

Wilshire



Wilshire Advisors

Executive Summary of Investment Performance

As of March 31, 2022

IMRF Performance Summary

- The Illinois Municipal Retirement Fund (“IMRF”) ended March 2022 with a market value of \$54.1 billion, down for the quarter by approximately \$2.7 billion. Market volatility associated with the Russia-Ukraine conflict and interest rate hikes intended to tame inflation provided a challenging environment for growth and defensive assets
- IMRF underperformed the benchmark during the quarter, returning -4.44% versus -2.99% for the Total Fund Benchmark. This was the first quarter of underperformance after 7 straight quarters of outperformance
 - Through the end of March 2022, IMRF returned 7.47% versus its benchmark of 7.37% for the one-year period.
- The U.S. Equity Portfolio underperformed the benchmark during the quarter, returning -6.22% versus -5.01%. In aggregate, investment manager performance in Large Cap Growth was the largest contributor to relative underperformance. Value outperformed growth considerably during the first quarter and portfolio shifts made last year and this year away from growth helped mitigate further losses.
 - Over the trailing one-year, the U.S. Equity portfolio underperformed the benchmark, returning 9.27% versus 12.24%.
- The International Equity Portfolio underperformed the benchmark during the first quarter, returning -7.76% versus -5.44%. Investment manager under performance in Large Cap Growth, Large Cap Core, and Emerging Markets were the largest detractors for the quarter.
 - Emerging markets as a whole were challenged as the Russia\Ukraine conflict impacted other regions and drove up energy prices, higher quality companies and underweights to energy names were headwinds that contributed to underperformance
 - Over the trailing one-year, the International Equity portfolio underperformed the benchmark, returning -2.51% versus -1.48%.
- The Fixed Income Portfolio outperformed the benchmark during the quarter, returning -5.54% versus -5.93%. Investment manager performance was mixed, however a structural tilt to less rate sensitive assets provide some protection as rates increased in the quarter
 - During the trailing one-year period, the Fixed Income portfolio outperformed the benchmark, returning -3.40% versus -4.15%.
- As of March quarter-end, Domestic Equity was 5.9% over its target. The current Statement of Investment Policy states that when actual allocations of the asset class differ by more than four percentage points from the policy target, a recommendation for rebalancing will be made to the Board of Trustees. At this time, IMRF is implementing the new asset allocation that was approved by the Board at the February 2022 meeting.

Performance referenced above is Net of Fees

Asset Class Performance

Asset Class Returns - Best to Worst

2017	2018	2019	2020	2021	2022 YTD	Annualized 5-Year as of 3/22
Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 25.5%	U.S. Equity 15.7%
Developed 25.6%	Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 0.0%	REITs 10.0%
U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	U.S. TIPS -3.0%	Commodities 9.0%
High Yield 7.5%	High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	REITs -3.9%	Developed 7.2%
REITs 4.2%	REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	High Yield -4.8%	Emrg Mrkts 6.4%
Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	U.S. Equity -4.9%	High Yield 4.7%
U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	Developed -5.8%	U.S. TIPS 4.4%
Commodities 1.7%	Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Core Bond -5.9%	Core Bond 2.1%
T-Bills 0.8%	Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	Emrg Mrkts -6.9%	T-Bills 1.1%

Data Sources: Bloomberg

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

Market Commentary

U.S. Equity

The U.S. stock market was down -4.9% for the first quarter of 2022. Sector performance was mixed as Energy (+39.0%) and Utilities (+4.8%) were up, supported by surging commodities prices. The worst performing sectors this quarter were Communication Services (-11.9%), Consumer Discretionary (-9.0%) and Technology (-8.4%). From a size perspective, large-cap outperformed small-cap while growth stocks underperformed value.

Geopolitical events shook the globe during the quarter as Russia invaded neighboring Ukraine. While the humanitarian fallout is of greatest importance, it is also necessary to understand the economic and market impacts that stem from these destabilizing events. Perhaps the most important tensions came from accelerating inflationary pressures the conflict imposed on the Federal Reserve. The Fed had already signaled it would soon raise the Fed Funds Rate and inflation for the first two months of the year had already climbed 1.4% (not annualized). The 10-year breakeven inflation rate pushed toward 3% and fed fund futures pricing implied an overnight rate of 2.25% by the end of the year.

Non-U.S. Equity

The UK economy surged in January and is now back above the level that existed before the COVID pandemic. An escalating COVID outbreak in China has led to some local lockdowns and is cutting into economic growth forecasts. Russia's invasion of Ukraine led MSCI to reclassify the Russian equity market from Emerging to a Standalone Market since Russian equities are currently uninvestable.

Fixed Income

The U.S. Treasury yield curve was up across all maturities during the quarter but most sharply in the intermediate range, with pronounced flattening further out the curve. The 2-year Treasury was up 160 basis points to 2.34% while the 10-year Treasury yield also ended the quarter at 2.34%, up 83 basis points. The now nonexistent spread is as low as it has been since August 2019. The Fed raised the overnight rate off zero by 0.25% at their March meeting. Through the Fed's "dot plot," it is messaging that the current intent is for additional increases totaling 150 basis points before the end of 2022.

March 2022 Asset Class Assumptions

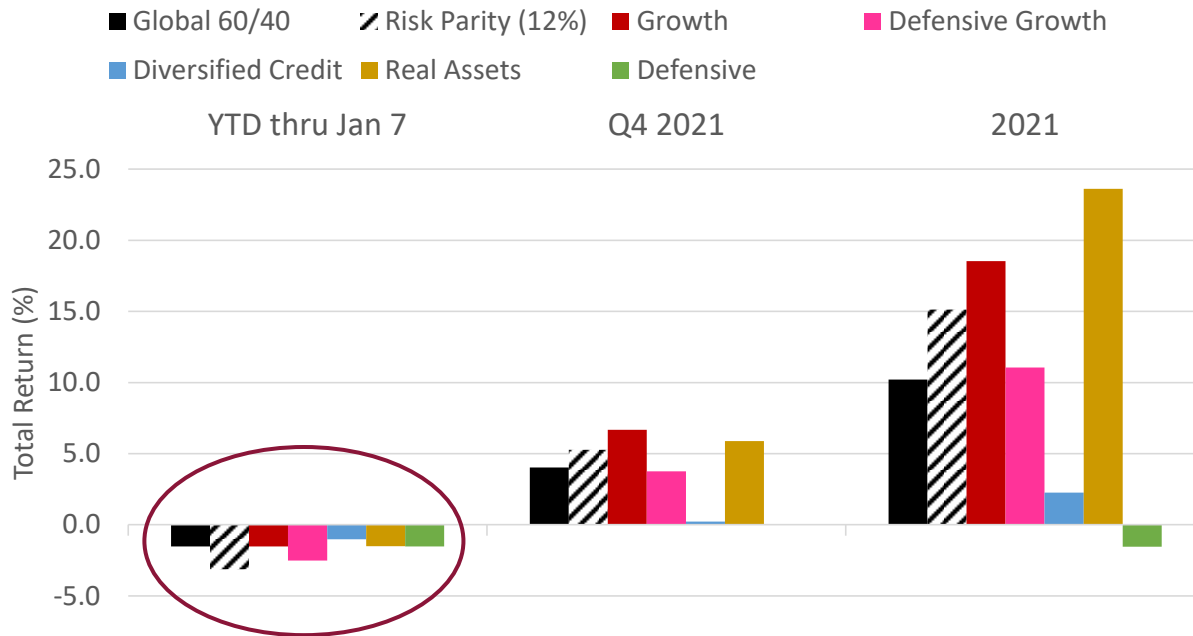
	Equity						Fixed Income					Real Assets						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Dev ex-US Bond (Hdg)	US RES	Global RES	Private RE	Cmdty	Real Assets	US CPI
Compound Return (%)	5.25	6.25	6.25	6.50	5.85	9.10	1.95	3.05	3.30	2.45	4.65	1.50	5.00	5.15	6.55	4.80	6.40	2.85
Expected Risk (%)	17.00	18.00	26.00	19.10	17.10	28.00	0.75	4.25	8.90	6.00	10.00	4.25	17.50	16.45	14.00	16.00	10.35	1.75
Cash Yield (%)	1.35	2.90	2.35	2.75	1.90	0.00	1.95	3.40	3.80	3.00	8.05	2.10	2.85	2.85	2.30	1.95	2.15	0.00
Growth Exposure	8.00	8.00	8.00	8.00	8.00	13.50	0.00	-0.85	-2.25	-3.00	4.00	-1.00	6.00	6.00	3.50	0.00	1.80	0.00
Inflation Exposure	-3.00	0.00	5.00	1.50	-1.25	-3.80	0.00	-2.50	-6.70	2.50	-1.00	-3.00	1.00	1.80	1.00	12.00	4.85	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	0.83	0.96	0.87	1.00														
Global Stock	0.95	0.92	0.83	0.94	1.00													
Private Equity	0.74	0.64	0.62	0.67	0.74	1.00												
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.07	0.00	1.00											
Core Bond	0.28	0.13	0.00	0.09	0.20	0.31	0.19	1.00										
LT Core Bond	0.31	0.16	0.01	0.12	0.23	0.32	0.11	0.92	1.00									
TIPS	-0.05	0.00	0.15	0.05	0.00	-0.03	0.20	0.59	0.47	1.00								
High Yield Bond	0.54	0.39	0.49	0.45	0.51	0.34	-0.10	0.25	0.32	0.05	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.17	0.18	0.26	0.10	0.66	0.65	0.39	0.26	1.00						
US RE Securities	0.58	0.47	0.44	0.49	0.56	0.50	-0.05	0.17	0.23	0.10	0.56	0.05	1.00					
Global RE Securities	0.64	0.58	0.56	0.61	0.65	0.58	-0.05	0.17	0.22	0.11	0.61	0.03	0.96	1.00				
Private Real Estate	0.54	0.44	0.44	0.47	0.52	0.51	-0.05	0.19	0.25	0.09	0.57	0.05	0.77	0.75	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.27	0.00	-0.02	-0.02	0.25	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.48	0.51	0.58	0.57	0.54	0.47	-0.02	0.23	0.25	0.39	0.56	0.05	0.70	0.75	0.70	0.65	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	-0.08	0.05	0.03	0.05	0.44	0.26	1.00

2022 Environmental Risk: A Year of Payback?

If some/much of COVID market returns have been liquidity fueled, can we expect to hang on to these gains when support is withdrawn?

Revisiting the environmental risk we noted in early 2022

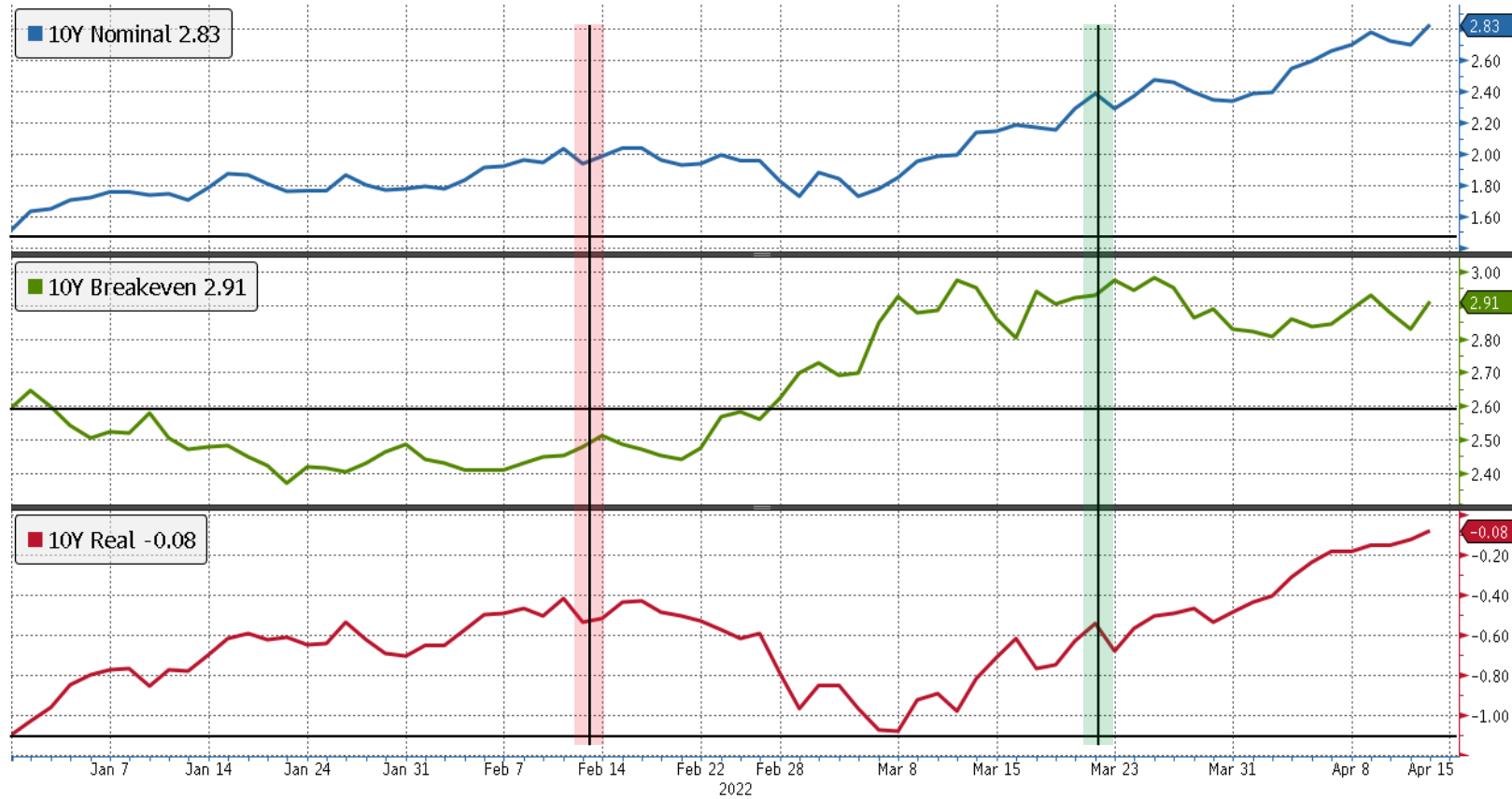
Asset Allocation & Thematic Returns



	YTD thru Jan 7	Q4 2021	2021
Global 60/40	(1.52)	4.02	10.20
Risk Parity (12%)	(3.13)	5.26	15.12
Growth	(1.52)	6.68	18.54
Defensive Growth	(2.52)	3.76	11.05
Diversified Credit	(1.02)	0.22	2.26
Real Assets	(1.51)	5.88	23.61
Defensive	(1.53)	0.01	(1.54)

Data Source: Bloomberg, Wilshire

Q1 Rate Moves (10Y Nominal, Real & BEI)



USGG10YR Index (US Generic Govt 10 Yr) 10yr Splits Daily 31DEC2021-15APR2022

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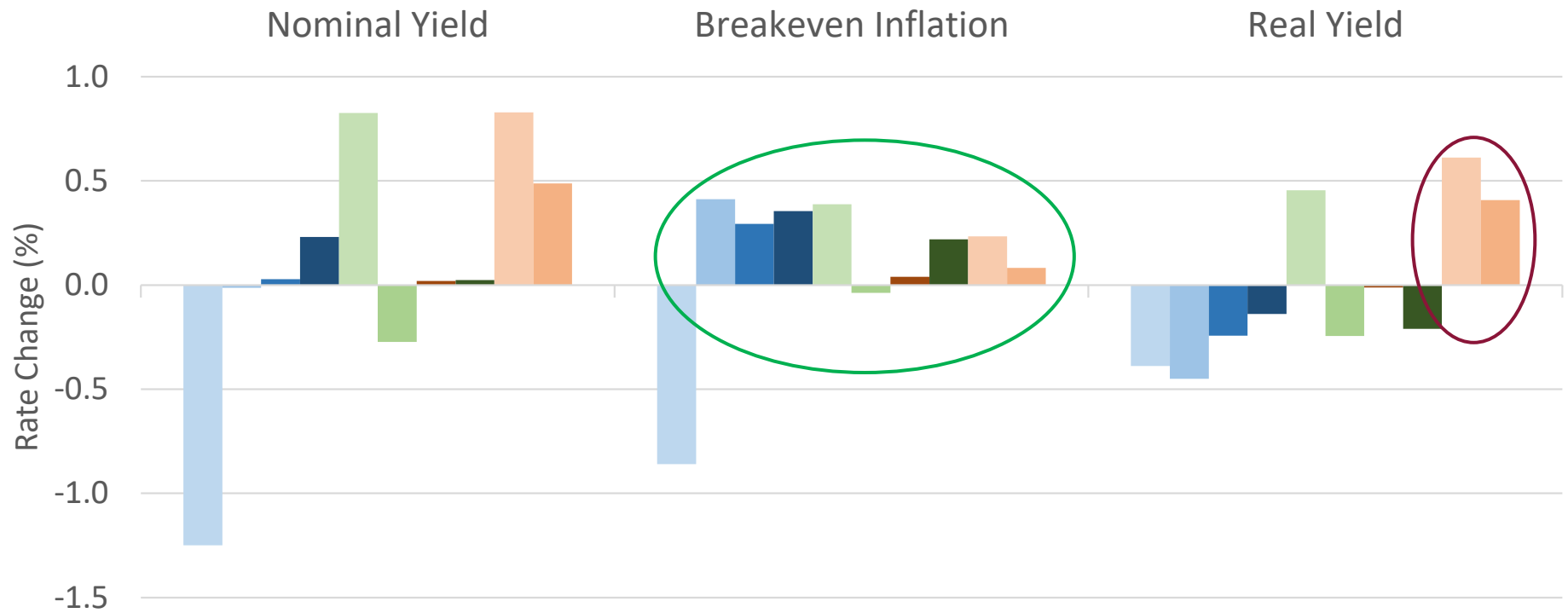
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Data Source: Bloomberg

Rate Changes (2020 – YTD 2022)

Quarterly Rate Changes

- Q1 2020
- Q2 2020
- Q3 2020
- Q4 2020
- Q1 2021
- Q2 2021
- Q3 2021
- Q4 2021
- Q1 2022
- QTD (4/15)



Data Source: Bloomberg

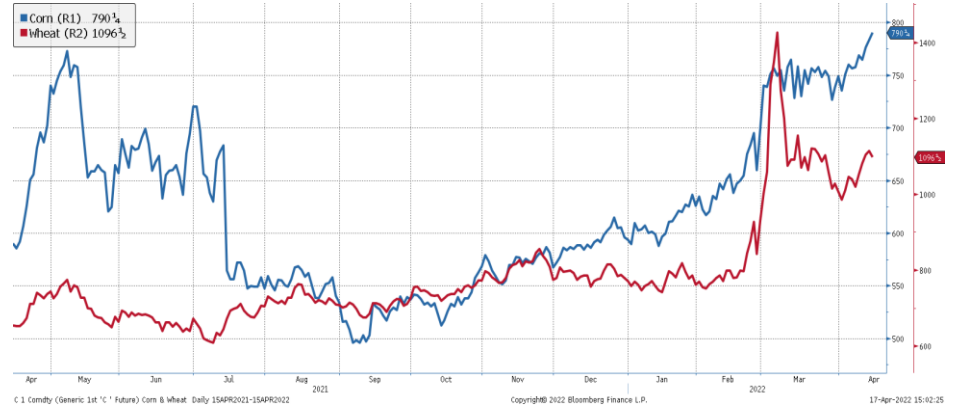
Inflation Impact

Oil prices (WTI & Brent)...



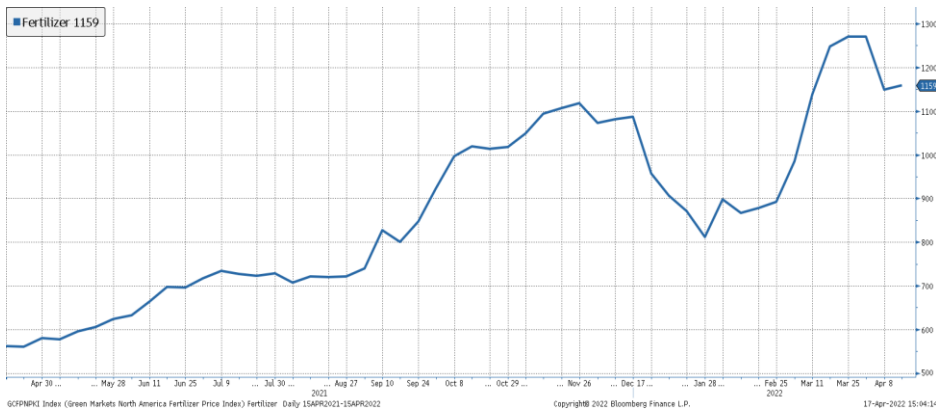
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Corn & Wheat prices...



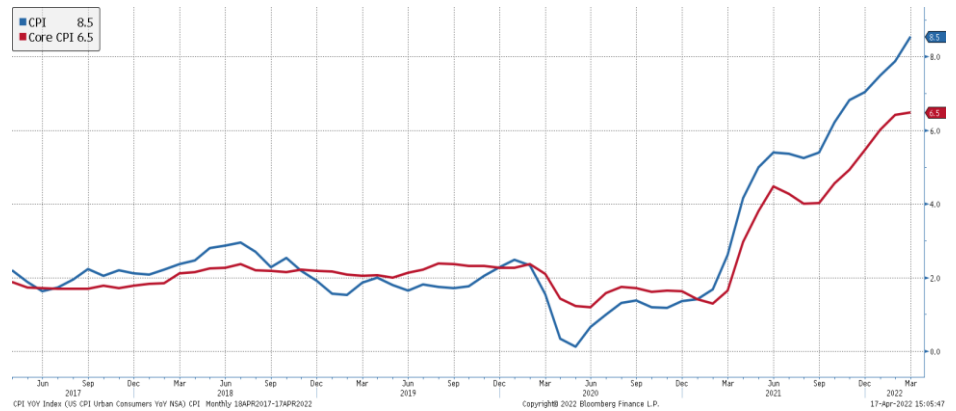
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Fertilizer prices...



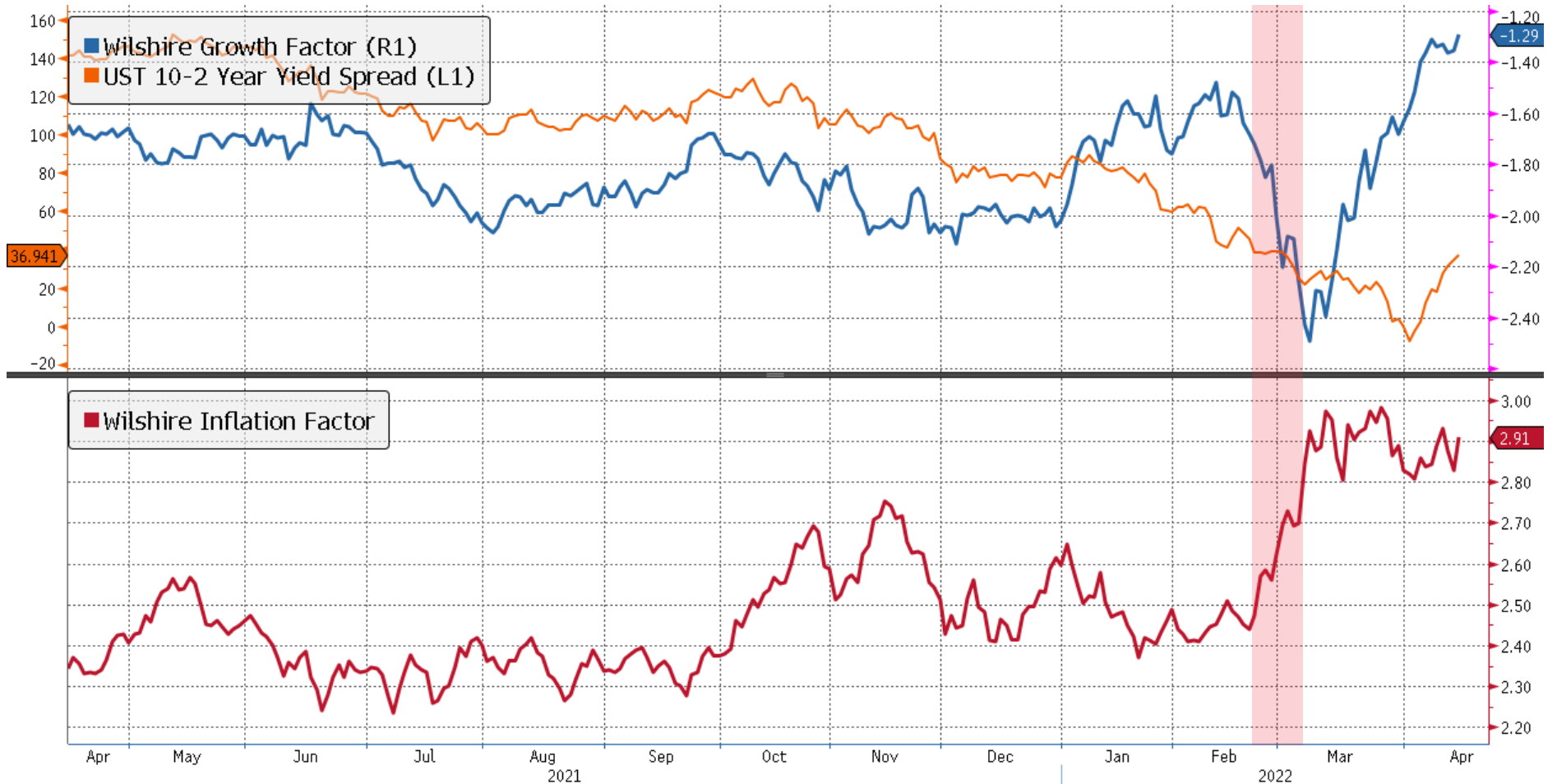
Data Source: Bloomberg

Headline & Core CPI (YoY)...



Data Source: Bloomberg

Economic Factors Proxies



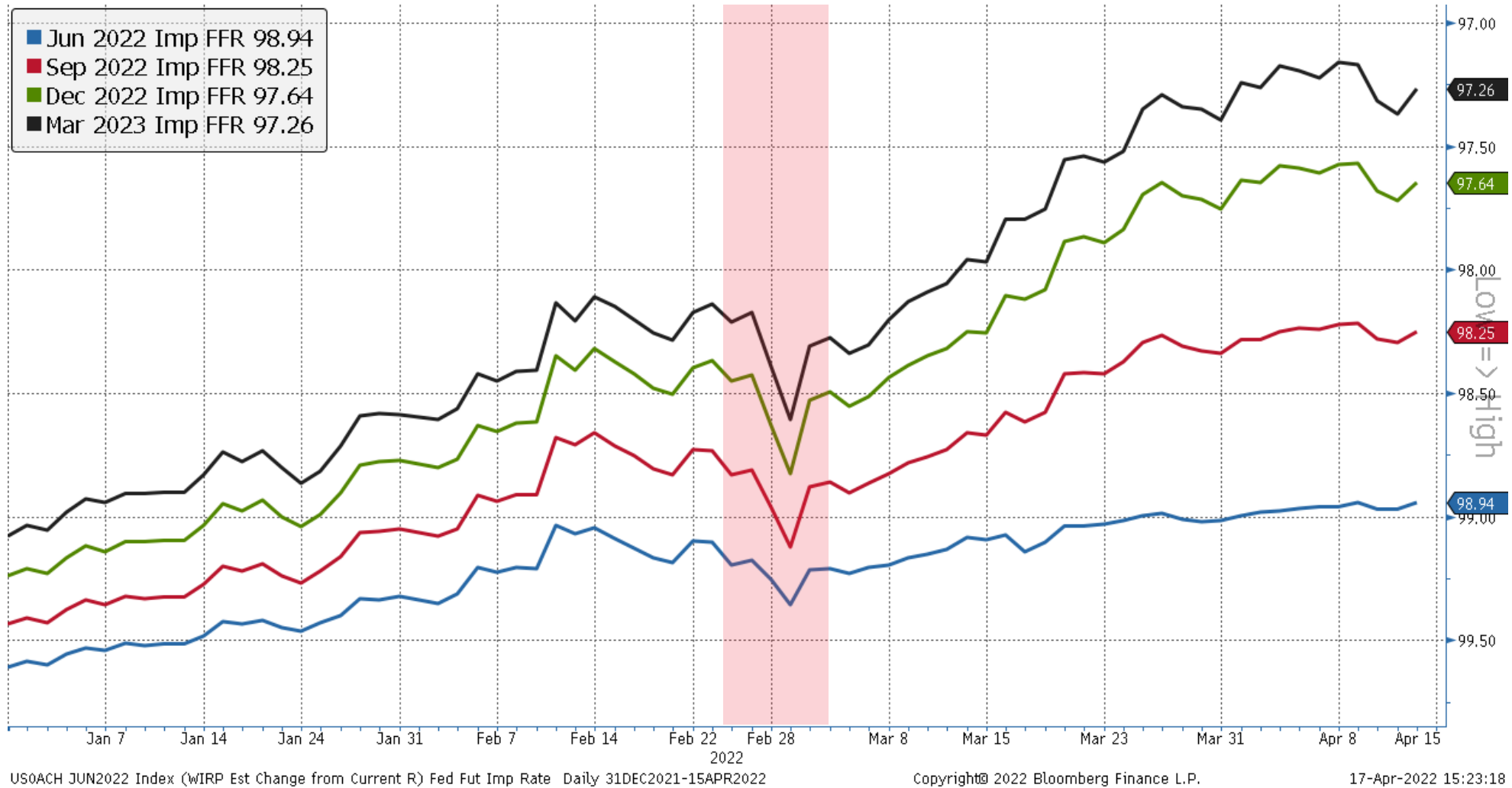
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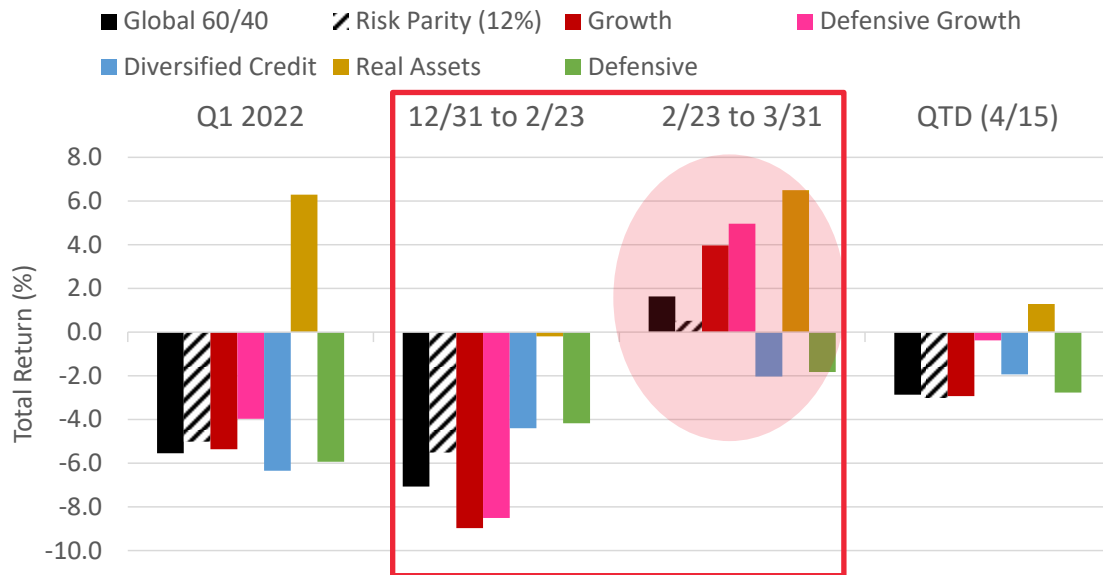
Fed Funds Discounting



Data Source: Bloomberg

Market Environment (YTD thru 4/15)

Asset Allocation & Thematic Returns

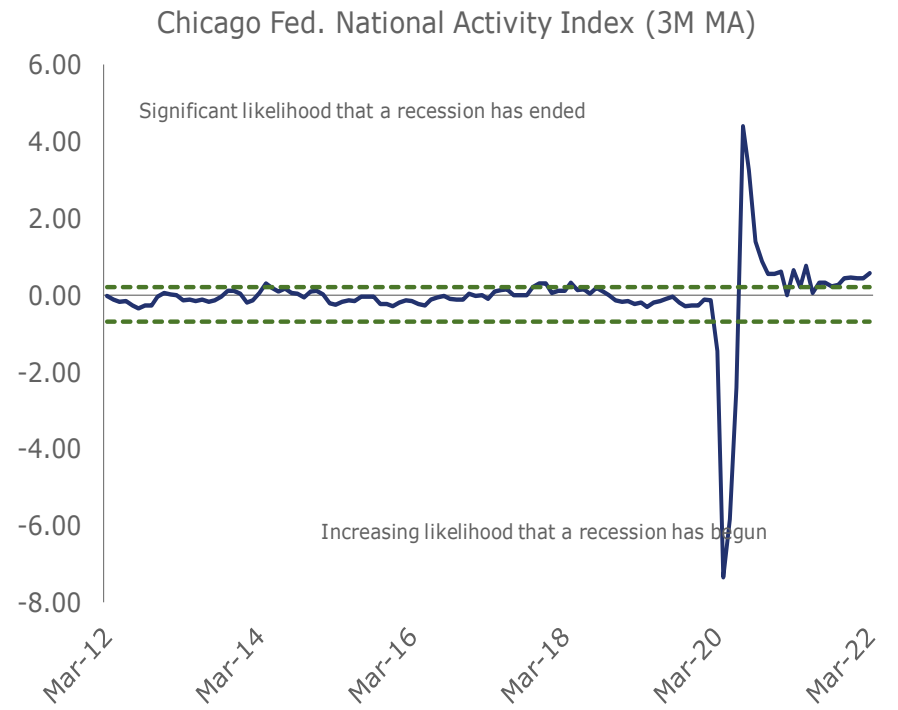
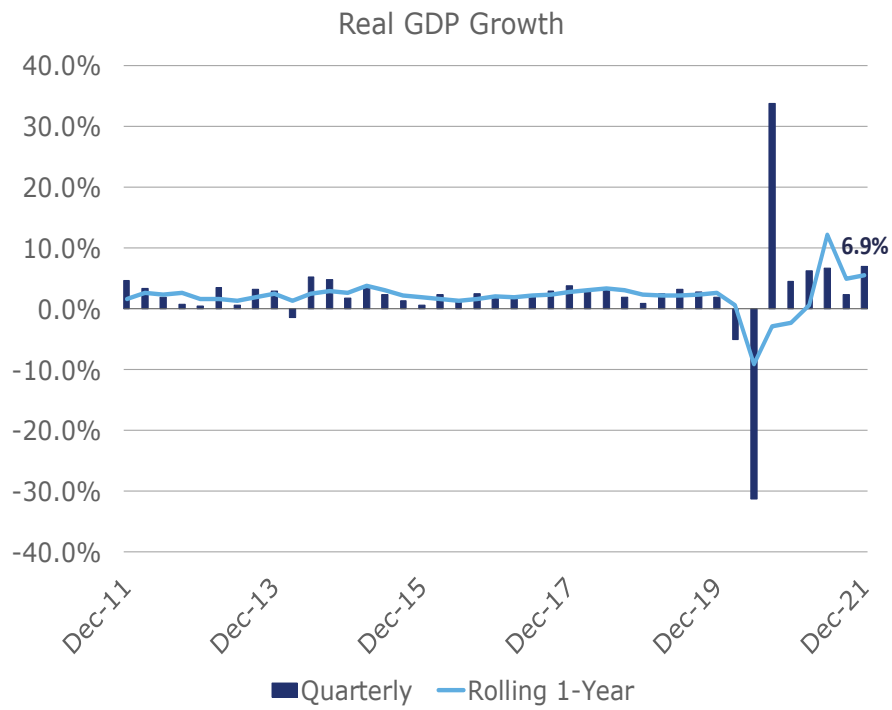


	Q1 2022	12/31 to 2/23	2/23 to 3/31	QTD (4/15)
Global 60/40	(5.55)	(7.07)	1.63	(2.87)
Risk Parity (12%)	(5.02)	(5.52)	0.53	(3.01)
Growth	(5.36)	(8.97)	3.97	(2.93)
Defensive Growth	(3.97)	(8.51)	4.97	(0.38)
Diversified Credit	(6.35)	(4.40)	(2.03)	(1.94)
Real Assets	6.30	(0.19)	6.50	1.29
Defensive	(5.93)	(4.18)	(1.83)	(2.77)

Data Source: Bloomberg

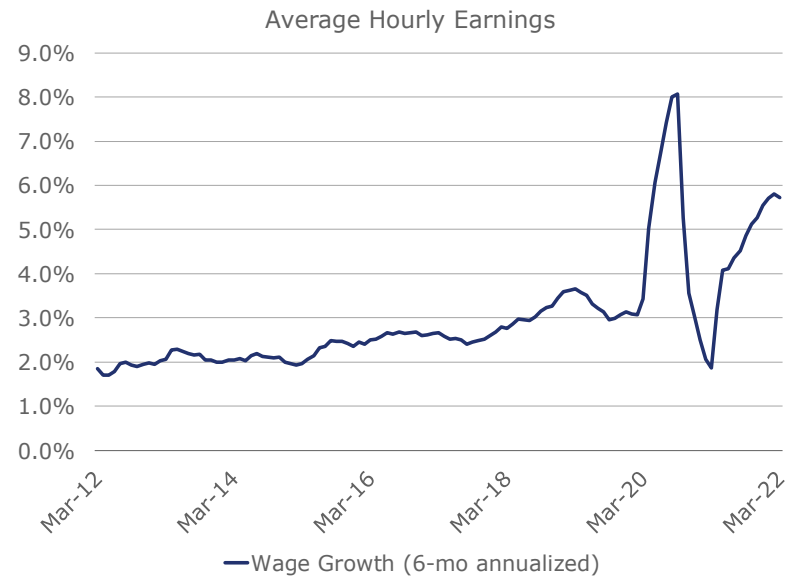
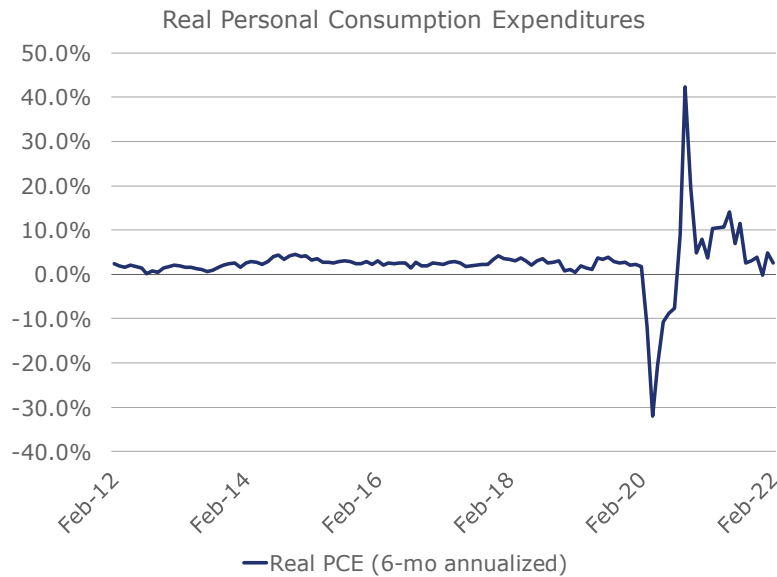
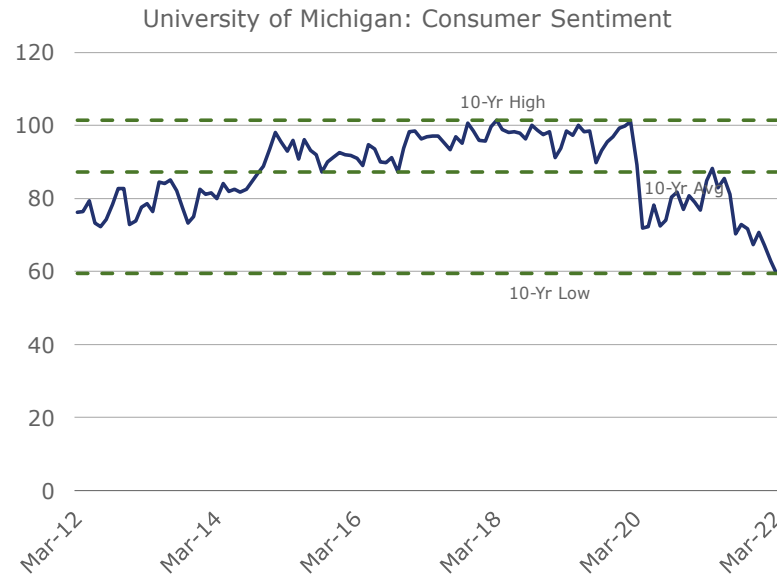
Economic/Market Activity

Economic Growth



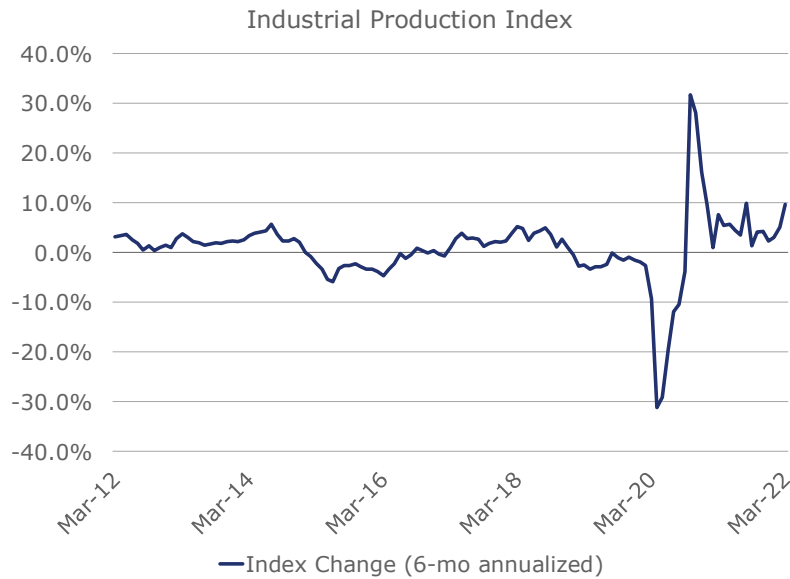
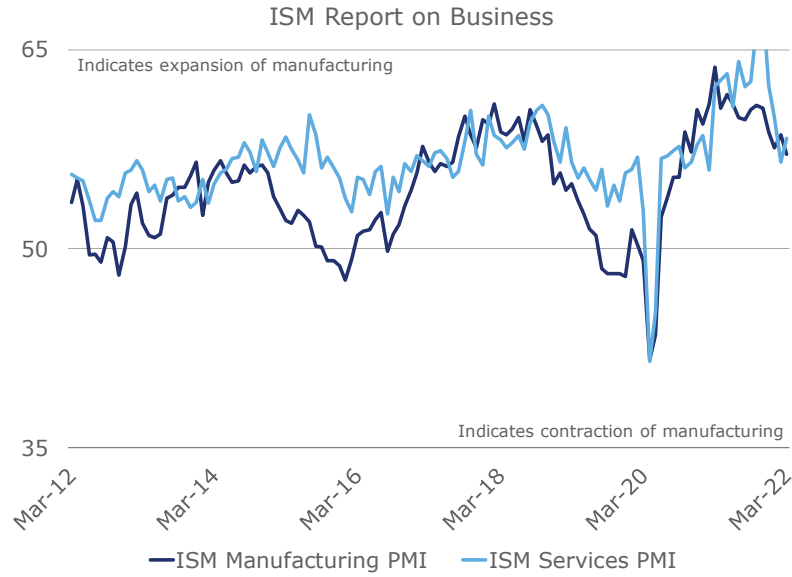
Data Sources: Bloomberg

Consumer Activity



Data Sources: Bloomberg

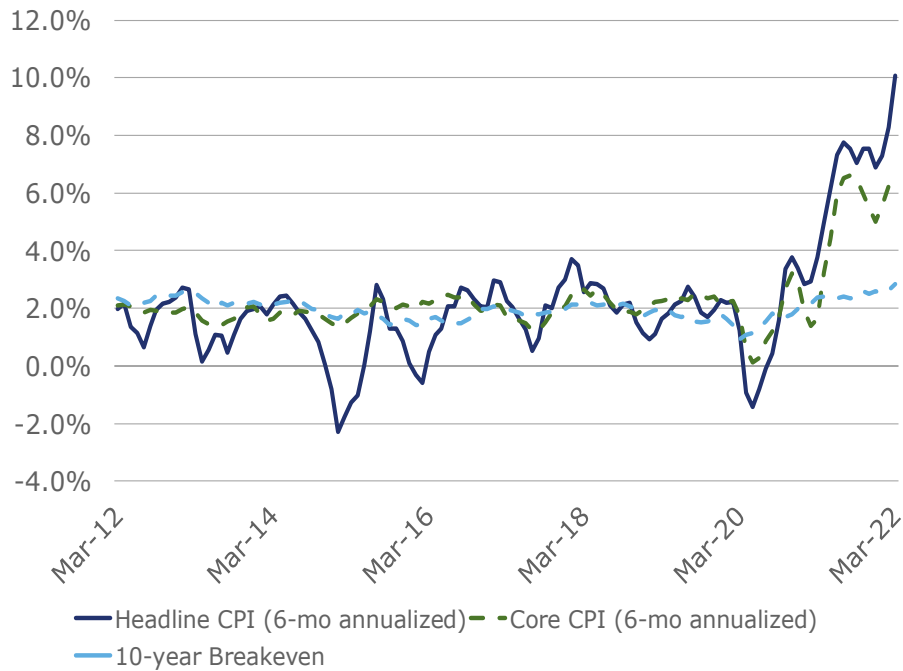
Business Activity



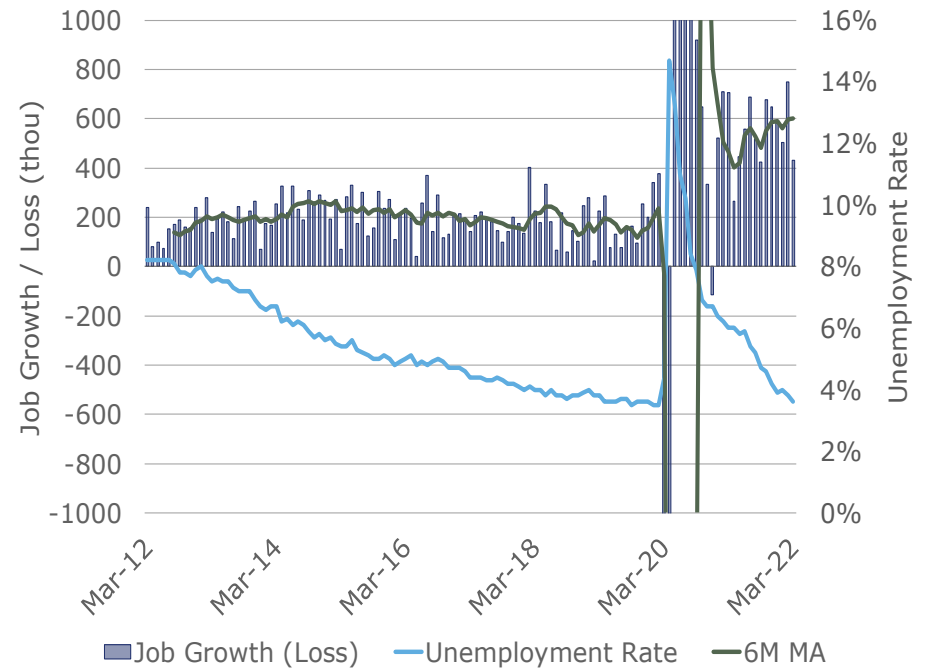
Data Sources: Bloomberg

Inflation and Employment

Inflation: Actual & Expected



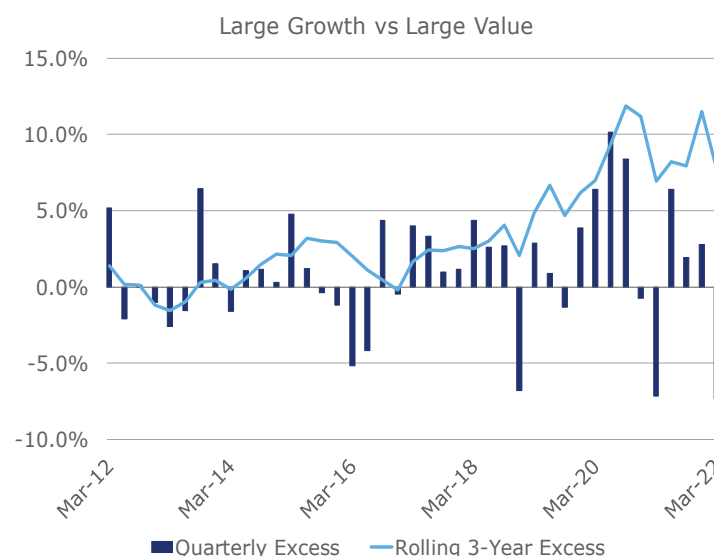
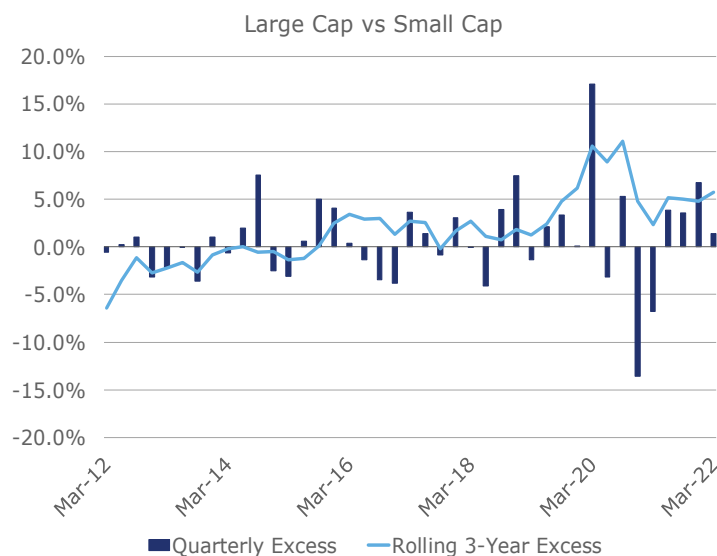
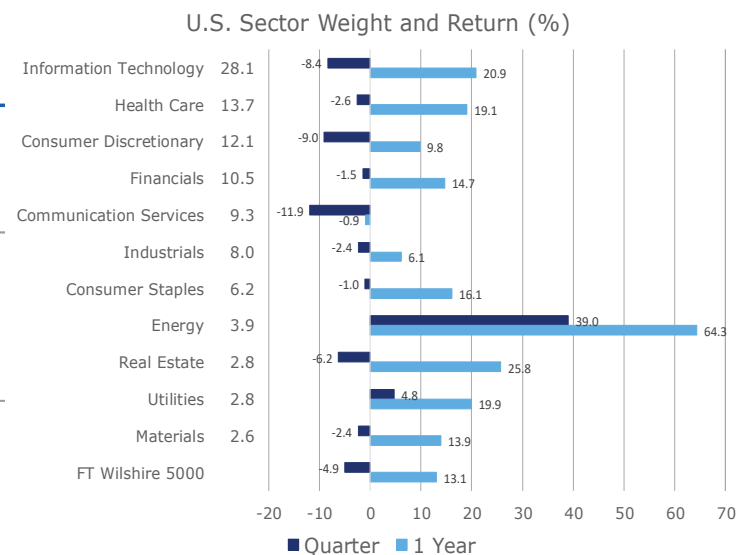
Employment Gains / Losses



Data Sources: Bloomberg

U.S. Equity Market

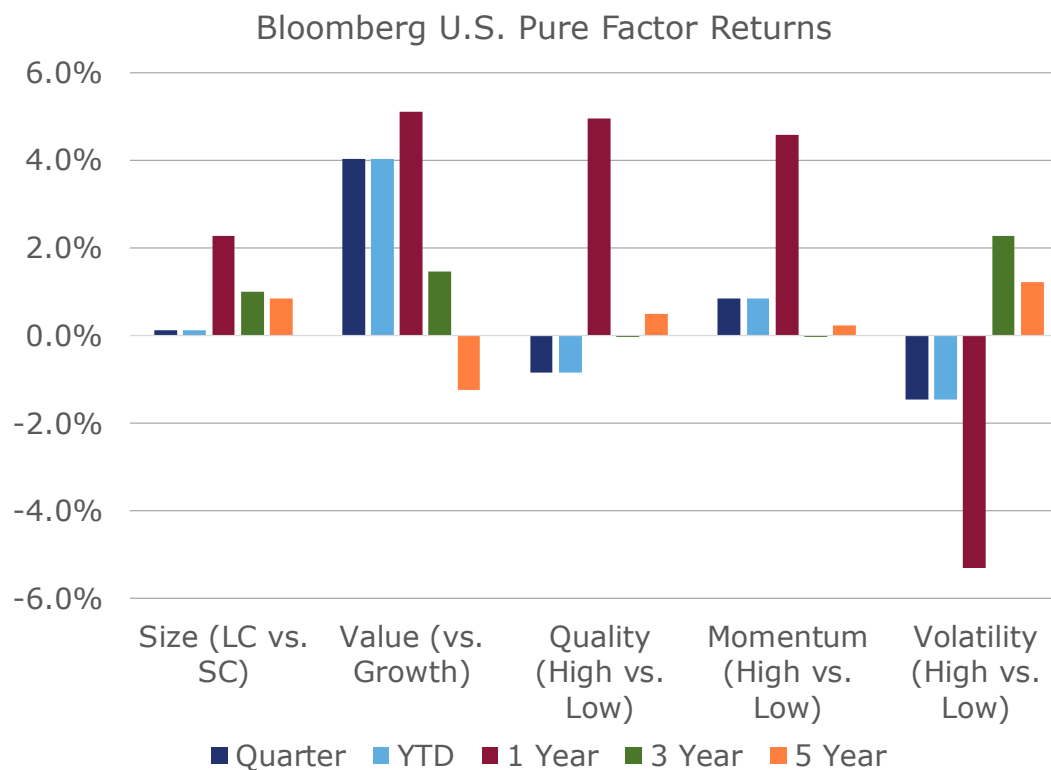
As of 3/31/2022	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	-4.9	-4.9	13.1	18.7	15.7	14.4
Wilshire U.S. Large Cap	-4.8	-4.8	14.6	19.3	16.2	14.7
Wilshire U.S. Small Cap	-6.1	-6.1	-1.4	12.8	10.4	11.8
Wilshire U.S. Large Growth	-8.0	-8.0	16.3	23.5	19.9	16.8
Wilshire U.S. Large Value	-0.7	-0.7	12.6	14.7	12.3	12.5
Wilshire U.S. Small Growth	-10.3	-10.3	-9.4	12.5	11.5	11.9
Wilshire U.S. Small Value	-1.8	-1.8	7.3	13.1	9.2	11.5
Wilshire REIT Index	-3.9	-3.9	29.1	11.9	10.0	9.9
MSCI USA Min. Vol. Index	-3.8	-3.8	13.8	11.8	12.5	13.0
FTSE RAFI U.S. 1000 Index	0.1	0.1	15.1	17.5	13.5	13.6



Data Sources: Bloomberg, Wilshire Atlas

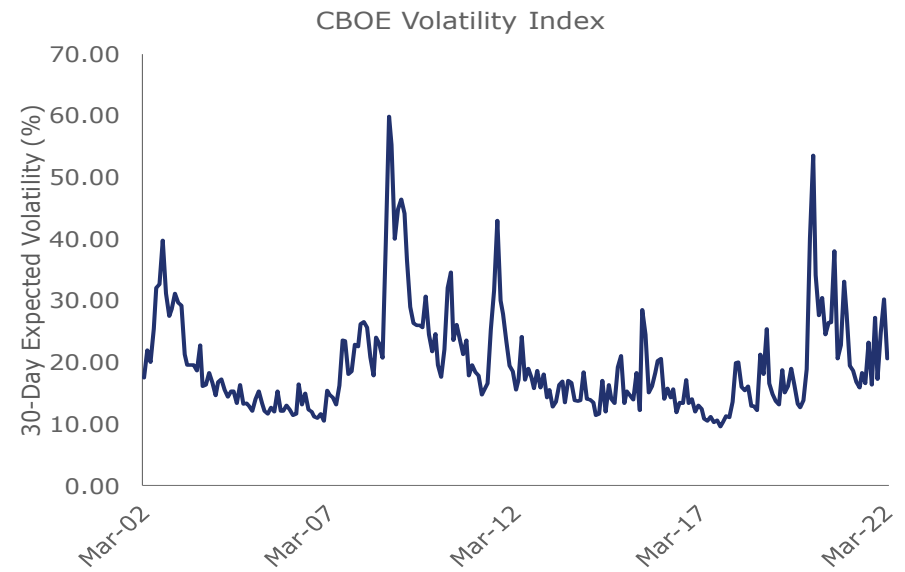
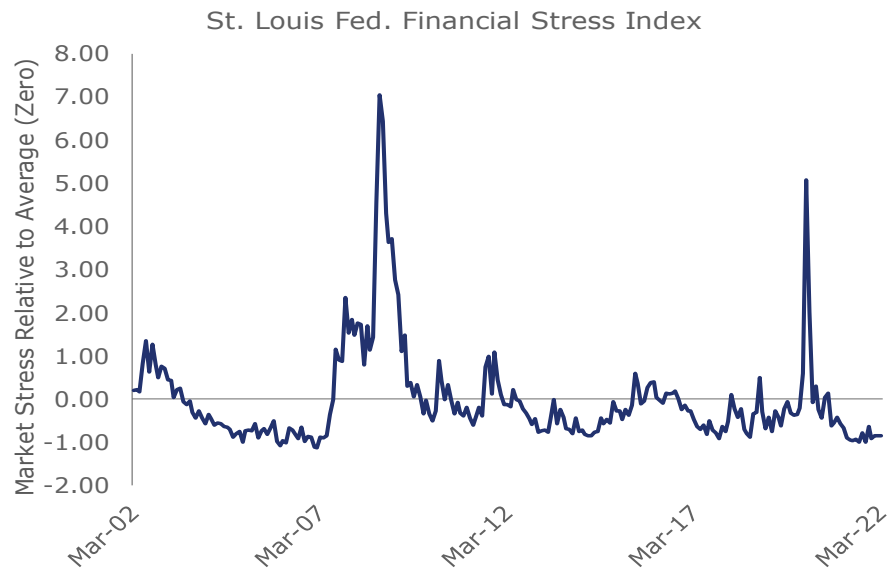
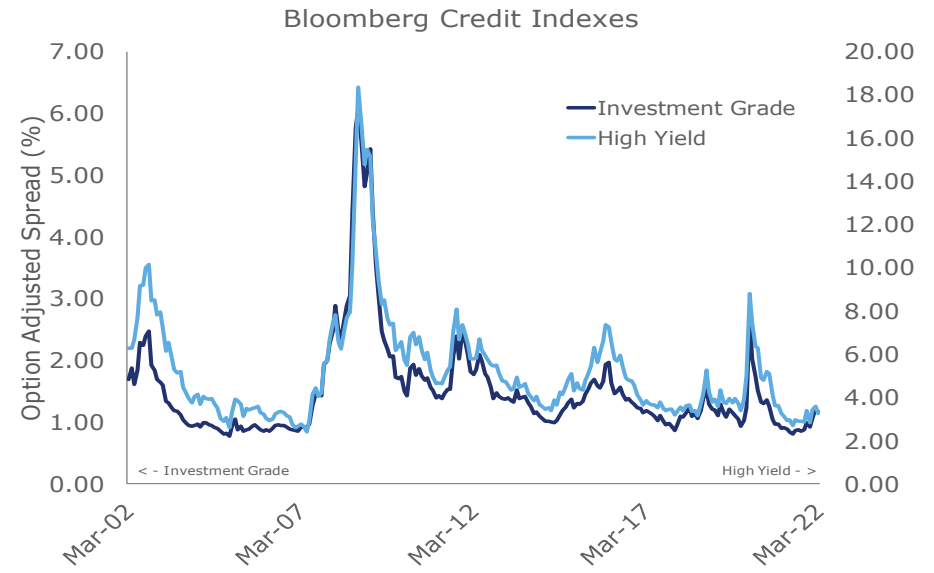
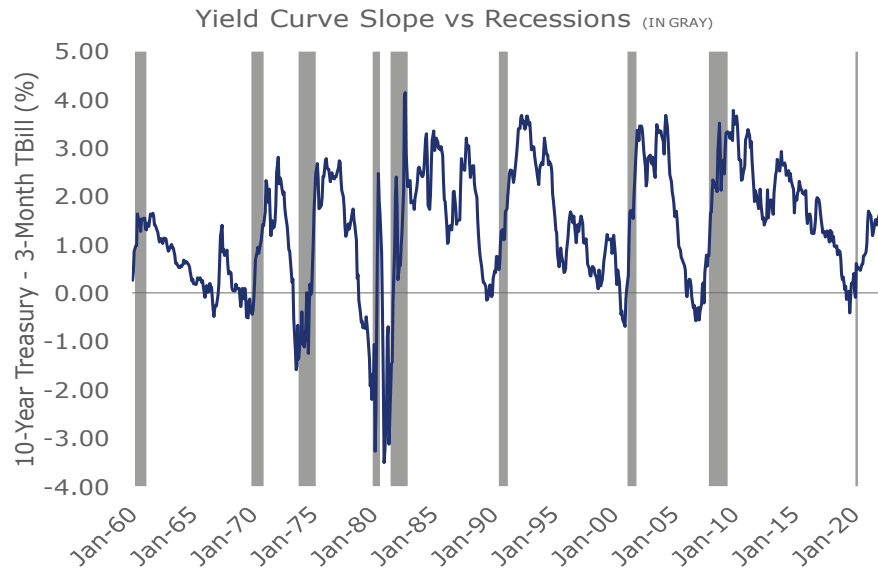
U.S. Factor Returns

- Factor returns represent the contribution from large cap, value, etc. stocks within Bloomberg’s Portfolio & Risk Analytics module
- Value stocks have rebounded during the past year



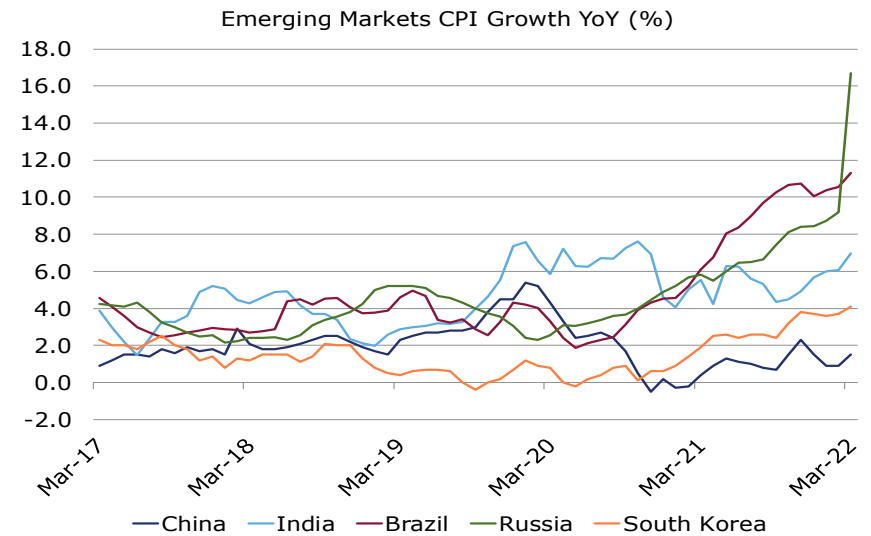
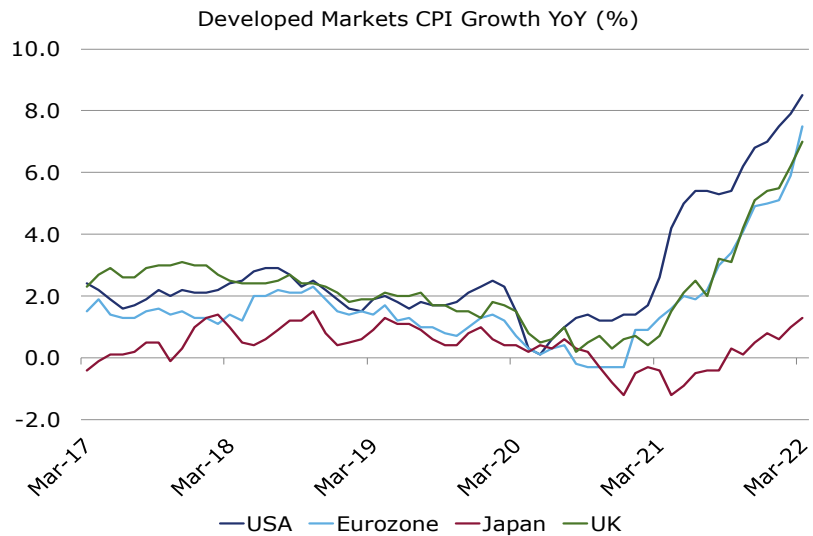
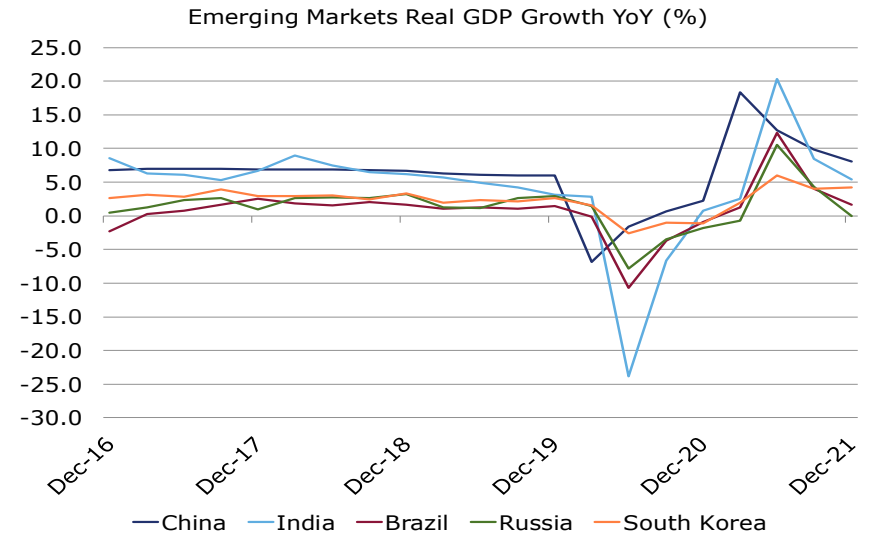
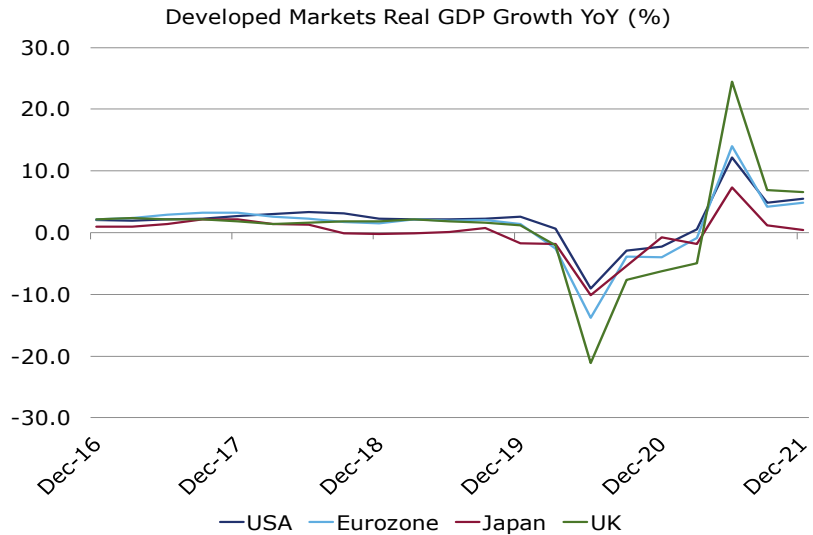
Data Sources: Bloomberg

Risk Monitor



Data Sources: Bloomberg

Non-U.S. Growth and Inflation

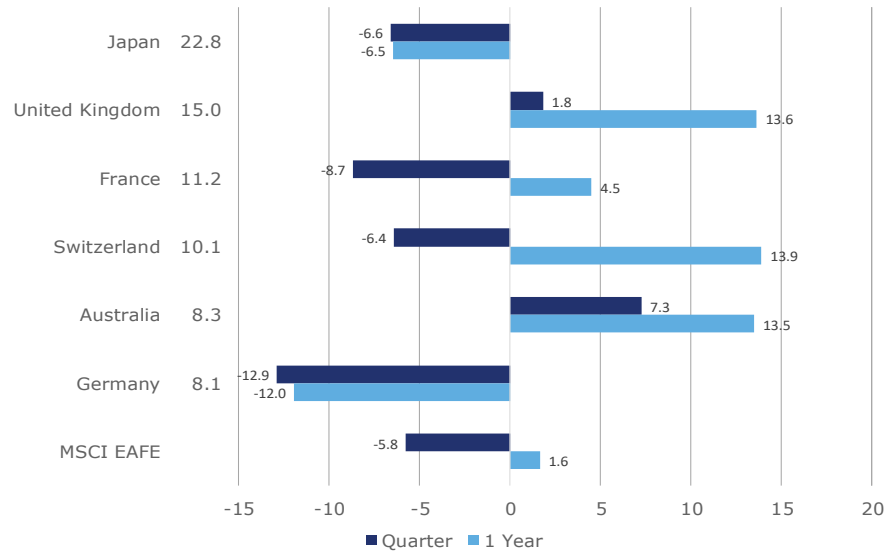


Data Sources: Bloomberg

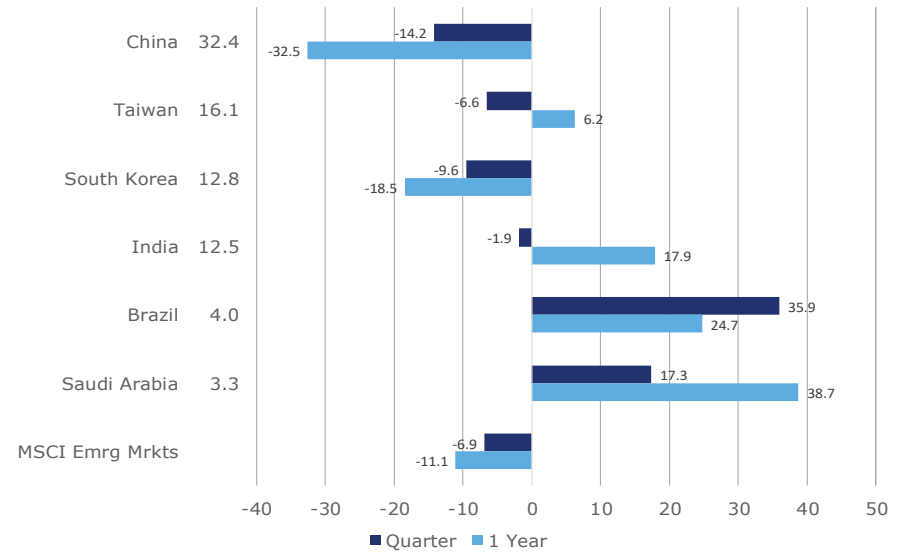
Non-U.S. Equity Market

As of 3/31/2022	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	-5.3	-5.3	-1.0	8.0	7.3	6.0
MSCI EAFE (\$G)	-5.8	-5.8	1.6	8.3	7.2	6.8
MSCI Emerging Markets (\$G)	-6.9	-6.9	-11.1	5.3	6.4	3.7
MSCI Frontier Markets (\$G)	0.6	0.6	11.9	2.4	3.6	3.0
MSCI ACWI ex-US Growth (\$G)	-10.7	-10.7	-5.9	9.5	9.0	7.1
MSCI ACWI ex-US Value (\$G)	-0.1	-0.1	3.9	6.5	5.5	5.2
MSCI ACWI ex-US Small (\$G)	-6.4	-6.4	0.4	10.7	8.3	7.7
MSCI ACWI Minimum Volatility	-2.9	-2.9	9.2	8.3	9.2	9.7
MSCI EAFE Minimum Volatility	-5.3	-5.3	2.4	3.6	5.4	6.8
FTSE RAFI Developed ex-US	-1.3	-1.3	5.0	8.5	6.7	6.3
MSCI EAFE LC (G)	-3.6	-3.6	6.7	8.7	7.1	9.1
MSCI Emerging Markets LC (G)	-6.1	-6.1	-9.6	6.6	7.9	6.7

Developed Markets Weight and Return (%)



Emerging Markets Weight and Return (%)



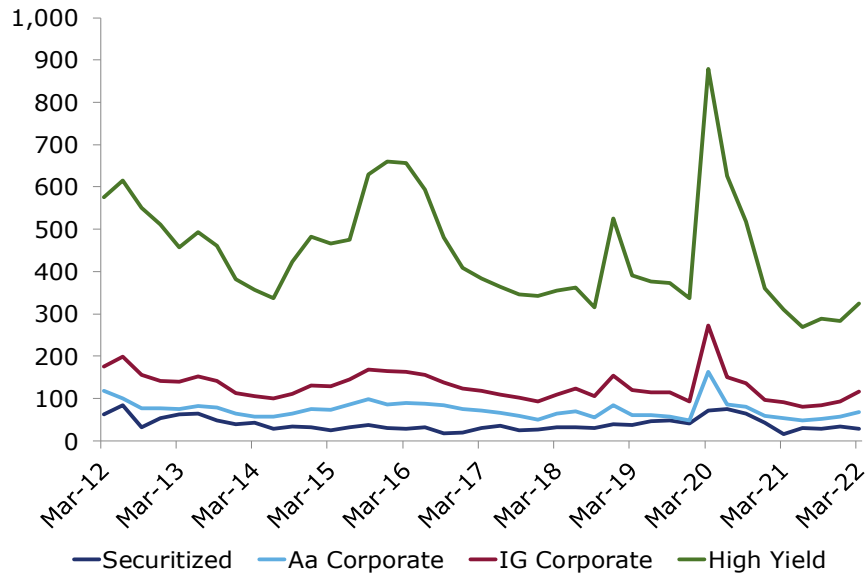
Data Sources: Bloomberg

U.S. Fixed Income

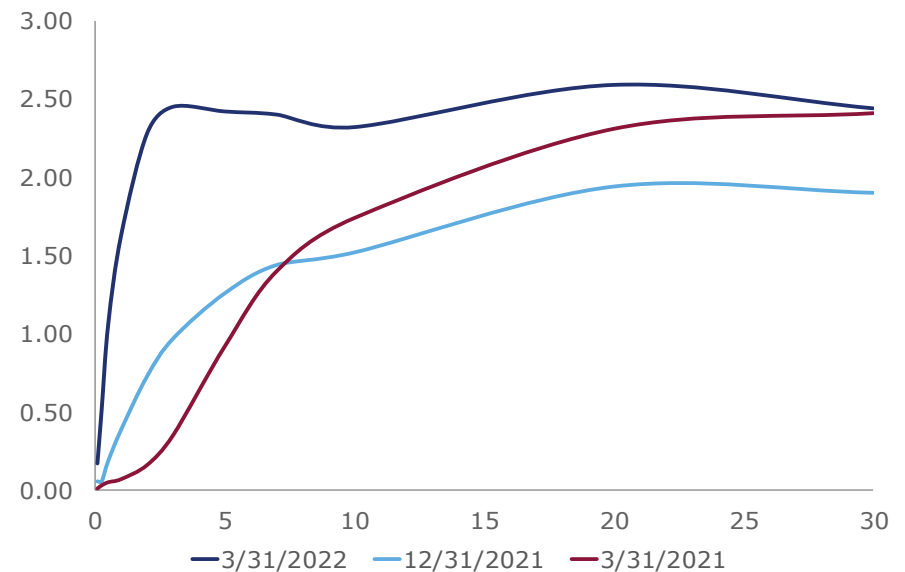
As of 3/31/2022	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	2.9	6.6	-5.9	-5.9	-4.2	1.7	2.1	2.2
Bloomberg Treasury	2.4	6.8	-5.6	-5.6	-3.7	1.4	1.8	1.7
Bloomberg Gov't-Rel.	2.9	5.9	-5.4	-5.4	-3.9	1.5	2.1	2.2
Bloomberg Securitized	3.0	5.1	-5.0	-5.0	-4.9	0.7	1.4	1.8
Bloomberg Corporate	3.6	8.1	-7.7	-7.7	-4.2	3.0	3.3	3.6
Bloomberg LT Gov't/Credit	3.4	15.7	-11.0	-11.0	-3.1	4.2	4.6	4.7
Bloomberg LT Treasury	2.6	17.8	-10.6	-10.6	-1.4	3.3	3.9	4.0
Bloomberg LT Gov't-Rel.	3.9	12.9	-9.7	-9.7	-4.0	2.7	4.0	4.3
Bloomberg LT Corporate	4.0	14.4	-11.4	-11.4	-4.3	4.6	4.9	5.2
Bloomberg U.S. TIPS *	2.4	8.1	-3.0	-3.0	4.3	6.2	4.4	2.7
Bloomberg High Yield	6.0	3.9	-4.8	-4.8	-0.7	4.6	4.7	5.7
S&P/LSTA Leveraged Loan	4.4	0.3	-0.1	-0.1	3.3	4.2	4.0	4.3
Treasury Bills	0.6	0.3	0.0	0.0	0.0	0.8	1.1	0.6

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

Fixed Income Option Adjusted Spread (bps)



Treasury Yield Curve (%)

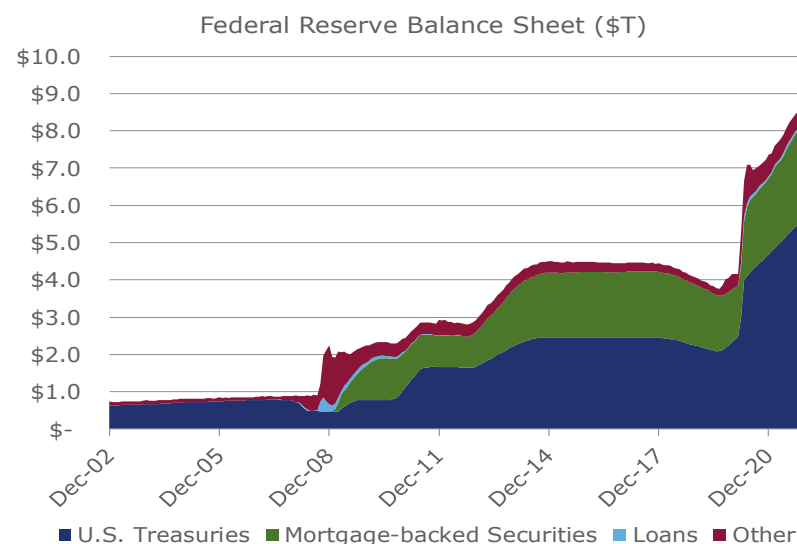
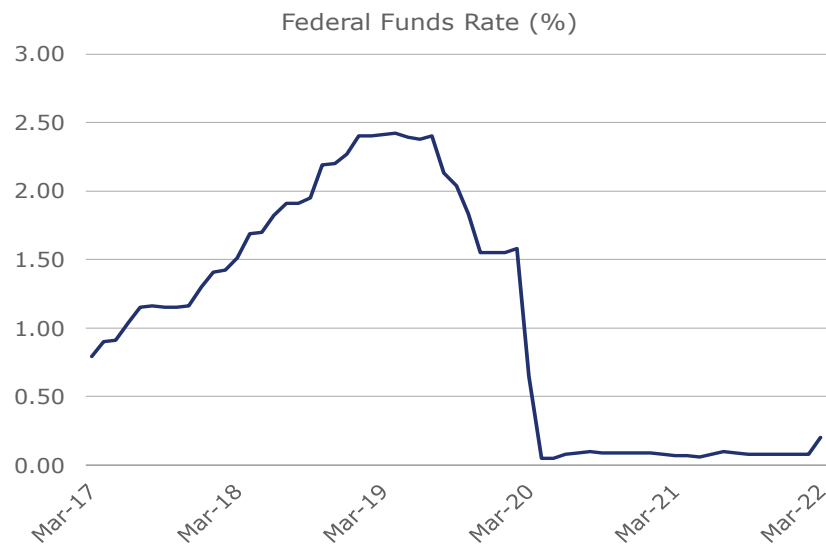


Data Sources: Bloomberg

Federal Reserve

- Current FOMC expectation is for three 25 basis point increases (or 0.75%) in the Fed-funds rate during 2022
- Federal Reserve has added more than \$4.5 trillion in assets to their balance sheet during the past 21 months
- QE4 is now larger than the 3 phases of quantitative easing – combined – following the global financial crisis

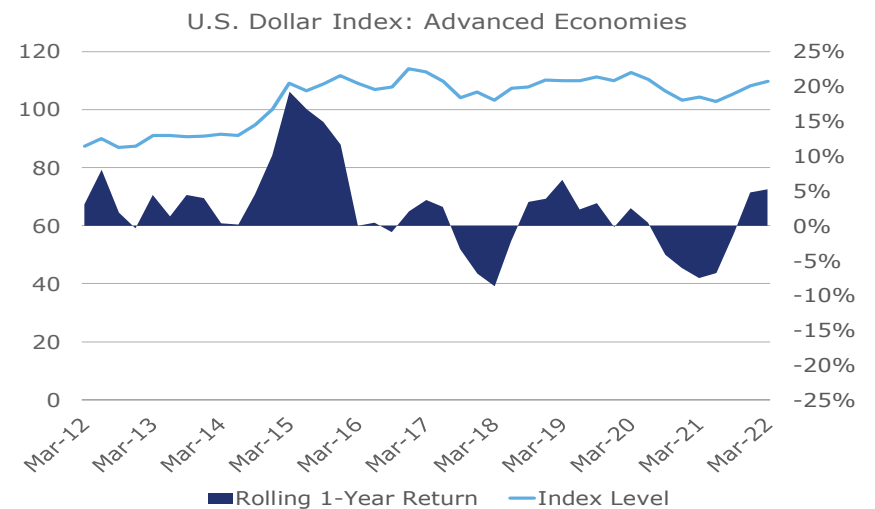
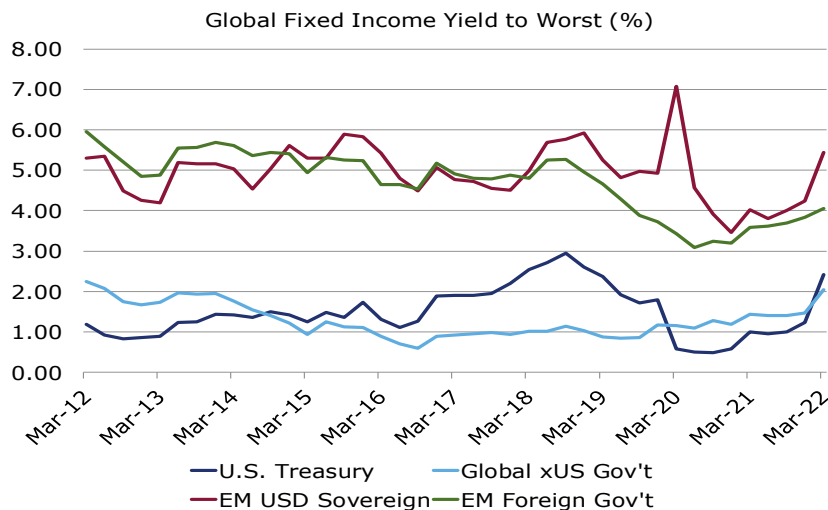
	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020	3/15/2022	\$4,804



Non-U.S. Fixed Income

As of 3/31/2022	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Developed Markets						
Bloomberg Global Aggregate xUS	-6.1	-6.1	-7.9	-0.2	1.3	0.1
Bloomberg Global Aggregate xUS *	-4.1	-4.1	-3.6	0.9	2.3	3.2
Bloomberg Global Inflation Linked xUS	-5.3	-5.3	0.0	3.8	4.1	2.7
Bloomberg Global Inflation Linked xUS *	-2.8	-2.8	5.5	4.6	4.5	5.3
Emerging Markets (Hard Currency)						
Bloomberg EM USD Aggregate	-9.2	-9.2	-7.5	0.7	1.9	3.6
Emerging Markets (Foreign Currency)						
Bloomberg EM Local Currency Gov't	-2.1	-2.1	0.0	2.8	2.8	1.7
Bloomberg EM Local Currency Gov't *	-3.5	-3.5	-2.9	1.4	2.2	2.4
Euro vs. Dollar	-2.7	-2.7	-5.7	-0.5	0.8	-1.9
Yen vs. Dollar	-5.4	-5.4	-9.0	-3.1	-1.8	-3.8
Pound vs. Dollar	-2.9	-2.9	-4.7	0.3	0.9	-2.0

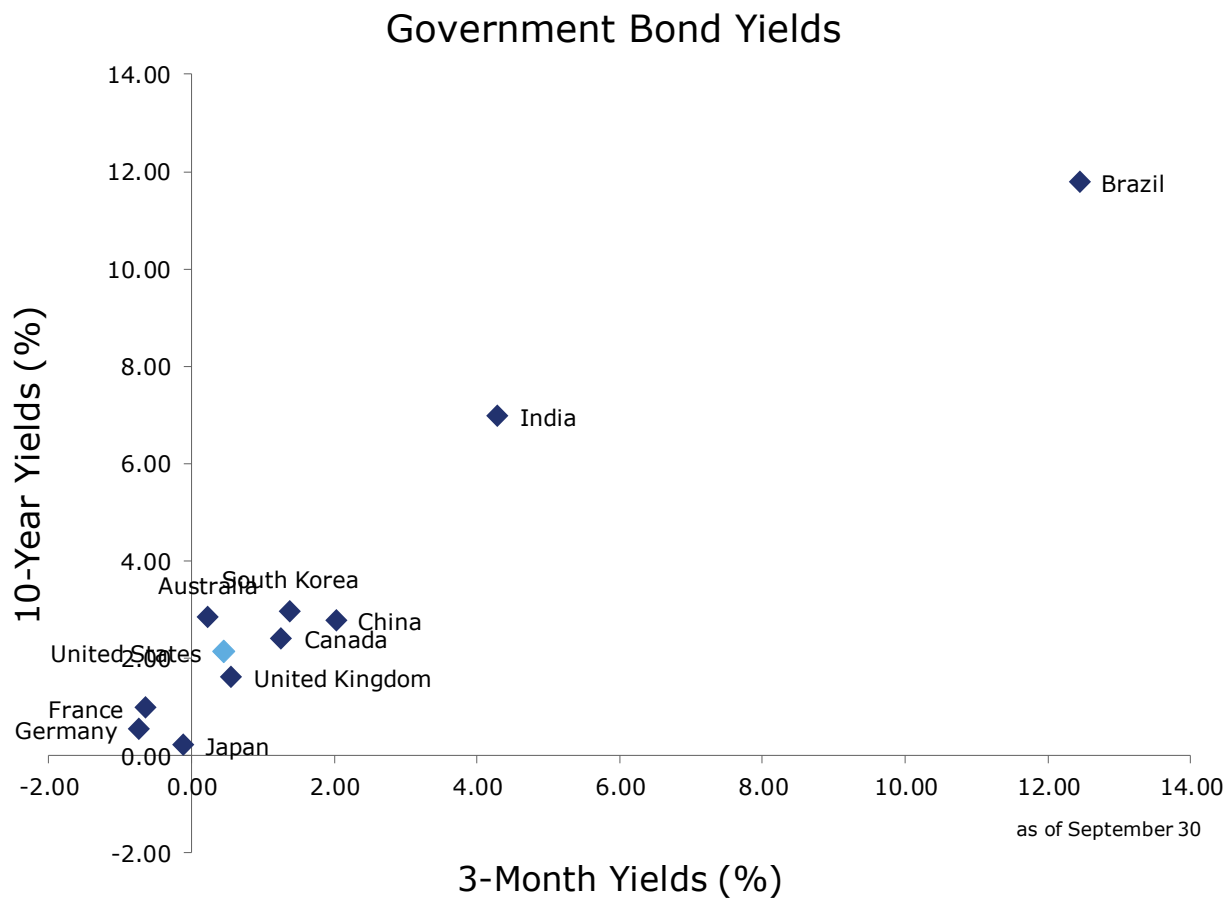
* Returns are reported in terms of local market investors, which removes currency effects.



Data Sources: Bloomberg

Global Interest Rates

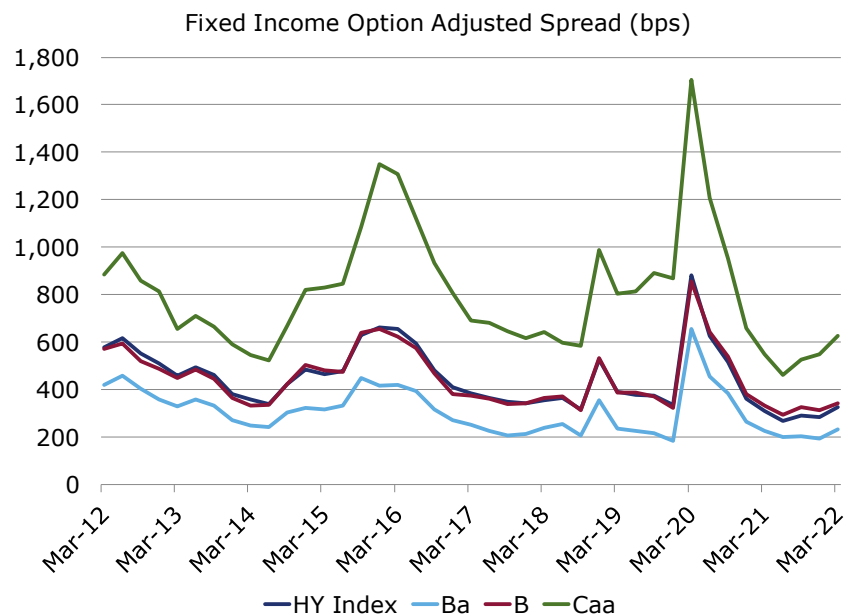
Negative rates found in Germany and France; low but positive rates, and at similar levels, in the U.S., Australia and in the U.K.



Data Sources: Bloomberg

High Yield Bond Market

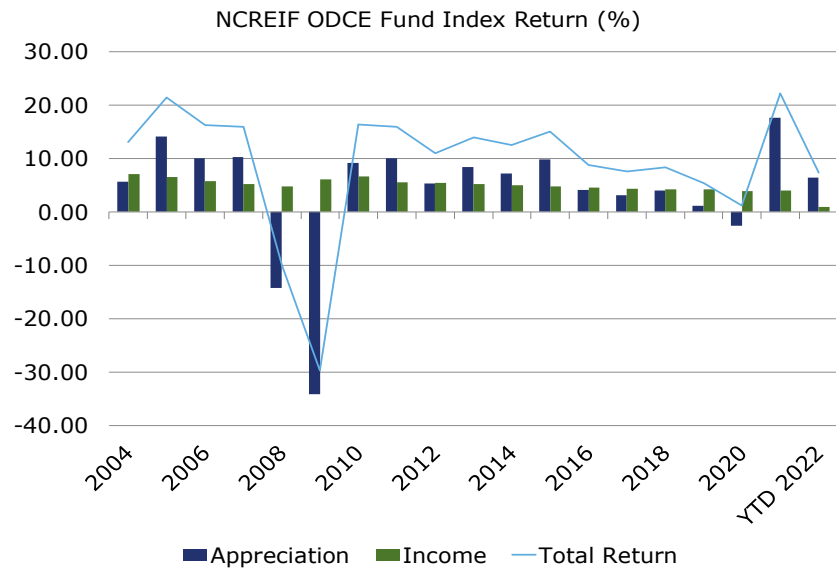
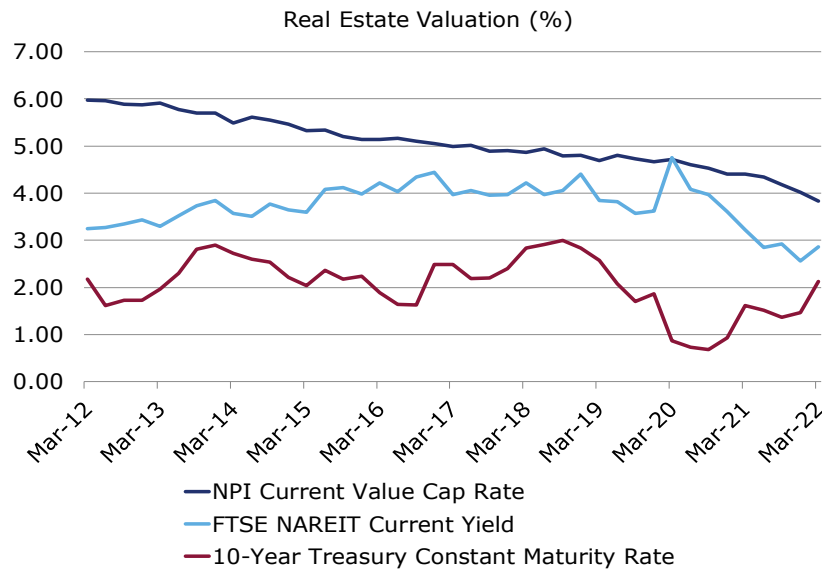
As of 3/31/2022		YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		6.0	-4.8	-4.8	-0.7	4.6	4.7	5.7
S&P LSTA Leveraged Loan		4.4	-0.2	-0.2	2.3	3.8	3.7	3.9
High Yield Quality Distribution	Weight							
Ba U.S. High Yield	51.3%	5.0	-5.9	-5.9	-1.5	5.3	5.1	5.9
B U.S. High Yield	37.0%	6.3	-3.5	-3.5	0.0	4.2	4.5	5.4
Caa U.S. High Yield	11.5%	9.1	-3.9	-3.9	0.8	2.9	3.5	5.8
Ca to D U.S. High Yield	0.3%	30.8	-3.8	-3.8	-5.5	-1.9	2.7	-3.0
Non-Rated U.S. High Yield	0.0%	0.0	0.0	0.0	0.0	-1.4	0.8	1.6



Data Sources: Bloomberg

Real Assets

As of 3/31/2022	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Bloomberg U.S. TIPS	-3.0	-3.0	4.3	6.2	4.4	2.7
Bloomberg Commodity Index	25.5	25.5	49.3	16.1	9.0	-0.7
Bloomberg Gold Index	6.6	6.6	13.1	13.0	8.1	0.7
Wilshire Global RESI Index	-3.0	-3.0	22.0	8.7	8.5	8.8
NCREIF ODCE Fund Index	7.4	7.4	28.5	11.3	9.9	10.9
NCREIF Timberland Index	3.2	3.2	11.8	4.7	4.1	5.6
FTSE Global Core Infrastructure 50/50	3.9	3.9	15.3	9.0	9.4	9.7
Alerian Midstream Energy	24.0	24.0	41.9	10.1	6.1	n.a.
Bitcoin	-1.2	-1.2	-22.4	123.6	111.8	149.7



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

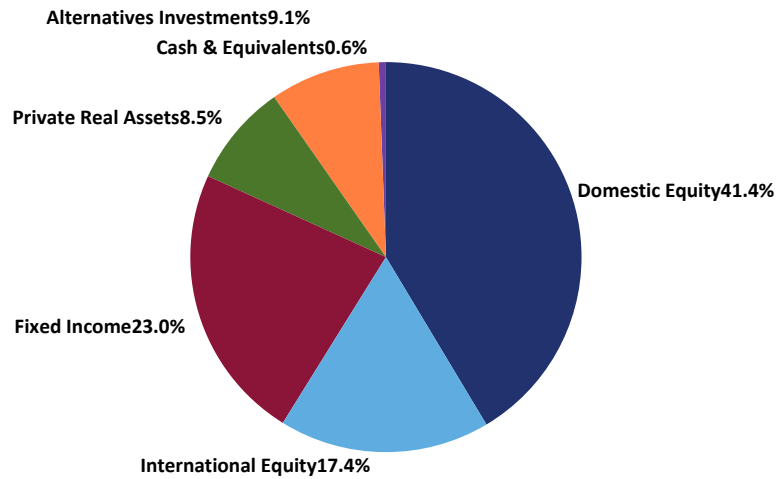
Total Fund

Asset Allocation

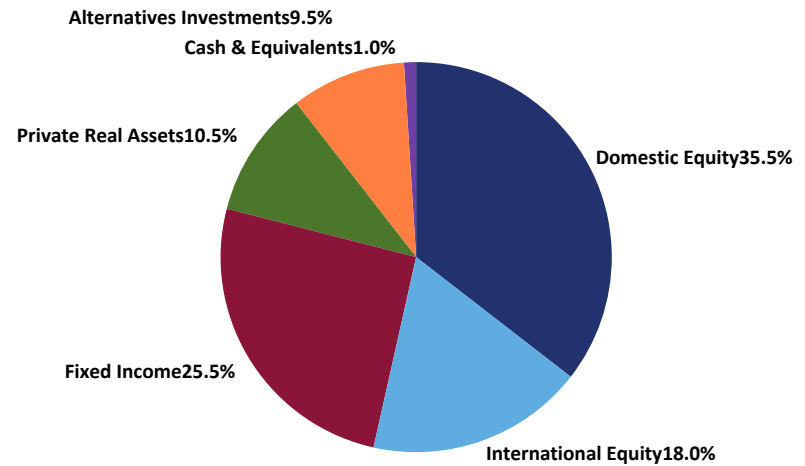
Total Fund

Periods Ended As of March 31, 2022

Actual Allocation



Target Allocation

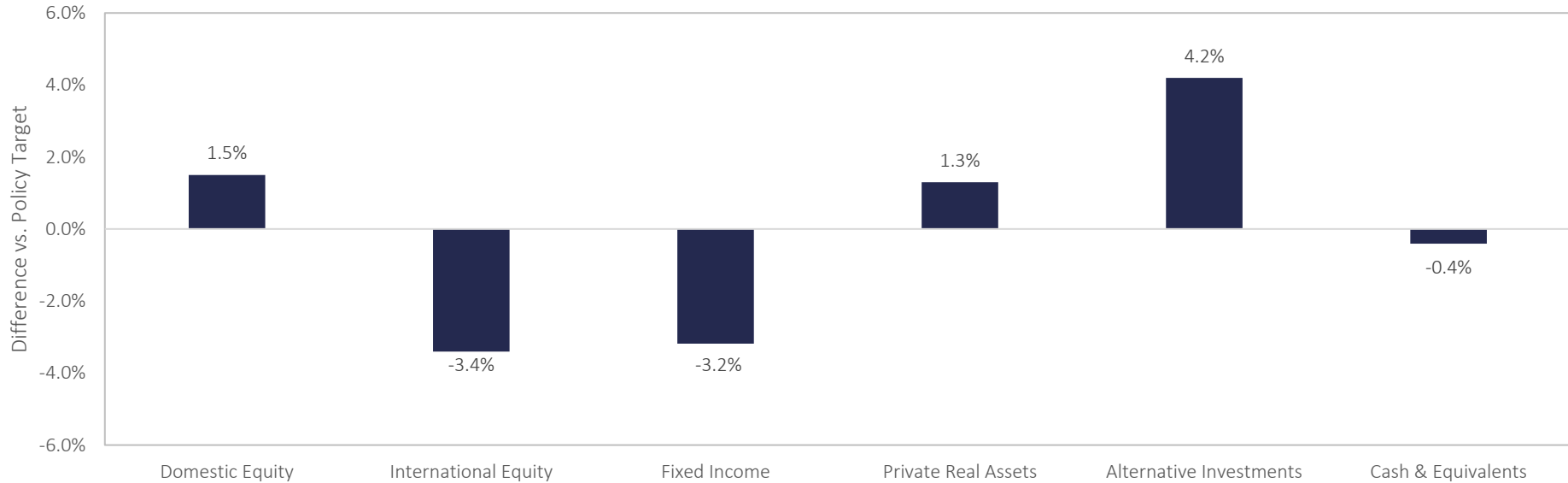


	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	54,085	100.0	100.0	0.0	
Domestic Equity	22,398	41.4	35.5	5.9	3,198
International Equity	9,426	17.4	18.0	-0.6	-309
Fixed Income	12,427	23.0	25.5	-2.5	-1,365
Private Real Assets	4,598	8.5	10.5	-2.0	-1,081
Alternatives Investments	4,915	9.1	9.5	-0.4	-223
Cash & Equivalents	321	0.6	1.0	-0.4	-220

Projected Deviations from the Benchmark

As of March 31, 2022

Projected Asset Allocation Difference vs. Target



- Includes committed, but unfunded amounts for Real Assets (\$1.78 billion) and Alternatives (\$2.49 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

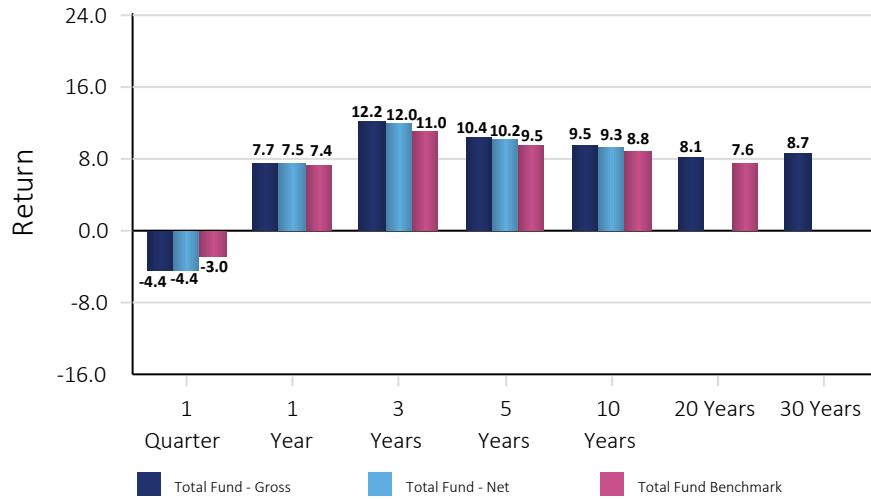
Real Assets Proxy: 50% Domestic Equity, 30% International Equity, 20% Fixed Income

Composite Performance Summary

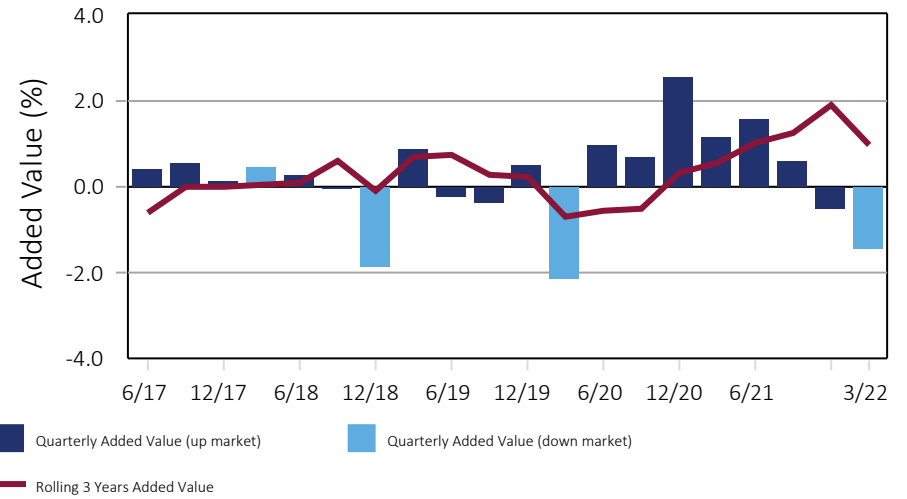
Total Fund

Periods Ended March 31, 2022

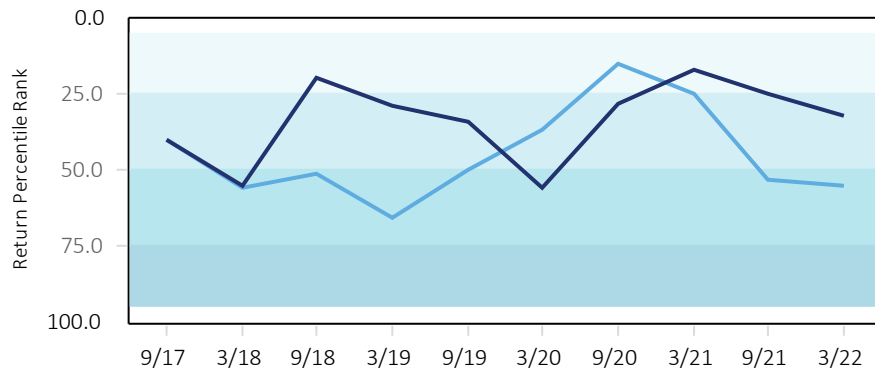
Comparative Performance



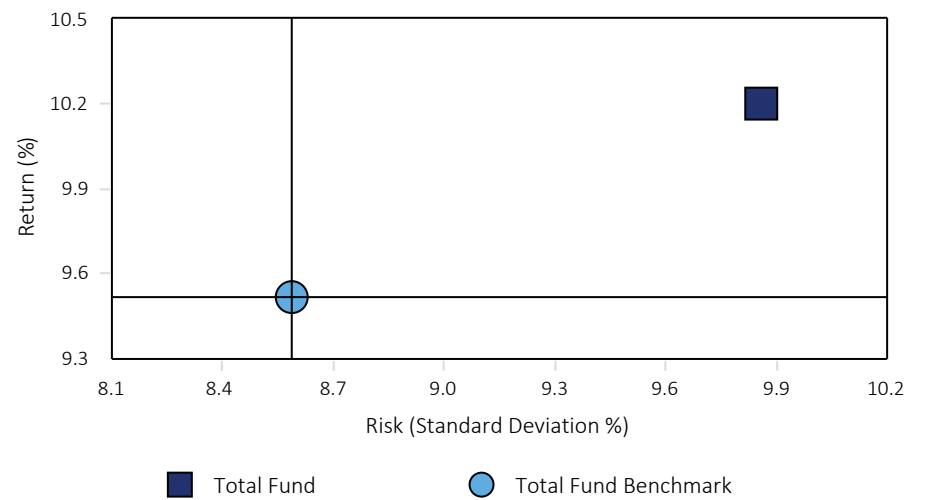
Added Value History



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



Risk and Return 04/01/17 - 03/31/22

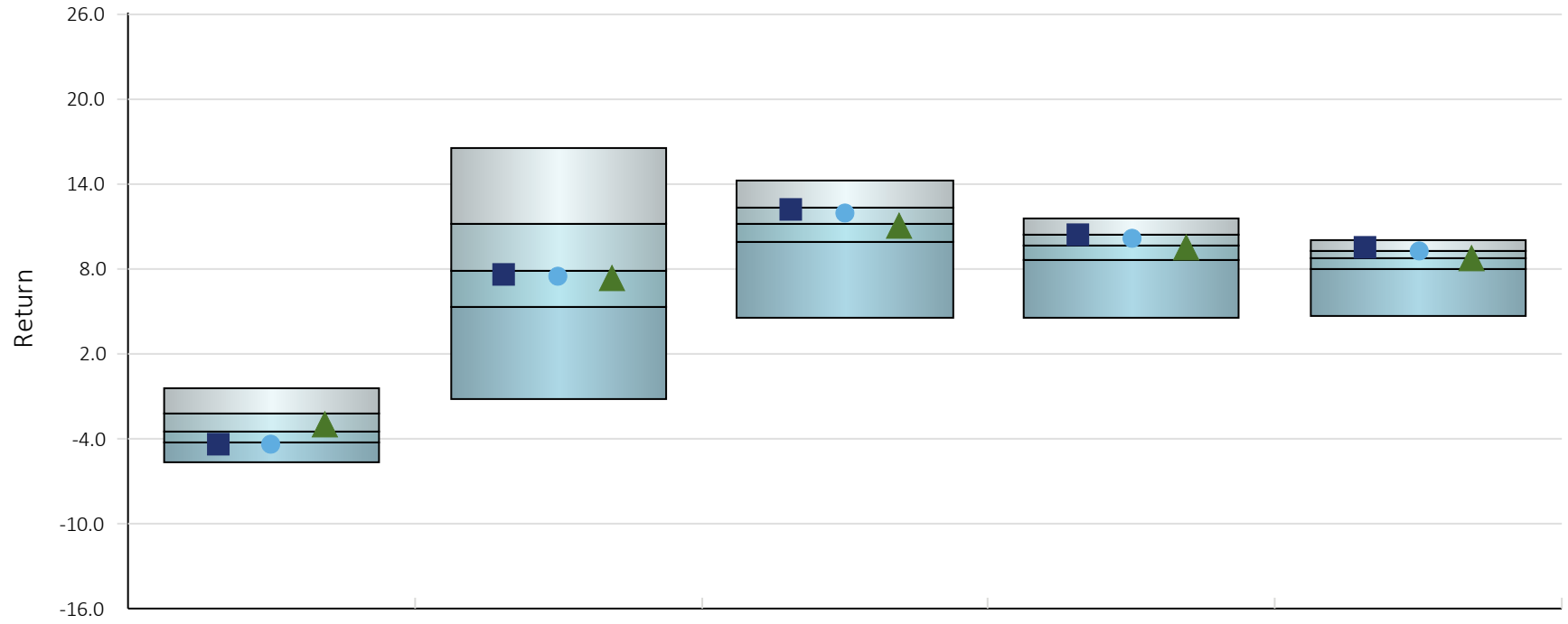


	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— Total Fund	10	3 (30%)	5 (50%)	2 (20%)	0 (0%)
— Total Fund Benchmark	10	2 (20%)	3 (30%)	5 (50%)	0 (0%)

Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2022



	QTD	1 Year	3 Years	5 Years	10 Years
■ Total Fund	-4.39 (77)	7.65 (54)	12.16 (28)	10.40 (27)	9.49 (14)
● Total Fund - Net	-4.44 (78)	7.47 (56)	11.97 (32)	10.21 (33)	9.27 (22)
▲ Total Fund Benchmark	-2.99 (42)	7.37 (56)	11.00 (55)	9.52 (56)	8.80 (48)
5th Percentile	-0.42	16.56	14.25	11.53	10.03
1st Quartile	-2.21	11.15	12.29	10.43	9.26
Median	-3.45	7.82	11.22	9.68	8.77
3rd Quartile	-4.31	5.26	9.97	8.62	8.00
95th Percentile	-5.71	-1.22	4.52	4.50	4.66
Population	86	85	85	84	83

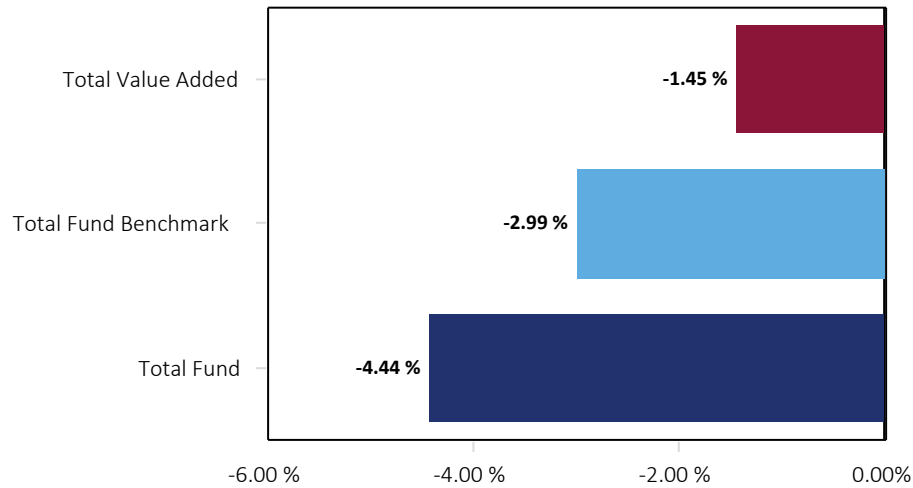
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18% MSCI AC World ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.

Total Fund Attribution

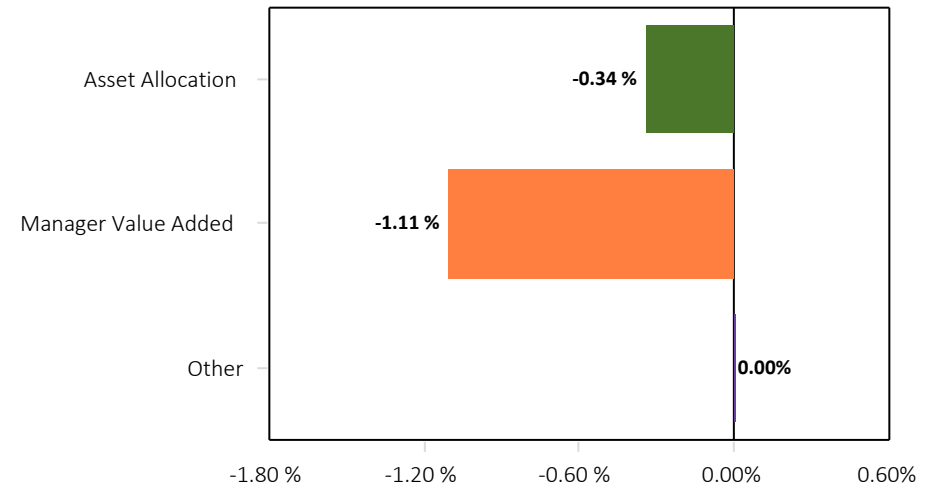
Total Fund

1 Quarter Ending March 31, 2022

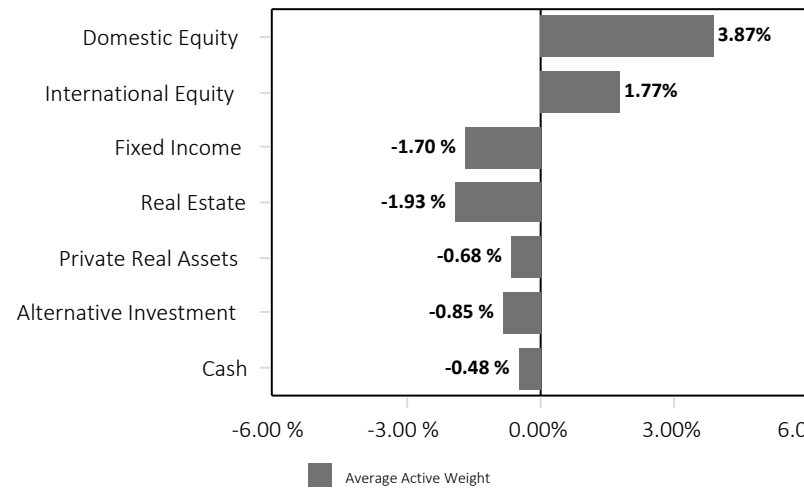
Total Fund Performance



Total Value Added:-1.45 %



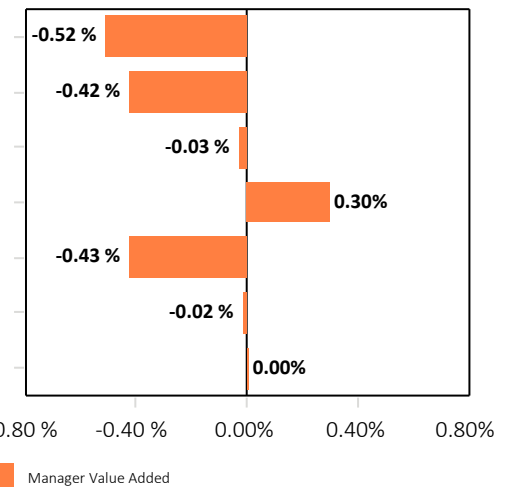
Asset Class Under or Overweighting



Asset Allocation Value Added:-0.34 %



Total Manager Value Added:-1.11 %



Total Fund Benchmark = 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.

Asset Class Returns

Periods Ended March 31, 2022

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Total Fund	-4.39	7.65	12.16	10.40	9.49	8.12	8.72	10.00	1/1/1982
Total Fund - Net	-4.44	7.47	11.97	10.21	9.27				
Total Fund Benchmark	-2.99	7.37	11.00	9.52	8.80	7.64			
Domestic Equity	-6.17	9.46	17.29	14.64	13.81	9.56	10.79	11.97	1/1/1982
Domestic Equity - Net	-6.22	9.27	17.08	14.43	13.56				
Custom Benchmark (U.S. Equity)	-5.01	12.24	18.35	15.46	14.29	9.56	10.55		
U.S. Equity IMRF Custom Benchmark	-5.24	11.90	16.99	13.92					
International Equity	-7.68	-2.14	8.60	7.69	7.06	7.28	7.61	7.78	9/1/1986
International Equity - Net	-7.76	-2.51	8.21	7.32	6.70				
MSCI AC World ex USA (Net)	-5.44	-1.48	7.51	6.76	5.55	6.41			
International Equity IMRF Custom Benchmark	-5.71	-2.22	7.44	6.72					
Fixed Income	-5.51	-3.30	2.39	2.78	3.13	4.86	5.75	7.76	1/1/1982
Fixed Income - Net	-5.54	-3.40	2.29	2.66	2.99				
Custom Benchmark (Fixed Income)	-5.40	-3.61	1.88	2.26	2.30	4.03	5.14	7.23	
Fixed Income IMRF Custom Benchmark	-5.56	-3.58	2.01	2.43					
Private Real Assets								1.55	3/1/2022
Private Real Assets - Net								1.55	
Custom Benchmark (Private Real Assets)								6.87	
Real Estate	6.10	26.84	13.54	11.81	11.49	8.16	6.54	6.07	5/1/1985
Real Estate - Net	6.08	26.76	13.48	11.78	11.46				
Blended Benchmark (Real Estate)	7.14	27.26	10.31	8.90	10.06	7.98	7.80	7.98	
Agriculture	1.43	4.04	1.63	-0.25	7.45	7.26		6.68	10/1/1997
NCREIF Farmland Index	2.63	9.73	5.89	6.17	9.56	12.49		11.27	

Benchmark definitions are on the following pages.

Asset Class Returns

Periods Ended March 31, 2022

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Timberland	-3.34	2.67	-0.23	0.03	1.79	3.14		6.70	10/1/1992
NCREIF Timberland Index	3.21	11.83	4.75	4.08	5.60	6.57		8.40	
Unlisted Infrastructure	6.26	13.10	14.68					13.01	4/1/2018
Blended Benchmark (Unlisted Infrastructure)	3.14	10.02	9.34					9.25	
Alternatives Investments	5.55	41.50	23.04	19.60	13.75	10.24	13.17	11.85	2/1/1986
Alternatives Investments - Net	5.55	41.48	23.02	19.51	13.52				
Custom Benchmark (Alternative Investments)	5.83	12.90	10.28	9.77	9.38	10.58	12.03	12.53	
Private Equity	6.09	47.63	26.78	23.26	16.50	12.41	15.93	14.18	2/1/1986
Blended Benchmark (Private Equity)	6.04	13.12	10.36	9.81	9.41	10.59			
Cash	0.94	3.06	2.93	2.67	1.49	1.41	3.03	3.75	7/1/1986
90 Day US Treasury Bill	0.04	0.06	0.81	1.13	0.62	1.23	2.38	3.10	

Benchmark definitions are on the following pages.

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

Asset Class Returns

Periods Ended March 31, 2022

	Performance (%)										
	YTD	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Total Fund	-4.39	16.82	14.98	19.77	-4.23	16.02	8.01	0.53	6.15	20.20	13.84
Total Fund - Net	-4.44	16.63	14.79	19.57	-4.40	15.78	7.77	0.29	5.90	19.94	13.58
Total Fund Benchmark	-2.99	13.48	13.16	18.68	-3.12	14.37	7.89	1.37	7.33	15.84	12.19
Domestic Equity	-6.17	24.89	22.07	29.23	-6.08	19.83	12.62	0.04	9.81	37.65	17.39
Domestic Equity - Net	-6.22	24.69	21.86	29.00	-6.25	19.59	12.35	-0.22	9.54	37.32	17.09
Blended Benchmark (U.S. Equity)	-5.01	25.66	20.89	31.02	-5.24	21.13	12.74	0.48	12.47	33.47	16.38
U.S. Equity IMRF Custom Benchmark	-5.24	25.68	18.00	29.67	-6.79	18.08	15.43				
International Equity	-7.68	9.78	13.52	23.76	-14.13	27.95	3.56	-1.90	-2.80	20.24	19.11
International Equity - Net	-7.76	9.37	13.08	23.39	-14.41	27.52	3.21	-2.23	-3.10	19.87	18.70
MSCI AC World ex USA (Net)	-5.44	7.82	10.65	21.51	-14.20	27.19	4.50	-5.66	-3.87	15.29	16.83
International Equity IMRF Custom Benchmark	-5.71	7.30	11.30	21.37	-14.36	27.79	3.92				
Fixed Income	-5.51	-0.44	7.87	9.50	-0.24	4.82	4.87	0.25	5.97	-0.59	7.41
Fixed Income - Net	-5.54	-0.53	7.75	9.37	-0.39	4.66	4.71	0.10	5.81	-0.75	7.24
Blmbg. U.S. Aggregate	-5.93	-1.55	7.51	8.72	0.01	3.54	2.65	0.55	5.97	-2.02	4.21
Fixed Income IMRF Custom Benchmark	-5.56	-0.85	7.29	9.14	-0.08	3.98	3.89				
Private Real Assets											
Custom Benchmark (Private Real Assets)											
Real Estate	6.10	21.95	4.20	9.81	8.36	10.03	8.97	12.54	13.02	10.82	12.85
Real Estate - Net	6.08	21.88	4.16	9.76	8.36	10.03	8.97	12.46	13.02	10.82	12.85
Blended Benchmark (Real Estate)	7.14	21.02	0.34	4.39	7.36	6.66	7.79	13.95	11.46	12.90	11.54
Agriculture	1.43	2.69	4.69	-5.82	0.28	-4.58	-0.47	20.18	24.73	25.68	13.55
NCREIF Farmland Index	2.63	7.83	3.08	4.81	6.74	6.19	7.09	10.35	12.63	20.91	18.58
Timberland	-3.34	-2.72	4.51	1.00	-3.62	4.68	-4.58	4.99	12.83	9.14	-3.59
NCREIF Timberland Index	3.21	9.17	0.81	1.30	3.21	3.63	2.59	4.97	10.48	9.69	7.75
Unlisted Infrastructure	6.26	11.68	15.90	9.65							
Blended Benchmark (Unlisted Infrastructure)	3.14	9.00	9.00	9.00							

Benchmark definitions are on the following pages.

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

Asset Class Returns

Periods Ended March 31, 2022

	Performance (%)										
	YTD	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Alternatives Investments	5.55	46.46	12.31	9.48	17.32	12.09	5.32	6.90	11.63	12.11	6.24
Alternative Investments - Net	5.55	46.44	12.27	9.43	17.14	11.91	5.00	6.47	11.16	11.86	6.00
Custom Benchmark (Alternative Investments)	5.83	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Private Equity	6.09	54.15	14.50	11.78	21.46	15.61	8.60	8.41	13.72	14.13	5.61
Blended Benchmark (Private Equity)	6.04	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Cash	0.94	2.44	2.56	3.59	2.36	1.67	0.63	0.29	0.17	0.11	0.23
90 Day US Treasury Bill	0.04	0.05	0.67	2.28	1.87	0.86	0.25	0.03	0.04	0.05	0.08

Benchmark definitions are on the following pages.

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

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

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 Benchmark	1/1/2013	Present	100% NCREIF Fund Index-ODCE (VW) (Net)**
	1/1/2007	12/31/2012	100% NPI + 1%
	1/1/2005	12/31/2016	100% Consumer Price Index + 5%
Alternatives Custom Benchmark	3/1/2022	Present	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%
	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

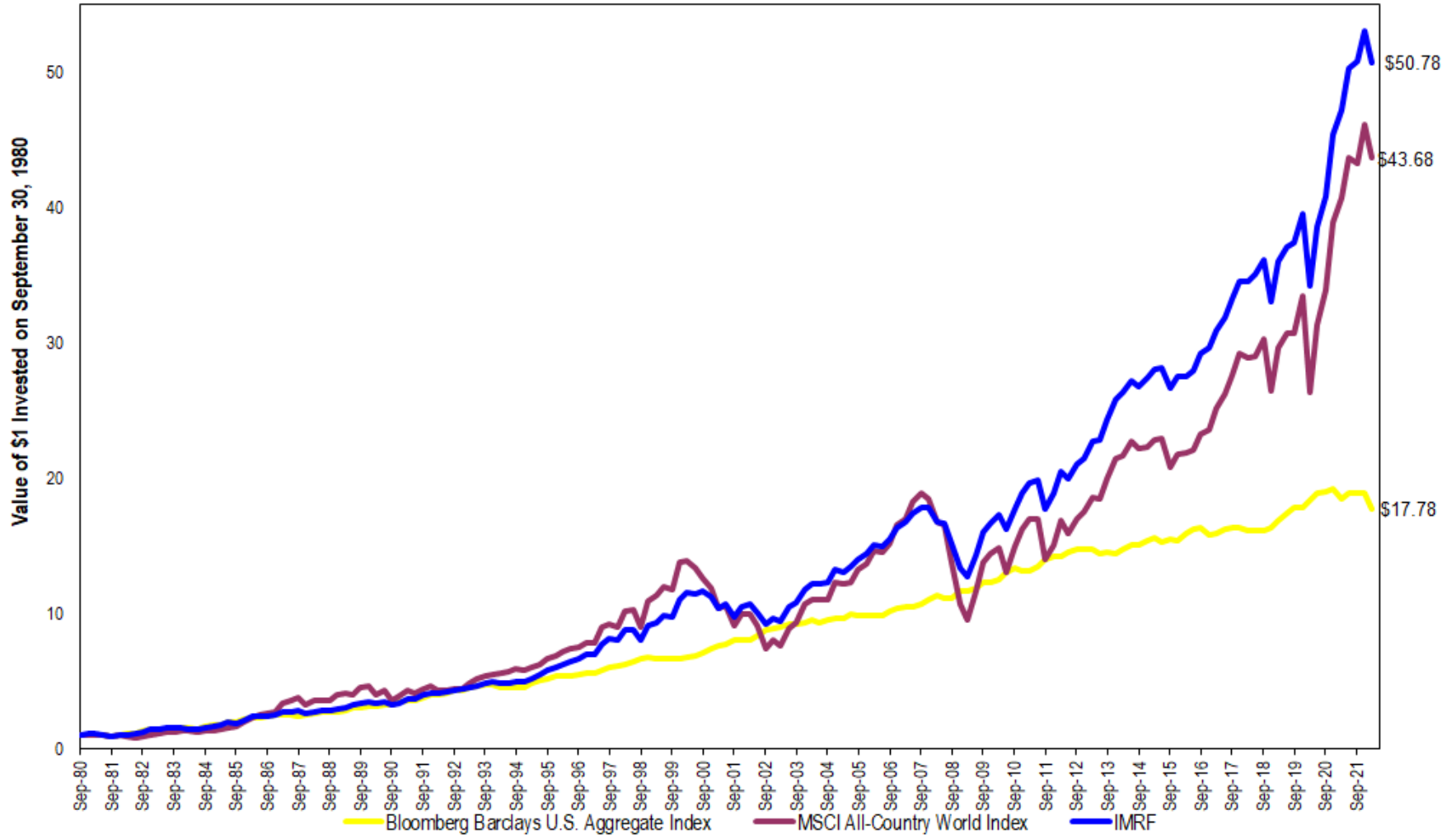
**ODCE returns are updated quarterly.

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.

Total Fund Growth of a Dollar

Growth of a Dollar - As of March 31, 2022



Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
Domestic Equity	24,263,588,229	42.71	22,397,947,137	41.41
Large Cap Growth	8,966,966,722	15.79	7,534,804,251	13.93
NTGI S&P 500 Growth	4,155,109,642	7.31	3,453,552,109	6.39
Sands Capital	2,352,249,613	4.14	1,843,848,163	3.41
Xponance Russell 1000 G	2,459,607,467	4.33	2,237,403,980	4.14
Large Cap Value	5,044,517,266	8.88	5,019,576,663	9.28
Dodge & Cox	1,895,588,088	3.34	1,906,842,354	3.53
LSV Asset	1,543,467,846	2.72	1,519,183,210	2.81
NTGI S&P 500 Value	1,605,461,332	2.83	1,593,551,100	2.95
Large Cap Pass. Core	3,255,297,472	5.73	3,079,794,923	5.69
NTGI MarketCap Idx.	3,255,297,472	5.73	3,079,794,923	5.69
Factor Diversity Strategies	1,685,001,206	2.97	1,583,425,819	2.93
U.S. Large Cap FDP-GSAM	1,685,001,206	2.97	1,583,425,819	2.93
Quantitative Factor Strategies	1,895,279,823	3.34	1,815,612,829	3.36
Quantitative US Equity - SciBeta	1,895,279,823	3.34	1,815,612,829	3.36
Small Cap Growth	860,226,828	1.51	789,461,182	1.46
Frontier Capital	860,226,828	1.51	789,461,182	1.46
Small Cap Value	1,532,024,888	2.70	1,508,746,381	2.79
Channing	342,867,129	0.60	338,698,999	0.63
DFA Small Cap Val.	541,157,352	0.95	546,646,562	1.01
William Blair Small Cap Value	648,000,407	1.14	623,400,820	1.15

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
Public Real Assets	1,024,266,931	1.80	1,066,525,086	1.97
Brookfield	193,837,513	0.34	208,310,698	0.39
Cohen & Steers	830,429,418	1.46	858,214,388	1.59
International Equity	10,213,451,507	17.98	9,426,493,695	17.43
Intl Large Cap Growth	1,775,800,868	3.13	1,613,458,917	2.98
EARNEST Part. Intl	633,247,732	1.11	634,339,683	1.17
William Blair	1,142,553,136	2.01	979,119,234	1.81
Intl Large Cap Value	1,391,290,279	2.45	1,366,997,412	2.53
Brandes Investment	606,793,349	1.07	596,775,229	1.10
Mondrian	642,066,919	1.13	631,847,525	1.17
Lazard	142,430,011	0.25	138,374,658	0.26
Intl Large Cap Core	4,788,394,708	8.43	4,493,473,193	8.31
Arrowstreet Capital	1,108,573,867	1.95	1,064,663,946	1.97
Brown Capital	667,668,782	1.18	560,794,246	1.04
GlobeFlex Capital	888,587,956	1.56	876,851,825	1.62
Xponance Intl EQ	108,889,659	0.19	98,508,960	0.18
Transition Account	119,870	0.00	119,717	0.00
Progress Intl Equity	705,844	0.00	659,544	0.00
NTGI ACWI ex US Index Fund	2,013,848,731	3.55	1,891,874,955	3.50
Intl All Cap Developed	178,770,019	0.31	165,796,869	0.31
Ativo International	178,770,019	0.31	165,796,869	0.31
Internationall Small Cap	721,707,021	1.27	600,108,570	1.11
Franklin Templeton	257,093,975	0.45	226,459,614	0.42

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
William Blair IntSC	464,613,046	0.82	373,648,956	0.69
Emerging Mkt Equity	1,357,488,612	2.39	1,186,658,735	2.19
Genesis Asset Mngrs.	1,357,488,612	2.39	1,186,658,735	2.19

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
Fixed Income	13,159,667,791	23.17	12,427,070,915	22.98
Domestic Fixed Core	4,300,008,101	7.57	4,064,715,748	7.52
Attucks Fixed Income	99,778,376	0.18	93,716,240	0.17
Brandes FI Core	374,372,550	0.66	354,946,090	0.66
EARNEST Partners	1,024,001,258	1.80	965,774,469	1.79
Garcia Hamilton	1,088,146,596	1.92	1,035,544,810	1.91
Ramirez Asset Management	600,486,115	1.06	563,847,708	1.04
Xponance Yield Advantage Agg.	1,113,223,206	1.96	1,050,886,430	1.94
Domestic Fixed Passive Core	3,654,995,037	6.43	3,439,948,286	6.36
NTGI Blmbg Agg.	1,817,007,757	3.20	1,709,083,276	3.16
BlackRock US Debt I	1,837,987,280	3.24	1,730,865,010	3.20
Domestic Fixed Core Plus	3,407,077,560	6.00	3,184,087,542	5.89
LM Capital Group FI	959,042,988	1.69	908,230,733	1.68
Progress Inv. FI	1,650	0.00	1,159	0.00
Loop Capital Management	661,962,167	1.17	619,953,817	1.15
Western Asset	1,130,766,162	1.99	1,039,857,546	1.92
Longfellow Core Plus	655,304,594	1.15	616,044,287	1.14
Bank Loans	734,087,200	1.29	726,116,001	1.34
Barings Global Loan Fund	734,087,200	1.29	726,116,001	1.34
Emerging Markets Debt	223,383,314	0.39	199,893,049	0.37
Standish-Mellon EMD	223,383,314	0.39	199,893,049	0.37
High Yield	839,906,376	1.48	812,100,026	1.50
MacKay Shields	839,715,134	1.48	812,100,023	1.50

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
FIAM High Yield	191,242	0.00	3	0.00

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
Private Real Assets		0.00	4,597,883,654	8.50
Real Estate	3,917,928,441	6.90	4,182,789,262	7.73
Real Estate Core Cmp	2,126,788,357	3.74	2,241,122,737	4.14
TA Assoc. Buckhead	817,726,253	1.44	894,660,982	1.65
Barings Euro Core Property	145,452,455	0.26	145,674,226	0.27
Blackstone Property Euro	162,085,823	0.29	160,735,892	0.30
INVESCO Core Real Estate	239,614,476	0.42	237,766,430	0.44
INVESCO European real estate	58,120,223	0.10	58,016,963	0.11
AEW Core Property Tr	252,746,615	0.44	272,951,247	0.50
CBRE Core Partners	282,528,121	0.50	282,528,121	0.52
JPM Strategic Property Fund	168,514,391	0.30	188,788,876	0.35
RE Non-Core Cmp	1,791,140,084	3.15	1,941,666,525	3.59
Artemis MWBE Spruce	311,927,332	0.55	355,210,635	0.66
Franklin T. EMREFF	4,776,924	0.01	4,639,964	0.01
Security Capital	69,456,897	0.12	61,777,751	0.11
Dune II	9,280,716	0.02	9,412,963	0.02
Non-Core Real Estate Funds	1,165,632,735	2.05	1,265,156,738	2.34
Non-Core Intl Real Estate	229,978,936	0.40	245,382,878	0.45
Almanac ARS V	86,544	0.00	85,596	0.00
Agriculture	228,223,321	0.40	231,475,704	0.43
Premiere Partners IV	228,223,321	0.40	231,475,704	0.43
Timberland	65,271,284	0.11	63,091,285	0.12
Forest Investment	65,271,284	0.11	63,091,285	0.12
Unlisted Infrastructure	109,077,734	0.19	120,527,403	0.22
Unlisted Infrastructure Funds	109,077,734	0.19	120,527,403	0.22

Investment Manager Asset Allocation

Periods Ended March 31, 2022

	Dec-2021		Mar-2022	
	\$	%	\$	%
Alternatives Investments	5,014,866,919*	8.83	4,914,673,500	9.09
Absolute Return	115,896	0.00	78,878	0.00
Aurora Investment	115,896	0.00	78,878	0.00
Private Equity	4,415,124,940	7.77	4,731,189,165	8.75
Abbott S/A Comp.	536,294,967	0.94	536,150,189	0.99
Muller Monroe MPEFF	520,309	0.00	517,859	0.00
Pantheon S/A Comp.	430,276,910	0.76	419,526,411	0.78
Private Equity Fund - Domestic	2,749,033,772	4.84	3,068,429,292	5.67
Private Equity Fund - International	556,840,434	0.98	551,353,095	1.02
Oakbrook Opportunities Fund	142,158,549	0.25	155,212,320	0.29
Private Credit	197,053,744	0.35	183,405,457	0.34
Private Credit Fund - Domestic	197,053,744	0.35	183,405,457	0.34
Cash & Equivalents	236,077,684	0.42	320,935,546	0.59
Total Fund	56,805,580,572	100.00	54,085,004,446	100.00

*As of 12/31/21, the total Alternative Investments composite contained Agriculture, Timberland, and Unlisted Infrastructure. Effective 3/1/22, these asset classes are now included in the Private Real Assets Composite.

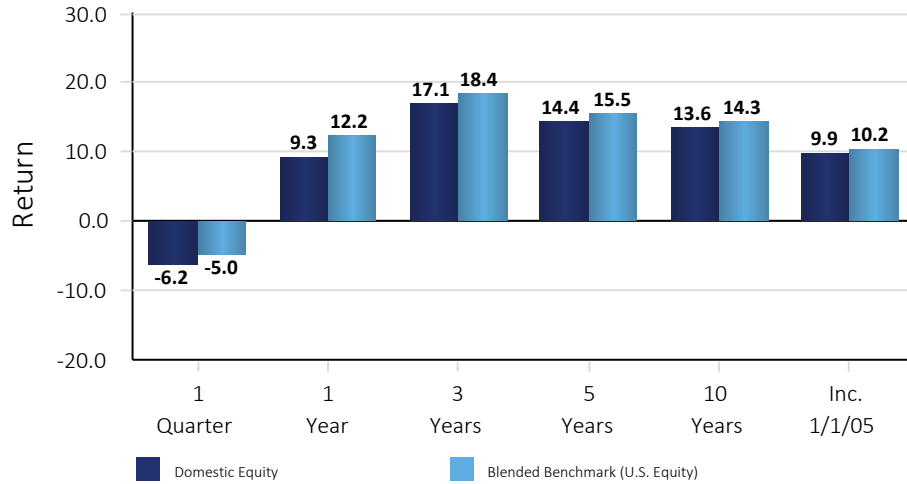
Domestic Equity

Composite Performance Summary

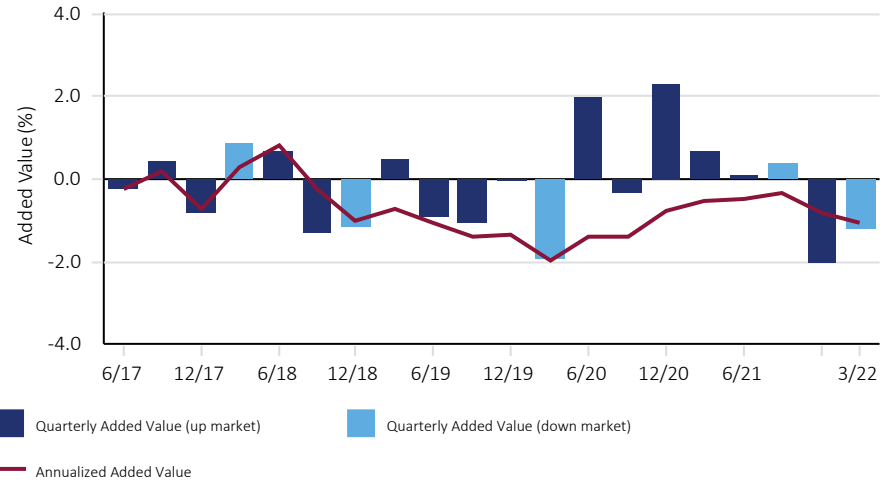
Domestic Equity

Periods Ended March 31, 2022

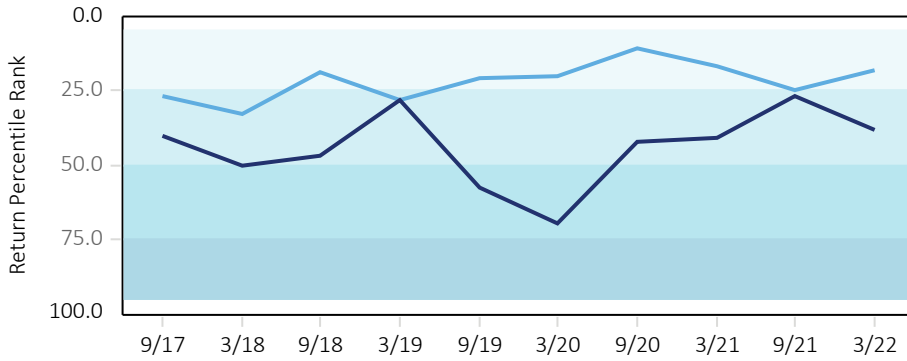
Comparative Performance



Added Value History

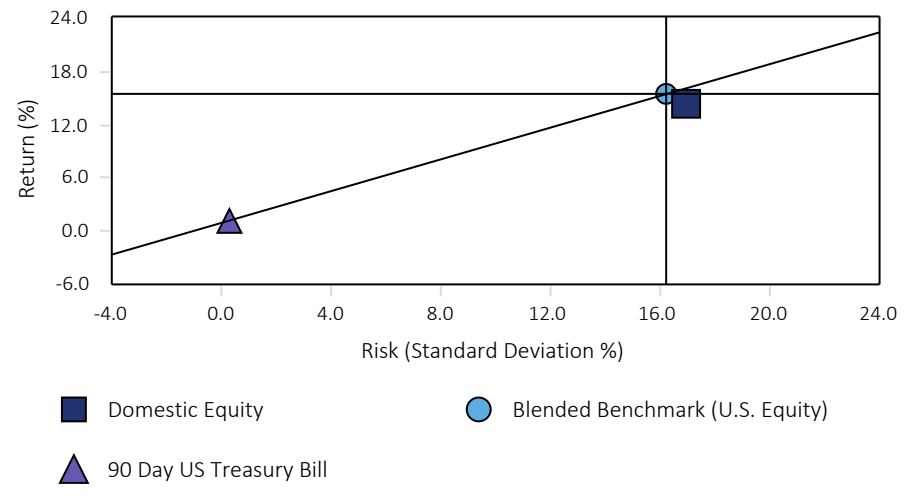


Rolling Percentile Rank: All Public Plans > \$1B-US Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— Domestic Equity	10	0 (0%)	8 (80%)	2 (20%)	0 (0%)
— Benchmark	10	7 (70%)	3 (30%)	0 (0%)	0 (0%)

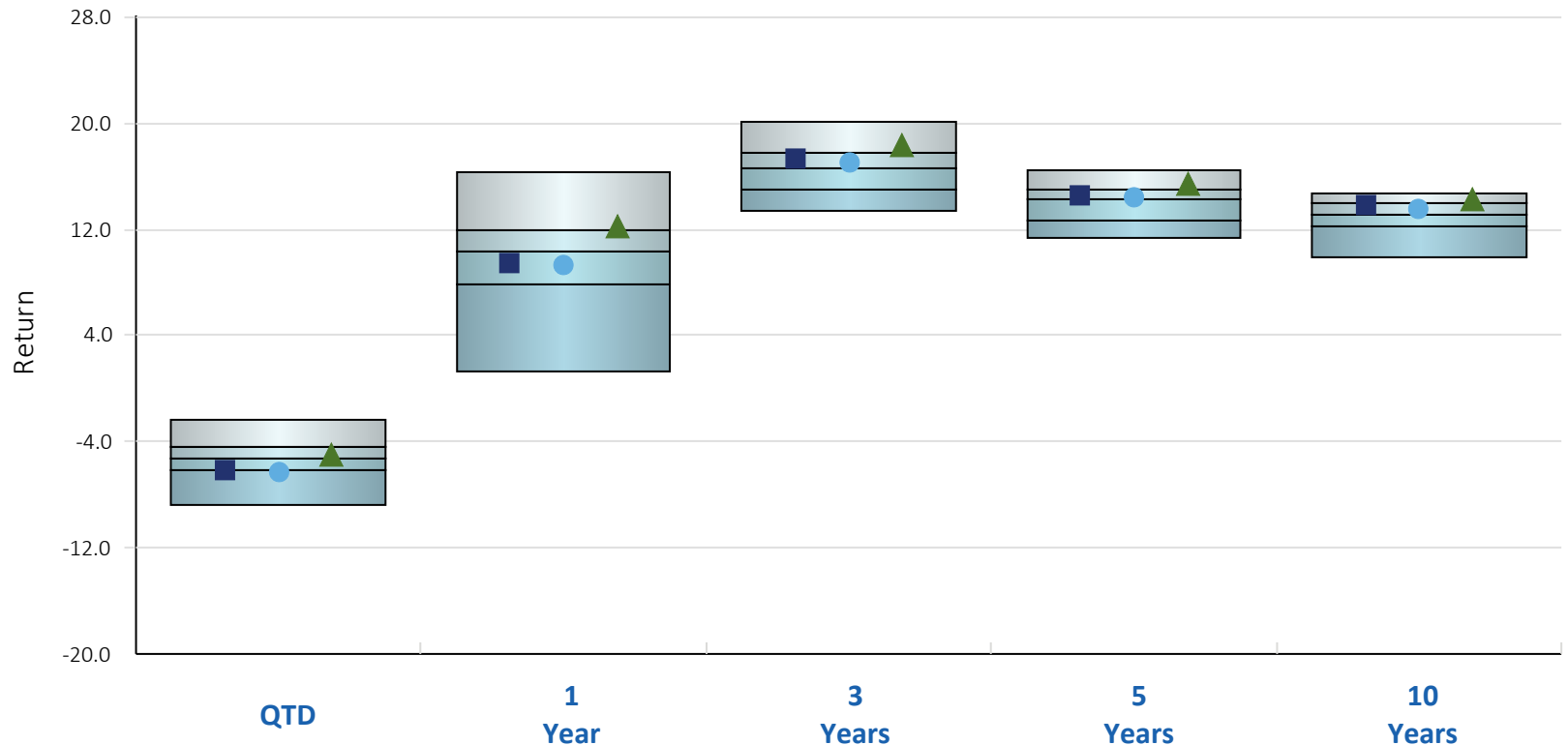
Risk and Return 04/1/17 - 03/31/22



Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2022



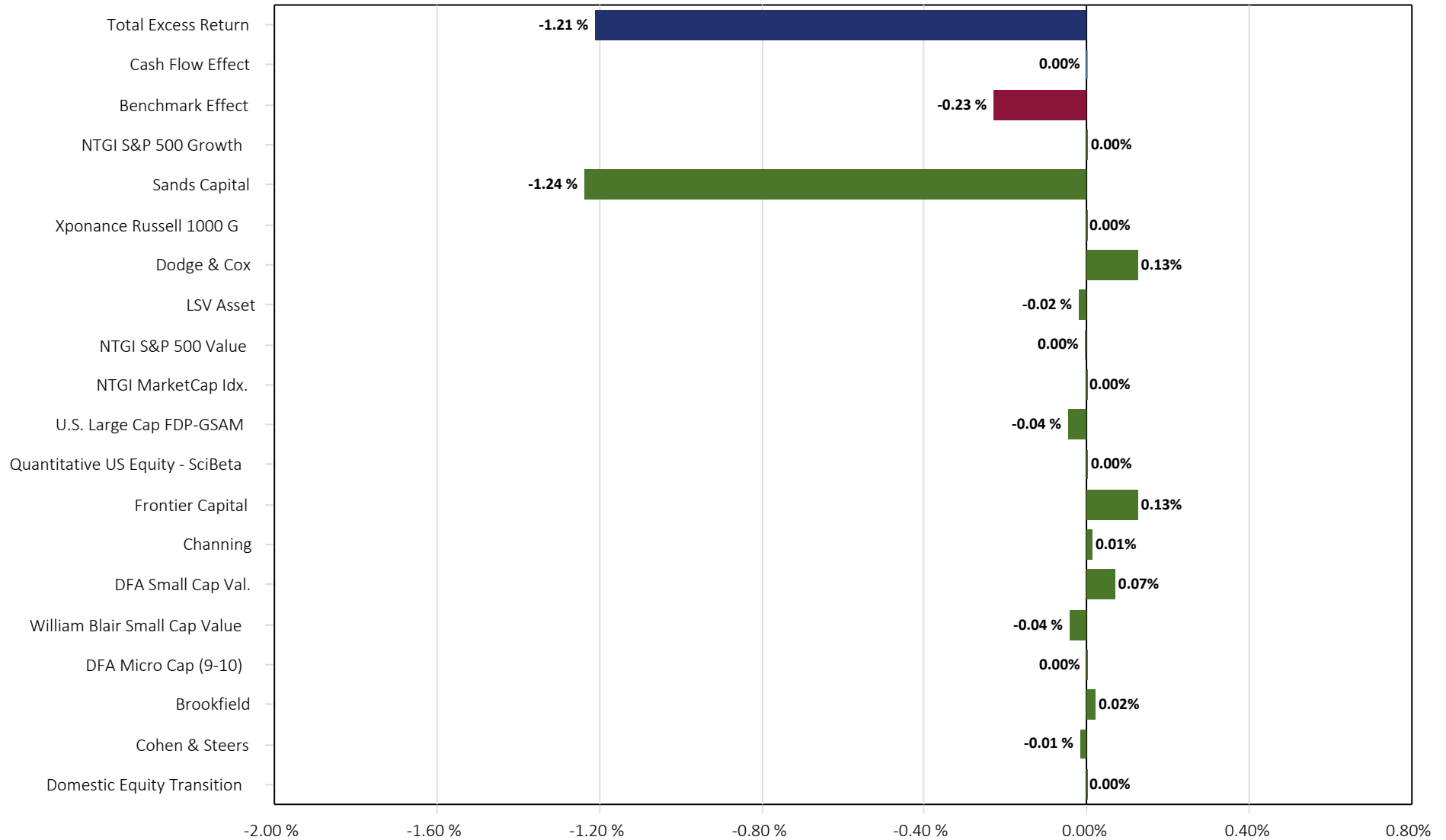
■ Domestic Equity	-6.17 (76)	9.46 (60)	17.29 (34)	14.64 (38)	13.81 (32)
● Domestic Equity - Net	-6.22 (76)	9.27 (62)	17.08 (38)	14.43 (45)	13.56 (37)
▲ Blended Benchmark (U.S. Equity)	-5.01 (41)	12.24 (25)	18.35 (18)	15.46 (19)	14.29 (17)
5th Percentile	-2.32	16.28	20.15	16.47	14.77
1st Quartile	-4.44	12.00	17.78	14.98	13.98
Median	-5.25	10.40	16.63	14.25	13.15
3rd Quartile	-6.16	7.93	15.04	12.63	12.18
95th Percentile	-8.81	1.30	13.37	11.39	9.90
Population	47	45	39	37	29

Asset Class Attribution

Domestic Equity

Periods Ended 1 Quarter Ending March 31, 2022

1 Quarter



Performance

Domestic Equity

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Domestic Equity	22,397,947,137	-6.17	9.46	17.29	14.64	13.81	11.97	1/1/1982
Domestic Equity - Net		-6.22	9.27	17.08	14.43	13.56		
Blended Benchmark (U.S. Equity)		-5.01	12.24	18.35	15.46	14.29		
Russell 3000 Index		-5.28	11.92	18.24	15.40	14.28	11.92	
U.S. Equity IMRF Custom Benchmark		-5.24	11.90	16.99	13.92			
Large Cap Equity	17,217,601,657	-7.21	9.98	18.00	15.49	14.35	11.70	1/1/1982
Large Cap Equity - Net		-7.23	9.89	17.90	15.38	14.21		
Russell 1000 Index		-5.13	13.27	18.71	15.82	14.53	12.07	
Large Cap Growth	7,534,804,251	-12.15	7.17	21.65	20.72	16.26	12.64	1/1/1982
Large Cap Growth - Net		-12.16	7.08	21.55	20.60	16.11		
LCG Blended Benchmark*		-9.04	14.98	23.60	20.88	17.04		
Russell 1000 Growth Index		-9.04	14.98	23.60	20.88	17.04	11.97	
NTGI S&P 500 Growth	3,453,552,109	-8.57	18.14	22.44	19.88	16.80	9.82	8/1/2001
NTGI S&P 500 Growth - Net		-8.57	18.13	22.43	19.87	16.79		
S&P 500 Growth		-8.59	18.16	22.48	19.92	16.80	9.80	
Xponance Russell 1000 G	2,237,403,980	-9.03	14.97	23.58			19.09	10/1/2018
Xponance Russell 1000 G - Net		-9.04	14.95	23.56			19.07	
Russell 1000 Growth Index		-9.04	14.98	23.60			19.10	
Sands Capital	1,843,848,163	-21.61	-15.57	15.53	19.14	15.28	12.95	11/1/2003
Sands Capital - Net		-21.67	-15.77	15.28	18.88	15.03		
LCG Blended Benchmark*		-9.04	14.98	23.60	20.88	17.04	11.90	
Russell 1000 Growth Index		-9.04	14.98	23.60	20.88	17.04	11.94	

* 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 March 31, 2022

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Large Cap Value	5,019,576,663	0.02	12.34	14.49	11.48	12.88	10.59	10/1/1982
Large Cap Value - Net		-0.01	12.17	14.32	11.31	12.70		
LCV Blended Benchmark**		-0.74	11.67	13.02	10.29	11.70		
Russell 1000 Value Index		-0.74	11.67	13.02	10.29	11.70	11.90	
Dodge & Cox	1,906,842,354	1.02	15.35	17.36	13.37	14.48	10.66	9/1/2003
Dodge & Cox - Net		0.97	15.12	17.12	13.14	14.24		
LCV Blended Benchmark**		-0.74	11.67	13.02	10.29	11.70	8.98	
Russell 1000 Value Index		-0.74	11.67	13.02	10.29	11.70	9.13	
LSV Asset	1,519,183,210	-0.95	8.68	12.74	10.24	12.65	11.12	2/1/2003
LSV Asset - Net		-1.01	8.43	12.47	9.98	12.38		
LCV Blended Benchmark**		-0.74	11.67	13.02	10.29	11.70	9.76	
Russell 1000 Value Index		-0.74	11.67	13.02	10.29	11.70	9.77	
NTGI S&P 500 Value	1,593,551,100	-0.21	12.45	14.19	11.21	11.98	6.80	8/1/1999
NTGI S&P 500 Value - Net		-0.21	12.44	14.18	11.20	11.97		
S&P 500 Value		-0.16	12.58	14.12	11.14	11.89	6.77	
Large Cap Pass. Core	3,079,794,923	-5.39	11.71	18.15	15.35	14.28	11.65	1/1/1985
Large Cap Pass. Core - Net		-5.39	11.70	18.14	15.34	14.27		
Dow Jones US Total Stock Market Index		-5.40	11.67	18.12	15.31	14.21		
NTGI MarketCap Idx.	3,079,794,923	-5.39	11.71	18.15	15.35	14.28	11.44	2/1/1985
NTGI MarketCap Idx. - Net		-5.39	11.70	18.14	15.34	14.27		
Dow Jones US Total Stock Market Index		-5.40	11.67	18.12	15.31	14.21		

* 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 March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Factor Diversity Strategies	1,583,425,819	-6.03	11.61				19.41	8/18/2020
U.S. Large Cap FDP-GSAM	1,583,425,819	-6.03	11.61				19.41	8/18/2020
U.S. Large Cap FDP-GSAM - Net		-6.04	11.56				19.33	
Solactive GBS U.S. 1000 Index		-5.41	12.93				20.00	
GSAM Active Beta US. Large Cap FDC Index		-6.03	11.68				19.36	
Quantitative Factor Strategies	1,815,612,829	-4.20	12.12				13.55	9/17/2019
Quantitative US Equity - SciBeta	1,815,612,829	-4.20	12.12				13.55	9/17/2019
Quantitative US Equity - SciBeta - Net		-4.22	12.05				13.32	
SciBeta US Hi-Fctr-Intst Div Multi-Beta Multi-Strat Index		-4.28	11.22				12.72	

* 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 March 31, 2022

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Small Cap	2,298,207,564	-3.93	3.04	15.40	11.96	12.21	12.39	7/1/1988
Small Cap Composite - Net		-4.27	2.27	14.65	11.30	11.58		
Russell 2000 Index		-7.53	-5.79	11.74	9.74	11.04	9.61	
Small Cap Growth	789,461,182	-8.23	-2.95	17.44	15.30	13.77	13.39	7/1/1988
Small Cap Growth - Net		-8.99	-4.21	16.28	14.40	13.04		
Russell 2000 Growth Index		-12.63	-14.33	9.88	10.33	11.21	8.29	
Frontier Capital	789,461,182	-8.23	-3.92	17.95	19.00	14.60	13.76	8/1/1988
Frontier Capital - Net		-8.99	-5.09	16.72	17.95	13.78		
Russell 2000 Growth Index		-12.63	-14.33	9.88	10.33	11.21	8.37	
Small Cap Value	1,508,746,381	-1.52	6.46	14.75	10.14	11.81	11.98	9/1/1989
Small Cap Value - Net		-1.62	6.00	14.20	9.59	11.27		
Russell 2000 Value Index		-2.40	3.32	12.73	8.57	10.54	10.23	
Channing	338,698,999	-1.22	3.42	15.16	9.57	12.38	11.52	7/1/2011
Channing - Net		-1.34	2.93	14.60	9.04	11.80	10.93	
Russell 2000 Value Index		-2.40	3.32	12.73	8.57	10.54	9.93	
DFA Small Cap Val.	546,646,562	1.01	12.00	16.39	10.28	12.16	12.38	2/1/1996
DFA Small Cap Val. - Net		0.92	11.52	15.85	9.74	11.62		
Russell 2000 Value Index		-2.40	3.32	12.73	8.57	10.54	9.82	
William Blair Small Cap Value	623,400,820	-3.80	3.19	13.31	10.33	11.99	11.67	5/1/1999
Inv. Couns. Maryland - Net		-3.89	2.76	12.75	9.77	11.47		
Russell 2000 Value Index		-2.40	3.32	12.73	8.57	10.54	9.45	

* 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 March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Public Real Assets	1,066,525,086	4.13	18.57	9.58			8.87	8/1/2017
Public Real Assets - Net		4.04	18.16	9.14			8.43	
Public Real Assets Benchmark***		3.93	15.72	7.93			6.98	
Brookfield	208,310,698	7.47	24.14	8.91			7.36	8/1/2017
Brookfield - Net		7.33	23.53	8.34			6.82	
Dow Jones Brookfield Global Infrastructure Composi		4.36	18.21	7.42			5.95	
Cohen & Steers	858,214,388	3.35	17.07	10.17			9.77	8/1/2017
Cohen & Steers - Net		3.27	16.70	9.78			9.37	
FTSE GLOBAL CORE INFRASTRUCTURE 50/50 INDEX (Net)		3.72	14.47	8.15			7.46	

* 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.

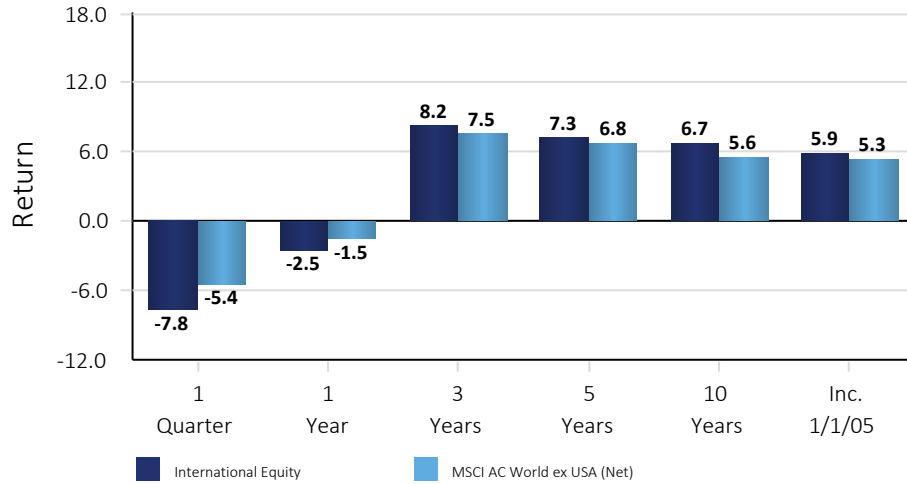
International Equity

Composite Performance Summary

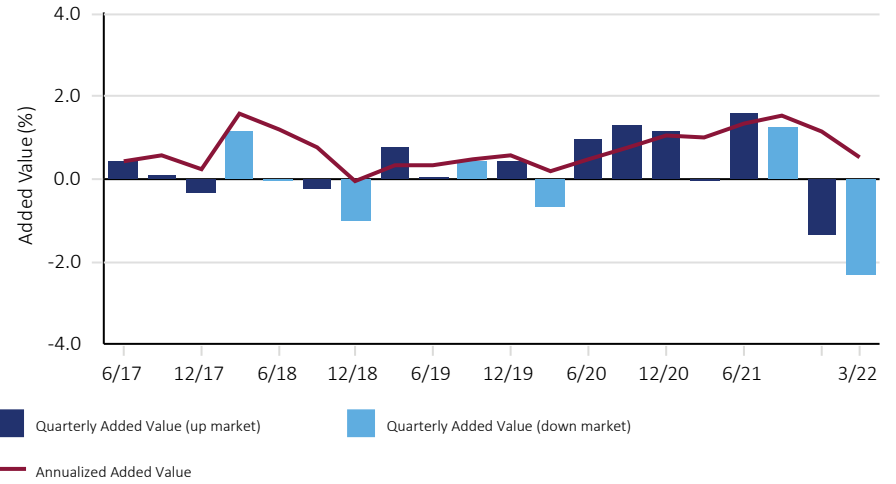
International Equity

Periods Ended March 31, 2022

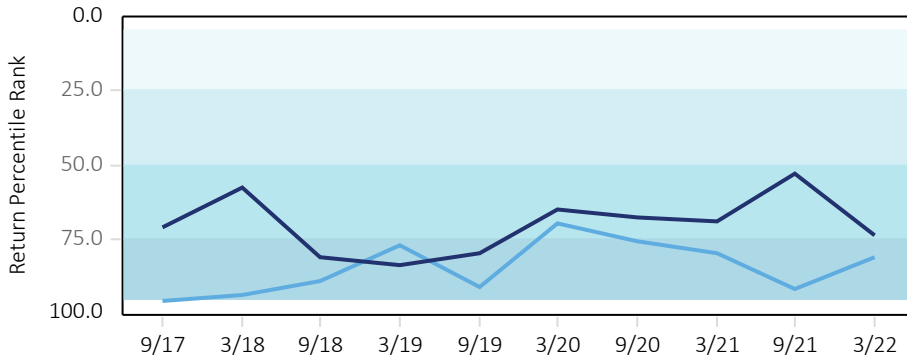
Comparative Performance



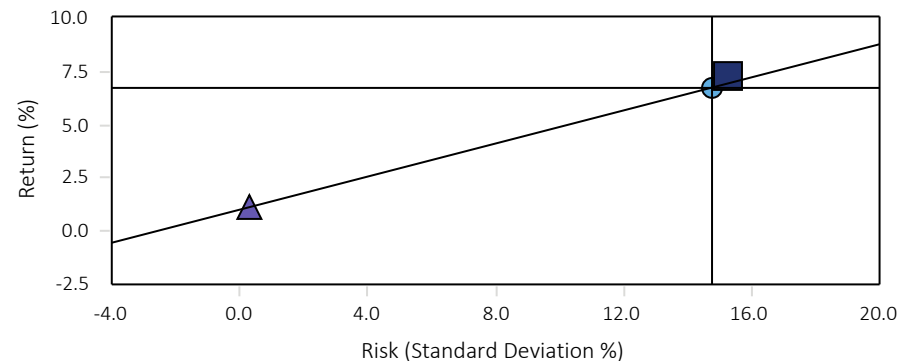
Added Value History



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



Risk and Return 04/1/17 - 03/31/22



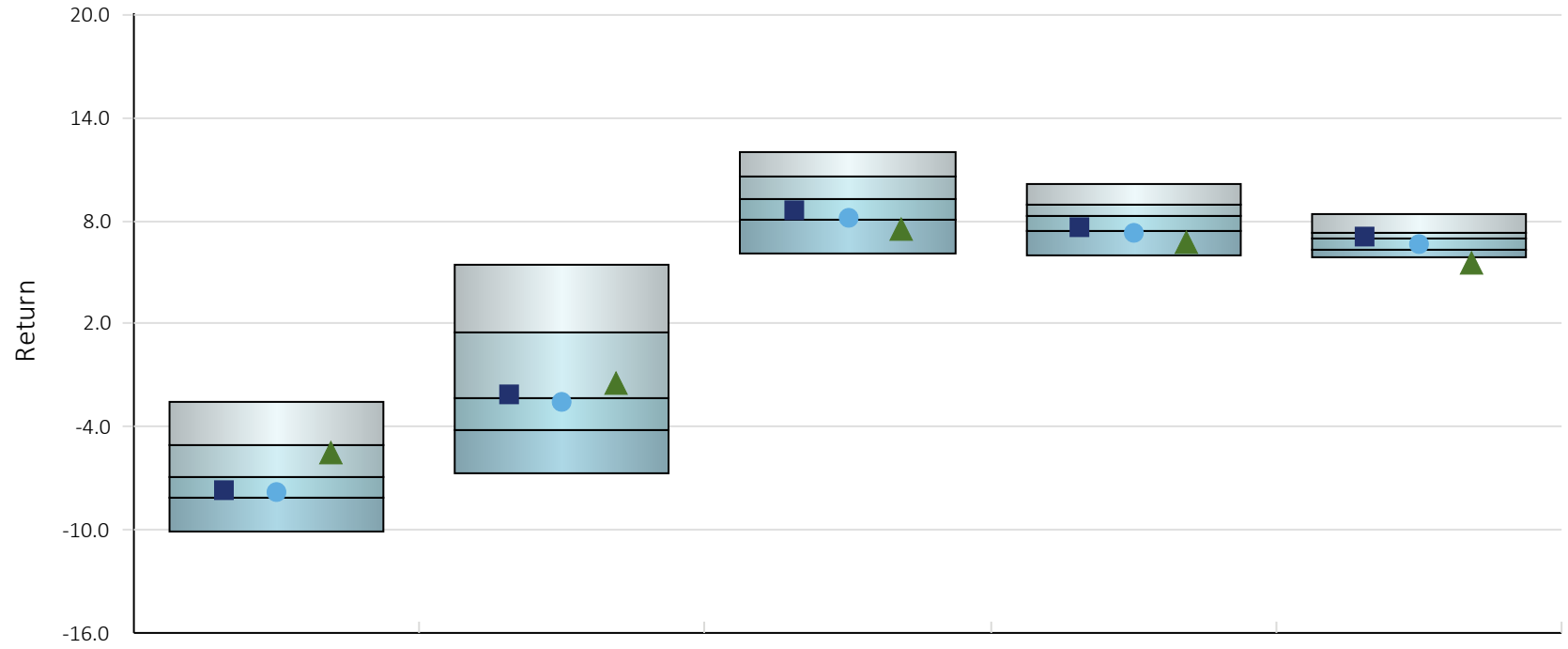
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
International Equity	10	0 (0%)	0 (0%)	7 (70%)	3 (30%)
Benchmark	10	0 (0%)	0 (0%)	1 (10%)	9 (90%)

International Equity	MSCI AC World ex USA (Net)
90 Day US Treasury Bill	

Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2022



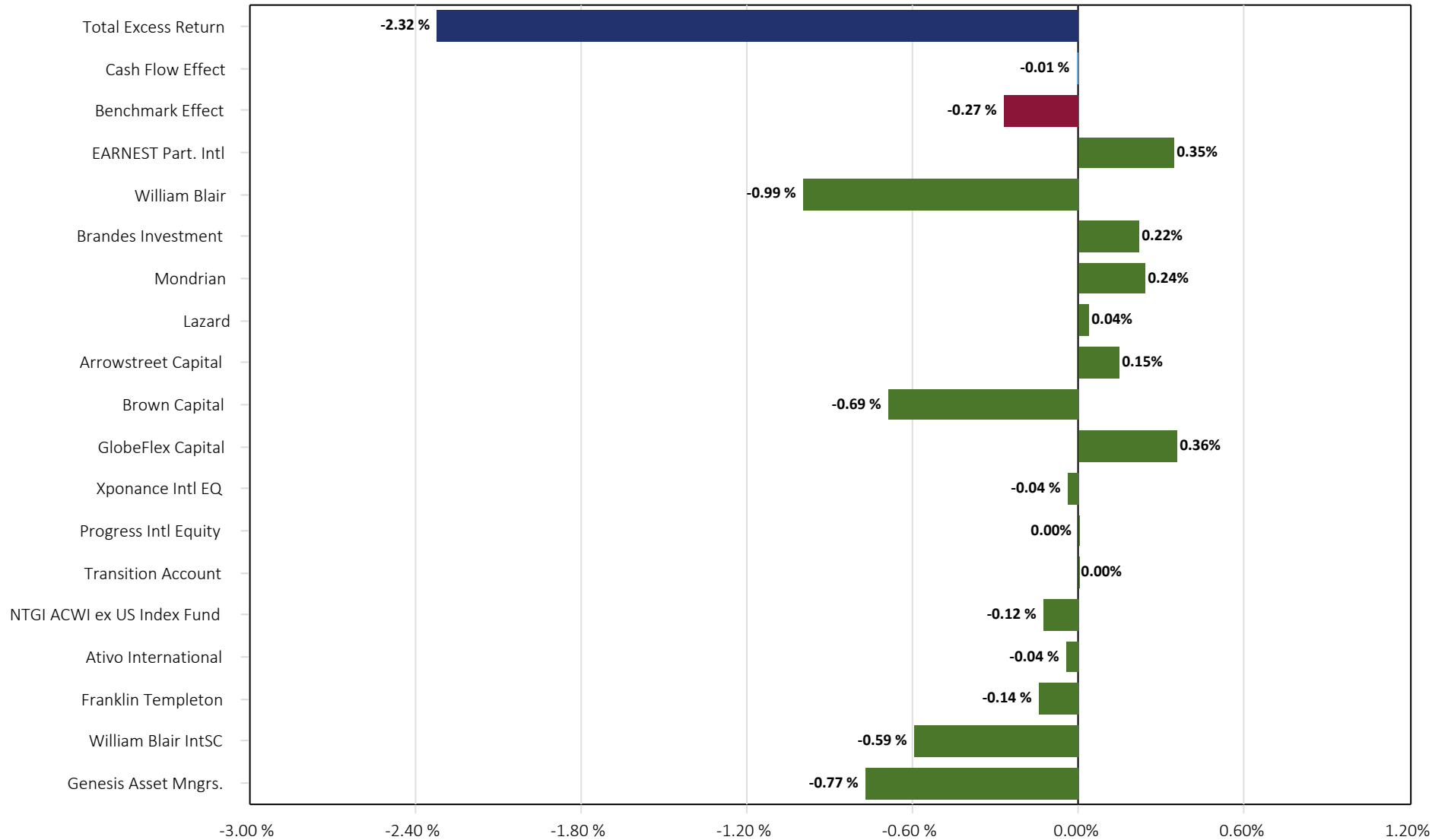
	QTD	1 Year	3 Years	5 Years	10 Years
■ International Equity	-7.68 (64)	-2.14 (50)	8.60 (63)	7.69 (67)	7.06 (42)
● International Equity - Net	-7.76 (65)	-2.51 (51)	8.21 (74)	7.32 (79)	6.70 (67)
▲ MSCI AC World ex USA (Net)	-5.44 (33)	-1.48 (49)	7.51 (81)	6.76 (85)	5.55 (100)
5th Percentile	-2.56	5.41	11.97	10.18	8.41
1st Quartile	-5.04	1.46	10.54	8.99	7.33
Median	-6.91	-2.33	9.30	8.34	6.94
3rd Quartile	-8.12	-4.20	8.06	7.42	6.30
95th Percentile	-10.04	-6.70	6.09	5.99	5.93
Population	47	47	42	42	32

Asset Class Attribution

International Equity

Periods Ended 1 Quarter Ending March 31, 2022

1 Quarter



Performance

International Equity

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
International Equity	9,426,493,695	-7.68	-2.14	8.60	7.69	7.06	7.78	9/1/1986
International Equity - Net		-7.76	-2.51	8.21	7.32	6.70		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55		
International Equity IMRF Custom Benchmark		-5.71	-2.22	7.44	6.72			
Intl Large Cap Equity	7,473,929,522	-6.05	1.42	9.57	8.13	7.40	7.85	9/1/1986
Intl LargeCap Equity - Net		-6.11	1.10	9.25	7.83	7.11		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55		
Intl Large Cap Grwth	1,613,458,917	-9.14	0.30	12.53	10.12	7.88	8.86	9/1/2002
Intl Large Cap Grwth - Net		-9.21	-0.05	12.20	9.81	7.56		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	7.27	
EARNEST Part. Intl	634,339,683	0.18	8.51	11.42	9.07	6.82	9.36	10/1/2004
EARNEST Part. Intl - Net		0.13	8.30	11.22	8.87	6.58		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	6.07	
MSCI AC World ex USA Growth (Net)		-10.78	-6.16	9.12	8.60	6.70	6.83	
William Blair	979,119,234	-14.30	-4.49	13.39	11.01	8.84	10.02	10/1/2002
William Blair - Net		-14.39	-4.91	12.98	10.61	8.43		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	7.92	
MSCI AC World ex USA Growth (Net)		-10.78	-6.16	9.12	8.60	6.70	8.18	
Intl Large Cap Val.	1,366,997,412	-1.73	1.59	5.99	5.49	5.80	8.36	10/1/1995
Intl Large Cap Val. - Net		-1.81	1.29	5.67	5.16	5.43		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	5.41	

* 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 March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Brandes Investment	596,775,229	-1.65	3.06	6.00	5.20	5.97	8.51	1/1/1996
Brandes Investment - Net		-1.70	2.85	5.77	4.97	5.73		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	5.32	
MSCI AC World ex USA Value		0.28	3.95	6.09	5.30	4.84		
Mondrian	631,847,525	-1.57	0.64	5.88	5.65	5.58	5.58	4/1/2012
Mondrian - Net		-1.57	0.34	5.48	5.21	5.10	5.10	
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	5.55	
MSCI AC World ex USA Value		0.28	3.95	6.09	5.30	4.84	4.84	
Lazard	138,374,658	-2.84	-0.21	7.53	7.14	6.48	6.48	4/1/2012
Lazard - Net		-2.84	-0.40	7.28	6.89	6.02	6.02	
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	5.55	
MSCI AC World ex USA Value		0.28	3.95	6.09	5.30	4.84	4.84	
Intl Large Cap Active Core	2,601,598,237	-6.22	2.30	11.20	9.53	9.02	6.04	2/1/2008
Intl Large Cap Active Core - Net		-6.31	1.75	10.61	8.99	8.46		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	3.20	
Arrowstreet Capital	1,064,663,946	-3.96	3.99	15.99	12.48	10.63	7.18	3/1/2008
Arrowstreet Capital - Net		-4.07	3.51	15.46	11.96	10.12	6.69	
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	3.01	
Brown Capital	560,794,246	-16.01	-6.24	8.21	7.84	8.67	7.85	10/1/2004
Brown Capital - Net		-16.07	-7.13	7.46	7.17	7.80		
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	6.07	

* 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 March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
GlobeFlex Capital	876,851,825	-1.29	7.07	9.54	7.99	8.05	5.71	3/1/2006
GlobeFlex Capital - Net		-1.36	6.73	9.12	7.58	7.62	5.26	
MSCI AC World ex USA (Net)		-5.44	-1.48	7.51	6.76	5.55	4.26	
Xponance Intl EQ	98,508,960	-9.53	-2.80				2.31	2/1/2021
Xponance Intl EQ - Net		-9.68	-3.39				1.78	
MSCI EAFE Index (Net)		-5.91	1.16				4.96	
Progress Intl Equity*	659,544							
Intl Large Cap Passive Core	1,891,874,955	-6.06	1.07	7.97	6.98	6.61	4.22	2/1/2000
Intl Large Cap Passive Core - Net		-6.06	1.06	7.97	6.97	6.61		
International Large Cap Passive Core Benchmark		-5.44	0.81	7.66	6.64	6.23	3.84	
NTGI ACWI ex US Index Fund	1,891,874,955	-6.06					-3.95	10/1/2021
NTGI ACWI ex US Index Fund - Net		-6.06					-3.95	
MSCI AC World ex USA (Net)		-5.44					-3.72	
Intl All Cap Developed	165,796,869	-7.26	3.31	7.65			8.24	2/1/2019
Intl All Cap Developed - Net		-7.37	2.81	7.14			7.75	
MSCI EAFE + Canada (Net)		-4.81	3.04	8.55			9.13	
Ativo International	165,796,869	-7.26	3.31	7.65			8.24	2/1/2019
Ativo International - Net		-7.37	2.81	7.14			7.75	
MSCI EAFE + Canada (Net)		-4.81	3.04	8.55			9.13	
Intl Small Cap Eqty	600,108,570	-16.85	-7.33	10.07	8.04	8.22	5.43	12/1/2005
Intl Small Cap Eqty - Net		-17.02	-8.02	9.26	7.24	7.42		
MSCI AC World ex USA Small Cap (Net)		-6.52	0.03	10.22	7.89	7.28	6.65	
Custom Benchmark (Intl Small Cap)		-6.52	0.03	10.22	7.89	7.28	6.02	

* 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 March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Franklin Templeton	226,459,614	-11.91	-6.74	6.39	6.62	7.45	6.21	8/1/2011
Franklin Templeton - Net		-12.08	-7.39	5.63	5.86	6.66	5.45	
MSCI AC World ex USA Small Cap (Net)		-6.52	0.03	10.22	7.89	7.28	5.95	
William Blair IntSC	373,648,956	-19.58	-7.68	12.54	8.96	8.73	9.47	9/1/2010
William Blair IntSC - Net		-19.76	-8.39	11.69	8.13	7.90	8.64	
MSCI AC World ex USA Small Cap (Net)		-6.52	0.03	10.22	7.89	7.28	7.63	
Custom Benchmark (Intl Small Cap)		-6.52	0.03	10.22	7.89	7.28	7.88	
Emerging Mkt Equity	1,186,658,735	-12.46	-18.57	2.84	5.58	4.12	8.42	2/1/1992
Emerging Mkt Equity - Net		-12.58	-19.03	2.27	4.97	3.52		
MSCI Emerging Markets Index		-6.92	-11.08	5.31	6.35	3.73	6.91	
Genesis Asset Mngrs.**	1,186,658,735	-12.46	-18.57	2.84	5.58	4.12	9.77	5/1/2004
Genesis Asset Mngrs. - Net		-12.58	-19.03	2.27	4.97	3.52		
MSCI Emerging Markets Index		-6.92	-11.08	5.31	6.35	3.73	8.33	

* 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.

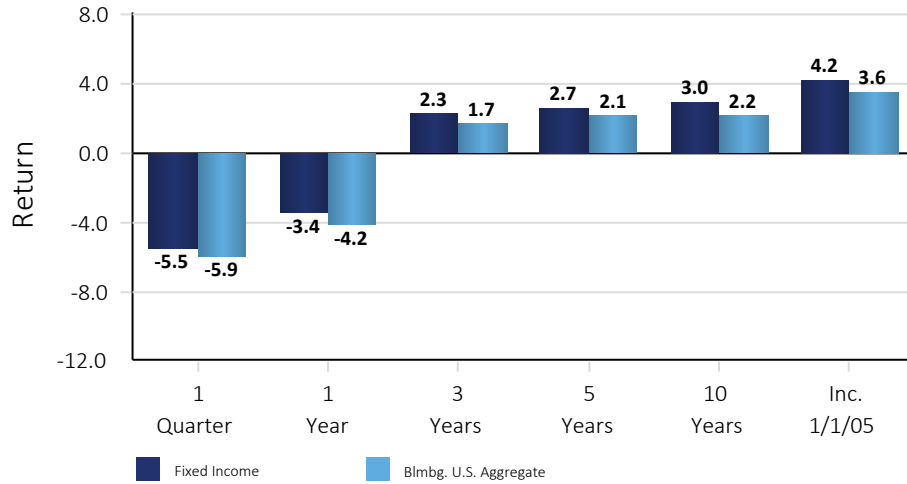
Fixed Income

Composite Performance Summary

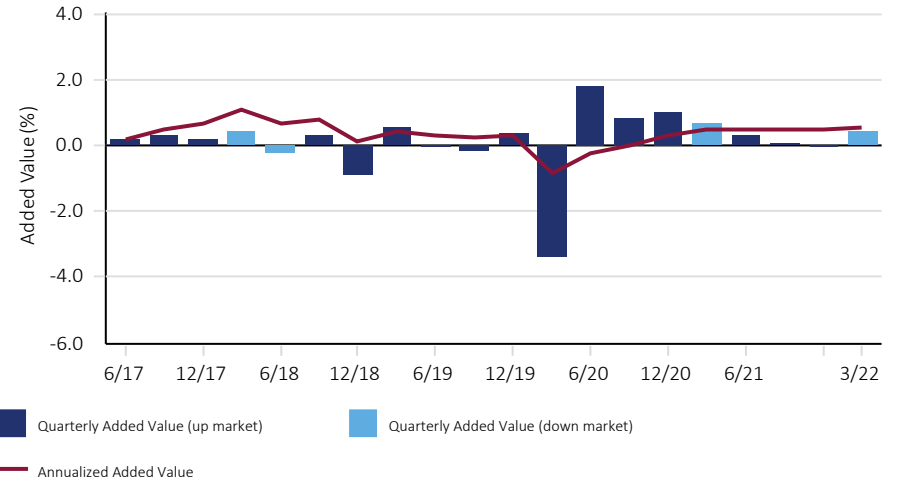
Fixed Income

Periods Ended March 31, 2022

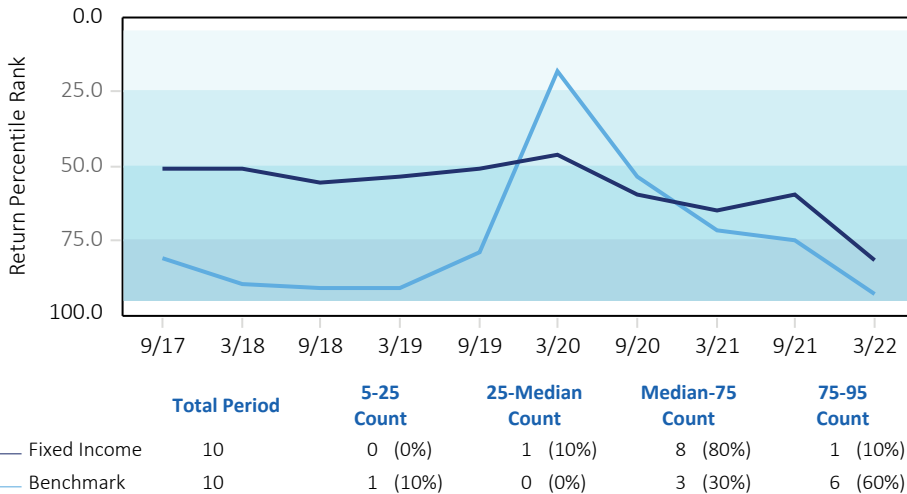
Comparative Performance



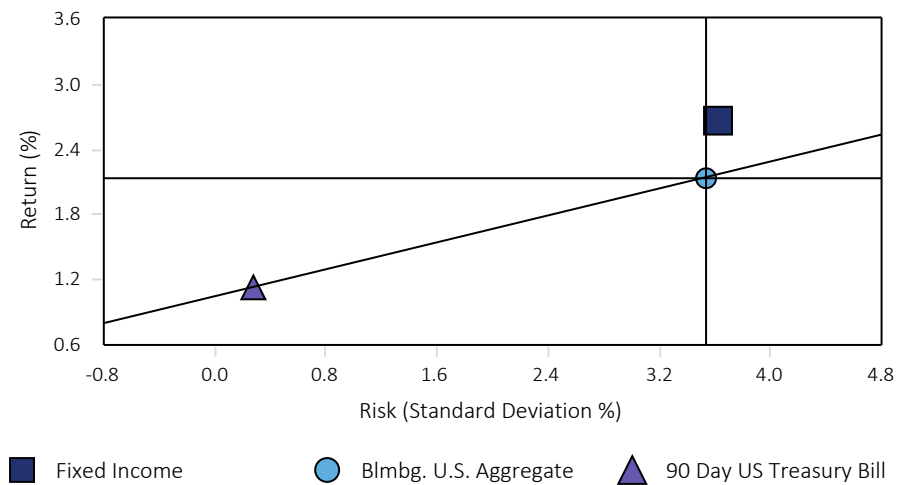
Added Value History



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



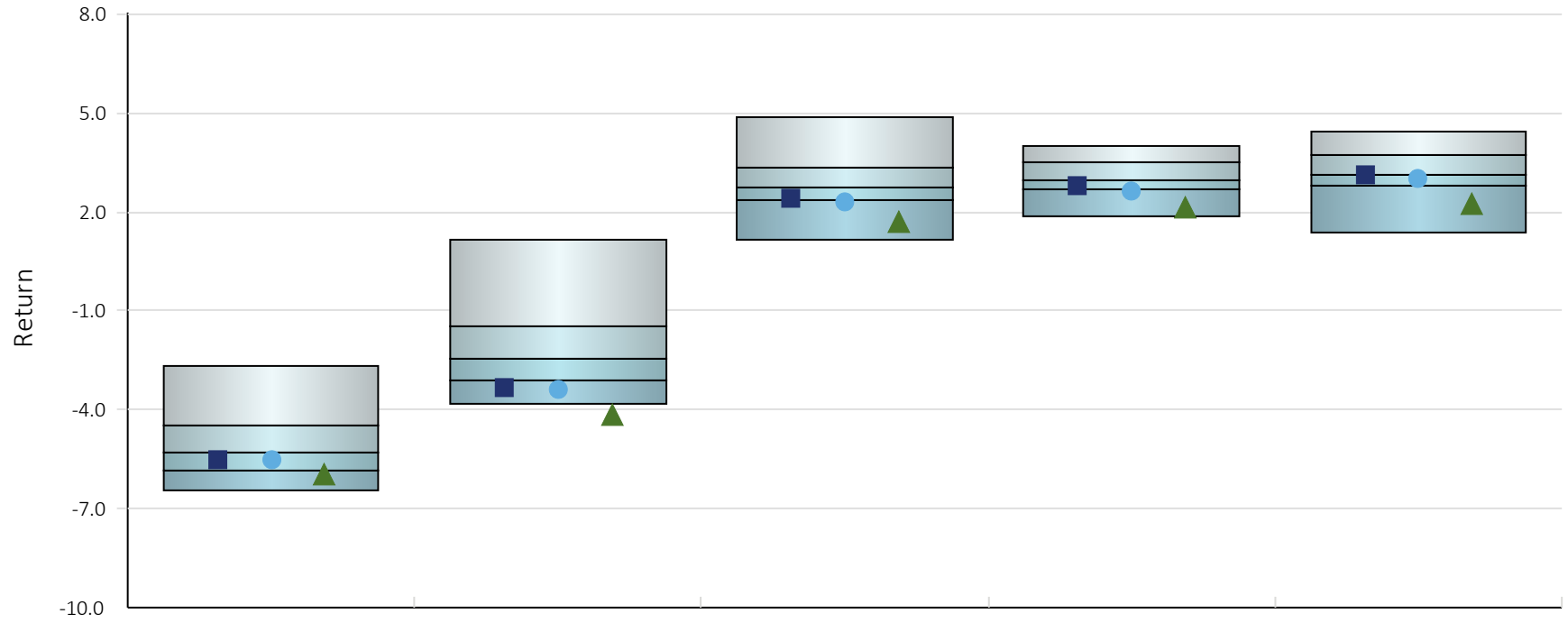
Risk and Return 04/1/17 - 03/31/22



Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2022



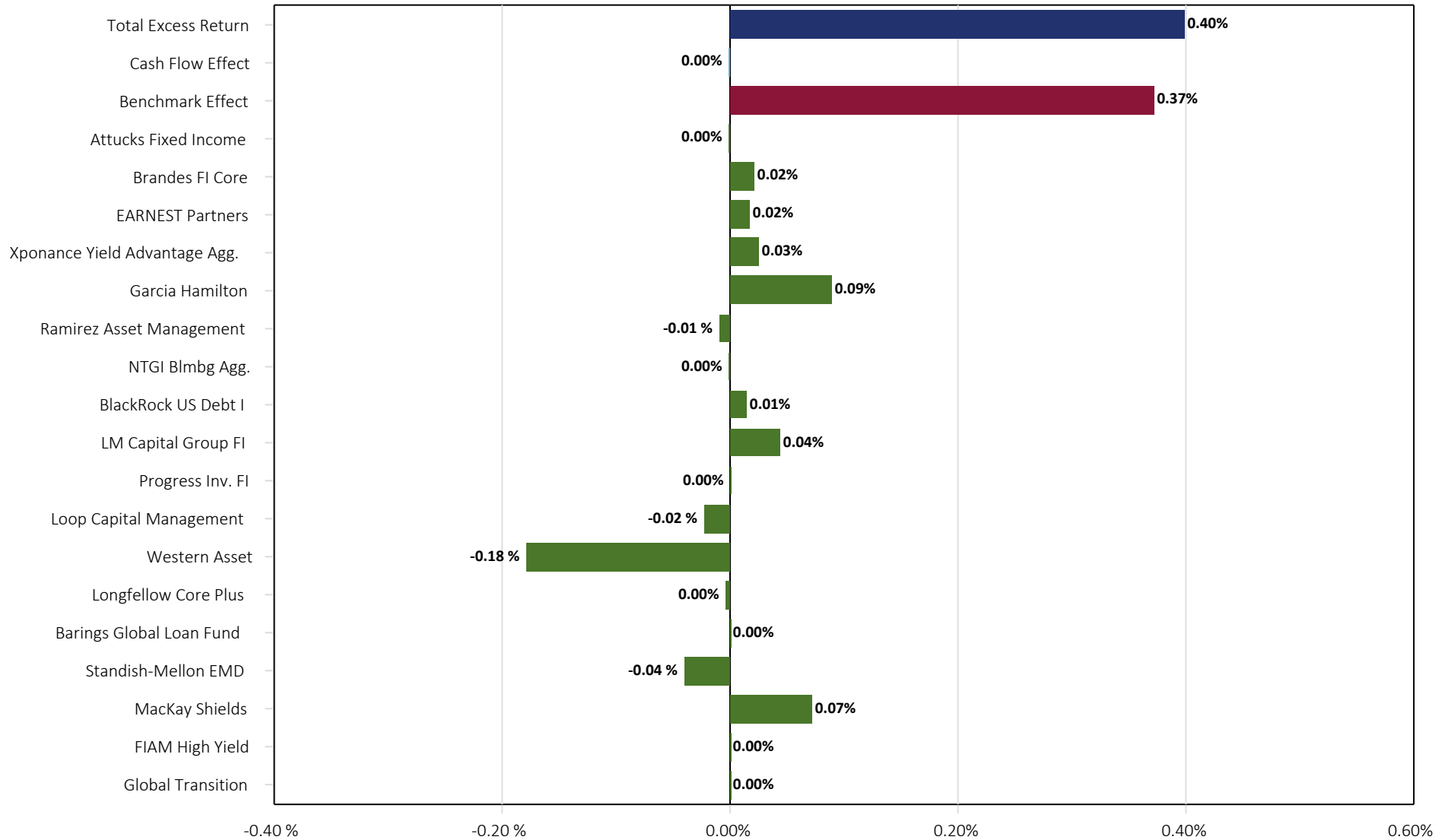
	QTD	1 Year	3 Years	5 Years	10 Years
■ Fixed Income	-5.51 (65)	-3.30 (83)	2.39 (75)	2.78 (69)	3.13 (52)
● Fixed Income - Net	-5.54 (66)	-3.40 (86)	2.29 (82)	2.66 (77)	2.99 (59)
▲ Blmbg. U.S. Aggregate	-5.93 (83)	-4.15 (100)	1.69 (93)	2.14 (93)	2.24 (91)
5th Percentile	-2.66	1.19	4.86	3.99	4.47
1st Quartile	-4.48	-1.48	3.36	3.53	3.76
Median	-5.27	-2.47	2.74	2.98	3.14
3rd Quartile	-5.84	-3.13	2.37	2.69	2.79
95th Percentile	-6.44	-3.84	1.14	1.85	1.39
Population	50	49	43	41	34

Asset Class Attribution

Fixed Income

Periods Ended 1 Quarter Ending March 31, 2022

1 Quarter



Performance

Fixed Income

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Fixed Income	12,427,070,915	-5.51	-3.30	2.39	2.78	3.13	7.76	1/1/1982
Fixed Income - Net		-5.54	-3.40	2.29	2.66	2.99		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	7.21	
Fixed Income IMRF Custom Benchmark		-5.56	-3.58	2.01	2.43			
Active Fixed Core	4,064,715,748	-5.47	-3.47	2.15	2.54	2.76	4.15	4/1/2001
Active Fixed Core - Net		-5.50	-3.58	2.05	2.43	2.62		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	4.07	
Attucks Fixed Income	93,716,240	-6.07	-3.56				-5.36	2/1/2021
Attucks Fixed Income - Net		-6.15	-3.87				-5.62	
Blmbg. U.S. Aggregate		-5.93	-4.15				-5.78	
Brandes FI Core	354,946,090	-5.19	-3.17	1.71	2.09		1.88	3/1/2016
Brandes FI Core - Net		-5.20	-3.19	1.70	2.08		1.88	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14		1.98	
EARNEST Partners	965,774,469	-5.69	-3.89	2.04	2.57	2.74	4.03	5/1/2005
EARNEST Partners - Net		-5.72	-4.01	1.91	2.43	2.57	3.85	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	3.59	
Xponance Yield Advantage Agg.	1,050,886,430	-5.60	-2.90	2.64	2.65	2.85	3.93	6/1/2005
Xponance Yield Advantage Agg. - Net		-5.63	-3.03	2.51	2.51	2.69	3.75	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	3.55	
Garcia Hamilton	1,035,544,810	-4.83	-3.38	1.95	2.48		2.45	6/1/2015
Garcia Hamilton - Net		-4.85	-3.46	1.87	2.40		2.36	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14		2.01	

Taplin, 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

** Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Performance

Fixed Income

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Ramirez Asset Management	563,847,708	-6.10	-3.72				-0.22	5/1/2020
Ramirez Asset Management - Net		-6.13	-3.84				-0.35	
Blmbg. U.S. Aggregate		-5.93	-4.15				-2.73	
Pass. Core Fixed Income	3,439,948,286	-5.88	-4.06	1.74	2.20	2.29	5.49	1/1/1990
Pass. Core Fixed Income - Net		-5.89	-4.07	1.73	2.19	2.28		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	5.47	
BlackRock US Debt I	1,730,865,010	-5.83	-4.06	1.78	2.24		2.53	10/1/2013
BlackRock US Debt I - Net		-5.83	-4.06	1.77	2.24		2.52	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14		2.41	
NTGI Blmbg Agg.	1,709,083,276	-5.94	-4.07	1.70	2.16	2.26	5.54	2/1/1990
NTGI Blmbg Agg. - Net		-5.94	-4.08	1.69	2.15	2.26		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	5.53	
Core Plus Fixed Income	3,184,087,542	-6.52	-4.14	2.58	2.85	3.20	7.63	1/1/1982
Core Plus Fixed Income - Net		-6.56	-4.28	2.41	2.67	3.03		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	7.21	
LM Capital Group FI	908,230,733	-5.30	-4.00	2.98	2.87	3.08	4.42	5/1/2005
LM Capital Group FI - Net		-5.34	-4.15	2.82	2.71	2.92	4.25	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	3.59	
Progress Inv. FI	1,159							
Progress Inv. FI - Net								
Loop Capital Management	619,953,817	-6.35	-3.80	2.23	2.77	3.40	4.43	5/1/2005
Loop Capital Management - Net		-6.38	-3.92	2.10	2.63	3.27	4.30	
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	3.59	

Taplin, 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

** Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Performance

Fixed Income

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Western Asset	1,039,857,546	-7.98	-4.90	2.36	2.88	3.47	4.92	11/1/2001
Western Asset - Net		-8.01	-5.03	2.23	2.75	3.33		
Blmbg. U.S. Aggregate		-5.93	-4.15	1.69	2.14	2.24	3.82	
Longfellow Core Plus	616,044,287	-5.99	-3.09				-0.13	5/1/2020
Longfellow Core Plus - Net		-6.02	-3.23				-0.27	
Blmbg. U.S. Aggregate		-5.93	-4.15				-2.73	
Bank Loans	726,116,001	-0.17	3.63	4.26	4.23		4.39	8/1/2014
Bank Loans - Net		-0.14	3.68	4.23	4.01		4.04	
Barings Custom Benchmark		-0.14	3.23	4.26	4.22		4.09	
Barings Global Loan Fund	726,116,001	-0.17	3.63	4.26	4.23		4.39	8/1/2014
Barings Global Loan Fund - Net		-0.14	3.68	4.23	4.01		4.04	
Barings Custom Benchmark*		-0.14	3.23	4.26	4.22		4.09	
Emerging Markets Debt	199,893,049	-10.52	-10.52	-0.97	0.53		0.89	8/1/2014
Emerging Markets Debt - Net		-10.60	-10.76	-1.29	0.20		0.56	
Custom Benchmark (EMD)		-8.27	-8.74	-0.35	1.02		0.75	
Standish-Mellon EMD	199,893,049	-10.52	-10.52	-0.97	0.53		0.89	8/1/2014
Standish EM MRK - Net		-10.60	-10.76	-1.29	0.20		0.56	
Custom Benchmark**		-8.27	-8.74	-0.35	1.02		0.75	
High Yield	812,100,026	-3.31	1.00	5.63	5.74	6.39	9.23	4/1/1986
High Yield - Net		-3.39	0.59	5.29	5.39	6.02		
ICE BofAML US High Yield, Cash Pay Index		-4.53	-0.30	4.37	4.55	5.68	7.98	

Taplin, 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

** Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Performance

Fixed Income

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Mackay Shields	812,100,023	-3.29	1.01	5.64	5.73	6.48	8.40	11/1/2000
Mackay Shields - Net		-3.37	0.60	5.30	5.38	6.11		
ICE BofAML US High Yield, Cash Pay Index		-4.53	-0.30	4.37	4.55	5.68	7.11	

Taplin, Canida, 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

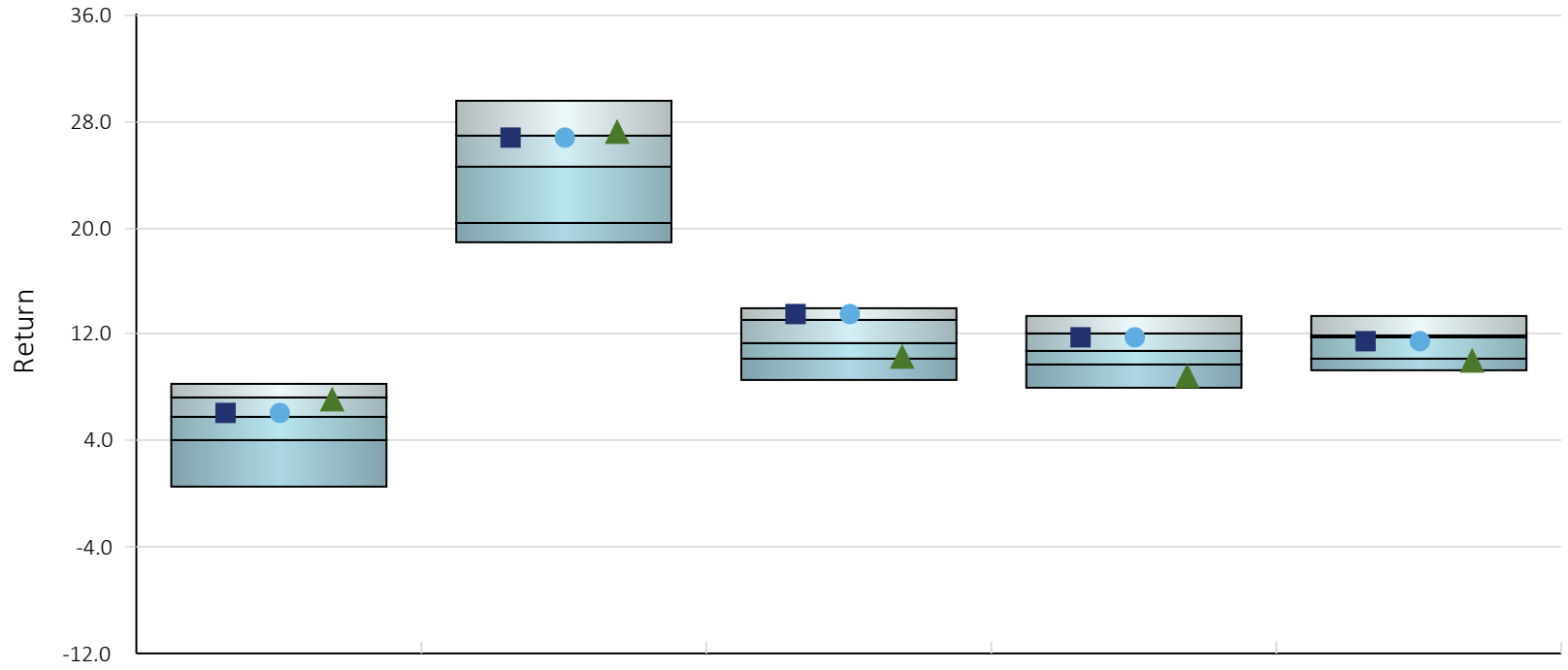
** Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Private Real Assets

Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2022



	QTD	1 Year	3 Years	5 Years	10 Years
■ Real Estate	6.10 (45)	26.84 (29)	13.54 (13)	11.81 (27)	11.49 (67)
● Real Estate - Net	6.08 (45)	26.76 (31)	13.48 (14)	11.78 (28)	11.46 (67)
▲ Blended Benchmark (Real Estate)	7.14 (28)	27.26 (22)	10.31 (74)	8.90 (86)	10.06 (85)
5th Percentile	8.22	29.54	13.93	13.34	13.42
1st Quartile	7.24	26.99	13.06	12.07	11.89
Median	5.82	24.55	11.29	10.80	11.78
3rd Quartile	4.07	20.43	10.21	9.79	10.20
95th Percentile	0.61	18.97	8.58	7.92	9.37
Population	41	37	27	21	13

Asset Allocation & Performance

Private Real Assets

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Private Real Assets	4,597,883,654						1.55	3/1/2022
Custom Benchmark (Private Real Assets)							6.87	
Real Estate	4,182,789,262	6.10	26.84	13.54	11.81	11.49	6.07	5/1/1985
Real Estate - Net		6.08	26.76	13.48	11.78	11.46		
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90	10.06	7.98	
Real Estate Core Cmp	2,241,122,737	5.66	26.95	15.06	12.76	11.73	8.24	4/1/1999
TA Assoc. Buckhead	894,660,982	9.68	43.32	22.70	19.29	15.27	11.96	8/1/1995
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90	10.06	7.81	
Barings Euro Core Property	145,674,226	0.15	4.79	19.45	13.29		13.21	3/1/2017
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90		8.86	
Blackstone Property Euro	160,735,892	-0.83	5.63	9.67			7.21	12/1/2017
Blended Benchmark (Real Estate)		7.14	27.26	10.31			9.25	
INVESCO Core Real Estate	237,766,430	-0.20	19.25	7.19	7.51	8.94	9.09	4/1/2011
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90	10.06	10.45	
INVESCO European real estate	58,016,963	-0.18	-6.87	0.71			-0.65	4/1/2018
Blended Benchmark (Real Estate)		7.14	27.26	10.31			9.35	
AEW Core Property Tr	272,951,247	8.87	21.17	8.73	8.03		8.74	10/1/2013
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90		9.67	
CBRE Core Partners	282,528,121	0.00	33.10	14.24	12.23		11.44	12/1/2013
Blended Benchmark (Real Estate)		7.14	27.26	10.31	8.90		9.62	

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 the Consumer Price Index + 5%.

Asset Allocation & Performance

Private Real Assets

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
JPM Strategic Property Fund Blended Benchmark (Real Estate)	188,788,876	12.03 7.14	24.99 27.26				20.20 23.10	1/1/2021
RE Non-Core Cmp	1,941,666,525	6.59	26.71	11.86	10.74	11.24	11.89	1/1/2010
Artemis MWBE Spruce Blended Benchmark (Real Estate)	355,210,635	9.63 7.14	18.76 27.26	12.53 10.31	8.80 8.90		6.56 8.67	6/1/2016
Franklin T. EMREFF Blended Benchmark (Real Estate)	4,639,964	-2.87 7.14	-1.74 27.26	-12.67 10.31	-5.40 8.90	5.21 10.06	4.21 10.21	9/1/2011
Security Capital Blended Benchmark (Real Estate)	61,777,751	6.29 7.14	33.65 27.26	16.55 10.31	12.33 8.90	8.86 10.06		7/1/1997
Dune II Blended Benchmark (Real Estate)	9,412,963	1.43 7.14	18.25 27.26	2.95 10.31	5.17 8.90	11.27 10.06	5.86 8.81	2/1/2009
Non-Core Real Estate Funds Blended Benchmark (Real Estate)	1,265,156,738	6.26 7.14	32.67 27.26	13.14 10.31	12.31 8.90	11.53 10.06	11.78 10.18	10/1/2011
Almanac ARS V	85,596							
Non-Core Intl Real Estate Blended Benchmark (Real Estate)	245,382,878	4.53 7.14	8.18 27.26	5.78 10.31	5.75 8.90		-0.54 9.51	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 the Consumer Price Index + 5%.

Asset Allocation & Performance

Private Real Assets

Periods Ended March 31, 2022

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Agriculture	231,475,704	1.43	4.04	1.63	-0.25	7.45	7.25	1/1/2010
NCREIF Farmland Index		2.63	9.73	5.89	6.17	9.56	10.07	
Premiere Partners IV	231,475,704	1.43	4.04	1.63	-0.25		2.33	3/1/2015
Timberland	63,091,285	-3.53	1.89	-0.82	-0.52	1.20	1.48	1/1/2010
NCREIF Timberland Index		3.21	11.83	4.75	4.08	5.60	4.70	
Forest Investment	63,091,285	-3.53	1.89	-0.82	-0.52	1.20	1.48	1/1/2010
Blended Benchmark (Timberland)		1.67	10.16	4.22	3.77	5.44	4.57	
Unlisted Infrastructure	120,527,403	6.26	13.10	14.68			13.01	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		3.14	10.02	9.34			9.25	
Unlisted Infrastructure Funds	120,527,403	6.26	13.10	14.68			13.01	4/1/2018
Blended Benchmark (Unlisted Infrastructure)		3.14	10.02	9.34			9.25	

Alternative Investments

Asset Allocation & Performance

Alternatives Investments

Periods Ended March 31, 2022

	Allocation	Performance (%)						
	Market Value \$	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Alternatives Investments	4,914,673,500	5.55	41.50	23.04	19.60	13.75	11.85	2/1/1986
Custom Benchmark (Alternative Investments)		5.83	12.90	10.28	9.77	9.38	12.53	
Absolute Return	78,878	0.16	10.91	-23.57	-13.28	-4.82	-0.12	1/1/2002
Aurora Investment	78,878							11/1/2001
Private Equity	4,731,189,165	6.09	47.63	26.78	23.26	16.50	14.18	2/1/1986
Blended Benchmark (Private Equity)		6.04	13.12	10.36	9.81	9.41		
Abbott S/A Comp.	536,150,189	3.13	54.83	29.46	24.91	17.13	15.14	6/1/1987
Muller Monroe MPEFF	517,859							5/1/2008
Pantheon S/A Comp.	419,526,411	0.00	56.71	26.92	22.92	16.29	12.11	10/1/2000
Private Equity Fund - Domestic	3,068,429,292	8.79	48.09	29.85	24.94		16.80	6/1/2012
Private Equity Fund - International	551,353,095	1.73	32.43	13.87	19.27		-1.86	7/1/2015
Oakbrook Opportunities Fund	155,212,320	-0.01	38.62				11.16	6/1/2019
Private Credit	183,405,457	-4.39	4.96				2.81	10/1/2019
Private Credit Fund - Domestic	183,405,457	-4.39	4.96				2.81	10/1/2019

The Alternatives Custom Benchmark is 95% MSCI World Index 1 Qtr Lagged +3%, 5% S&P LSTA Leveraged Loan Index +2%. Prior to March 1, 2022, it was based on an annualized return of 9%. Prior to July 1, 2010, it was based on an annual return of 12%. Prior to 2004, it was based on an annualized return of 13%. Prior to 2003, it was based on an annual return of 15%. Private Equity and Blended Benchmark (Private Equity) returns are 1 quarter lagged

Manager Watch List

As of March 31, 2022

Organization

Investment Manager	Asset Class	Effective Date	Resolution