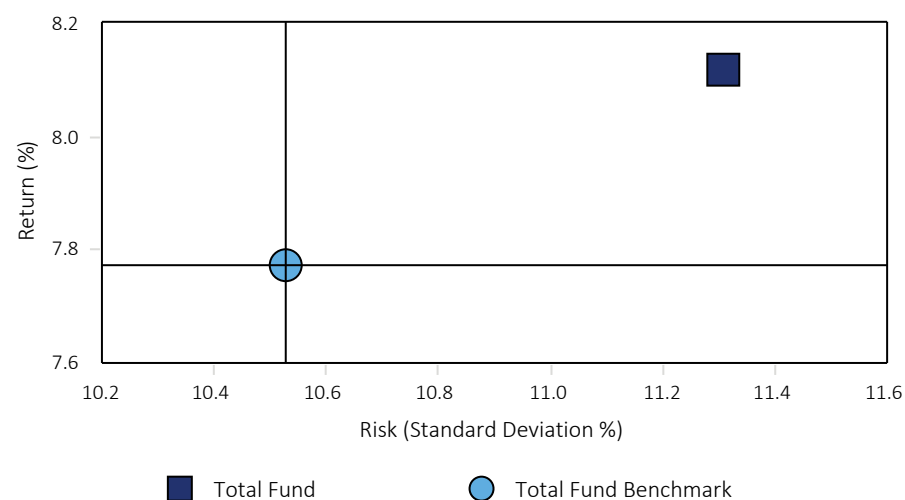
Added Value History



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



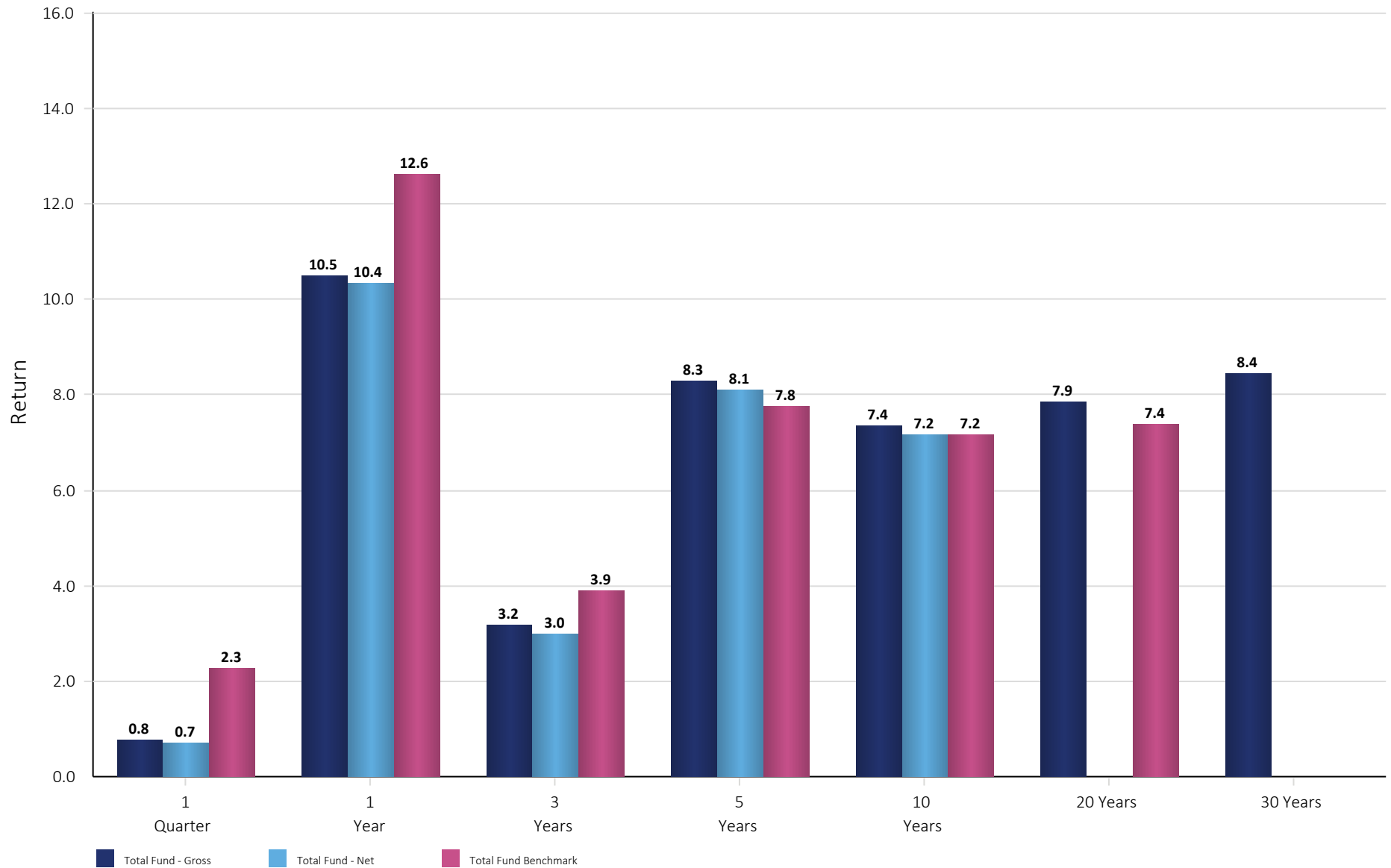
Risk and Return 07/01/19 - 06/30/24



Comparative Performance

Total Fund - Gross

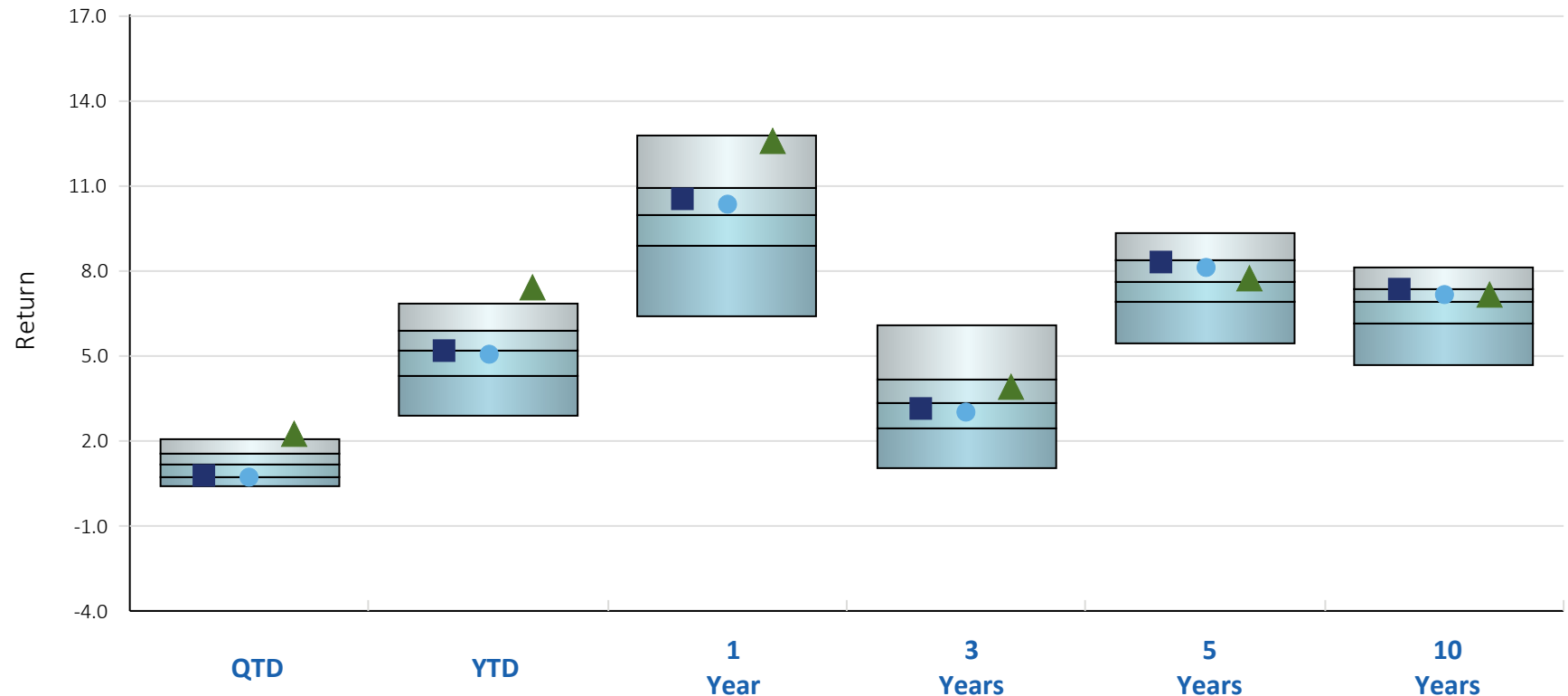
Periods Ended June 30, 2024



Plan Sponsor Peer Group Analysis

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

Periods Ended June 30, 2024



Total Fund	0.77 (72)	5.17 (52)	10.53 (37)	3.17 (55)	8.29 (30)	7.37 (26)
Total Fund - Net	0.73 (75)	5.09 (54)	10.35 (42)	3.01 (62)	8.12 (36)	7.17 (37)
Total Fund Benchmark	2.28 (4)	7.41 (2)	12.62 (8)	3.90 (33)	7.77 (44)	7.19 (36)
5th Percentile	2.03	6.85	12.77	6.09	9.34	8.16
1st Quartile	1.56	5.89	10.91	4.17	8.40	7.38
Median	1.15	5.20	9.97	3.33	7.63	6.91
3rd Quartile	0.73	4.31	8.86	2.42	6.90	6.14
95th Percentile	0.38	2.90	6.39	1.05	5.47	4.69
Population	122	122	121	116	115	112

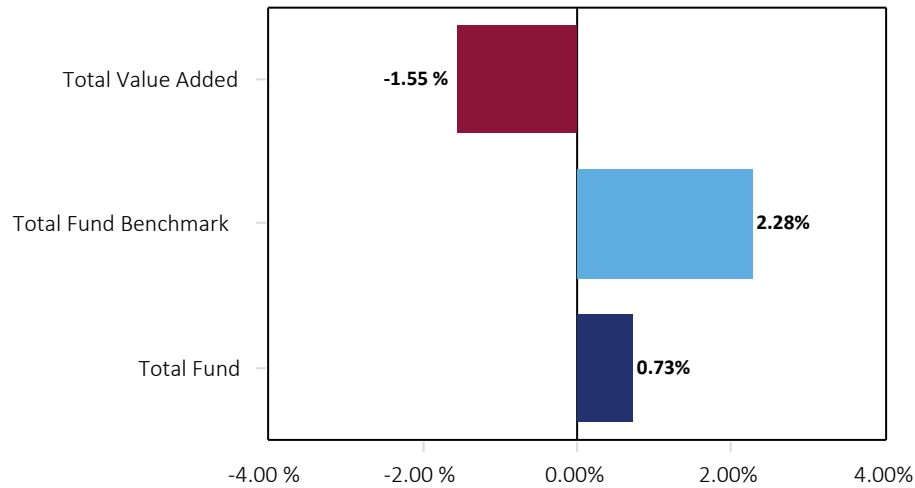
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI ACWI ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1.0% 90 Day US Treasury Bill.

Total Fund Attribution

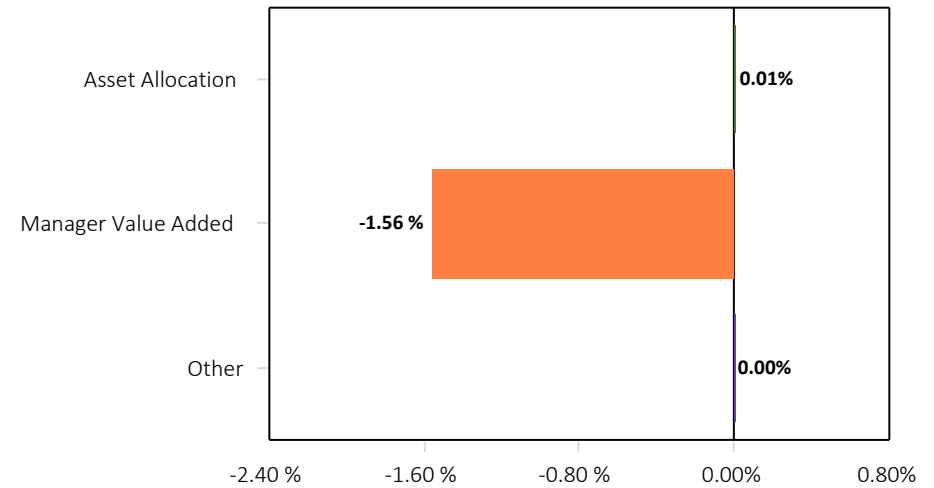
Total Fund

1 Quarter Ending June 30, 2024

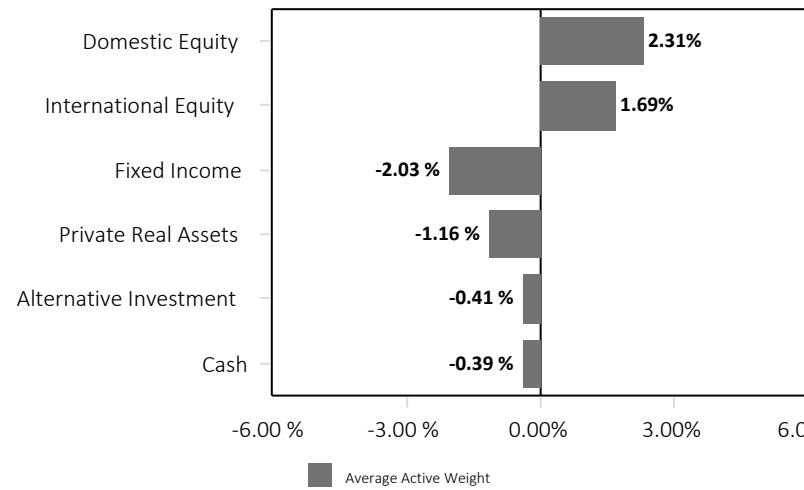
Total Fund Performance



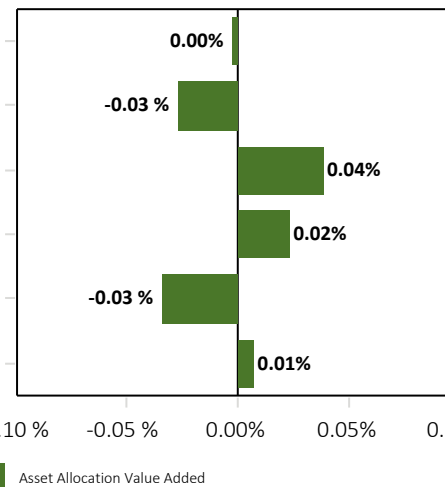
Total Value Added:-1.55 %



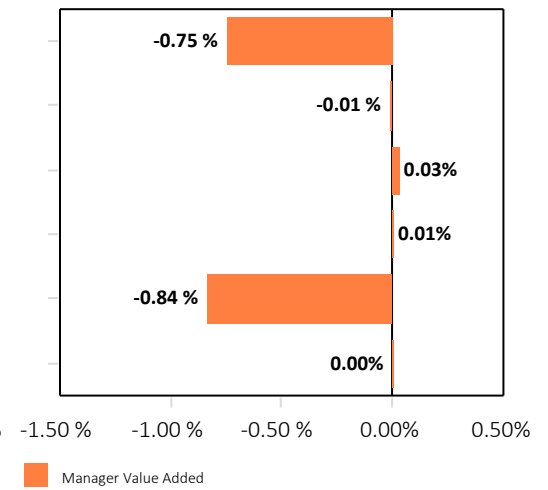
Asset Class Under or Overweighting



Asset Allocation Value Added:0.01%



Total Manager Value Added:-1.56 %



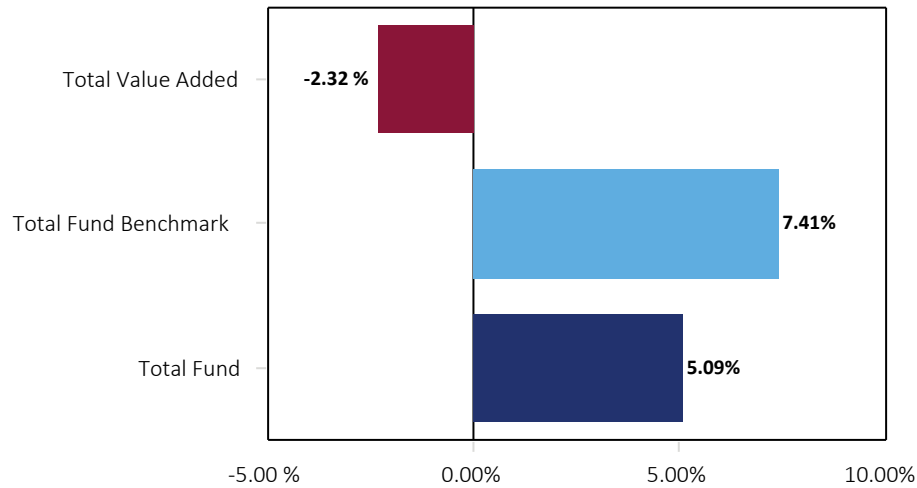
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI ACWI ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1.0% 90 Day US Treasury Bill.

Total Fund Attribution

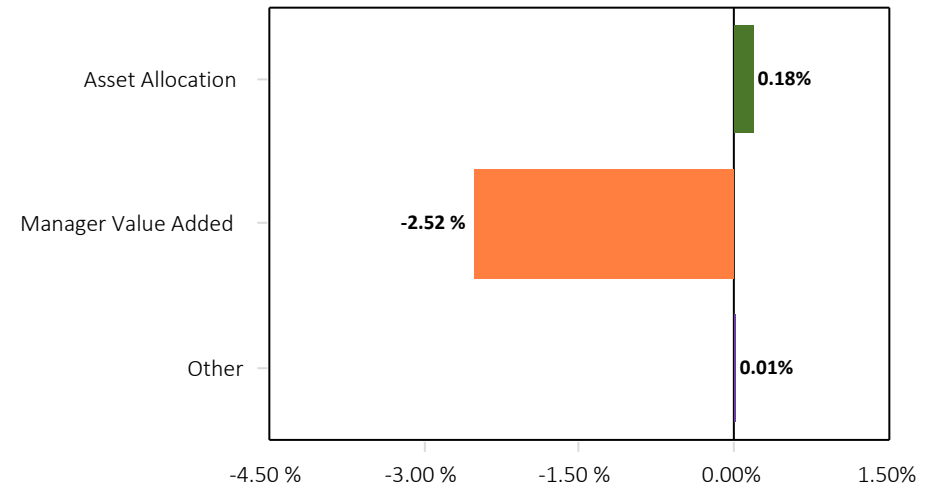
Total Fund

Year To Date Ending June 30, 2024

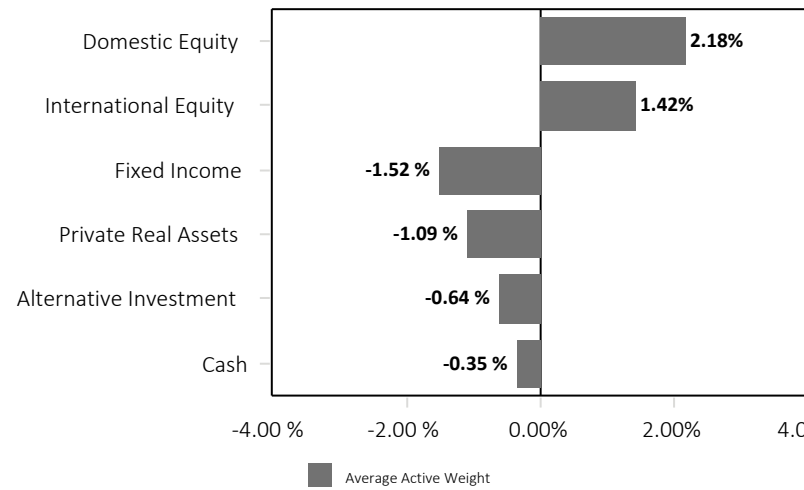
Total Fund Performance



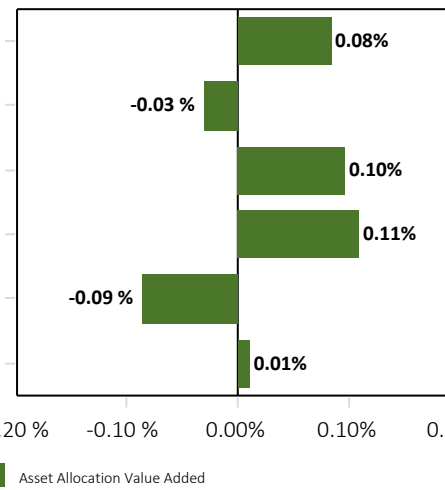
Total Value Added:-2.32 %



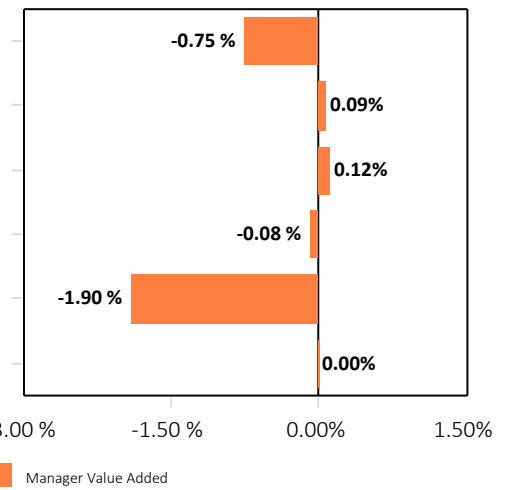
Asset Class Under or Overweighting



Asset Allocation Value Added:0.18 %



Total Manager Value Added:-2.52 %



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 June 30, 2024

	Performance (%)									
	1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Total Fund	0.77	5.17	10.53	3.17	8.29	7.37	7.85	8.45	9.67	1/1/1982
Total Fund - Net	0.73	5.09	10.35	3.01	8.12	7.17				
Total Fund Benchmark	2.28	7.41	12.62	3.90	7.77	7.19	7.41			
Domestic Equity	1.04	10.70	20.13	5.93	12.96	11.17	10.00	10.76	11.73	1/1/1982
Domestic Equity - Net	1.01	10.61	19.95	5.76	12.77	10.96				
Custom Benchmark (U.S. Equity)	3.05	12.76	21.74	7.58	13.84	11.99	10.18	10.63		
U.S. Equity IMRF Custom Benchmark	1.73	10.46	19.19	6.17	12.28					
International Equity	0.99	6.34	13.89	1.12	7.06	5.12	6.82	6.89	7.65	9/1/1986
International Equity - Net	0.89	6.14	13.46	0.75	6.68	4.76				
MSCI AC World ex USA (Net)	0.96	5.69	11.62	0.46	5.55	3.84	5.78	5.25		
International Equity IMRF Custom Benchmark	1.10	5.59	11.72	-0.13	5.32					
Fixed Income	0.51	0.61	4.84	-1.48	1.03	2.24	4.08	5.14	7.36	1/1/1982
Fixed Income - Net	0.49	0.57	4.76	-1.57	0.94	2.12				
Custom Benchmark (Fixed Income)	0.34	0.07	4.21	-1.71	0.58	1.76	3.33	4.67	6.84	
Fixed Income IMRF Custom Benchmark	0.41	0.27	4.44	-1.75	0.65					
Private Real Assets	-0.42	-3.46	-5.00						-0.12	3/1/2022
Private Real Assets - Net	-0.45	-3.50	-5.07						-0.19	
Custom Benchmark (Private Real Assets)	-0.55	-2.85	-9.20						-3.79	
Real Estate	-0.64	-3.72	-5.46	5.70	6.51	8.31	7.37	7.60	5.63	5/1/1985
Real Estate - Net	-0.66	-3.76	-5.54	5.63	6.44	8.27				
Blended Benchmark (Real Estate)	-0.66	-3.22	-9.99	1.02	2.27	5.47	6.15	6.58	7.02	
Agriculture	-1.08	-7.01	-16.02	-2.39	-1.62	2.00	6.58		5.58	10/1/1997
NCREIF Farmland Index	-0.21	0.53	2.54	6.77	5.82	6.90	12.06		10.76	
Timberland	1.14	-1.50	24.02	13.46	7.30	4.35	4.24	6.47	7.43	10/1/1992
NCREIF Timberland Index	1.71	3.86	9.84	10.99	7.18	5.89	7.12	7.40	8.53	

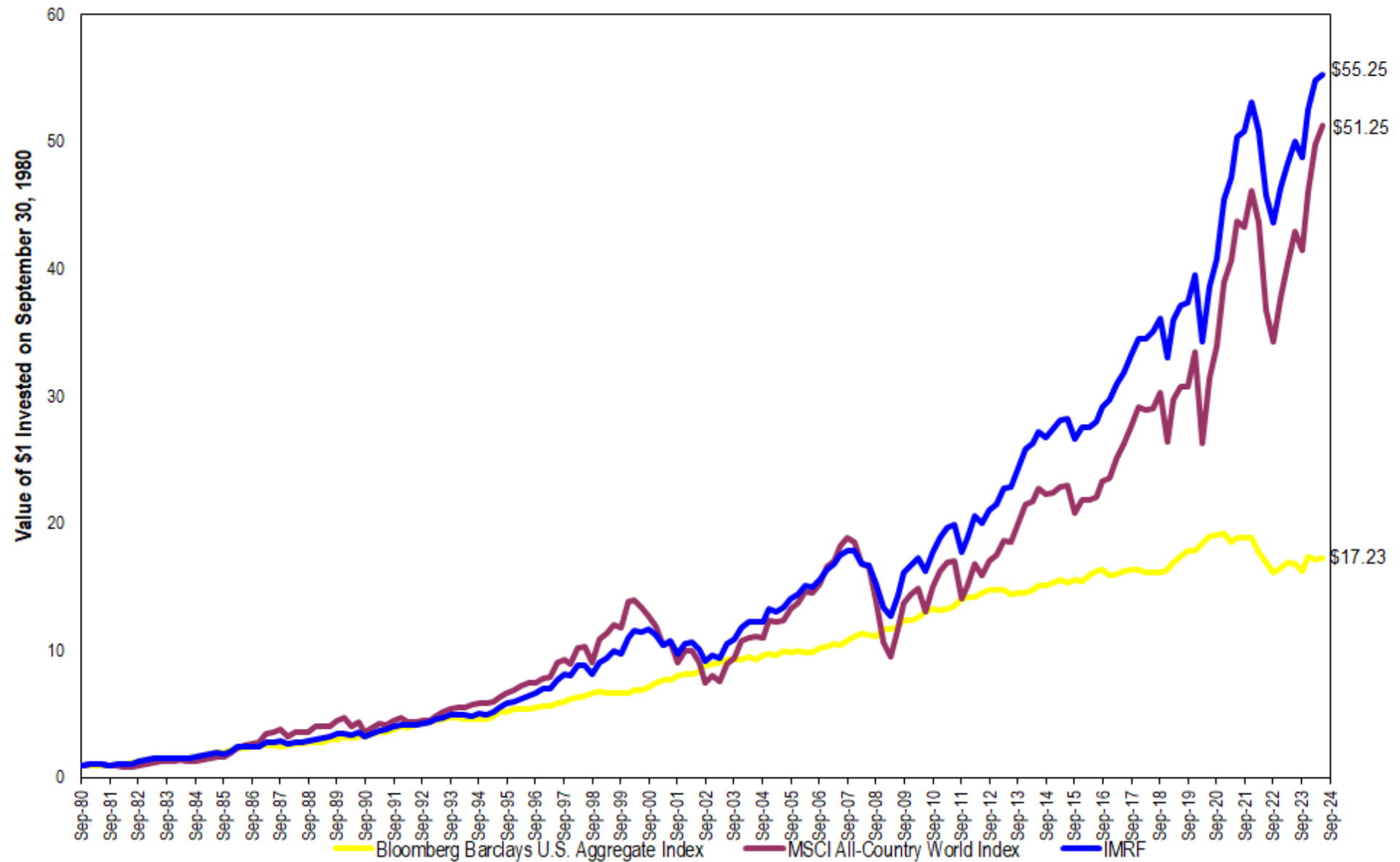
Benchmark definitions on next page.

Asset Class Returns

Periods Ended June 30, 2024

	Performance (%)									
	1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Unlisted Infrastructure	3.74	4.71	11.60	12.56	13.37				12.52	4/1/2018
Blended Benchmark (Unlisted Infrastructure)	1.58	4.45	7.09	8.72	8.83				8.87	
Alternatives Investments	1.06	2.66	2.18	9.51	13.81	11.83	10.08	12.53	11.23	2/1/1986
Alternatives Investments - Net	1.06	2.66	2.17	9.50	13.80	11.68				
Custom Benchmark (Alternative Investments)	8.75	20.69	26.52	8.91	8.94	8.97	9.88	11.44	12.21	
Private Equity	0.91	2.17	1.70	10.31	15.81	14.07	12.70	15.16	13.42	2/1/1986
Blended Benchmark (Private Equity)	9.69	23.12	28.86	9.29	9.18	9.09	9.94			
Cash	1.33	2.82	5.60	4.24	3.63	2.48	1.34	3.08	3.80	7/1/1986
90 Day U.S. Treasury Bill	1.32	2.63	5.40	3.03	2.16	1.50	1.54	2.44	3.16	

Growth of a Dollar - As of June 30, 2024



Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Domestic Equity	20,235,048,894	37.38	19,699,374,157	36.45
Large Cap Growth	4,240,032,463	7.83	4,360,355,122	8.07
Sands Capital	1,871,958,797	3.46	1,878,471,607	3.48
Xponance Russell 1000 G	2,368,073,666	4.37	2,481,883,516	4.59
Large Cap Value	4,202,295,848	7.76	3,783,925,336	7.00
Dodge & Cox	1,578,219,209	2.92	1,466,820,660	2.71
LSV Asset	1,070,019,075	1.98	1,032,307,902	1.91
NTGI S&P 500 Value	1,554,057,564	2.87	1,284,796,773	2.38
Large Cap Pass. Core	2,030,523,678	3.75	1,797,162,661	3.33
NTGI MarketCap Idx.	2,030,523,678	3.75	1,797,162,661	3.33
Factor Diversity Strategies	3,227,280,806	5.96	3,313,613,456	6.13
U.S. Large Cap FDP-GSAM	3,227,280,806	5.96	3,313,613,456	6.13
Quantitative Factor Strategies	2,708,479,092	5.00	2,682,957,866	4.96
Quantitative US Equity - SciBeta	2,708,479,092	5.00	2,682,957,866	4.96
Small Cap Multi-Factor Strategies	622,575,261	1.15	604,845,020	1.12
U.S. Small Cap Equity Multi-Factor - S&P	622,575,261	1.15	604,845,020	1.12
Small Cap Growth	784,733,747	1.45	771,783,395	1.43
Frontier Capital	784,733,747	1.45	771,783,395	1.43

Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Small Cap Value	936,164,662	1.73	886,369,259	1.64
Channing	378,457,255	0.70	357,661,972	0.66
William Blair Small Cap Value	557,707,406	1.03	528,707,286	0.98
Domestic Equity Transition		0.00		0.00
Transition Account	148	0.00		0.00
Public Real Assets	1,482,963,190	2.74	1,498,362,042	2.77
Brookfield	425,185,296	0.79	425,620,151	0.79
Cohen & Steers	1,057,777,893	1.95	1,072,741,891	1.98
International Equity	10,544,926,371	19.48	10,642,885,348	19.69
Intl Large Cap Growth	1,763,321,091	3.26	1,752,596,963	3.24
EARNEST Part. Intl	732,588,932	1.35	737,697,434	1.37
William Blair	1,030,732,159	1.90	1,014,899,529	1.88
Intl Large Cap Value	1,658,715,359	3.06	1,669,614,736	3.09
Brandes Investment	794,988,273	1.47	796,096,626	1.47
Mondrian	710,063,846	1.31	722,819,628	1.34
Lazard	153,663,240	0.28	150,698,483	0.28
Intl Large Cap Core	5,859,433,237	10.82	5,934,358,185	10.98
Arrowstreet Capital	1,346,990,844	2.49	1,383,371,274	2.56
Brown Capital	636,277,306	1.18	624,020,992	1.15
GlobeFlex Capital	969,491,926	1.79	989,336,188	1.83
Xponance Intl EQ	109,442,144	0.20	108,445,480	0.20
Transition Account	148	0.00		0.00
Progress Intl Equity	380,983	0.00	350,499	0.00
NTGI ACWI ex US Index Fund	2,796,850,034	5.17	2,828,833,751	5.23

Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Intl All Cap Developed	181,456,053	0.34	180,156,734	0.33
Ativo International	181,456,053	0.34	180,156,734	0.33
International Small Cap	592,218,092	1.09	590,055,565	1.09
Franklin Templeton	237,527,741	0.44	239,590,659	0.44
William Blair IntSC	354,690,351	0.66	350,464,906	0.65
Emerging Mkt Equity	489,782,539	0.90	516,103,165	0.95
Genesis Investment Management, LLP.	6,501,292	0.01	1,089,538	0.00
Arrowstreet EME	483,281,247	0.89	515,013,627	0.95

Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Fixed Income	12,198,633,936	22.53	12,041,493,687	22.28
Domestic Fixed Core	3,763,590,621	6.95	3,738,176,427	6.92
Attucks Fixed Income	91,532,288	0.17	91,626,897	0.17
Brandes FI Core	334,816,147	0.62	332,449,097	0.62
EARNEST Partners	893,990,402	1.65	887,326,806	1.64
Garcia Hamilton	947,786,384	1.75	943,114,864	1.75
Ramirez Asset Management	519,061,498	0.96	513,175,744	0.95
Xponance Yield Advantage Agg.	976,403,902	1.80	970,483,019	1.80
Domestic Fixed Passive Core	2,829,850,810	5.23	2,833,088,972	5.24
NTGI Blmbg Agg.	1,152,321,716	2.13	1,153,220,323	2.13
BlackRock US Debt I	1,677,529,094	3.10	1,679,868,648	3.11
Domestic Fixed Core Plus	2,940,964,567	5.43	2,910,249,284	5.38
LM Capital Group FI	839,843,091	1.55	832,887,406	1.54
Progress Inv. FI		0.00		0.00
Loop Capital Management	580,430,489	1.07	575,290,219	1.06
Western Asset	948,592,874	1.75	933,030,855	1.73
Longfellow Core Plus	572,098,113	1.06	569,040,804	1.05
Bank Loans	1,537,632,640	2.84	1,435,690,076	2.66
Barings Global Loan Fund	1,537,632,640	2.84	1,435,690,076	2.66
Emerging Markets Debt	246,797	0.00	262,996	0.00
Standish-Mellon EMD	246,797	0.00	262,996	0.00
High Yield	1,126,348,502	2.08	1,124,025,931	2.08
MacKay Shields	1,126,348,502	2.08	1,124,025,931	2.08

Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Private Real Assets	4,957,242,269	9.16	5,083,364,820	9.41
Real Estate	4,423,901,823	8.17	4,533,397,609	8.39
Real Estate Core Cmp	2,107,300,984	3.89	2,090,491,829	3.87
TA Assoc. Buckhead	897,170,612	1.66	905,666,983	1.68
Barings Euro Core Property	97,740,635	0.18	96,295,019	0.18
Blackstone Property Euro	166,650,441	0.31	168,570,549	0.31
INVESCO Core Real Estate	211,752,989	0.39	202,966,279	0.38
INVESCO European real estate	53,673,504	0.10	53,257,038	0.10
AEW Core Property Tr	248,566,122	0.46	243,805,184	0.45
CBRE Core Partners	275,155,157	0.51	271,102,756	0.50
JPM Strategic Property Fund	156,591,524	0.29	148,828,022	0.28
RE Non-Core Cmp	2,316,600,839	4.28	2,442,905,780	4.52
Artemis MWBE Spruce	382,562,434	0.71	401,891,714	0.74
Franklin T. EMREFF	1,066,392	0.00	1,066,392	0.00
Security Capital	96,515,080	0.18	101,001,431	0.19
Dune II	6,765,804	0.01	6,955,701	0.01
Non-Core Real Estate Funds	1,527,563,043	2.82	1,622,485,265	3.00
Non-Core Intl Real Estate	302,064,540	0.56	309,449,746	0.57
Almanac ARS V	63,546	0.00	55,532	0.00
Agriculture	224,080,653	0.41	221,660,429	0.41
Premiere Partners IV	224,080,653	0.41	221,660,429	0.41
Timberland	68,325,998	0.13	69,103,553	0.13
Forest Investment	68,325,998	0.13	69,103,553	0.13
Unlisted Infrastructure	240,933,795	0.45	259,203,229	0.48
Unlisted Infrastructure Funds	240,933,795	0.45	259,203,229	0.48

Investment Manager Asset Allocation

Periods Ended June 30, 2024

	Mar-2024		Jun-2024	
	\$	%	\$	%
Alternatives Investments	5,788,365,236	10.69	6,128,125,580	11.34
Absolute Return	48,943	0.00	15,652	0.00
Aurora Investment	48,943	0.00	15,652	0.00
Private Equity	5,438,715,801	10.05	5,604,811,669	10.37
Abbott S/A Comp.	491,026,319	0.91	490,534,261	0.91
Muller Monroe MPEFF		0.00		0.00
Pantheon S/A Comp.	418,179,220	0.77	429,685,655	0.80
Private Equity Fund - Domestic	3,531,699,273	6.52	3,628,345,975	6.71
Private Equity Fund - International	720,520,812	1.33	772,683,132	1.43
Oakbrook Opportunities Fund	277,290,177	0.51	283,562,645	0.52
Private Credit	349,600,492	0.65	523,298,259	0.97
Private Credit Fund - Domestic	325,268,275	0.60	491,085,939	0.91
Private Credit Fund - International	24,332,217	0.04	32,212,320	0.06
Cash & Equivalents	415,443,664	0.77	448,413,524	0.83
Total Fund	54,139,660,370	100.00	54,043,657,115	100.00

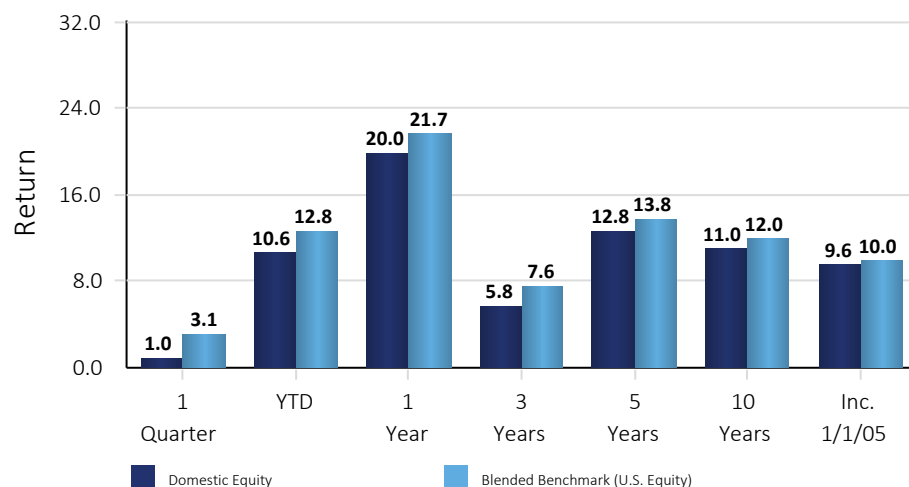
Domestic Equity

Composite Performance Summary

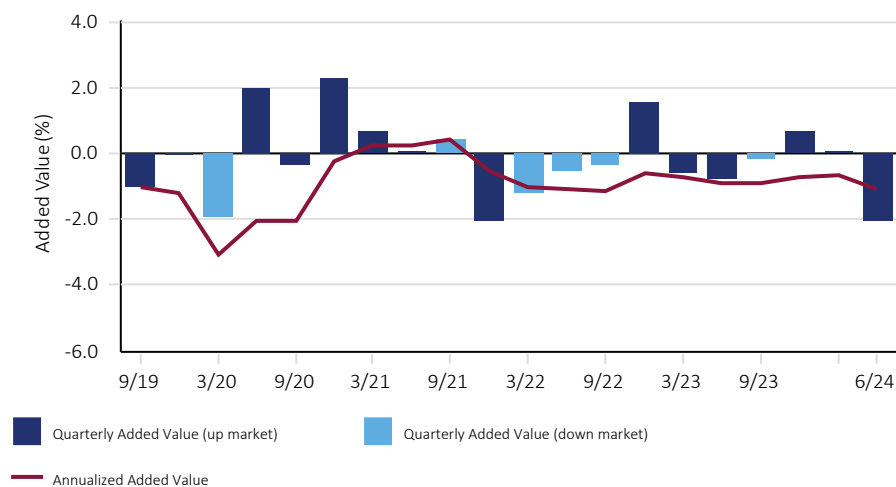
Domestic Equity

Periods Ended June 30, 2024

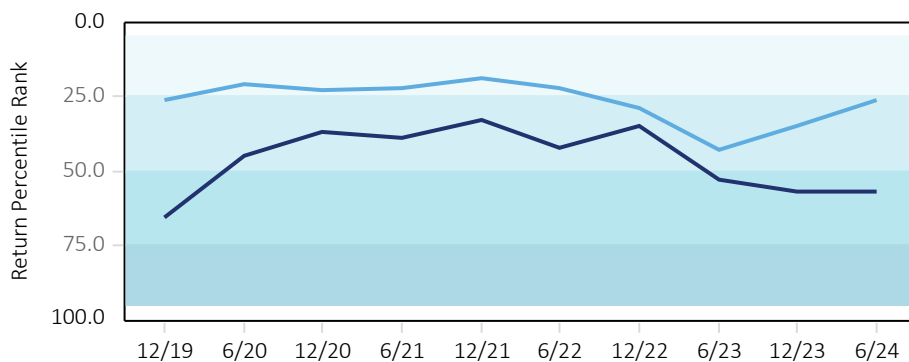
Comparative Performance



Added Value History

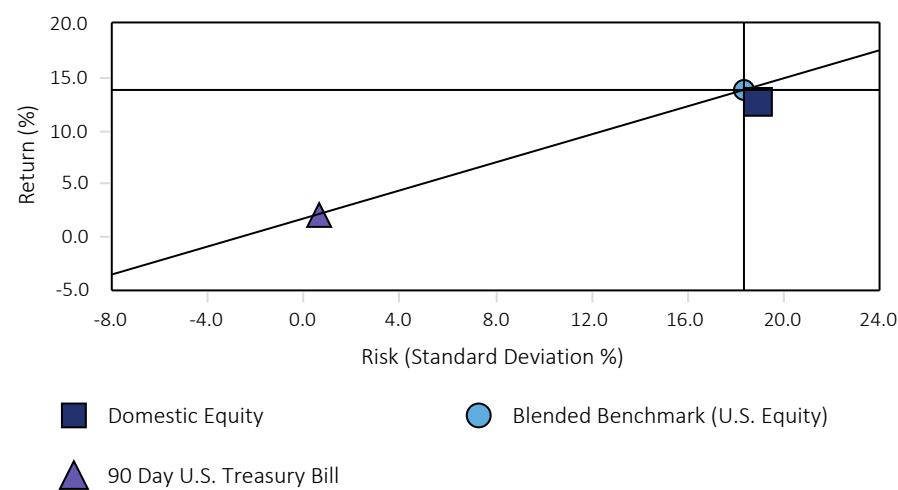


Rolling Percentile Rank: All Public Plans > \$1B-US Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Domestic Equity	10	0 (0%)	6 (60%)	4 (40%)	0 (0%)
Benchmark	10	5 (50%)	5 (50%)	0 (0%)	0 (0%)

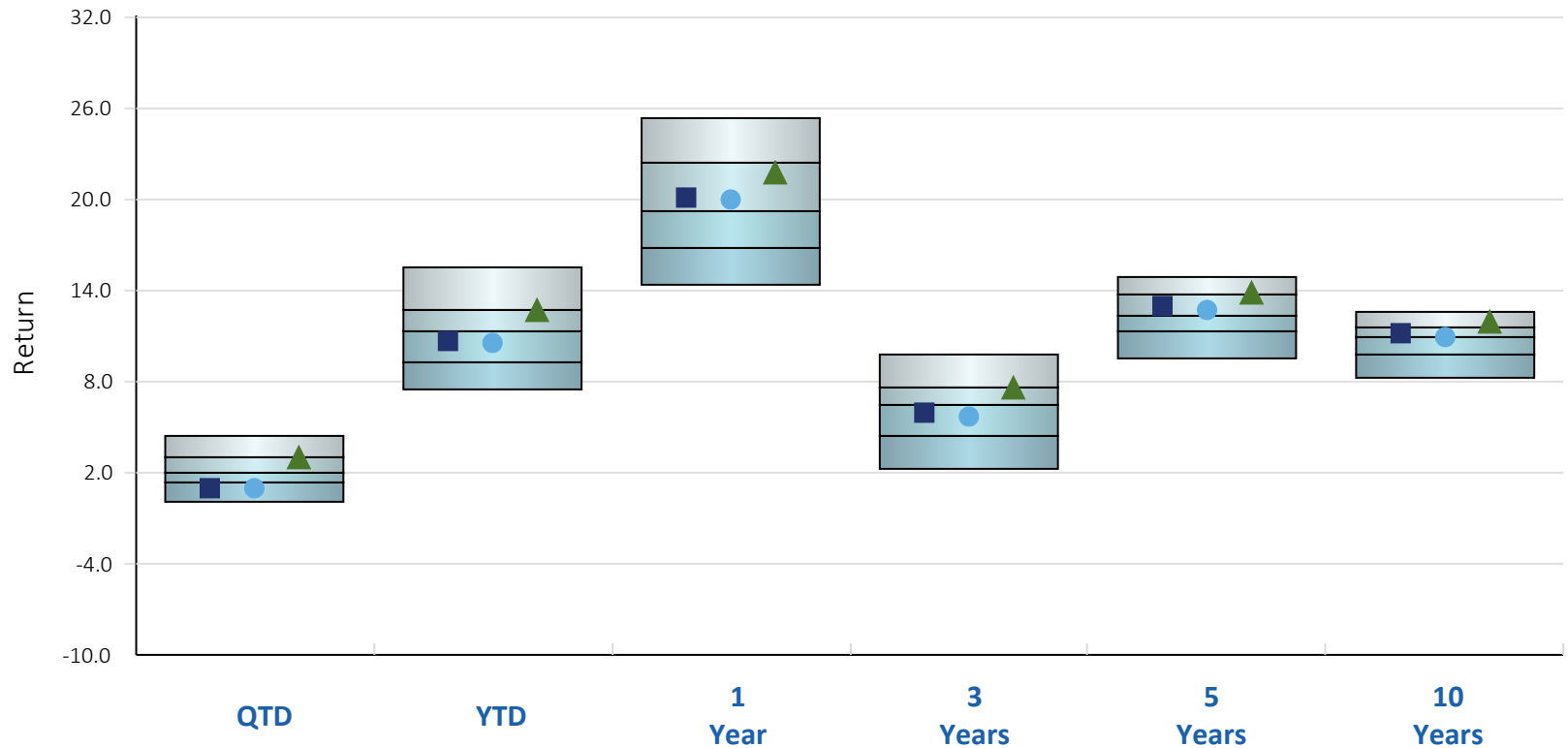
Risk and Return 07/1/19 - 06/30/24



Plan Sponsor Peer Group Analysis

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

Periods Ended June 30, 2024



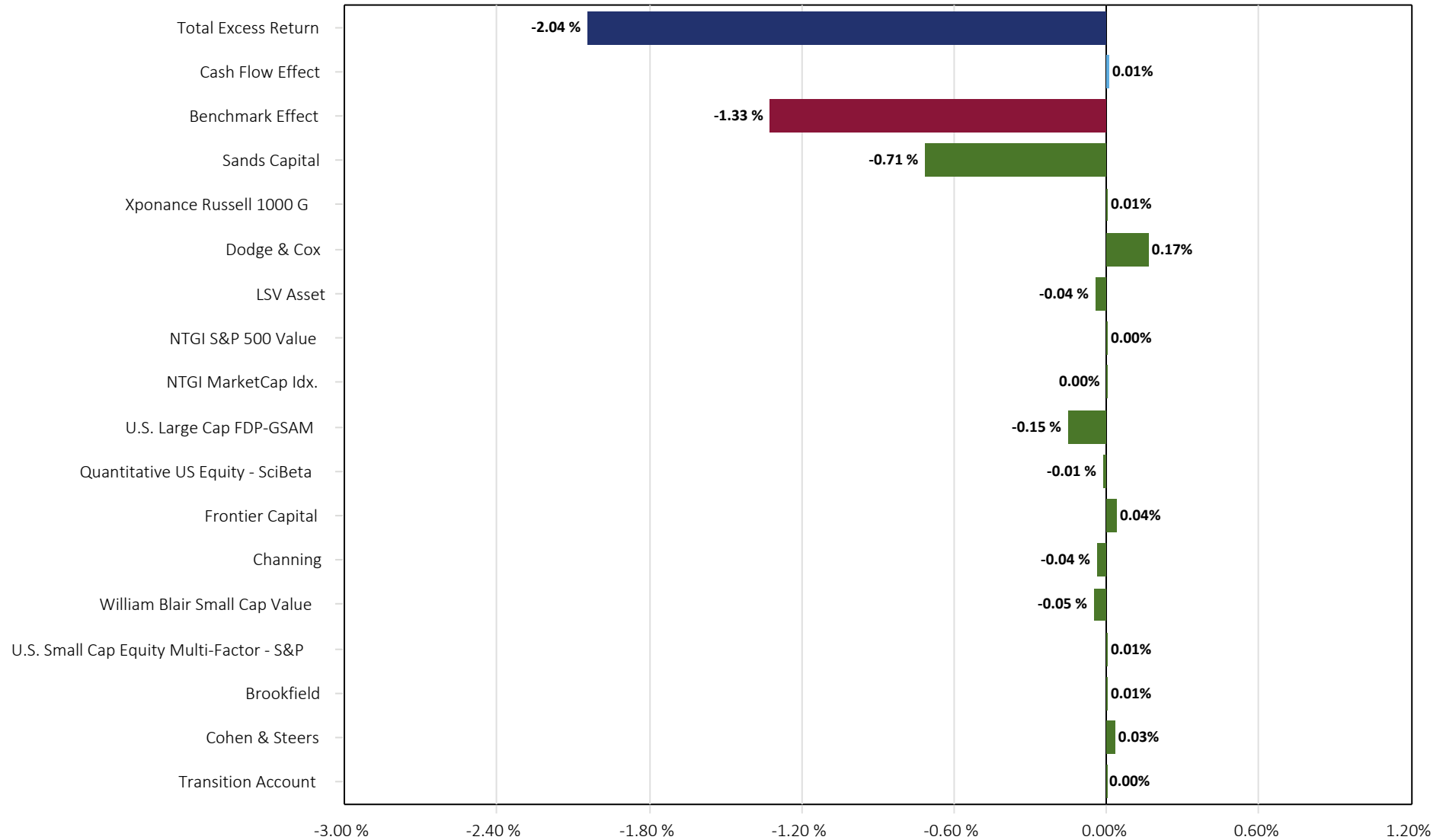
Domestic Equity	1.04 (84)	10.70 (55)	20.13 (48)	5.93 (56)	12.96 (37)	11.17 (32)
Domestic Equity - Net	1.01 (84)	10.61 (58)	19.95 (49)	5.76 (57)	12.77 (39)	10.96 (49)
Blended Benchmark (U.S. Equity)	3.05 (25)	12.76 (25)	21.74 (32)	7.58 (26)	13.84 (23)	11.99 (19)
5th Percentile	4.37	15.51	25.40	9.80	14.94	12.55
1st Quartile	2.97	12.74	22.47	7.59	13.75	11.56
Median	2.00	11.29	19.27	6.44	12.37	10.88
3rd Quartile	1.42	9.30	16.85	4.46	11.38	9.83
95th Percentile	0.13	7.49	14.32	2.28	9.54	8.32
Population	53	52	51	48	42	37

Asset Class Attribution

Domestic Equity

Periods Ended 1 Quarter Ending June 30, 2024

1 Quarter

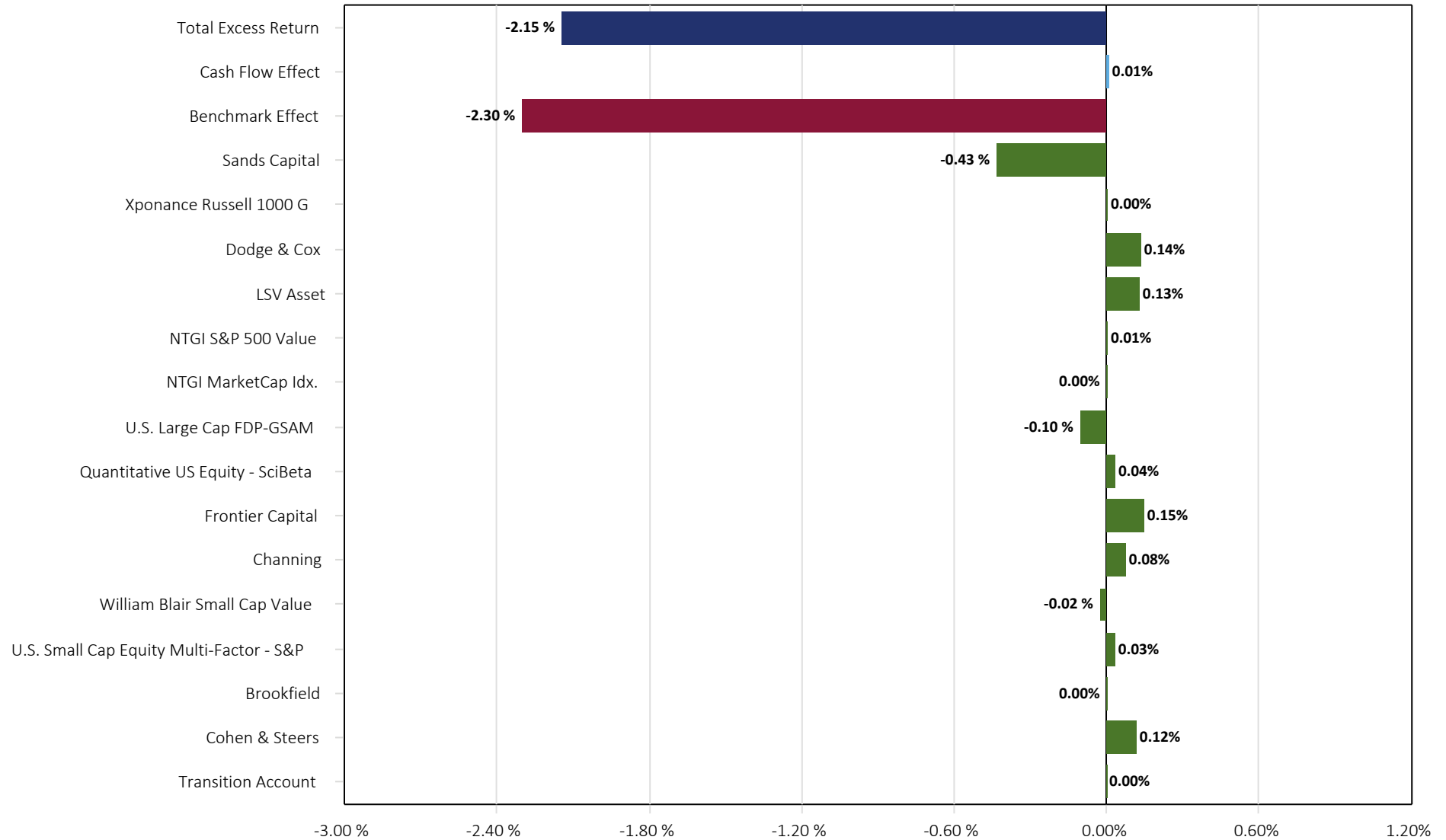


Asset Class Attribution

Domestic Equity

Periods Ended Year To Date Ending June 30, 2024

Year To Date



Performance

Domestic Equity

Periods Ended June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Domestic Equity	19,699,374,157	1.04	10.70	20.13	5.93	12.96	11.17	11.73	1/1/1982
Domestic Equity - Net		1.01	10.61	19.95	5.76	12.77	10.96		
Blended Benchmark (U.S. Equity)		3.05	12.76	21.74	7.58	13.84	11.99		
Russell 3000 Index		3.22	13.56	23.12	8.05	14.14	12.15	11.77	
U.S. Equity IMRF Custom Benchmark		1.73	10.46	19.19	6.17	12.28			
Large Cap Equity	13,255,056,575	2.24	13.35	24.51	7.29	14.26	12.23	11.59	1/1/1982
Large Cap Equity - Net		2.22	13.31	24.40	7.20	14.17	12.12		
Russell 1000 Index		3.57	14.24	23.88	8.74	14.61	12.51	11.95	
Large Cap Growth	4,360,355,122	4.80	18.49	32.36	7.49	17.39	15.26	12.61	1/1/1982
Large Cap Growth - Net		4.77	18.43	32.22	7.39	17.28	15.13		
LCG Blended Benchmark*		8.33	20.70	33.48	11.28	19.34	16.33		
Russell 1000 Growth Index		8.33	20.70	33.48	11.28	19.34	16.33	12.08	
Xponance Russell 1000 G	2,481,883,516	8.39	20.75	33.58	11.31	19.35		17.07	10/1/2018
Xponance Russell 1000 G - Net		8.38	20.74	33.55	11.29	19.33		17.05	
Russell 1000 Growth Index		8.33	20.70	33.48	11.28	19.34		17.06	
Sands Capital	1,878,471,607	0.35	15.81	31.13	-4.40	11.19	12.55	12.21	11/1/2003
Sands Capital - Net		0.29	15.69	30.85	-4.62	10.95	12.30		
LCG Blended Benchmark*		8.33	20.70	33.48	11.28	19.34	16.33	12.12	
Russell 1000 Growth Index		8.33	20.70	33.48	11.28	19.34	16.33	12.16	
Large Cap Value	3,783,925,336	-1.46	7.71	17.78	8.13	11.87	9.90	10.46	10/1/1982
Large Cap Value - Net		-1.49	7.64	17.59	7.97	11.71	9.73		
LCV Blended Benchmark**		-2.17	6.62	13.06	5.52	9.01	8.23		
Russell 1000 Value Index		-2.17	6.62	13.06	5.52	9.01	8.23	11.50	

* 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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Dodge & Cox	1,466,820,660	0.08	8.59	19.53	7.73	13.24	10.84	10.33	9/1/2003
Dodge & Cox - Net		0.02	8.48	19.26	7.50	13.00	10.60		
LCV Blended Benchmark**		-2.17	6.62	13.06	5.52	9.01	8.23	8.50	
Russell 1000 Value Index		-2.17	6.62	13.06	5.52	9.01	8.23	8.63	
LSV Asset	1,032,307,902	-2.89	9.23	18.29	7.16	10.76	9.22	10.79	2/1/2003
LSV Asset - Net		-2.95	9.10	17.95	6.90	10.49	8.96		
LCV Blended Benchmark**		-2.17	6.62	13.06	5.52	9.01	8.23	9.21	
Russell 1000 Value Index		-2.17	6.62	13.06	5.52	9.01	8.23	9.22	
NTGI S&P 500 Value	1,284,796,773	-2.04	5.87	15.39	9.60	11.94	9.95	7.05	8/1/1999
NTGI S&P 500 Value - Net		-2.04	5.87	15.39	9.59	11.93	9.95		
S&P 500 Value		-2.10	5.79	15.29	9.59	11.89	9.89	7.01	
Large Cap Pass. Core	1,797,162,661	3.24	13.61	23.24	7.94	14.07	12.13	11.51	1/1/1985
Large Cap Pass. Core - Net		3.24	13.61	23.24	7.94	14.06	12.12		
Dow Jones U.S. Total Stock Market Index		3.24	13.61	23.20	7.90	14.04	12.07		
NTGI MarketCap Idx.	1,797,162,661	3.24	13.61	23.24	7.94	14.07	12.13	11.31	2/1/1985
NTGI MarketCap Idx. - Net		3.24	13.61	23.24	7.94	14.06	12.12		
Dow Jones U.S. Total Stock Market Index		3.24	13.61	23.20	7.90	14.04	12.07		
Factor Diversity Strategies	3,313,613,456	2.68	13.69	23.40	8.60			13.94	8/18/2020
U.S. Large Cap FDP-GSAM	3,313,613,456	2.68	13.69	23.40	8.60			13.94	8/18/2020
U.S. Large Cap FDP-GSAM - Net		2.67	13.68	23.37	8.57			13.89	
Solactive GBS U.S. 1000 Index		3.60	14.31	23.98	8.58			13.97	
GSAM Active Beta US. Large Cap FDC Index		2.70	13.76	23.41	8.63			13.92	

* 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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Quantitative Factor Strategies	2,682,957,866	-0.94	8.32	16.48	6.47			10.29	9/17/2019
Quantitative US Equity - SciBeta	2,682,957,866	-0.94	8.32	16.48	6.47			10.29	9/17/2019
Quantitative US Equity - SciBeta - Net		-0.95	8.30	16.43	6.41			10.14	
SciBeta US Hi-Fctr-Intst Div Multi-Beta Multi-Strat Index		-0.87	8.03	16.04	5.57			9.36	

* 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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Small Cap	2,262,997,673	-3.43	3.26	8.85	3.16	10.99	8.81	11.90	7/1/1988
Small Cap Composite - Net		-3.51	2.90	8.22	2.49	10.29	8.18		
Russell 2000 Index		-3.28	1.73	10.06	-2.58	6.94	7.00	9.05	
Small Cap Multi-Factor Strategies	604,845,020	-2.85	0.31					4.40	8/1/2023
U.S. Small Cap Equity Multi-Factor - S&P	604,845,020	-2.85	0.31					4.40	8/1/2023
U.S. Small Cap Equity Multi-Factor - S&P		-2.85	0.31					4.40	
S&P SmallCap 600 QVML Top 90% Multi-Factor Index		-2.84	0.32					4.48	
S&P SmallCap 600 Index		-3.11	-0.72					2.98	
Small Cap Growth	771,783,395	-1.65	9.23	9.50	2.57	13.38	11.15	12.99	7/1/1988
Small Cap Growth - Net		-1.77	8.34	8.30	1.38	12.22	10.29		
Russell 2000 Growth Index		-2.92	4.44	9.14	-4.86	6.17	7.39	7.89	
Frontier Capital	771,783,395	-1.65	9.23	9.50	2.18	14.08	11.94	13.33	8/1/1988
Frontier Capital - Net		-1.77	8.34	8.30	1.02	12.87	11.00		
Russell 2000 Growth Index		-2.92	4.44	9.14	-4.86	6.17	7.39	7.96	
Small Cap Value	886,369,259	-5.32	0.50	8.76	3.60	9.98	7.98	11.42	9/1/1989
Small Cap Value - Net		-5.42	0.29	8.16	3.12	9.45	7.45		
Russell 2000 Value Index		-3.64	-0.85	10.90	-0.53	7.07	6.23	9.52	
Channing	357,661,972	-5.49	3.46	10.58	2.40	9.37	7.58	9.89	7/1/2011
Channing - Net		-5.61	3.22	10.05	1.90	8.83	7.07	9.32	
Russell 2000 Value Index		-3.64	-0.85	10.90	-0.53	7.07	6.23	8.11	
William Blair Small Cap Value	528,707,286	-5.20	-1.41	7.44	0.83	7.73	8.03	10.69	5/1/1999
Inv. Couns. Maryland - Net		-5.29	-1.60	6.87	0.34	7.18	7.49		
Russell 2000 Value Index		-3.64	-0.85	10.90	-0.53	7.07	6.23	8.55	

* 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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Public Real Assets	1,498,362,042	1.05	3.36	6.59	4.34	4.99		6.07	8/1/2017
Public Real Assets - Net		0.98	3.21	6.27	4.01	4.62		5.68	
Public Real Assets Benchmark***		0.37	1.62	4.16	2.18	3.07		4.09	
Brookfield	425,620,151	0.10	0.36	5.62	5.60	5.06		5.34	8/1/2017
Brookfield - Net		0.00	0.16	5.18	5.15	4.57		4.85	
Dow Jones Brookfield Global Infrastructure Composi		-0.36	0.27	3.77	2.13	3.01		3.53	
Cohen & Steers	1,072,741,891	1.43	4.60	6.98	4.01	5.17		6.59	8/1/2017
Cohen & Steers - Net		1.37	4.47	6.71	3.73	4.84		6.24	
FTSE Global Core Infrastructure 50/50 Index (Net)		0.73	2.29	4.34	2.18	3.07		4.34	

* 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.

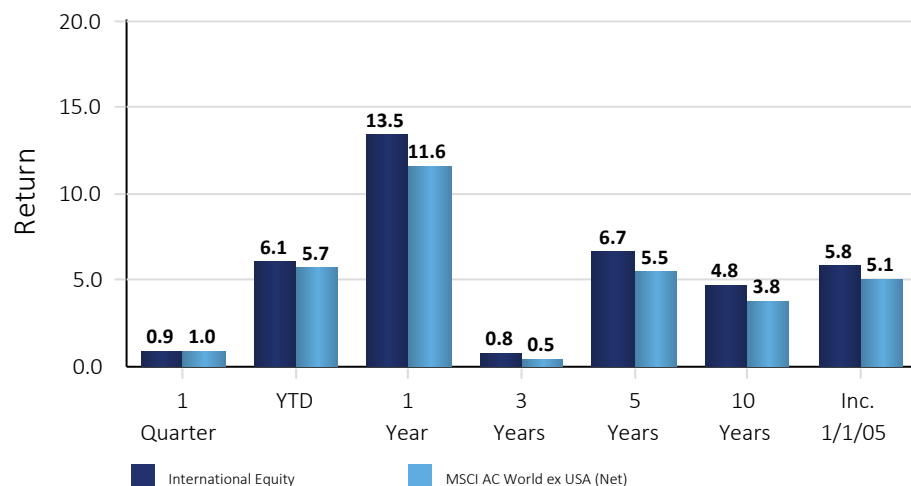
International Equity

Composite Performance Summary

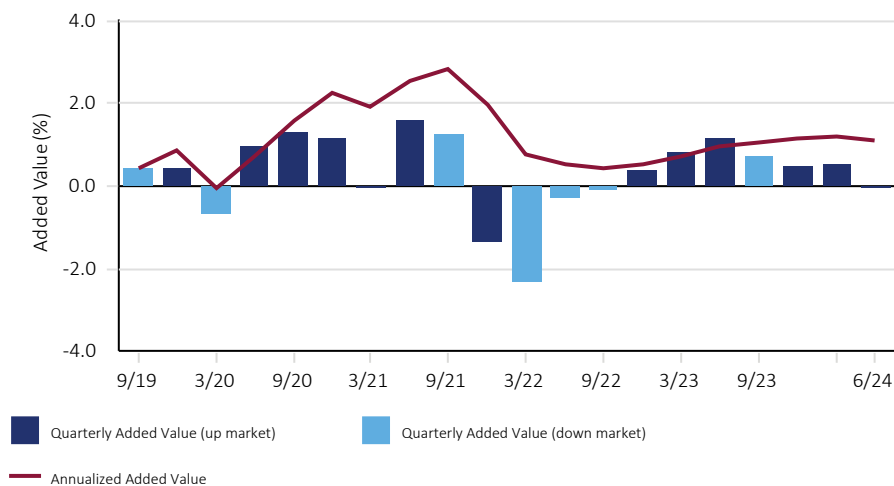
International Equity

Periods Ended June 30, 2024

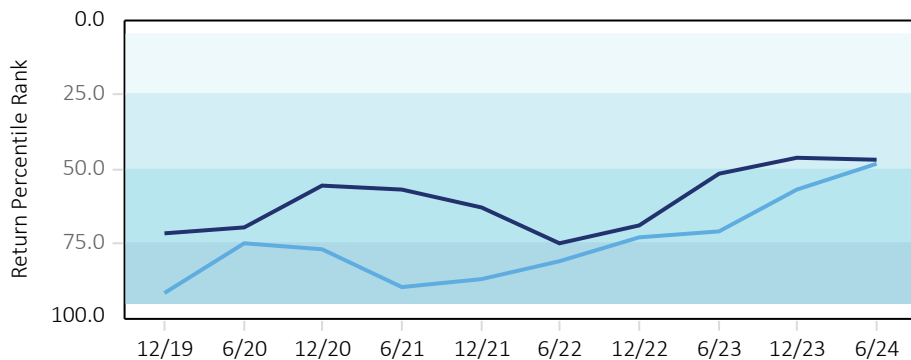
Comparative Performance



Added Value History

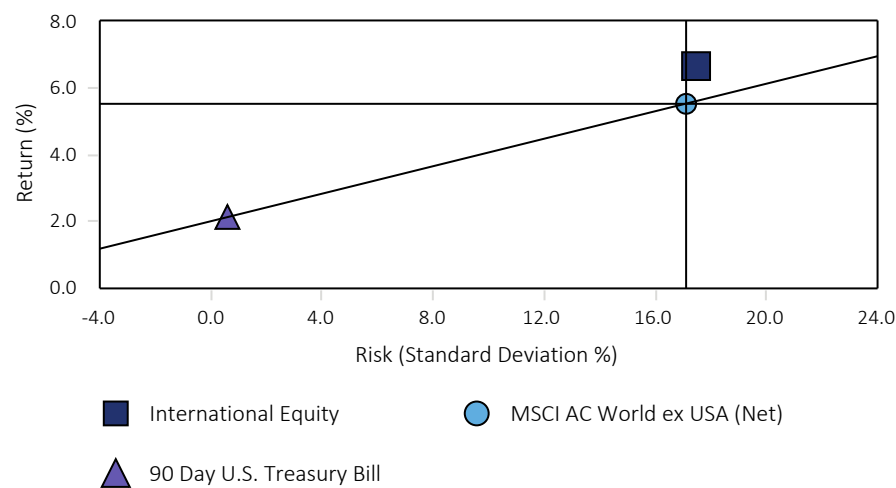


Rolling Percentile Rank: All Public Plans > \$1B-Intl. Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
International Equity	10	0 (0%)	2 (20%)	8 (80%)	0 (0%)
Benchmark	10	0 (0%)	1 (10%)	4 (40%)	5 (50%)

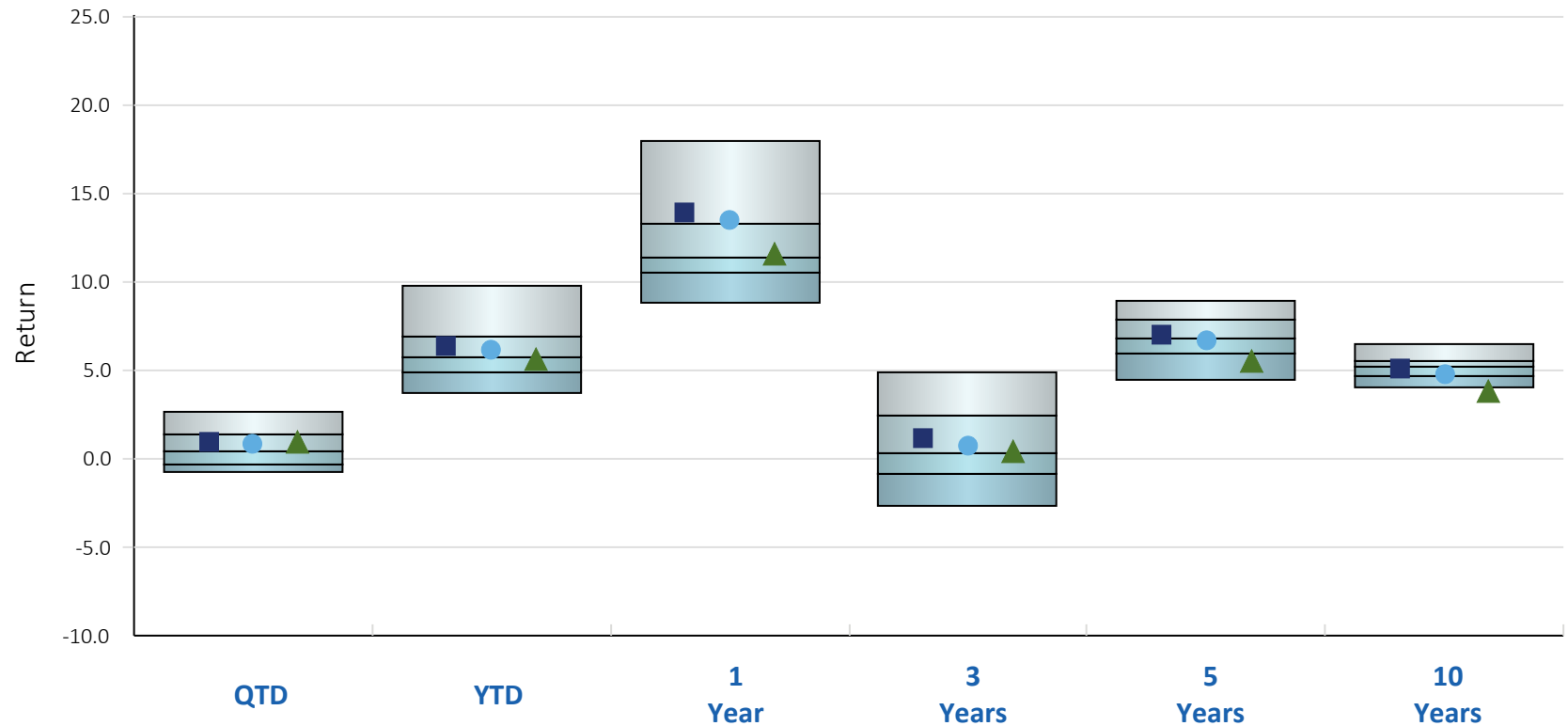
Risk and Return 07/1/19 - 06/30/24



Plan Sponsor Peer Group Analysis

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

Periods Ended June 30, 2024



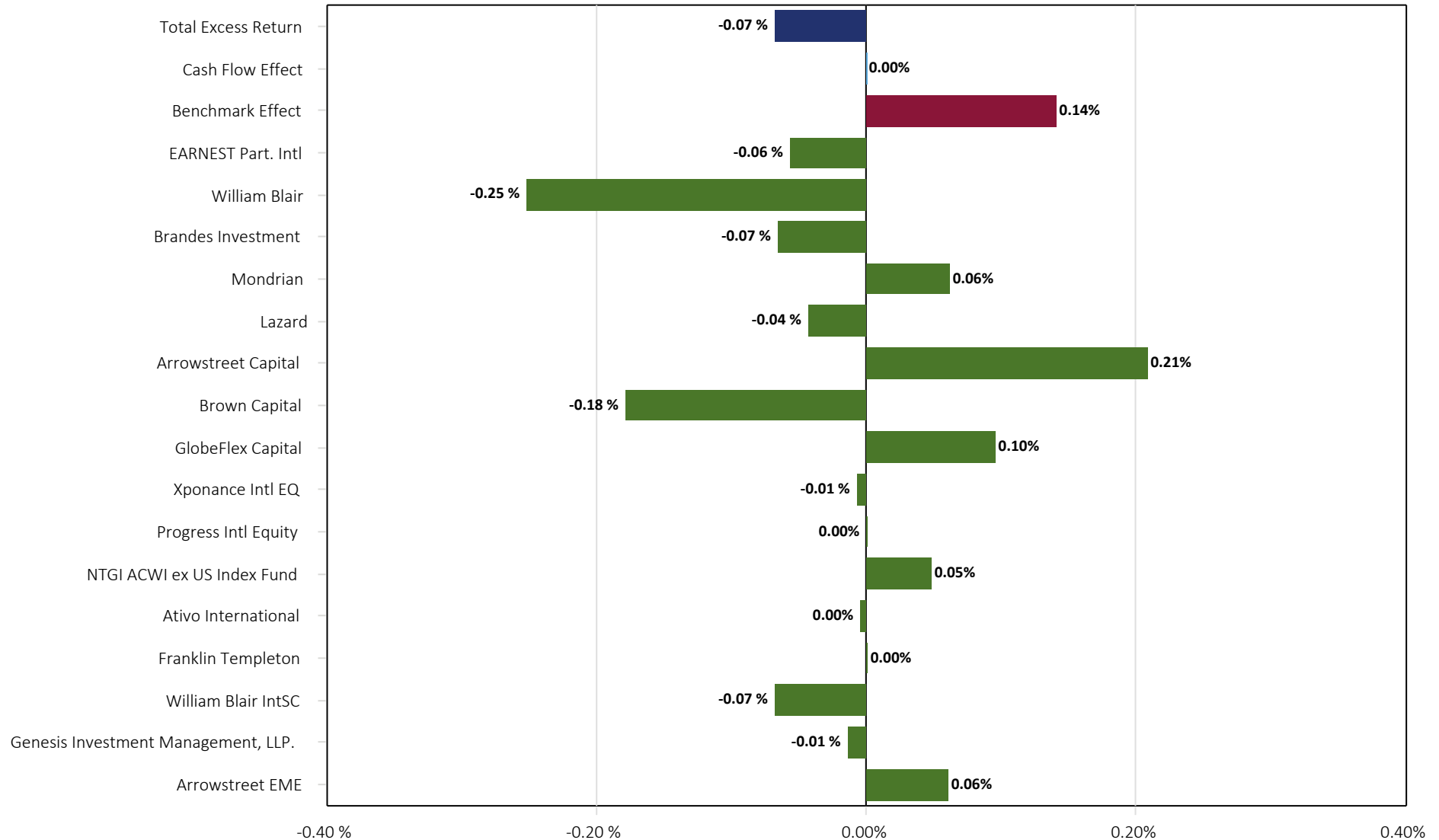
International Equity	0.99 (33)	6.34 (37)	13.89 (22)	1.12 (43)	7.06 (38)	5.12 (57)
International Equity - Net	0.89 (36)	6.14 (43)	13.46 (24)	0.75 (47)	6.68 (55)	4.76 (69)
MSCI AC World ex USA (Net)	0.96 (34)	5.69 (51)	11.62 (47)	0.46 (48)	5.55 (82)	3.84 (98)
5th Percentile	2.69	9.80	18.01	4.90	8.94	6.49
1st Quartile	1.34	6.90	13.34	2.50	7.88	5.56
Median	0.41	5.72	11.43	0.35	6.80	5.22
3rd Quartile	-0.31	4.92	10.50	-0.82	5.94	4.68
95th Percentile	-0.70	3.72	8.85	-2.61	4.49	3.99
Population	53	53	52	51	46	42

Asset Class Attribution

International Equity

Periods Ended 1 Quarter Ending June 30, 2024

1 Quarter



Performance

International Equity

Periods Ended June 30, 2024

	Market Value \$	Performance (%)								
		1 Quarter	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
International Equity	10,642,885,348	0.99	0.99	6.34	13.89	1.12	7.06	5.12	7.65	9/1/1986
International Equity - Net		0.89	0.89	6.14	13.46	0.75	6.68	4.76		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84		
International Equity IMRF Custom Benchmark		1.10	1.10	5.59	11.72	-0.13	5.32			
Intl Large Cap Equity	9,356,569,884	0.83	0.83	6.54	14.04	2.85	8.00	5.53	7.77	9/1/1986
Intl LargeCap Equity - Net		0.73	0.73	6.35	13.66	2.54	7.68	5.23		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84		
Intl Large Cap Grwth	1,752,596,963	-0.60	-0.60	5.99	11.60	0.05	8.27	5.80	8.32	9/1/2002
Intl Large Cap Grwth - Net		-0.88	-0.88	5.63	10.87	-0.38	7.86	5.45		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	6.90	
EARNEST Part. Intl	737,697,434	0.70	0.70	7.07	14.61	5.54	9.42	5.82	9.08	10/1/2004
EARNEST Part. Intl - Net		0.15	0.15	6.44	13.36	5.01	9.01	5.51		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.80	
MSCI AC World ex USA Growth (Net)		0.72	0.72	6.68	9.88	-2.62	5.49	4.74	6.29	
William Blair	1,014,899,529	-1.53	-1.53	5.22	9.51	-3.31	7.49	5.90	9.12	10/1/2002
William Blair - Net		-1.61	-1.61	5.05	9.14	-3.68	7.10	5.52		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	7.48	
MSCI AC World ex USA Growth (Net)		0.72	0.72	6.68	9.88	-2.62	5.49	4.74	7.54	
Intl Large Cap Val.	1,669,614,736	0.74	0.74	4.97	14.74	5.71	7.54	4.70	8.44	10/1/1995
Intl Large Cap Val. - Net		0.67	0.67	4.65	14.22	5.34	7.18	4.33		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.27	
Brandes Investment	796,096,626	0.14	0.14	5.46	19.22	8.99	9.71	5.55	8.91	1/1/1996
Brandes Investment - Net		0.09	0.09	4.98	18.56	8.64	9.41	5.28		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.19	
MSCI AC World ex USA Value		1.55	1.55	5.21	14.24	4.30	5.98	3.40		

* 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 June 30, 2024

	Market Value \$	Performance (%)								
		1 Quarter	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Mondrian	722,819,628	1.98	1.98	4.80	11.89	3.40	5.98	4.12	5.71	4/1/2012
Mondrian - Net		1.88	1.88	4.59	11.45	3.02	5.58	3.66	5.24	
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.21	
MSCI AC World ex USA Value		1.55	1.55	5.21	14.24	4.30	5.98	3.40	5.06	
Lazard	150,698,483	-1.93	-1.93	3.28	6.62	1.45	5.17	3.99	6.00	4/1/2012
Lazard - Net		-1.99	-1.99	3.15	6.36	1.22	4.92	3.66	5.58	
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.21	
MSCI AC World ex USA Value		1.55	1.55	5.21	14.24	4.30	5.98	3.40	5.06	
Intl Large Cap Active Core	3,105,524,434	1.42	1.42	8.42	16.95	3.86	9.79	7.11	6.33	2/1/2008
Intl Large Cap Active Core - Net		1.32	1.32	8.23	16.53	3.42	9.28	6.58		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	3.27	
Arrowstreet Capital	1,383,371,274	2.70	2.70	11.92	21.67	6.95	14.41	9.60	7.84	3/1/2008
Arrowstreet Capital - Net		2.59	2.59	11.68	21.14	6.46	13.90	9.10	7.35	
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	3.11	
Brown Capital	624,020,992	-1.93	-1.93	2.03	15.23	-1.37	6.12	5.35	7.50	10/1/2004
Brown Capital - Net		-1.99	-1.99	1.91	14.96	-1.85	5.57	4.61		
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	5.80	
GlobeFlex Capital	989,336,188	2.08	2.08	8.53	12.88	3.91	8.03	5.87	5.69	3/1/2006
GlobeFlex Capital - Net		2.00	2.00	8.37	12.53	3.57	7.65	5.47	5.26	
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62	0.46	5.55	3.84	4.19	
Xponance Intl EQ	108,445,480	-0.91	-0.91	3.59	8.49	0.28			3.65	2/1/2021
Xponance Intl EQ - Net		-1.06	-1.06	3.29	7.83	-0.34			3.03	
MSCI EAFE (Net)		-0.42	-0.42	5.34	11.54	2.89			5.44	
Progress Intl Equity*	350,499									
Intl Large Cap Passive Core	2,828,833,751	1.14	1.14	5.80	11.75	1.78	5.93	4.26	4.23	2/1/2000
Intl Large Cap Passive Core - Net		1.14	1.14	5.80	11.74	1.77	5.92	4.25		
International Large Cap Passive Core Benchmark		0.96	0.96	5.69	11.62	1.33	5.49	3.86	3.83	

* 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 June 30, 2024

	Market Value \$	Performance (%)								
		1 Quarter	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
NTGI ACWI ex US Index Fund	2,828,833,751	1.14	1.14	5.80	11.75				2.04	10/1/2021
NTGI ACWI ex US Index Fund - Net		1.14	1.14	5.80	11.74				2.03	
MSCI AC World ex USA (Net)		0.96	0.96	5.69	11.62				1.62	
Intl All Cap Developed	180,156,734	-0.72	-0.72	3.72	12.25	1.95	5.25		6.36	2/1/2019
Intl All Cap Developed - Net		-0.84	-0.84	3.48	11.70	1.45	4.73		5.86	
MSCI EAFE + Canada (Net)		-0.60	-0.60	4.96	11.22	2.82	6.55		7.37	
Ativo International	180,156,734	-0.72	-0.72	3.72	12.25	1.95	5.25		6.36	2/1/2019
Ativo International - Net		-0.84	-0.84	3.48	11.70	1.45	4.73		5.86	
MSCI EAFE + Canada (Net)		-0.60	-0.60	4.96	11.22	2.82	6.55		7.37	
Intl Small Cap Eqty	590,055,565	-0.32	-0.32	-0.50	6.59	-5.76	4.75	4.33	4.68	12/1/2005
Intl Small Cap Eqty - Net		-0.51	-0.51	-0.85	5.80	-6.47	3.97	3.55		
MSCI AC World ex USA Small Cap (Net)		0.66	0.66	2.78	11.26	-1.45	6.13	4.44	5.92	
Custom Benchmark (Intl Small Cap)		0.66	0.66	2.78	11.26	-1.45	6.13	4.44	5.37	
Franklin Templeton	239,590,659	0.89	0.89	1.38	9.45	-2.64	4.57	4.25	5.56	8/1/2011
Franklin Templeton - Net		0.72	0.72	1.03	8.68	-3.33	3.82	3.50	4.81	
MSCI AC World ex USA Small Cap (Net)		0.66	0.66	2.78	11.26	-1.45	6.13	4.44	5.03	
William Blair IntSC	350,464,906	-1.14	-1.14	-1.74	4.72	-7.67	4.86	4.40	7.40	9/1/2010
William Blair IntSC - Net		-1.33	-1.33	-2.11	3.92	-8.39	4.07	3.61	6.59	
MSCI AC World ex USA Small Cap (Net)		0.66	0.66	2.78	11.26	-1.45	6.13	4.44	6.48	
Custom Benchmark (Intl Small Cap)		0.66	0.66	2.78	11.26	-1.45	6.13	4.44	6.69	
Emerging Mkt Equity	516,103,165	6.25	6.25	12.27	18.67	-5.16	3.26	3.41	8.15	2/1/1992
Emerging Mkt Equity - Net		6.25	6.25	12.08	18.04	-5.71	2.67	2.81		
MSCI Emerging Markets Index		5.12	5.12	7.68	12.97	-4.68	3.49	3.18	6.50	
Genesis Investment Management, LLP.**	1,089,538									
Arrowstreet EME	515,013,627	6.57	6.57	13.35	22.65				21.39	3/1/2023
Arrowstreet EME - Net		6.57	6.57	13.35	22.65				21.39	
MSCI Emerging Markets IMI (Net)		5.13	5.13	7.41	13.56				13.63	

* 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.

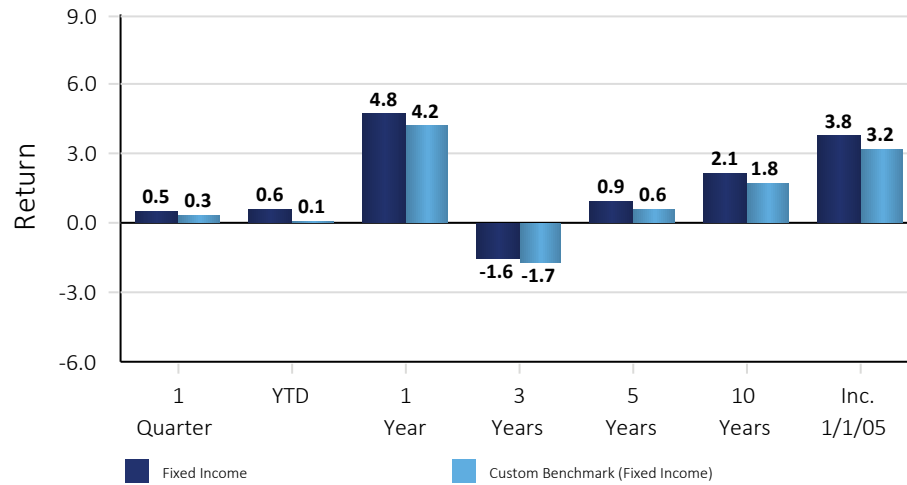
Fixed Income

Composite Performance Summary

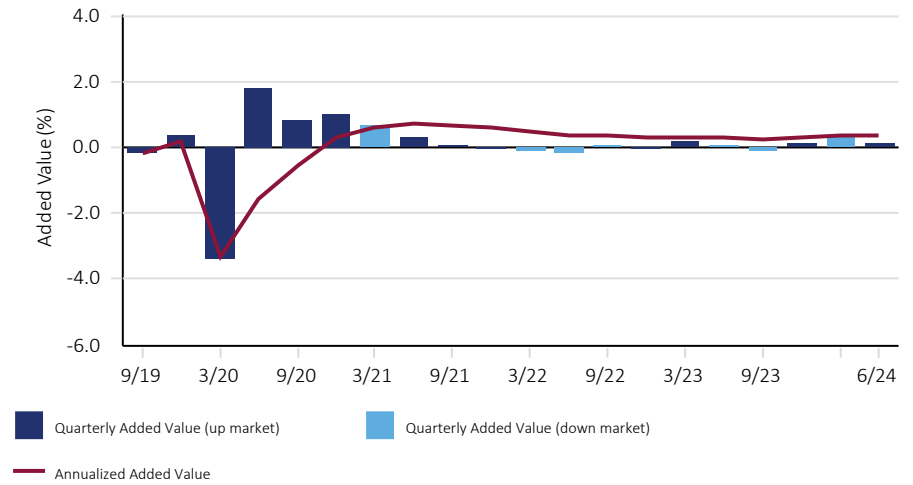
Fixed Income

Periods Ended June 30, 2024

Comparative Performance

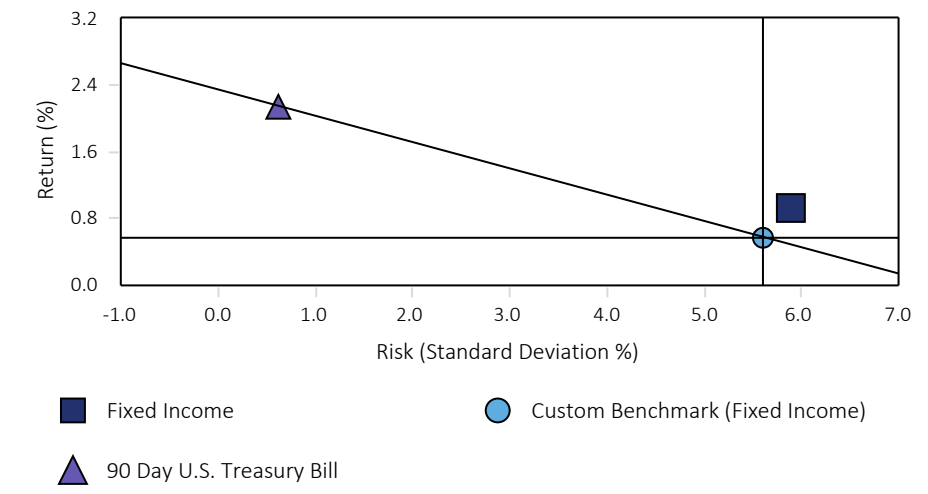
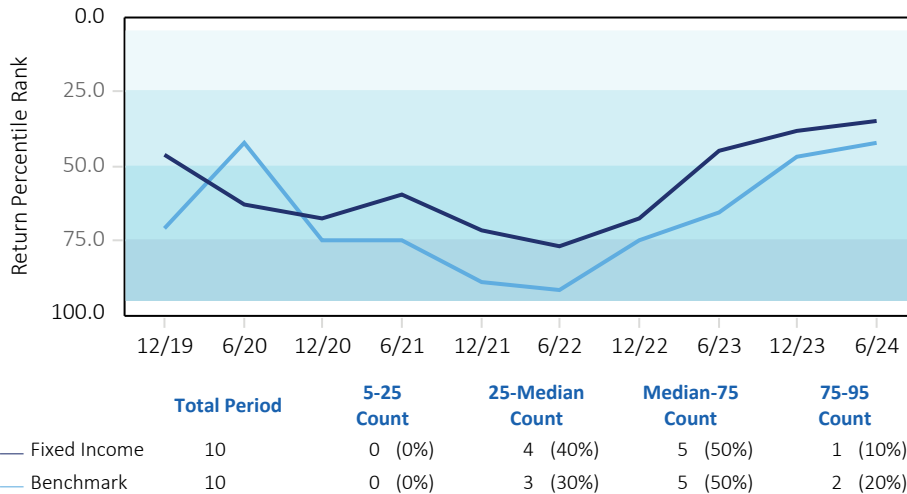


Added Value History



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

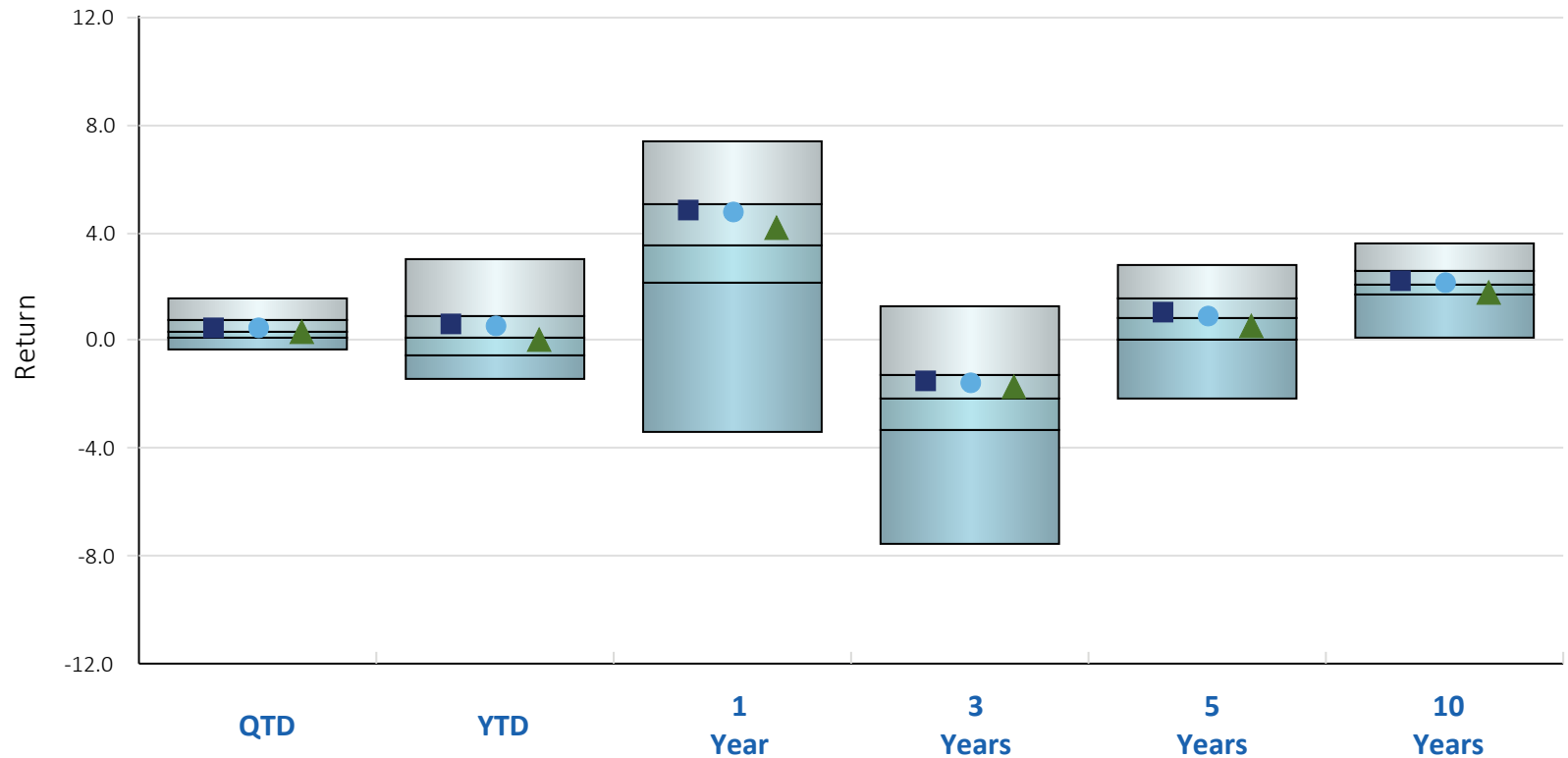
Risk and Return 07/1/19 - 06/30/24



Plan Sponsor Peer Group Analysis

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

Periods Ended June 30, 2024



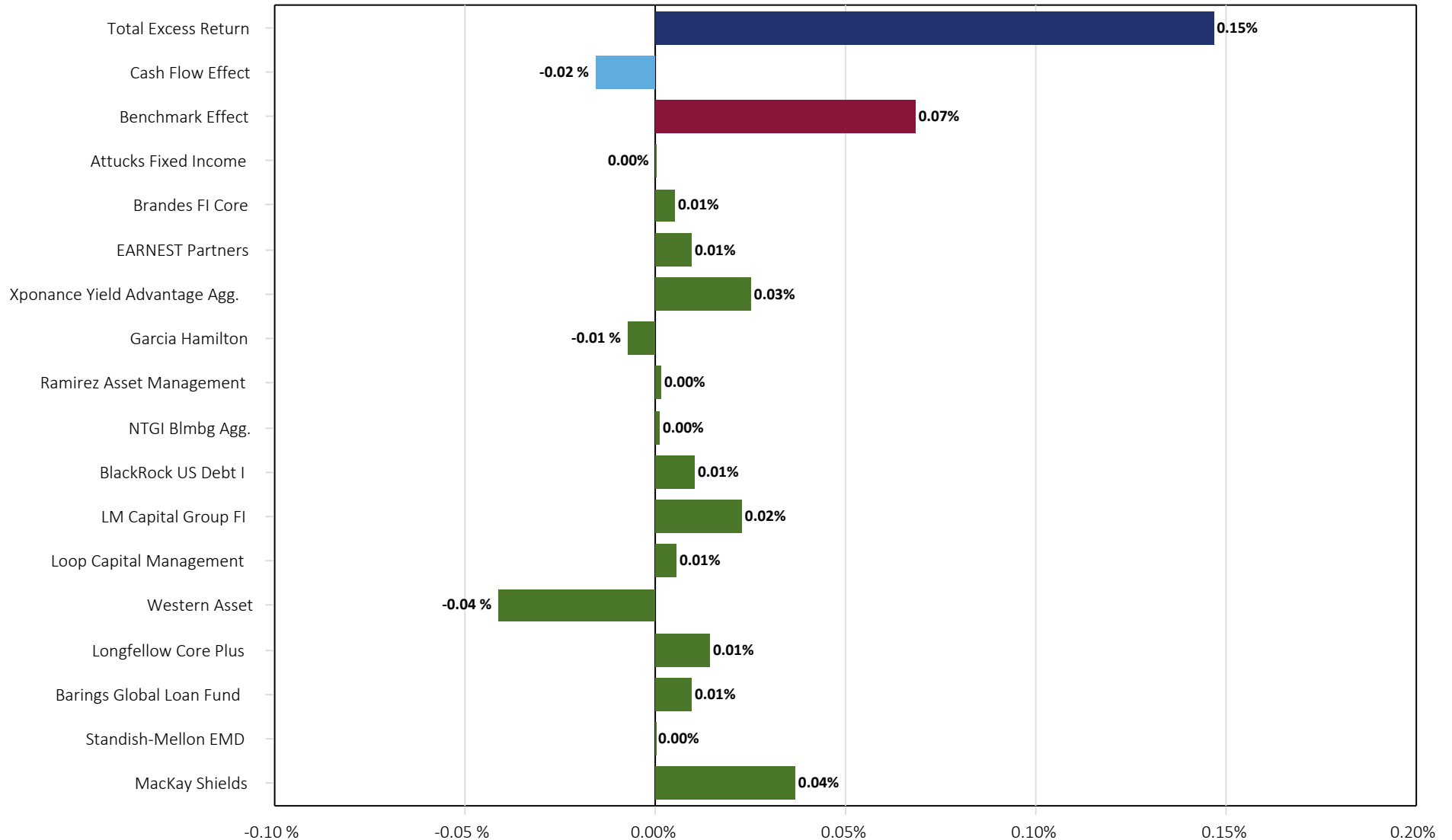
	QTD	YTD	1 Year	3 Years	5 Years	10 Years
Fixed Income	0.51 (34)	0.61 (35)	4.84 (27)	-1.48 (32)	1.03 (41)	2.24 (39)
Fixed Income - Net	0.49 (36)	0.57 (36)	4.76 (29)	-1.57 (35)	0.94 (47)	2.12 (43)
Custom Benchmark (Fixed Income)	0.34 (48)	0.07 (51)	4.21 (36)	-1.71 (42)	0.58 (65)	1.76 (75)
5th Percentile	1.55	3.05	7.44	1.25	2.79	3.62
1st Quartile	0.75	0.95	5.09	-1.27	1.54	2.59
Median	0.33	0.12	3.52	-2.18	0.80	2.04
3rd Quartile	0.08	-0.55	2.12	-3.34	0.07	1.74
95th Percentile	-0.34	-1.44	-3.39	-7.56	-2.14	0.14
Population	55	55	53	51	45	41

Asset Class Attribution

Fixed Income

Periods Ended 1 Quarter Ending June 30, 2024

1 Quarter



Performance

Fixed Income

Periods Ended June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Fixed Income	12,041,493,687	0.51	0.61	4.84	-1.48	1.03	2.24	7.36	1/1/1982
Fixed Income - Net		0.49	0.57	4.76	-1.57	0.94	2.12		
Custom Benchmark (Fixed Income)		0.34	0.07	4.21	-1.71	0.58	1.76	6.84	
Fixed Income IMRF Custom Benchmark		0.41	0.27	4.44	-1.75	0.65			
Active Fixed Core	3,738,176,427	0.21	-0.28	3.19	-2.48	0.30	1.79	3.65	4/1/2001
Active Fixed Core - Net		0.18	-0.34	3.07	-2.59	0.19	1.67		
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	3.53	
Attucks Fixed Income	91,626,897	0.13	-0.31	3.40	-2.75			-2.50	2/1/2021
Attucks Fixed Income - Net		0.04	-0.47	3.07	-3.07			-2.81	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02			-2.91	
Brandes FI Core	332,449,097	0.27	-0.22	3.60	-1.72	0.49		1.36	3/1/2016
Brandes FI Core - Net		0.26	-0.23	3.57	-1.75	0.47		1.35	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23		1.06	
EARNEST Partners	887,326,806	0.23	0.06	3.65	-2.52	0.25	1.85	3.46	5/1/2005
EARNEST Partners - Net		0.20	0.00	3.51	-2.65	0.12	1.70	3.28	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	3.00	
Xponance Yield Advantage Agg.	970,483,019	0.42	0.51	4.60	-2.24	0.65	1.89	3.38	6/1/2005
Xponance Yield Advantage Agg. - Net		0.38	0.44	4.46	-2.37	0.51	1.75	3.21	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	2.95	
Garcia Hamilton	943,114,864	-0.01	-1.41	1.26	-2.83	-0.09		1.41	6/1/2015
Garcia Hamilton - Net		-0.03	-1.45	1.17	-2.91	-0.17		1.33	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23		1.15	

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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Ramirez Asset Management	513,175,744	0.14	-0.29	3.09	-2.65			-0.51	5/1/2020
Ramirez Asset Management - Net		0.10	-0.36	2.95	-2.77			-0.64	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02			-2.01	
Pass. Core Fixed Income	2,833,088,972	0.11	-0.64	2.67	-2.96	-0.17	1.41	5.03	1/1/1990
Pass. Core Fixed Income - Net		0.11	-0.64	2.66	-2.97	-0.18	1.40		
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	5.01	
BlackRock US Debt I	1,679,868,648	0.14	-0.59	2.69	-2.94	-0.15	1.44	1.71	10/1/2013
BlackRock US Debt I - Net		0.14	-0.59	2.69	-2.95	-0.16	1.44	1.70	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	1.60	
NTGI Blmbg Agg.	1,153,220,323	0.08	-0.70	2.63	-2.99	-0.20	1.38	5.07	2/1/1990
NTGI Blmbg Agg. - Net		0.08	-0.70	2.63	-2.99	-0.21	1.37		
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	5.06	
Core Plus Fixed Income	2,910,249,284	0.11	-0.17	3.71	-2.74	0.57	2.06	7.17	1/1/1982
Core Plus Fixed Income - Net		0.07	-0.24	3.56	-2.89	0.42	1.89		
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	6.74	
LM Capital Group FI	832,887,406	0.44	0.26	3.86	-2.24	0.98	2.12	3.85	5/1/2005
LM Capital Group FI - Net		0.39	0.18	3.69	-2.40	0.82	1.95	3.68	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	3.00	
Loop Capital Management	575,290,219	0.22	0.26	4.83	-2.14	0.71	2.21	3.89	5/1/2005
Loop Capital Management - Net		0.19	0.19	4.69	-2.27	0.58	2.08	3.76	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	3.00	

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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Western Asset	933,030,855	-0.43	-1.10	2.55	-3.75	0.03	2.06	4.27	11/1/2001
Western Asset - Net		-0.47	-1.17	2.40	-3.90	-0.11	1.93		
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02	-0.23	1.35	3.29	
Longfellow Core Plus	569,040,804	0.41	0.33	4.32	-2.23			-0.36	5/1/2020
Longfellow Core Plus - Net		0.37	0.26	4.16	-2.37			-0.51	
Blmbg. U.S. Aggregate Index		0.07	-0.71	2.63	-3.02			-2.01	
Bank Loans	1,435,690,076	2.05	4.58	11.03	5.09	5.00		4.76	8/1/2014
Bank Loans - Net		2.10	4.68	11.23	5.22	5.07		4.52	
Barings Custom Benchmark		2.01	4.56	11.20	6.14	5.55		4.84	
Barings Global Loan Fund	1,435,690,076	2.05	4.58	11.03	5.09	5.00		4.76	8/1/2014
Barings Global Loan Fund - Net		2.10	4.68	11.23	5.22	5.07		4.52	
Barings Custom Benchmark*		2.01	4.56	11.20	6.14	5.55		4.84	
Emerging Markets Debt	262,996								
Standish-Mellon EMD	262,996								
High Yield	1,124,025,931	1.50	3.35	10.39	3.19	5.02	5.34	8.97	4/1/1986
High Yield - Net		1.42	3.20	10.06	2.85	4.69	4.99		
ICE BofA U.S. High Yield, Cash Pay Index		1.02	2.50	10.34	1.65	3.71	4.20	7.71	
MacKay Shields	1,124,025,931	1.50	3.35	10.39	3.19	5.02	5.44	8.07	11/1/2000
MacKay Shields - Net		1.42	3.20	10.06	2.85	4.70	5.09		
ICE BofA U.S. High Yield, Cash Pay Index		1.02	2.50	10.34	1.65	3.71	4.20	6.77	

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

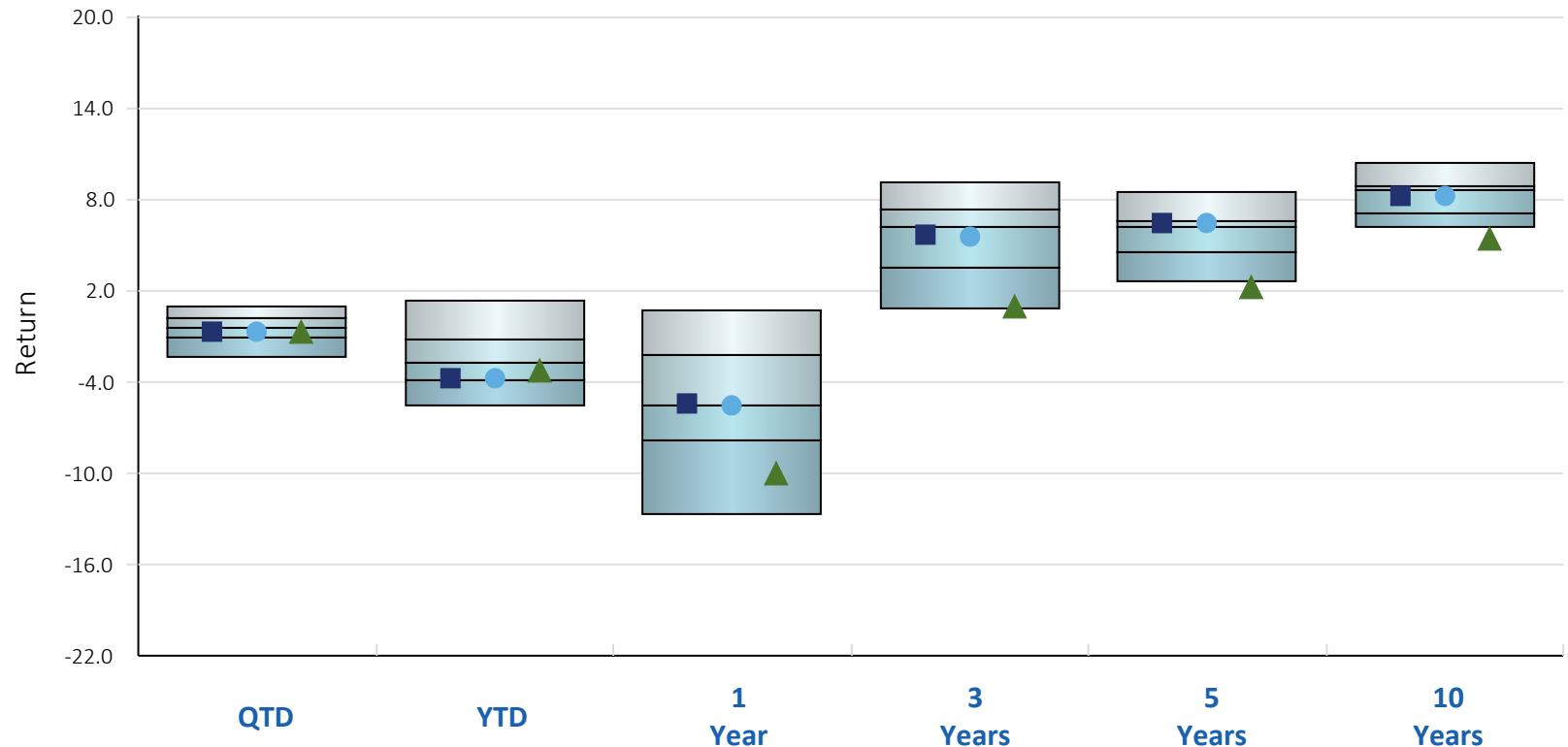
* Custom Benchmark is Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Private Real Assets

Plan Sponsor Peer Group Analysis

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

Periods Ended June 30, 2024



Real Estate	-0.64 (58)	-3.72 (71)	-5.46 (50)	5.70 (59)	6.51 (36)	8.31 (56)
Real Estate - Net	-0.66 (59)	-3.76 (72)	-5.54 (51)	5.63 (59)	6.44 (38)	8.27 (57)
Blended Benchmark (Real Estate)	-0.66 (59)	-3.22 (65)	-9.99 (93)	1.02 (95)	2.27 (100)	5.47 (100)
5th Percentile	1.02	1.41	0.77	9.17	8.55	10.38
1st Quartile	0.25	-1.19	-2.24	7.42	6.63	8.86
Median	-0.46	-2.71	-5.53	6.27	6.22	8.58
3rd Quartile	-1.08	-3.86	-7.82	3.58	4.60	7.12
95th Percentile	-2.37	-5.53	-12.72	0.87	2.59	6.27
Population	44	39	38	35	26	14

Asset Allocation & Performance

Private Real Assets

Periods Ended June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Private Real Assets	5,083,364,820	-0.42	-3.46	-5.00				-0.12	3/1/2022
Private Real Assets- Net		-0.45	-3.50	-5.07				-0.19	
Custom Benchmark (Private Real Assets)		-0.55	-2.85	-9.20				-3.79	
Real Estate	4,533,397,609	-0.64	-3.72	-5.46	5.70	6.51	8.31	5.63	5/1/1985
Real Estate - Net		-0.66	-3.76	-5.54	5.63	6.44	8.27		
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27	5.47	7.02	
Real Estate Core Cmp	2,090,491,829	-0.27	-4.54	-6.13	5.97	7.12	8.63	7.34	4/1/1999
TA Assoc. Buckhead	905,666,983	1.68	-1.80	3.56	13.25	13.99	12.85	11.24	8/1/1995
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27	5.47	6.54	
Barings Euro Core Property	96,295,019	-1.48	-27.24	-29.39	-11.97	-4.63		3.05	3/1/2017
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27		3.57	
Blackstone Property Euro	168,570,549	1.17	-7.68	-8.07	2.04	5.81		5.46	12/1/2017
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27		3.22	
INVESCO Core Real Estate	202,966,279	-3.59	-3.79	-12.31	2.13	1.84	5.32	6.62	4/1/2011
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27	5.47	7.18	
INVESCO European real estate	53,257,038	-0.78	-3.00	-7.53	-5.64	-1.41		-1.78	4/1/2018
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27		2.97	
AEW Core Property Tr	243,805,184	-0.97	-0.02	-7.29	4.64	4.07	6.02	6.48	10/1/2013
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27	5.47	5.84	
CBRE Core Partners	271,102,756	-1.47	-1.32	-9.58	7.61	6.97	8.39	8.48	12/1/2013
Blended Benchmark (Real Estate)		-0.66	-3.22	-9.99	1.02	2.27	5.47	5.74	

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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
JPM Strategic Property Fund Blended Benchmark (Real Estate)	148,828,022	-4.30 -0.66	-11.76 -3.22	-17.51 -9.99	-0.71 1.02			0.53 2.47	1/1/2021
RE Non-Core Cmp	2,442,905,780	-0.96	-2.91	-4.81	5.32	5.78	7.95	9.76	1/1/2010
Artemis MWBE Spruce Blended Benchmark (Real Estate)	401,891,714	-0.02 -0.66	-2.20 -3.22	-4.33 -9.99	4.48 1.02	5.78 2.27		4.17 3.91	6/1/2016
Franklin T. EMREFF Blended Benchmark (Real Estate)	1,066,392	0.00 -0.66	0.00 -3.22	-58.08 -9.99	-38.47 1.02	-30.42 2.27	-10.97 5.47	-7.20 6.89	9/1/2011
Security Capital Blended Benchmark (Real Estate)	101,001,431	5.86 -0.66	3.81 -3.22	11.95 -9.99	0.82 1.02	6.78 2.27	5.55 5.47		7/1/1997
Dune II Blended Benchmark (Real Estate)	6,955,701	2.81 -0.66	-0.09 -3.22	1.76 -9.99	9.93 1.02	2.96 2.27	6.86 5.47	5.49 6.27	2/1/2009
Non-Core Real Estate Funds Blended Benchmark (Real Estate)	1,622,485,265	-1.57 -0.66	-2.94 -3.22	-4.97 -9.99	7.43 1.02	7.23 2.27	9.44 5.47	9.64 6.84	10/1/2011
Almanac ARS V	55,532								
Non-Core Intl Real Estate Blended Benchmark (Real Estate)	309,449,746	-1.27 -0.66	-5.80 -3.22	-9.08 -9.99	-2.67 1.02	-0.61 2.27		-1.92 5.41	8/1/2014

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 June 30, 2024

	Market Value \$	Performance (%)							
		1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Agriculture	221,660,429	-1.08	-7.01	-16.02	-2.39	-1.62	2.00	5.58	10/1/1997
NCREIF Farmland Index		-0.21	0.53	2.54	6.77	5.82	6.90	10.76	
Premiere Partners IV	221,660,429	-1.08	-7.01	-16.02	-2.39	-1.62		0.33	3/1/2015
Timberland	69,103,553	1.14	-1.50	24.02	13.46	7.30	4.35	7.43	10/1/1992
NCREIF Timberland Index		1.71	3.86	9.84	10.99	7.18	5.89	8.53	
Forest Investment	69,103,553	1.14	-1.50	24.02	13.46	7.30	4.35	7.57	10/1/1992
Blended Benchmark (Timberland)		1.58	4.45	7.09	8.94	5.99	5.30	8.34	
Unlisted Infrastructure	259,203,229	3.74	4.71	11.60	12.56	13.37		12.52	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		1.58	4.45	7.09	8.72	8.83		8.87	
Unlisted Infrastructure Funds	259,203,229	3.74	4.71	11.60	12.56	13.37		12.52	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		1.58	4.45	7.09	8.72	8.83		8.87	

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 June 30, 2024

	Allocation	Performance (%)							
	Market Value \$	1 Quarter	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Alternatives Investments	6,128,125,580	1.06	2.66	2.18	9.51	13.81	11.83	11.23	2/1/1986
Custom Benchmark (Alternative Investments)		8.75	20.69	26.52	8.91	8.94	8.97	12.21	
Absolute Return	15,652								
Aurora Investment	15,652								
Private Equity	5,604,811,669	0.91	2.17	1.70	10.31	15.81	14.07	13.42	2/1/1986
Blended Benchmark (Private Equity)		9.69	23.12	28.86	9.29	9.18	9.09		
Abbott S/A Comp.	490,534,261	0.76	1.05	2.22	8.37	17.29	14.07	14.19	6/1/1987
Muller Monroe MPEFF									
Pantheon S/A Comp.	429,685,655	2.75	2.76	3.94	11.03	15.68	13.78	11.02	10/1/2000
Private Equity Fund - Domestic	3,628,345,975	0.48	1.89	0.80	10.36	16.08	15.62	13.53	6/1/2012
Private Equity Fund - International	772,683,132	2.45	4.47	3.66	12.12	14.57		1.54	7/1/2015
Oakbrook Opportunities Fund	283,562,645	-0.12	0.94	3.63	13.05	7.05		6.93	6/1/2019
Private Credit	523,298,259	3.03	10.21	8.57	0.86			1.17	10/1/2019
Private Credit Fund - Domestic	491,085,939	2.26	10.93	9.27	1.07			1.31	10/1/2019
Private Credit Fund - International	32,212,320	15.78	-19.58					-19.58	1/1/2024

Manager Watch List

As of June 30, 2024

Investment Manager	Asset Class	Effective Date	Resolution
Ativo	International Equity – All Cap	August 2023	
Brown	International Equity – Large Cap	March 2024	
Western Asset	Fixed Income – Core Plus	August 2024	

Appendix

Asset Class Returns

Periods Ended June 30, 2024

	Performance (%)										
	YTD	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Total Fund	5.17	13.42	-12.77	16.82	14.98	19.77	-4.23	16.02	8.01	0.53	6.15
Total Fund - Net	5.09	13.24	-12.90	16.63	14.79	19.57	-4.40	15.78	7.77	0.29	5.90
Total Fund Benchmark	7.41	14.28	-13.26	13.48	13.16	18.68	-3.12	14.37	7.89	1.37	7.33
Domestic Equity	10.70	23.30	-19.12	24.89	22.07	29.23	-6.08	19.83	12.62	0.04	9.81
Domestic Equity - Net	10.61	23.10	-19.25	24.69	21.86	29.00	-6.25	19.59	12.35	-0.22	9.54
Blended Benchmark (U.S. Equity)	12.76	24.16	-18.53	25.66	20.89	31.02	-5.24	21.13	12.74	0.48	12.47
U.S. Equity IMRF Custom Benchmark	10.46	21.36	-18.21	25.68	18.00	29.67	-6.79	18.08	15.43		
International Equity	6.34	19.64	-17.86	9.78	13.52	23.76	-14.13	27.95	3.56	-1.90	-2.80
International Equity - Net	6.14	19.22	-18.14	9.37	13.08	23.39	-14.41	27.52	3.21	-2.23	-3.10
MSCI AC World ex USA (Net)	5.69	15.62	-16.00	7.82	10.65	21.51	-14.20	27.19	4.50	-5.66	-3.87
International Equity IMRF Custom Benchmark	5.59	15.11	-16.70	7.30	11.30	21.37	-14.36	27.79	3.92		
Fixed Income	0.61	7.62	-11.83	-0.44	7.87	9.50	-0.24	4.82	4.87	0.25	5.97
Fixed Income - Net	0.57	7.53	-11.90	-0.53	7.75	9.37	-0.39	4.66	4.71	0.10	5.81
Blmbg. U.S. Aggregate Index	-0.71	5.53	-13.01	-1.55	7.51	8.72	0.01	3.54	2.65	0.55	5.97
Fixed Income IMRF Custom Benchmark	0.27	7.27	-11.98	-0.85	7.29	9.14	-0.08	3.98	3.89		
Private Real Assets	-3.50	-3.50									
Custom Benchmark (Private Real Assets)	-2.85	-11.80									
Real Estate	-3.72	-4.15	11.77	21.95	4.20	9.81	8.36	10.03	8.97	12.54	13.02
Real Estate - Net	-3.76	-4.21	11.71	21.88	4.16	9.76	8.36	10.03	8.97	12.46	13.02
Blended Benchmark (Real Estate)	-3.22	-12.73	6.54	21.02	0.34	4.39	7.36	6.66	7.79	13.95	11.46
Agriculture	-7.01	-8.09	3.98	2.69	4.69	-5.82	0.28	-4.58	-0.47	20.18	24.73
NCREIF Farmland Index	0.53	4.96	9.47	7.83	3.08	4.81	6.74	6.19	7.09	10.35	12.63
Timberland	-1.50	26.14	11.94	-2.72	4.51	1.00	-3.62	4.68	-4.58	4.99	12.83
NCREIF Timberland Index	3.86	9.45	12.90	9.17	0.81	1.30	3.21	3.63	2.59	4.97	10.48
Unlisted Infrastruct	4.71	16.38	11.76	11.68	15.90	9.65					
Blended Benchmark (Unlisted Infrastructure)	4.45	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 June 30, 2024

	Performance (%)										
	YTD	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Alternatives Investments	2.66	2.60	4.39	46.46	12.31	9.48	17.32	12.09	5.32	6.90	11.63
Alternative Investments - Net	2.66	2.60	4.38	46.44	12.27	9.43	17.14	11.91	5.00	6.47	11.16
Custom Benchmark (Alternative Investments)	20.69	25.15	-18.08	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Private Equity	2.17	2.61	5.36	54.15	14.50	11.78	21.46	15.61	8.60	8.41	13.72
Blended Benchmark (Private Equity)	23.12	25.61	-19.14	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Cash	2.82	5.23	3.18	2.44	2.56	3.59	2.36	1.67	0.63	0.29	0.17
90 Day U.S. Treasury Bill	2.63	5.02	1.46	0.05	0.67	2.28	1.87	0.86	0.25	0.03	0.04

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	1/1/2024	Present	87% MSCI World World Index (Net) 1 Qtr Lagged +3%, 13% S&P LSTA Leveraged Loan 100 Index +2%
Benchmark	3/1/2022	12/31/2023	95% MSCI World World Index (Net) 1 Qtr Lagged +3%, 5% S&P LSTA Leveraged Loan 100 Index +2%
	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%
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	1/1/2024	Present	82% Bloomberg U.S. Aggregate, 10% Custom Barings Global Loan Benchmark, 8% ICE BofAML U.S. High Yield Cash Pay
	3/1/2022	12/31/2023	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	1/1/2024	Present	34.5% Blended Benchmark (U.S. Equity), 18.0% MSCI AC World ex USA (Net), 24.5% Custom Benchmark (Fixed Income), 10.5% Custom Benchmark (Private Real Assets), 11.5% Custom Benchmark (Alternative Investments), 1.0% 90 Day U.S. Treasury Bill
	3/1/2022	1/1/2024	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.