

Wilshire



Wilshire Advisors

Executive Summary of Investment Performance

As of December 31, 2021

IMRF Performance Summary

- The Illinois Municipal Retirement Fund (“IMRF”) ended December 2021 with a market value of \$56.8 billion, up for the quarter by approximately \$1.9 billion as markets generally rebounded from the market sell-off during September 2021.
- IMRF underperformed the benchmark during the quarter, returning +4.36% versus +4.89% for the Total Fund Benchmark. Relative to peers, IMRF ranked at the 44th Percentile during the quarter and at the 32nd Percentile over the trailing one-year.
 - Through the end of 2021, IMRF returned +16.63% versus its benchmark of +13.48% for the calendar year.
- The U.S. Equity Portfolio underperformed the Russell 3000 Index during the quarter, returning +7.25% versus +9.28%. In aggregate, investment manager performance within Large Cap Growth was the largest detractor to relative performance.
 - Over the trailing one-year, the U.S. Equity underperformed the benchmark, returning +24.69% versus 25.66%. Investment manager underperformance within Large Cap Growth was partially offset by strong absolute and relative returns within Small Cap.
 - Relative to peers, the U.S. Equity Portfolio ranked at 66th Percentile during the quarter and at the 39th Percentile over one-year.
- The International Equity Portfolio underperformed the benchmark during the quarter, returning +0.45% versus +1.82%. In aggregate, investment managers in both Large Cap, Small Cap and Emerging Markets underperformed their respective benchmarks.
 - During the one-year ending December 31, 2021, the International Equity Portfolio generated strong excess returns above the index, returning +9.37% versus +7.82% for the benchmark.
 - Relative to peers, the International Equity Portfolio ranked at the 81st Percentile during the quarter and at the 48th Percentile over one-year.
- The Fixed Income Portfolio was in-line with the benchmark during the quarter, returning -0.03% versus +0.01%. In aggregate, investment manager underperformance within Core Plus and Emerging Markets Debt was offset by stronger returns within the allocations to Bank Loans (+0.77%) and High Yield (+0.39%).
 - Over the trailing one-year, the Fixed Income Portfolio outperformed the benchmark, returning -0.53% versus -1.55%.
 - Relative to peers, the Fixed Income Portfolio ranked at the 76th Percentile during the quarter and at the 69th Percentile over one-year.
- As of December quarter-end, all underlying asset class allocations in the Portfolio are within the stated four percentage point rebalancing range as outlined by the current Statement of Investment Policy.

IMRF returns referenced above are Net of Fees

Peer rankings referenced above are Gross of Fees

Asset Class Performance

Asset Class Returns - Best to Worst

2016	2017	2018	2019	2020	2021 YTD	Annualized 5-Year as of 12/21
High Yield 17.1%	Emrg Mrkts 37.7%	T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	U.S. Equity 18.1%
U.S. Equity 13.4%	Developed 25.6%	Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	REITs 10.9%
Commodities 11.8%	U.S. Equity 21.0%	U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	Emrg Mrkts 10.3%
Emrg Mrkts 11.6%	High Yield 7.5%	High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	Developed 10.1%
REITs 7.2%	REITs 4.2%	REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	High Yield 6.3%
U.S. TIPS 4.7%	Core Bond 3.6%	U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	U.S. TIPS 5.3%
Core Bond 2.6%	U.S. TIPS 3.0%	Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	Commodities 3.7%
Developed 1.5%	Commodities 1.7%	Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Core Bond 3.6%
T-Bills 0.3%	T-Bills 0.8%	Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	T-Bills 1.2%

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, represented by the FT Wilshire 5000 IndexSM, was up 9.6% for the fourth quarter of 2021. Nearly all sectors were in positive territory, with Real Estate (+14.7%), Information Technology (+14.6%) and Materials (+14.4%) representing the best performing sectors. The only sector that was negative this quarter was Communication Services (-0.8%). Large-cap outperformed small-cap while growth stocks outperformed value within the large-cap segment of the market.

Sharply rising inflation will likely be remembered as the economic story of 2021. Increases in CPI have reached rates not seen in 40 years. Food and energy prices are up meaningfully, but so too are the major “core” CPI items of automobiles and apparel. Consumers’ ability to manage this period will help determine whether the U.S. can continue its economic progress. The employment picture is quite strong but the personal savings rate has fallen to a level last seen in late-2017, suggesting that consumers are saving less as they adjust to rising prices.

Non-U.S. Equity

In Europe, Germany is facing a potential recession as supply issues and new coronavirus cases weigh on the economy. Growth has slowed in the U.K., as well, and is expected to face additional headwinds. Emerging Markets have experienced weakness this year, particularly in China, South Korea and Brazil. In China, the real estate market, which accounts for nearly a third of China’s GDP, has been experiencing a major slump and developers are heavily indebted.

Fixed Income

The U.S. Treasury yield curve was up 45 basis points in the short end (at the 2-year maturity) but down in the long end of the curve. The 10-year Treasury yield ended the quarter at 1.51%, up two basis points. Through the Fed’s “dot plot,” they are messaging that the current intent is for three 25 basis point increases in the overnight rate before the end of 2022. During the December meeting, the committee announced that it would begin to reduce (i.e., taper) the monthly pace of its asset purchases starting in January.

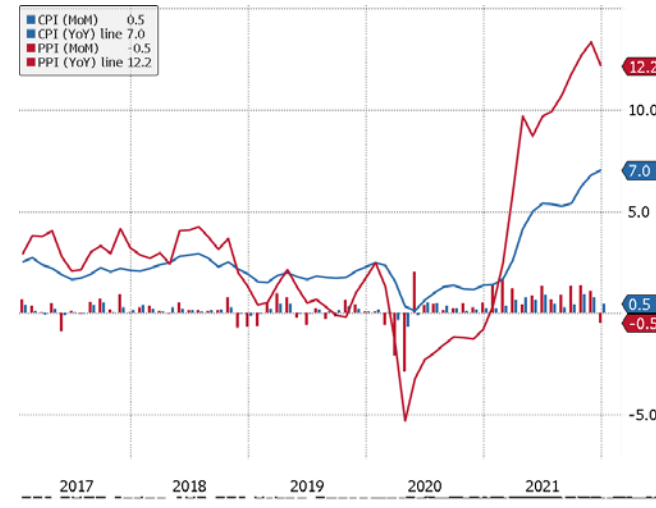
December 2021 Asset Class Assumptions

	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 (%)	4.50	5.50	5.50	5.75	5.10	8.10	1.70	2.00	2.30	1.45	3.60	0.85	4.55	4.70	5.90	4.30	5.60	2.60
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 (%)	1.25	2.50	2.00	2.35	1.70	0.00	1.70	2.95	3.15	2.25	7.35	1.65	2.60	2.60	2.30	1.70	1.85	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

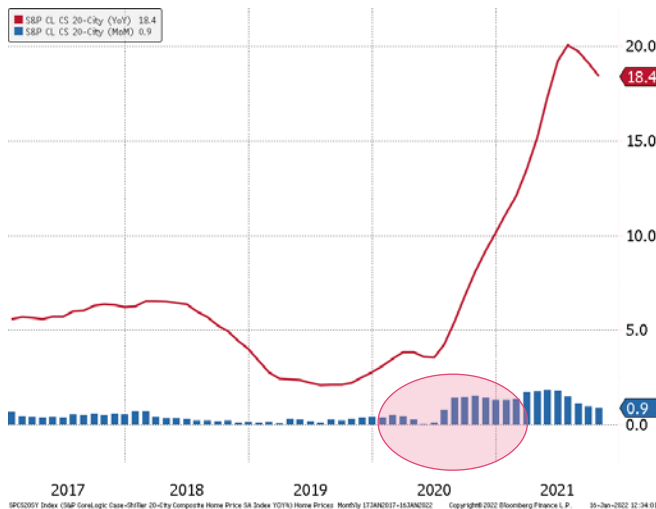
Inflation Roundup: "Lyin' in a Bed of Fire"¹



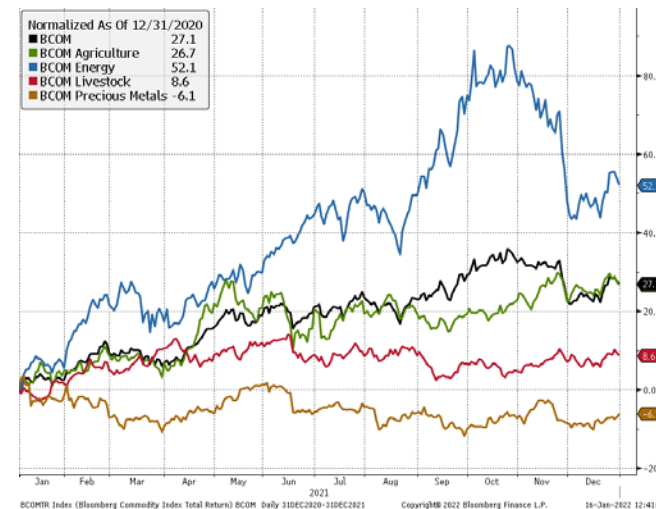
CPI
+7.0%



PPI
+12.2%



Home Prices
+18.4%

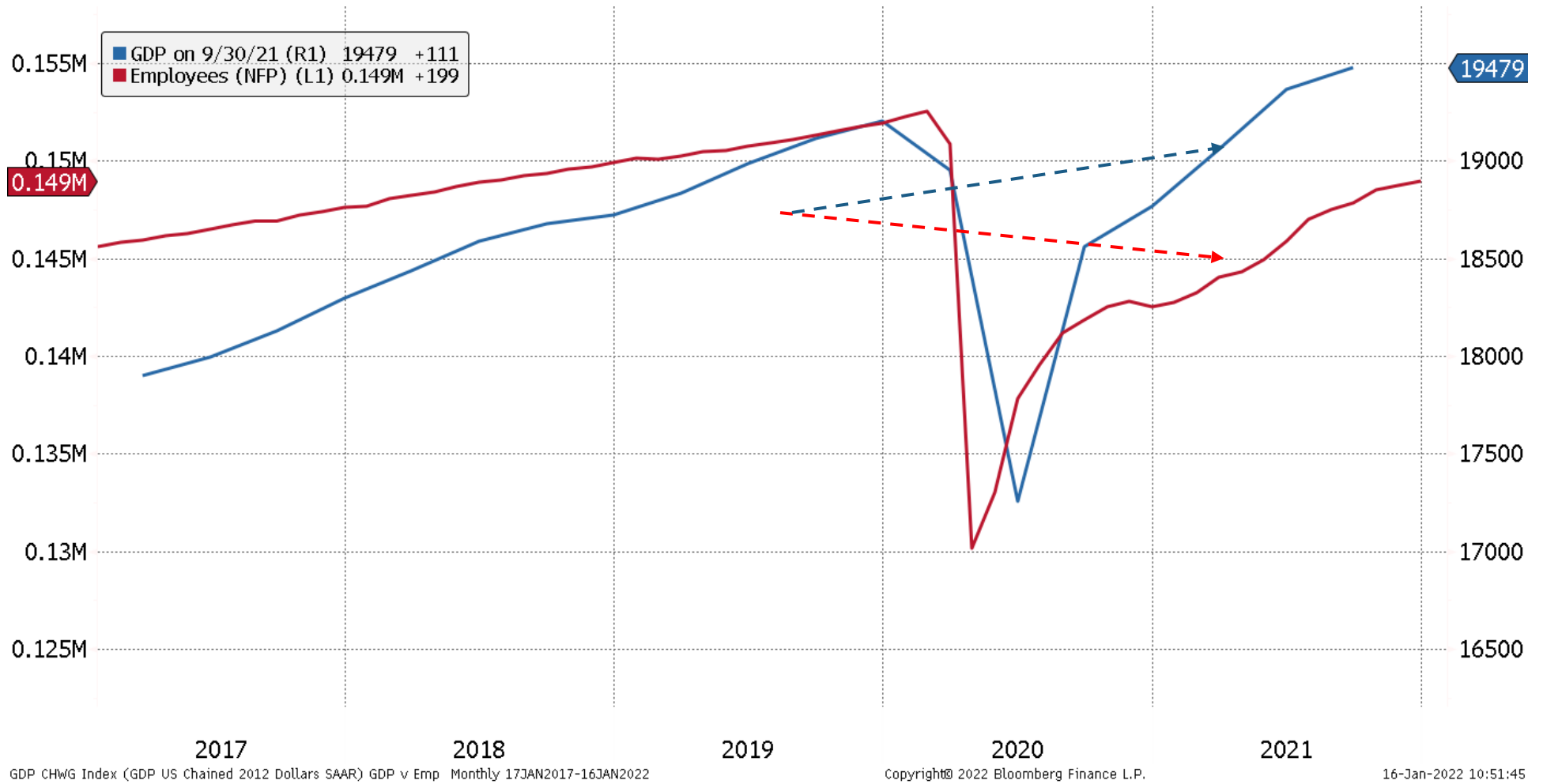


Commodities
+27.1%

Data Source: Bloomberg

1 Little Steven & The Disciples of Soul, "Lyin' in a Bed of Fire", Men Without Women, 1982

Employment Lagging Economic Growth



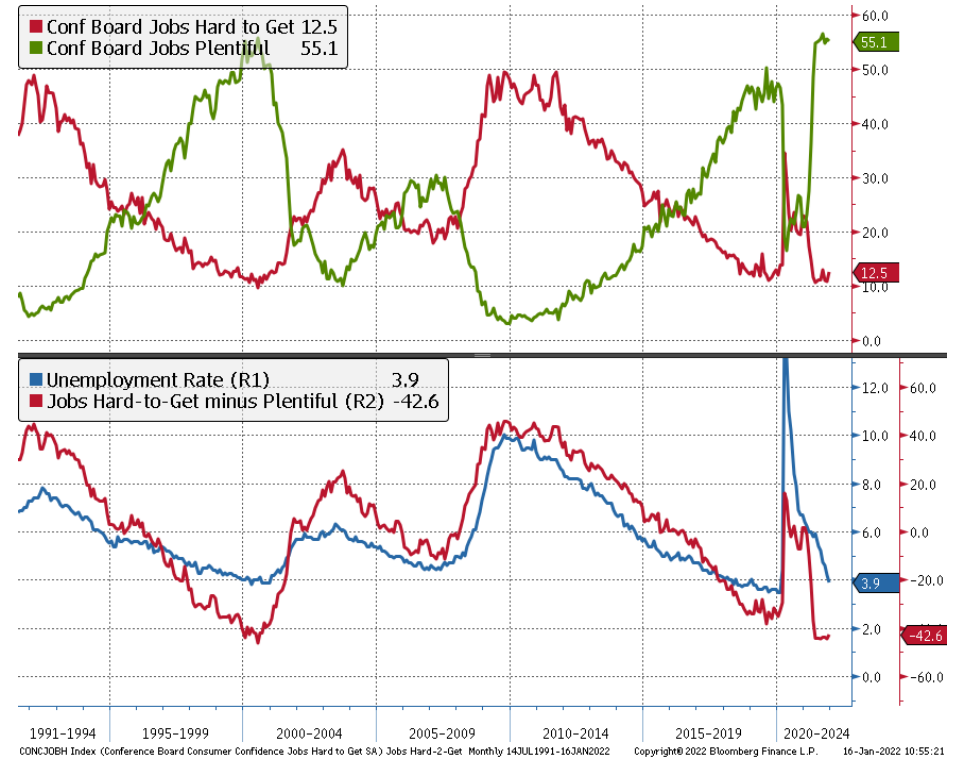
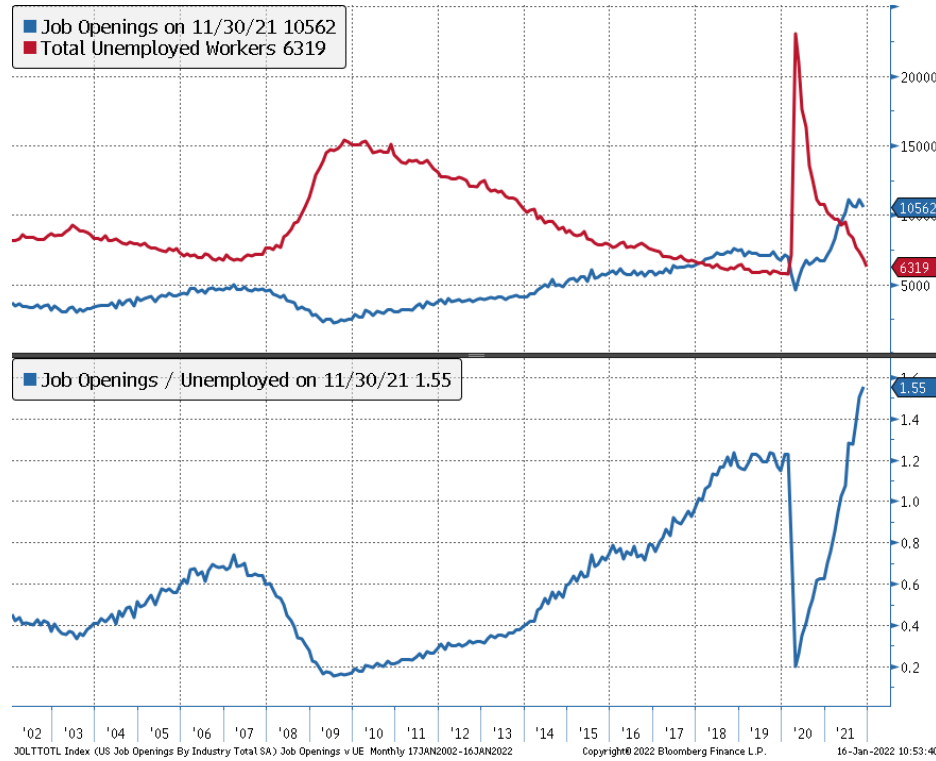
GDP CHWG Index (GDP US Chained 2012 Dollars SAAR) GDP v Emp Monthly 17JAN2017-16JAN2022

Copyright© 2022 Bloomberg Finance L.P.

16-Jan-2022 10:51:45

Data Source: Bloomberg

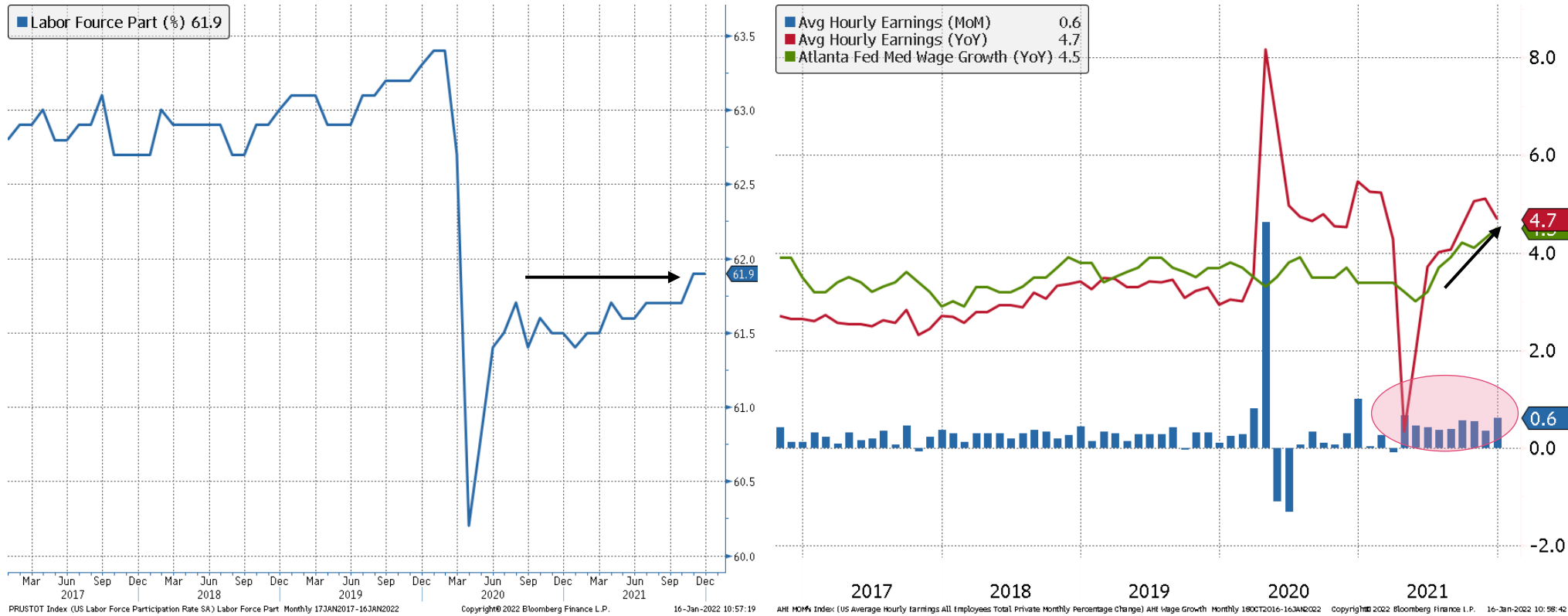
Job Shortage: “the neighborhood ain’t what it used to be”¹



Data Source: Bloomberg

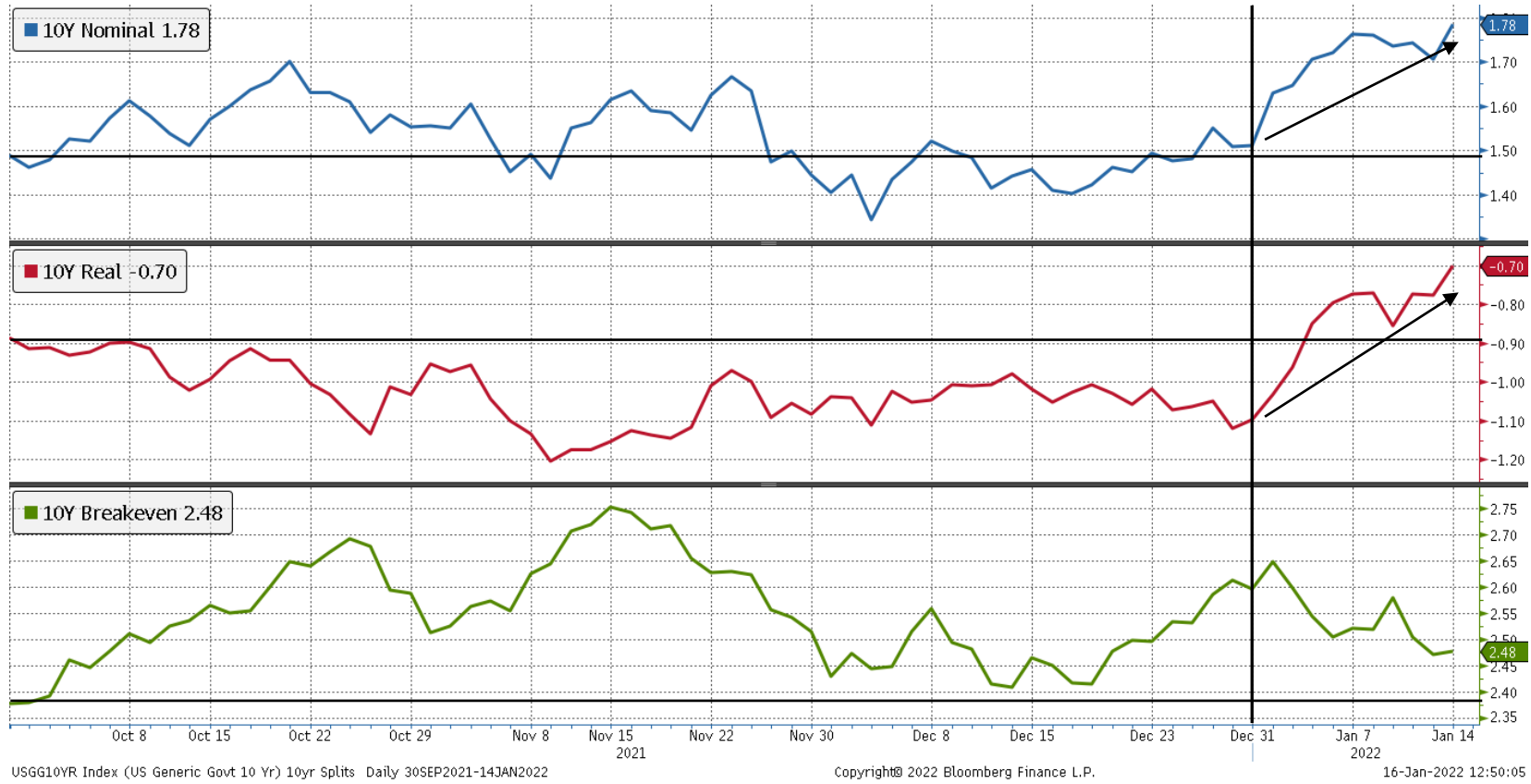
1 Little Steven & The Disciples of Soul, “Lynin’ in a Bed of Fire”, Men Without Women, 1982

What Will It Take to Get Employees Back in Labor Force?



Data Source: Bloomberg

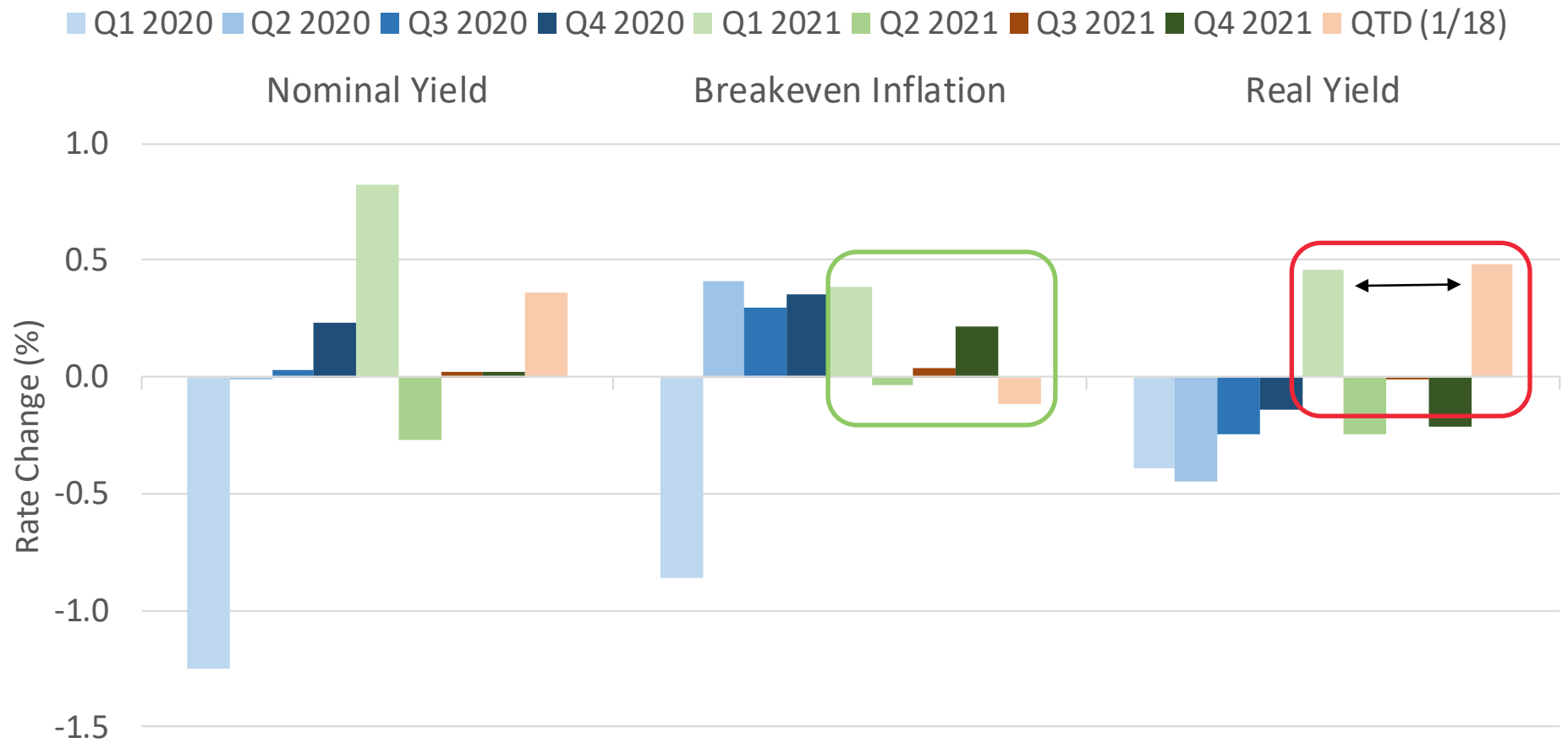
Rate Splits: Yield / Inflation Environment



Data Source: Bloomberg

Rate Change Attribution (8+ Quarters)

Quarterly Rate Changes



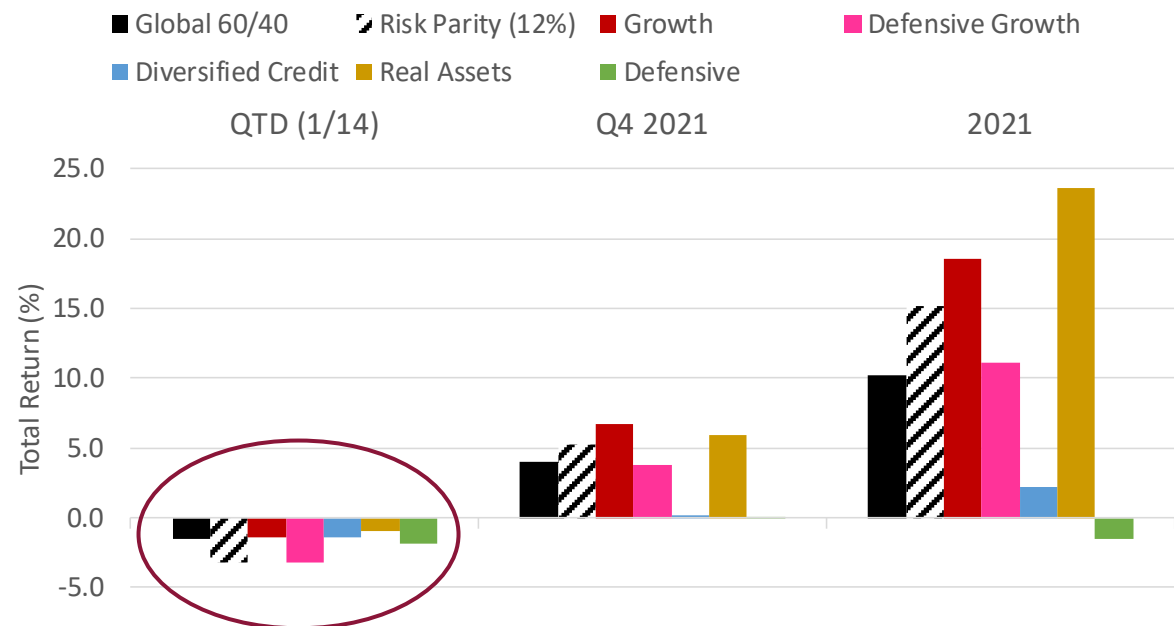
Data Source: Bloomberg

2022 Environmental Risk: A Year of Transition?

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

- YTD market activity provides a glimpse at the potential challenges of the 2022 environment

Asset Allocation & Thematic Returns

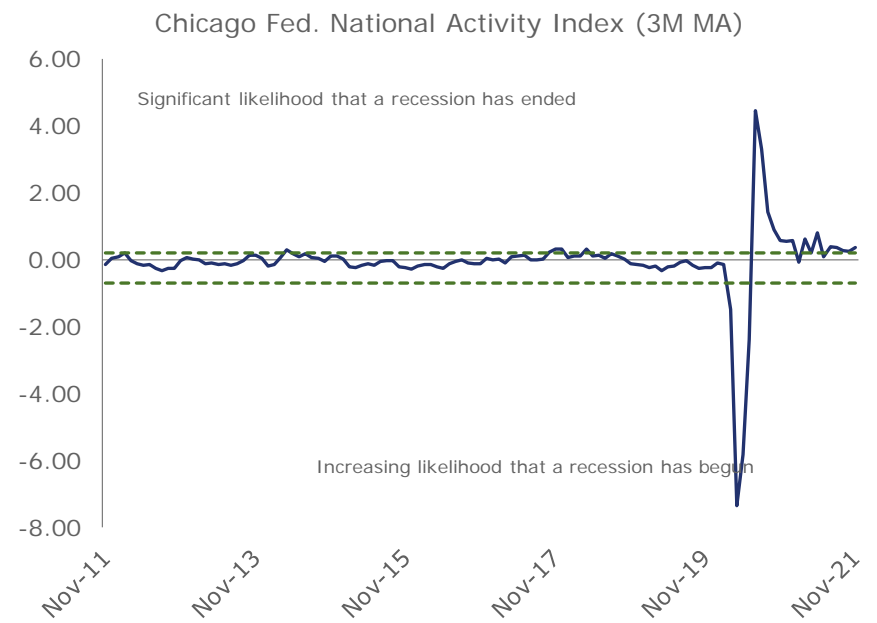
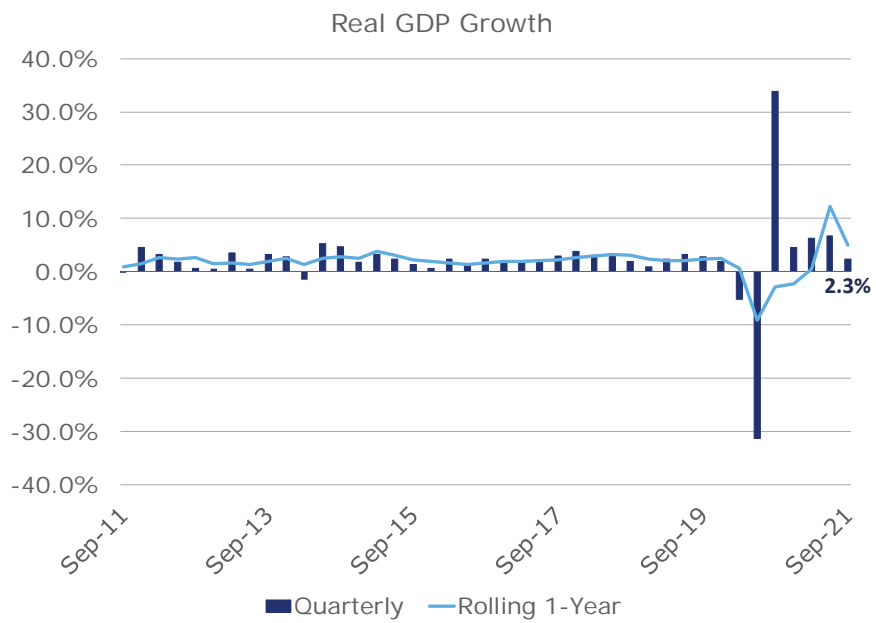


	QTD (1/14)	Q4 2021	2021
Global 60/40	(1.54)	4.02	10.20
Risk Parity (12%)	(3.23)	5.26	15.12
Growth	(1.35)	6.68	18.54
Defensive Growth	(3.17)	3.76	11.05
Diversified Credit	(1.44)	0.22	2.26
Real Assets	(0.95)	5.88	23.61
Defensive	(1.82)	0.01	(1.54)

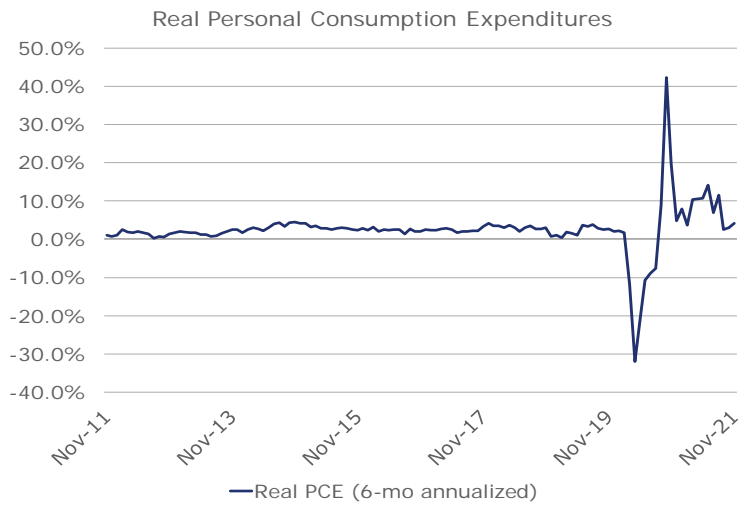
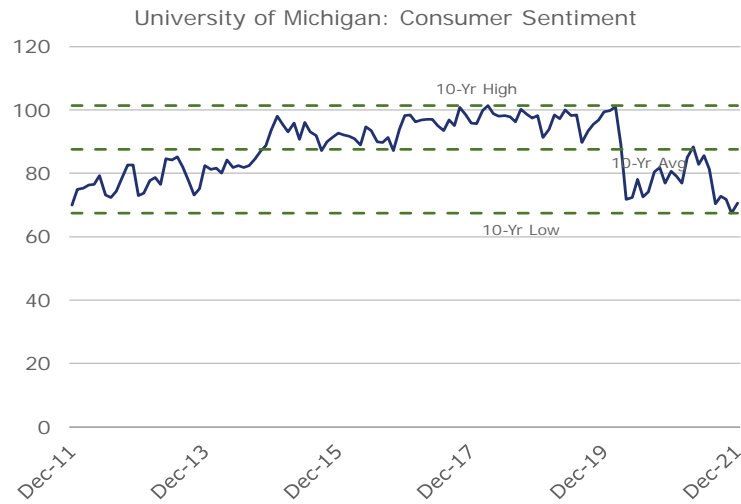
Data Source: Bloomberg, Wilshire

Economic/Market Activity

Economic Growth

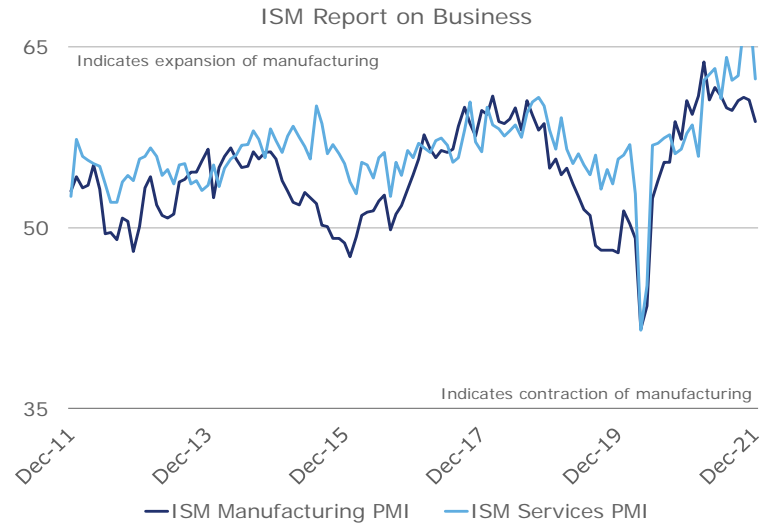


Consumer Activity



Data Sources: Bloomberg

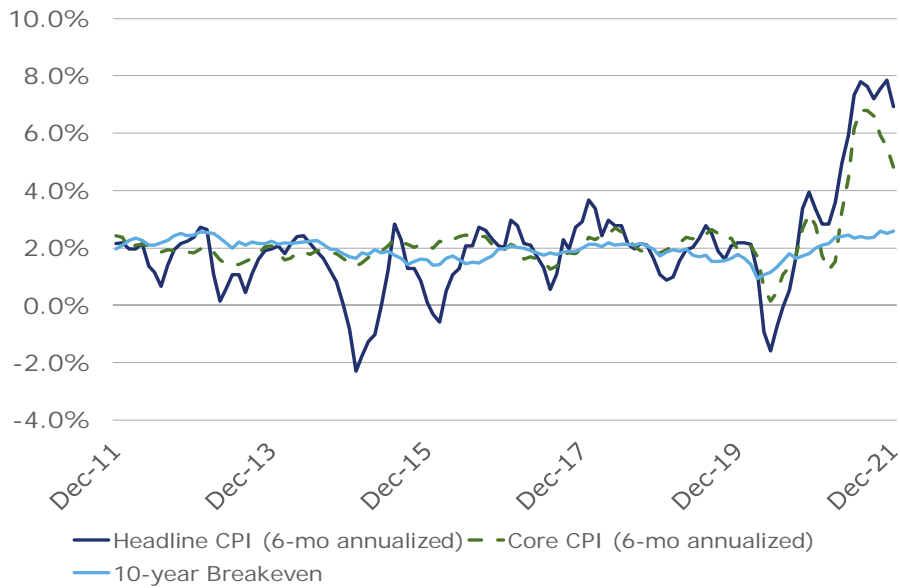
Business Activity



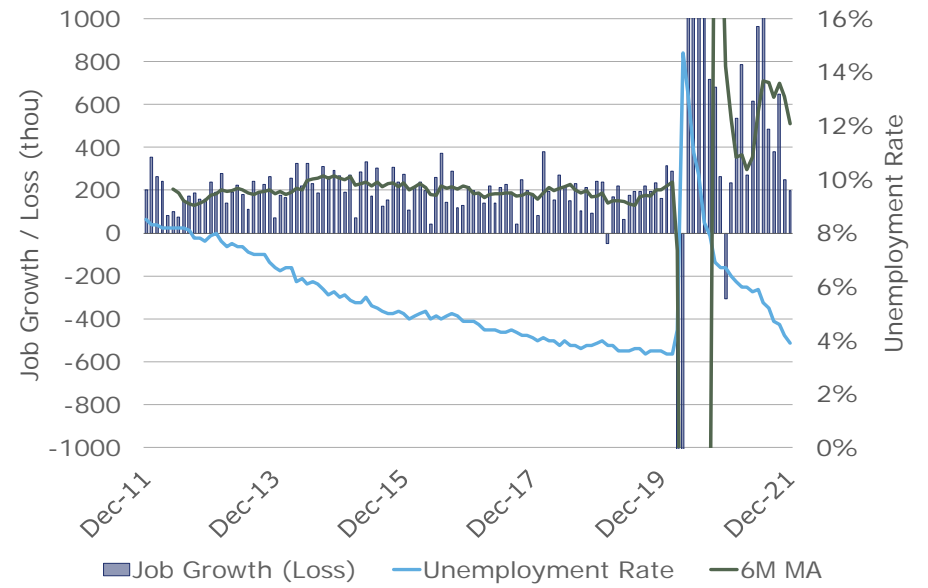
Data Sources: Bloomberg

Inflation and Employment

Inflation: Actual & Expected



Employment Gains / Losses

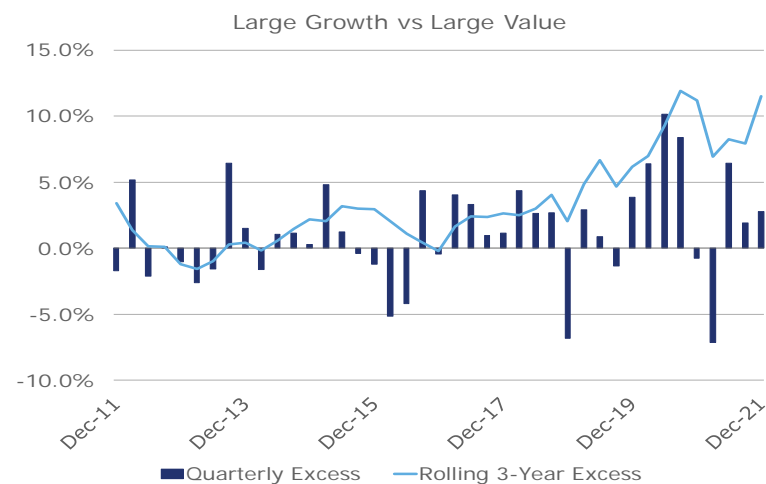
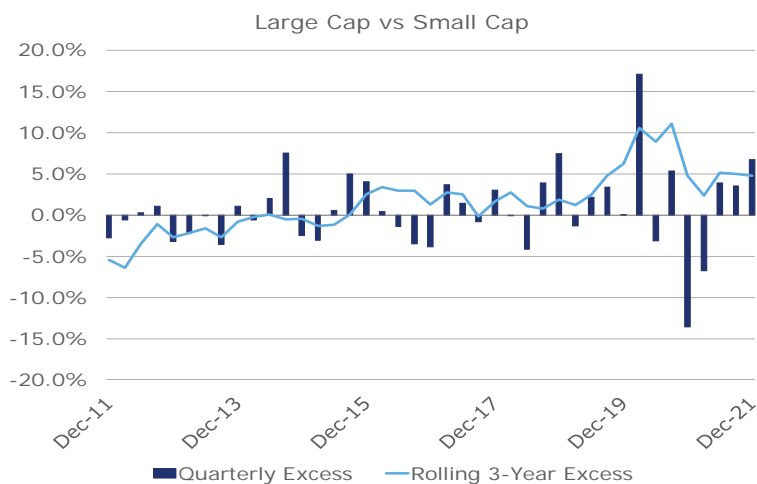
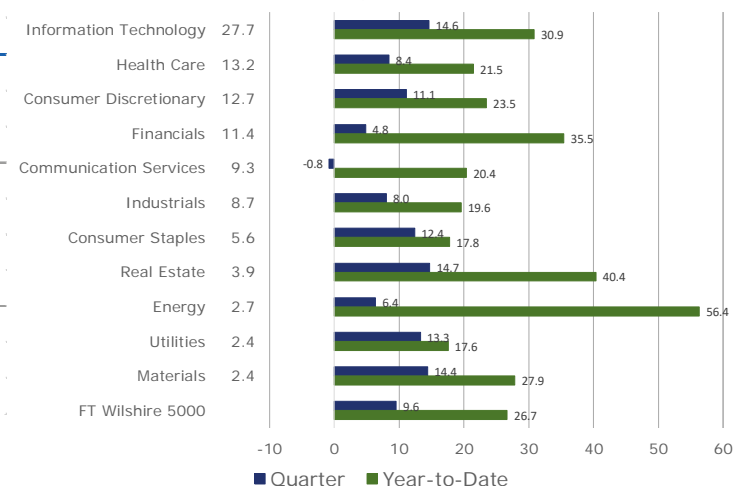


Data Sources: Bloomberg

U.S. Equity Market

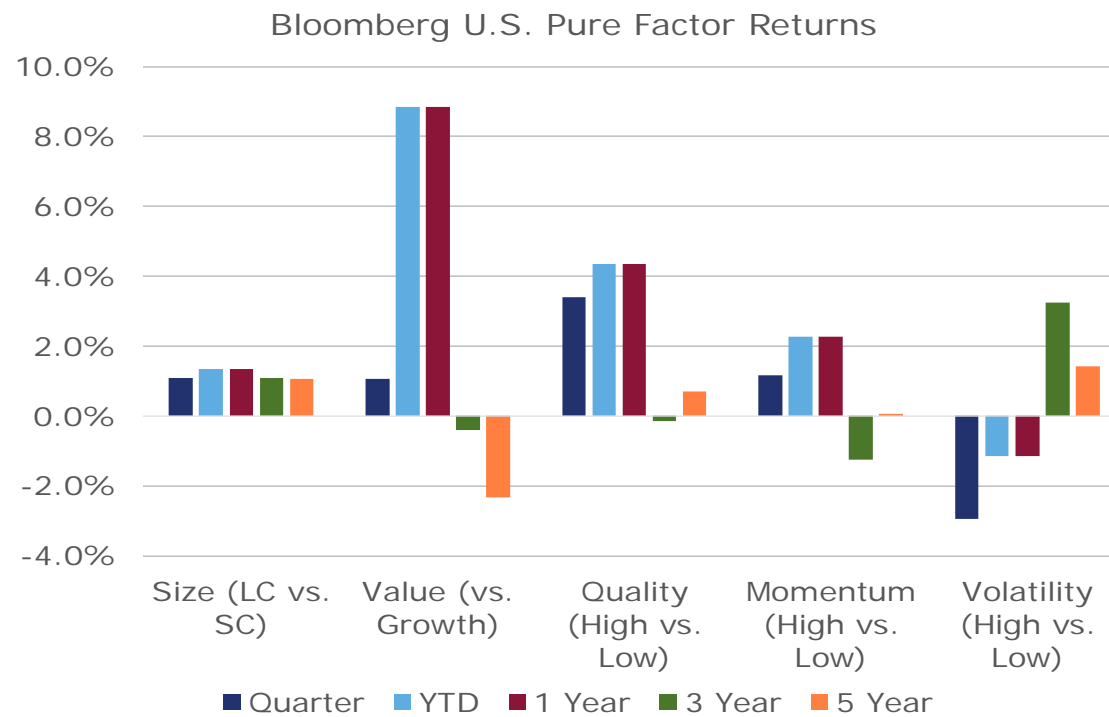
As of 12/31/2021	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	9.6	26.7	26.7	26.1	18.1	16.4
Wilshire U.S. Large Cap	10.2	27.5	27.5	26.6	18.7	16.7
Wilshire U.S. Small Cap	3.3	19.2	19.2	20.9	12.3	13.9
Wilshire U.S. Large Growth	11.6	28.9	28.9	33.3	23.9	19.5
Wilshire U.S. Large Value	8.6	24.5	24.5	19.5	13.3	13.7
Wilshire U.S. Small Growth	1.8	10.1	10.1	22.7	14.8	14.5
Wilshire U.S. Small Value	4.8	29.2	29.2	19.1	9.8	13.2
Wilshire REIT Index	17.1	46.2	46.2	19.2	10.9	11.5
MSCI USA Min. Vol. Index	10.4	21.0	21.0	17.9	14.7	14.2
FTSE RAFI U.S. 1000 Index	9.0	31.6	31.6	22.1	14.2	14.8

U.S. Sector Weight and Return (%)



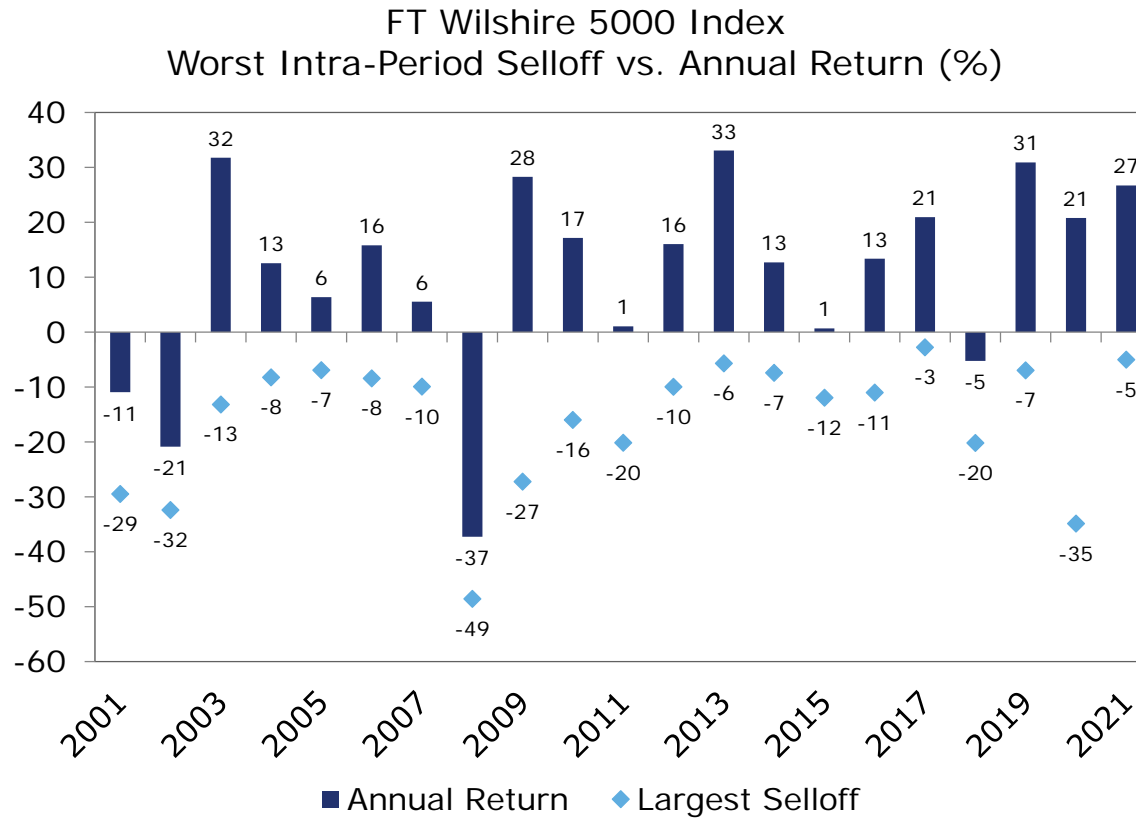
U.S. Factor Returns

- 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



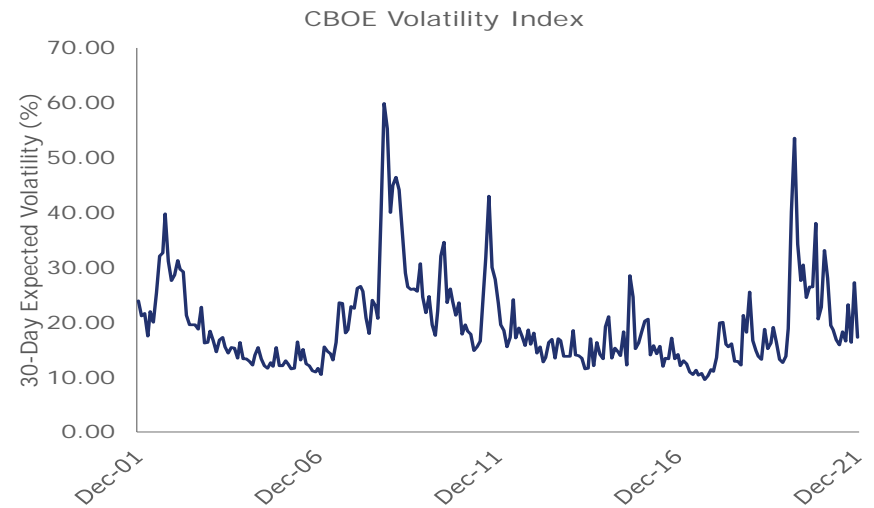
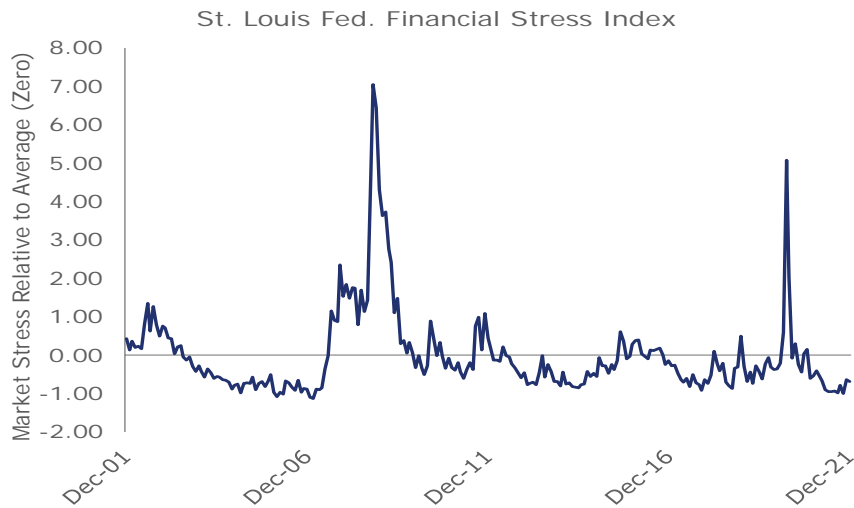
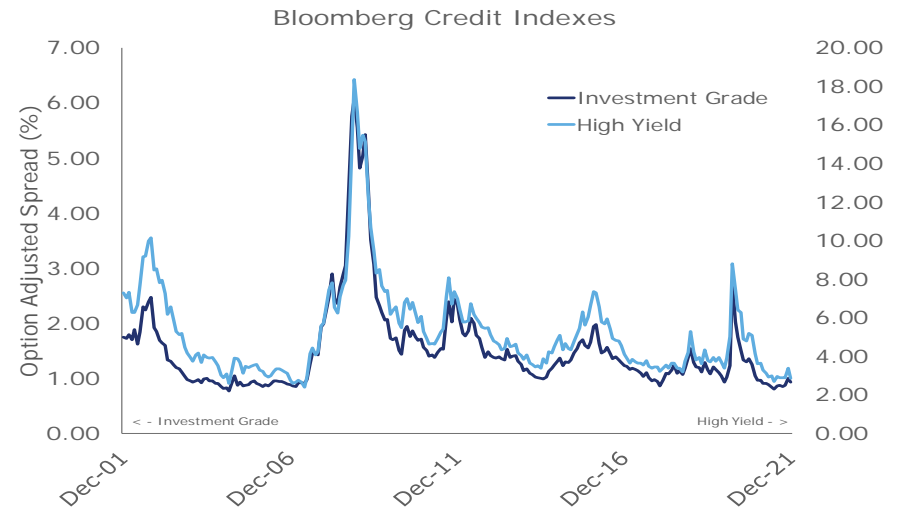
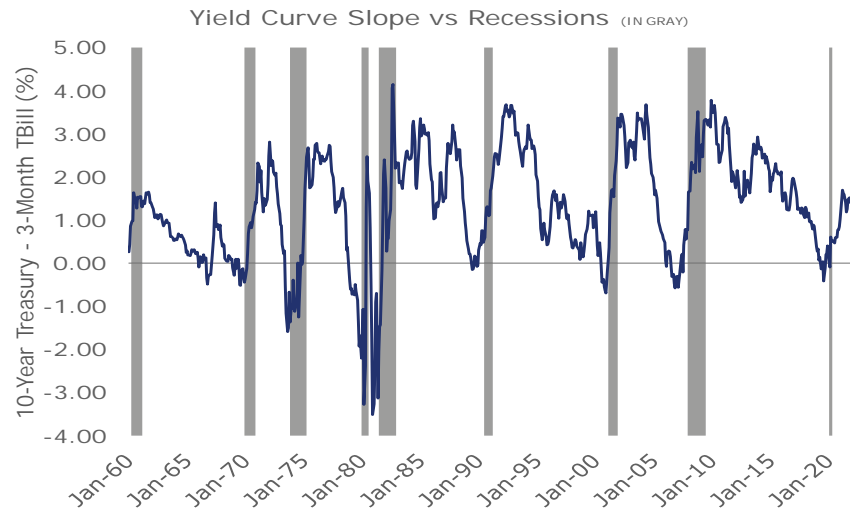
Annual Equity Market Selloffs

Third consecutive year of very strong performance; relatively minor selloff compared to previous years



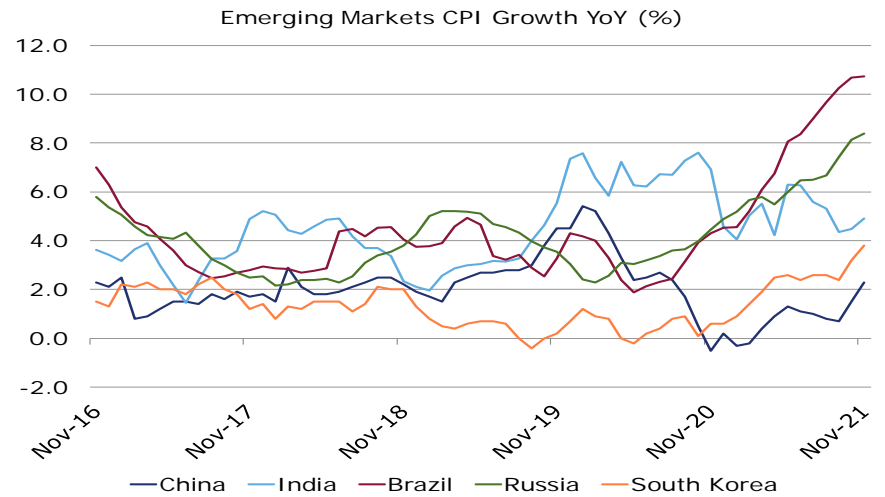
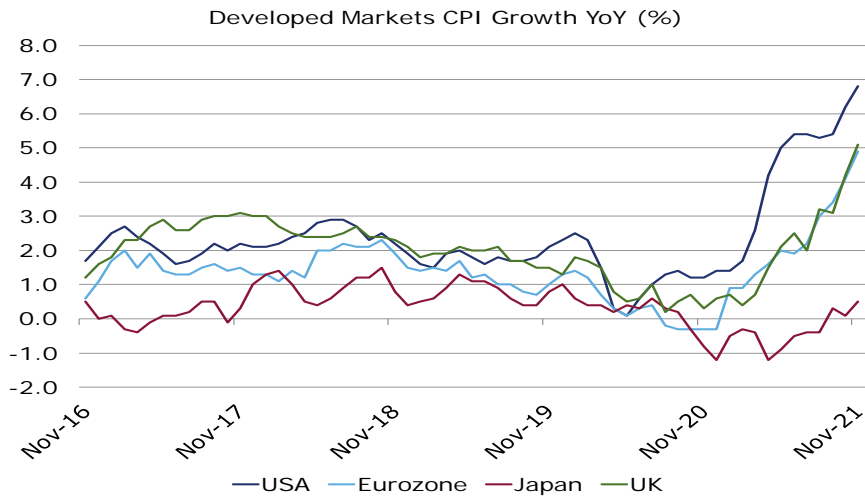
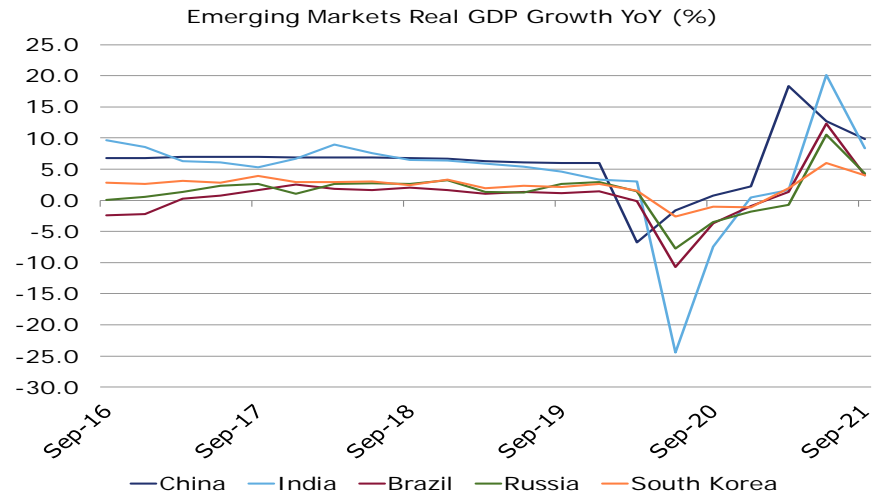
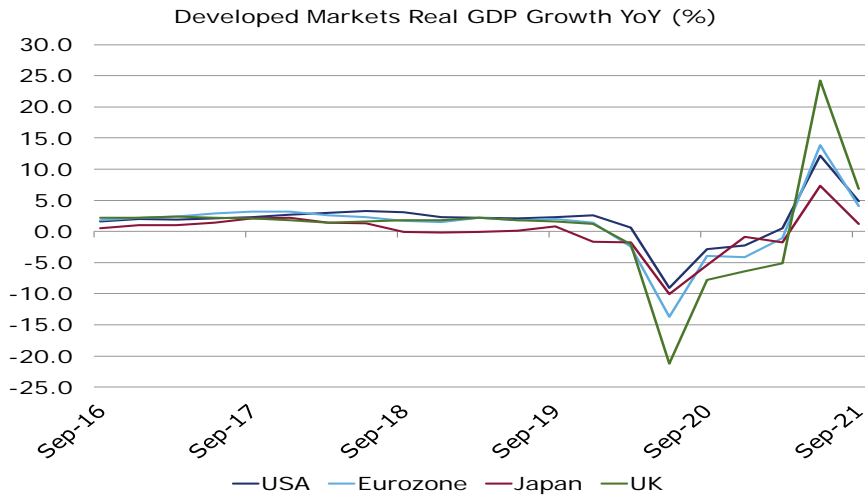
Data Sources: Wilshire Web, Bloomberg

Risk Monitor



Data Sources: Bloomberg

Non-U.S. Growth and Inflation

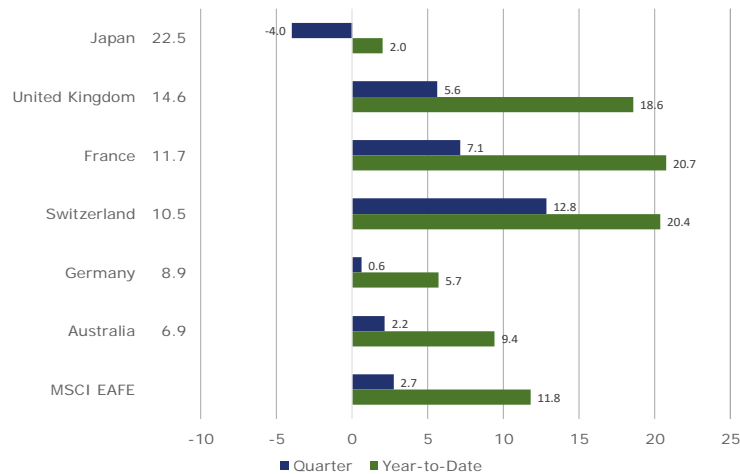


Data Sources: Bloomberg

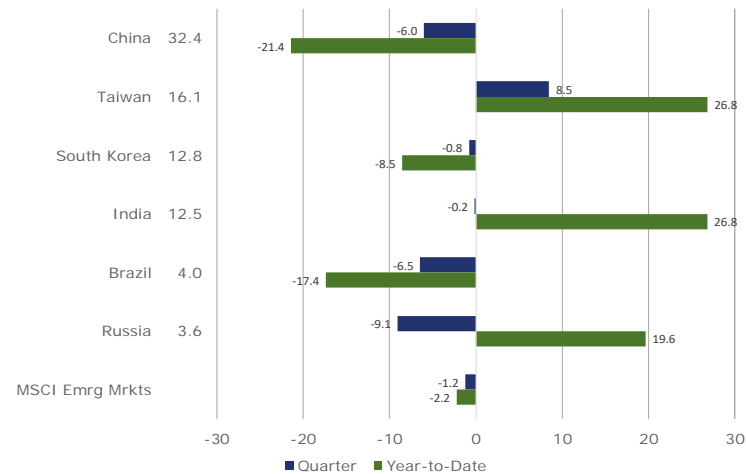
Non-U.S. Equity Market

As of 12/31/2021	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	1.9	8.3	8.3	13.7	10.1	7.8
MSCI EAFE (\$G)	2.7	11.8	11.8	14.1	10.1	8.5
MSCI Emerging Markets (\$G)	-1.2	-2.2	-2.2	11.3	10.3	5.9
MSCI Frontier Markets (\$G)	2.0	4.6	4.6	5.3	5.0	4.1
MSCI ACWI ex-US Growth (\$G)	2.4	5.4	5.4	18.2	13.4	9.5
MSCI ACWI ex-US Value (\$G)	1.2	11.6	11.6	9.5	7.0	6.3
MSCI ACWI ex-US Small (\$G)	0.7	13.4	13.4	16.9	11.6	9.9
MSCI ACWI Minimum Volatility	6.4	14.5	14.5	13.0	11.1	10.7
MSCI EAFE Minimum Volatility	2.5	7.6	7.6	8.3	8.0	8.0
FTSE RAFI Developed ex-US	2.6	15.5	15.5	12.0	8.3	7.5
MSCI EAFE LC (G)	4.0	19.2	19.2	13.9	8.9	10.6
MSCI Emerging Markets LC (G)	-0.8	0.1	0.1	12.3	10.9	8.4

Developed Markets Weight and Return (%)



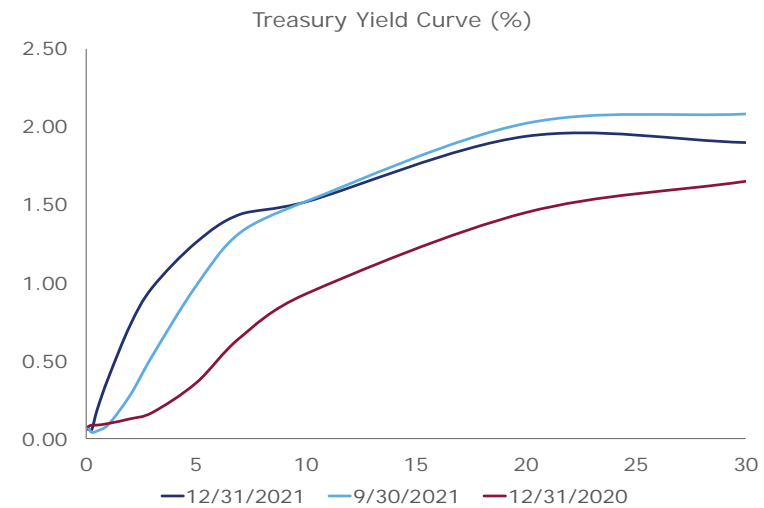
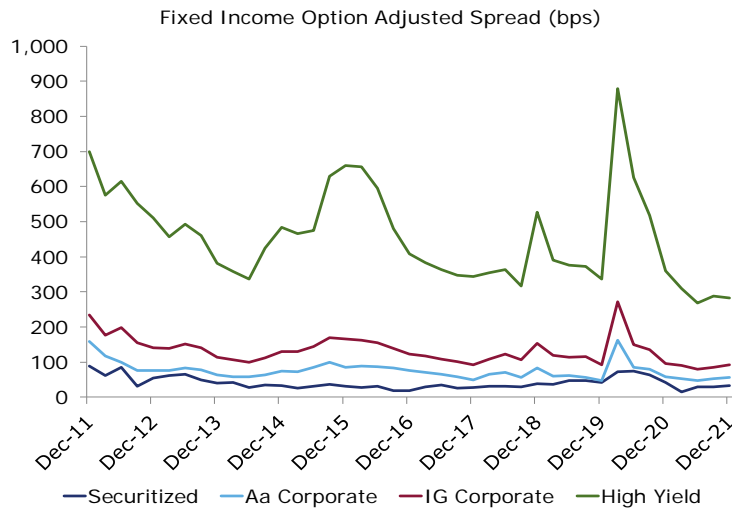
Emerging Markets Weight and Return (%)



U.S. Fixed Income

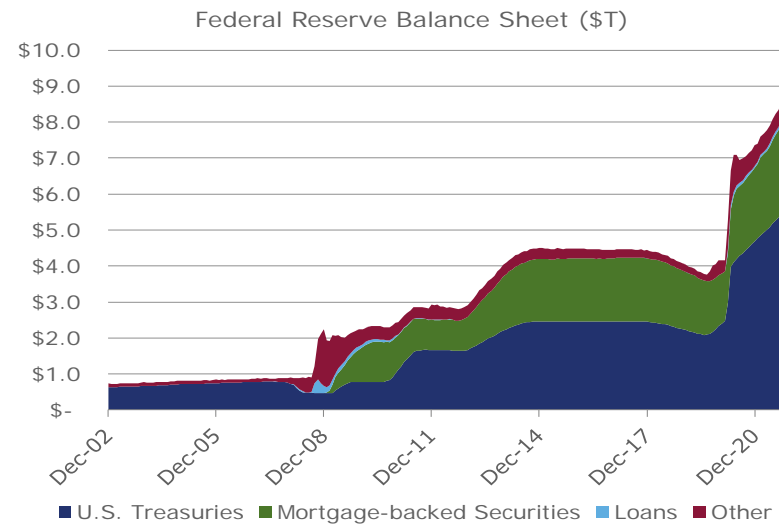
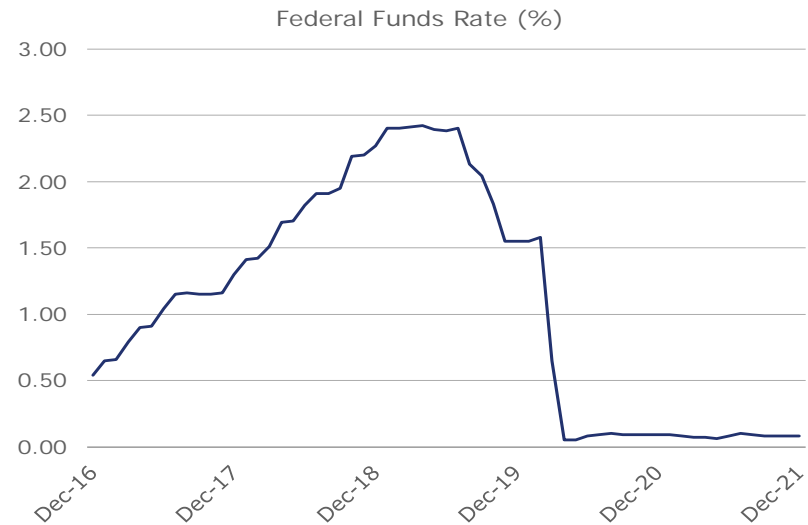
As of 12/31/2021	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	1.8	6.8	0.0	-1.5	-1.5	4.8	3.6	2.9
Bloomberg Treasury	1.2	7.1	0.2	-2.3	-2.3	4.1	3.1	2.1
Bloomberg Gov't-Rel.	1.6	6.1	0.0	-1.3	-1.3	4.5	3.6	2.8
Bloomberg Securitized	2.0	4.8	-0.4	-1.0	-1.0	3.1	2.6	2.4
Bloomberg Corporate	2.3	8.7	0.2	-1.0	-1.0	7.6	5.3	4.7
Bloomberg LT Gov't/Credit	2.6	16.5	2.2	-2.5	-2.5	10.6	7.4	5.7
Bloomberg LT Treasury	1.9	18.6	3.1	-4.6	-4.6	8.8	6.5	4.5
Bloomberg LT Gov't-Rel.	3.0	13.6	1.9	-1.5	-1.5	8.6	6.8	5.5
Bloomberg LT Corporate	3.1	15.2	1.5	-1.1	-1.1	11.8	7.7	6.5
Bloomberg U.S. TIPS *	1.4	8.2	2.4	6.0	6.0	8.4	5.3	3.1
Bloomberg High Yield	4.2	3.8	0.7	5.3	5.3	8.8	6.3	6.8
S&P/LSTA Leveraged Loan	3.9	0.3	0.7	5.2	5.2	5.6	4.3	4.7
Treasury Bills	0.1	0.3	0.0	0.0	0.0	1.0	1.2	0.7

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



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

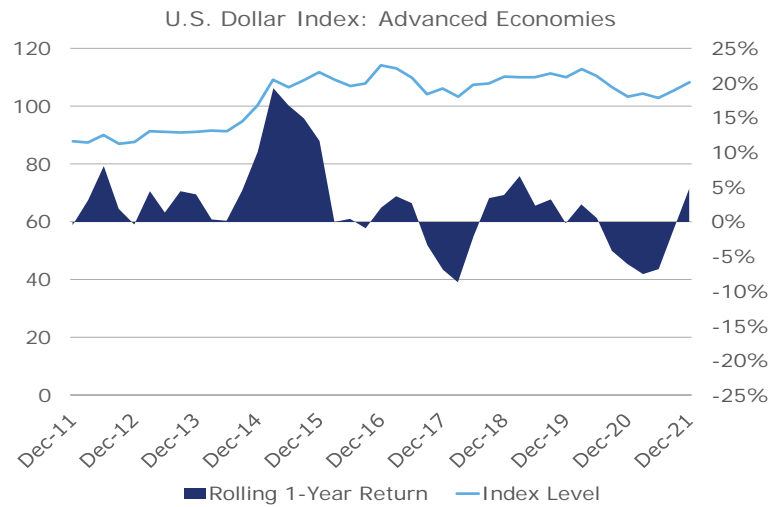
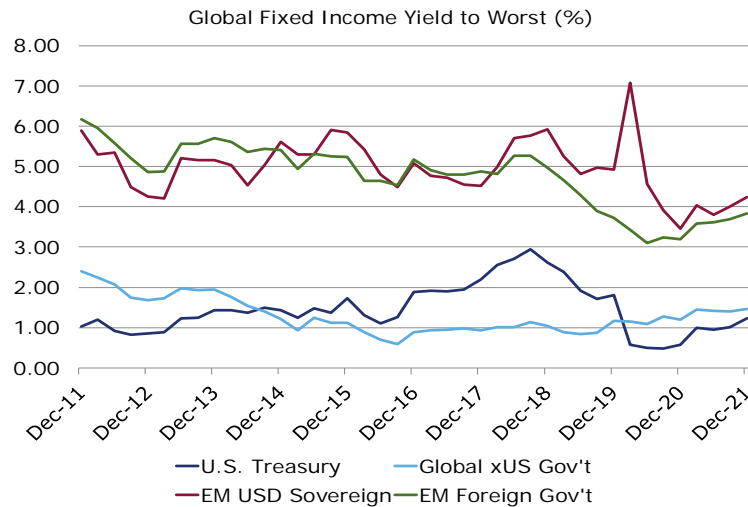


	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020		\$4,599

Non-U.S. Fixed Income

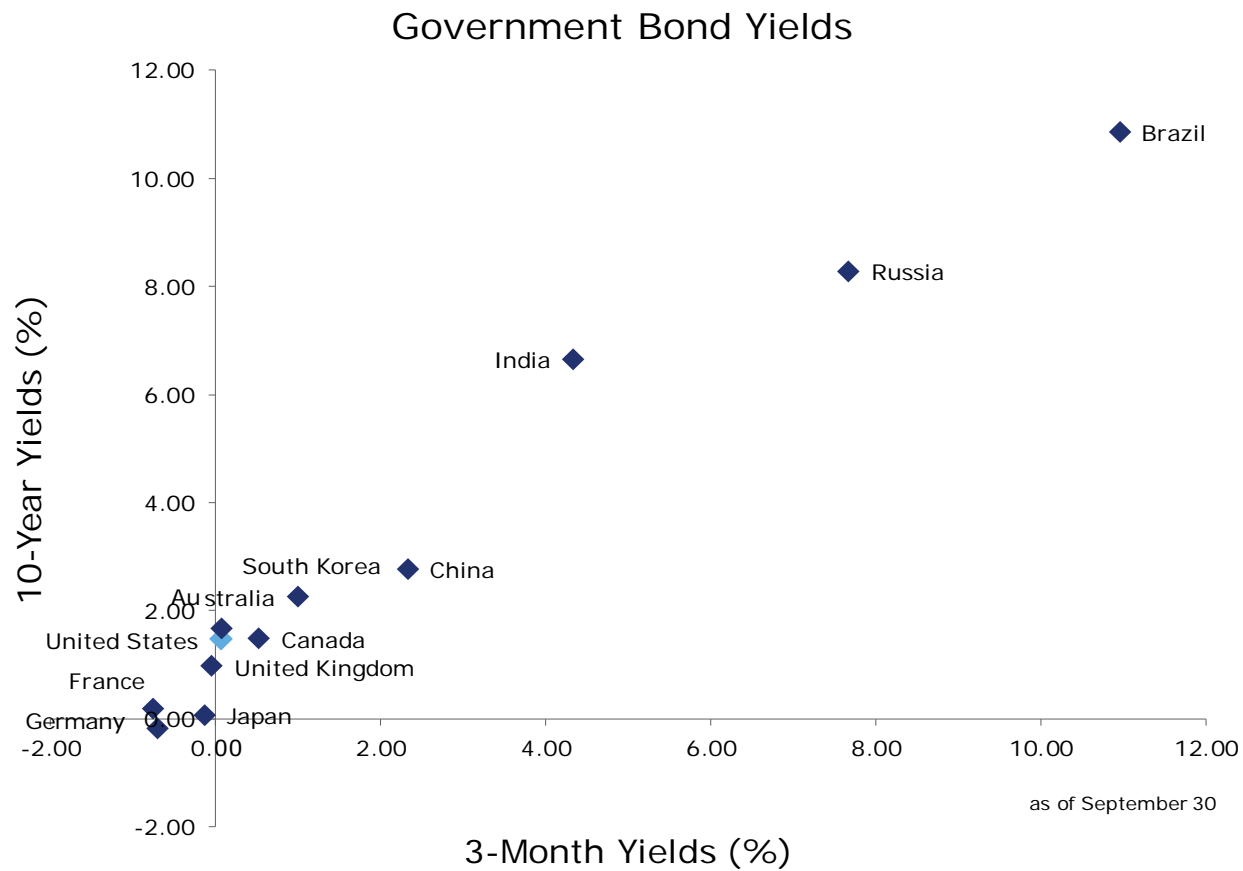
As of 12/31/2021	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
Developed Markets						
Bloomberg Global Aggregate xUS	-1.2	-7.0	-7.0	2.5	3.1	0.8
Bloomberg Global Aggregate xUS *	0.1	-1.4	-1.4	3.3	3.1	3.8
Bloomberg Global Inflation Linked xUS	2.9	0.7	0.7	7.2	5.5	3.6
Bloomberg Global Inflation Linked xUS *	3.5	4.9	4.9	7.1	5.2	5.8
Emerging Markets (Hard Currency)						
Bloomberg EM USD Aggregate	-0.5	-1.7	-1.7	5.8	4.6	5.1
Emerging Markets (Foreign Currency)						
Bloomberg EM Local Currency Gov't	0.4	-1.6	-1.6	4.3	4.6	2.5
Bloomberg EM Local Currency Gov't *	-0.4	-1.4	-1.4	3.4	3.3	2.9
Euro vs. Dollar	-1.8	-6.9	-6.9	-0.3	1.6	-1.3
Yen vs. Dollar	-3.3	-10.3	-10.3	-1.6	0.3	-3.9
Pound vs. Dollar	0.4	-1.0	-1.0	2.0	1.9	-1.4

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



Global Interest Rates

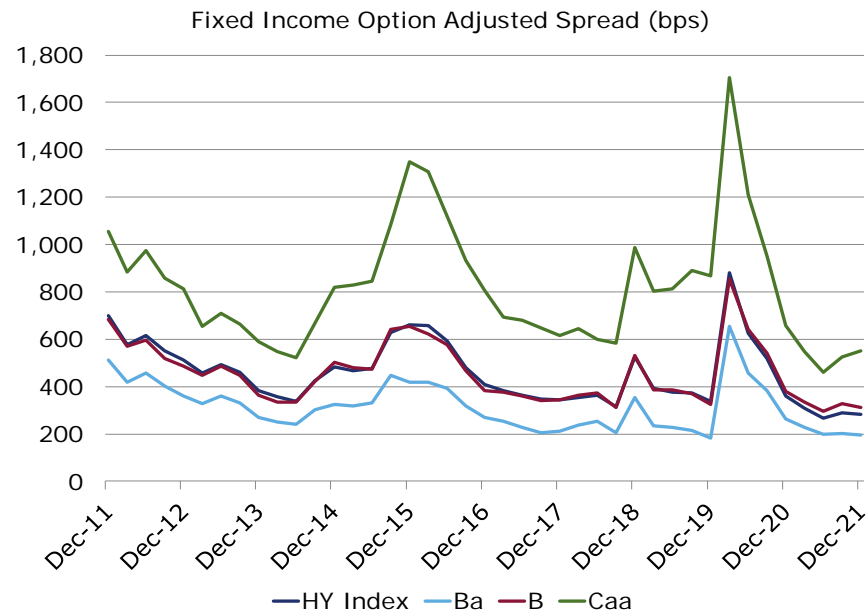
Negative rates found in Germany and France; low but positive rates, and at similar levels, in the U.S., Australia and in the U.K.



Data Sources: Bloomberg

High Yield Bond Market

As of 12/31/2021		YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		4.2	0.7	5.3	5.3	8.8	6.3	6.8
S&P LSTA Leveraged Loan		3.7	0.4	3.5	3.5	5.6	3.9	4.3
High Yield Quality Distribution	Weight							
Ba U.S. High Yield	52.8%	3.3	0.7	4.6	4.6	10.0	6.9	7.0
B U.S. High Yield	35.7%	4.6	0.8	4.8	4.8	8.0	5.8	6.3
Caa U.S. High Yield	11.3%	6.8	0.5	8.6	8.6	6.7	5.2	7.1
Ca to D U.S. High Yield	0.3%	27.8	-12.9	12.5	12.5	4.8	5.3	-1.4
Non-Rated U.S. High Yield	0.0%	0.0	0.0	0.0	0.0	-0.2	1.9	2.5



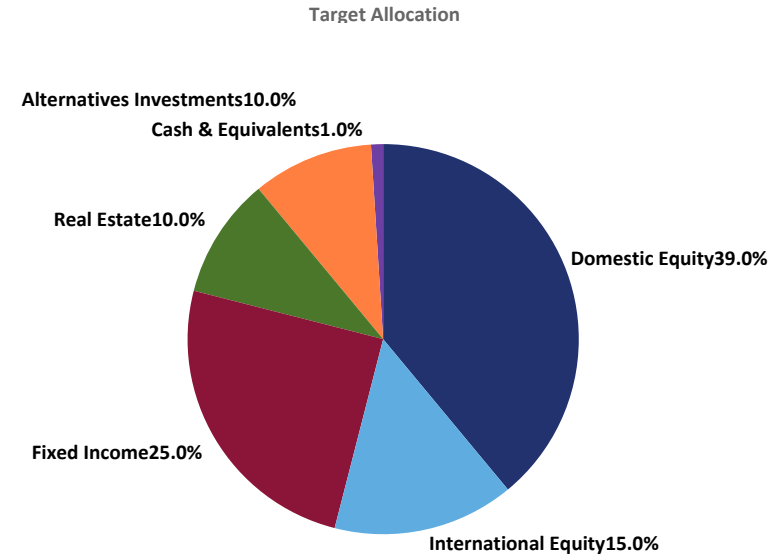
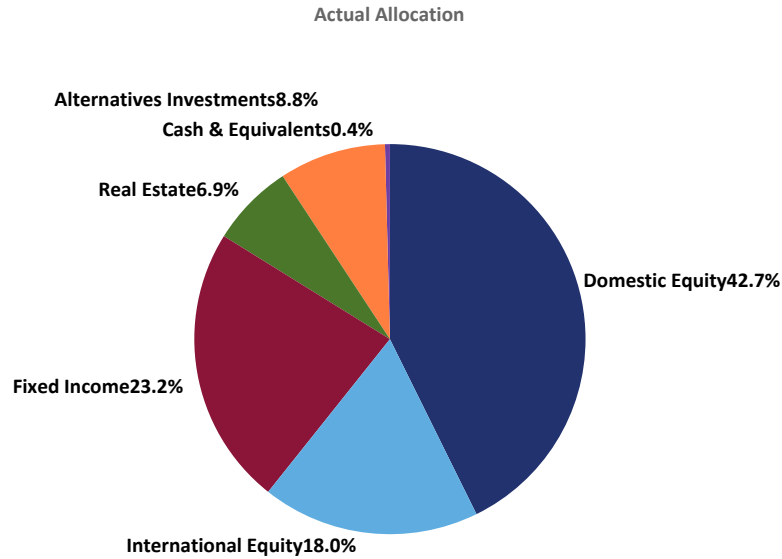
Data Sources: Bloomberg

Total Fund

Asset Allocation

Total Fund

Periods Ended As of December 31, 2021

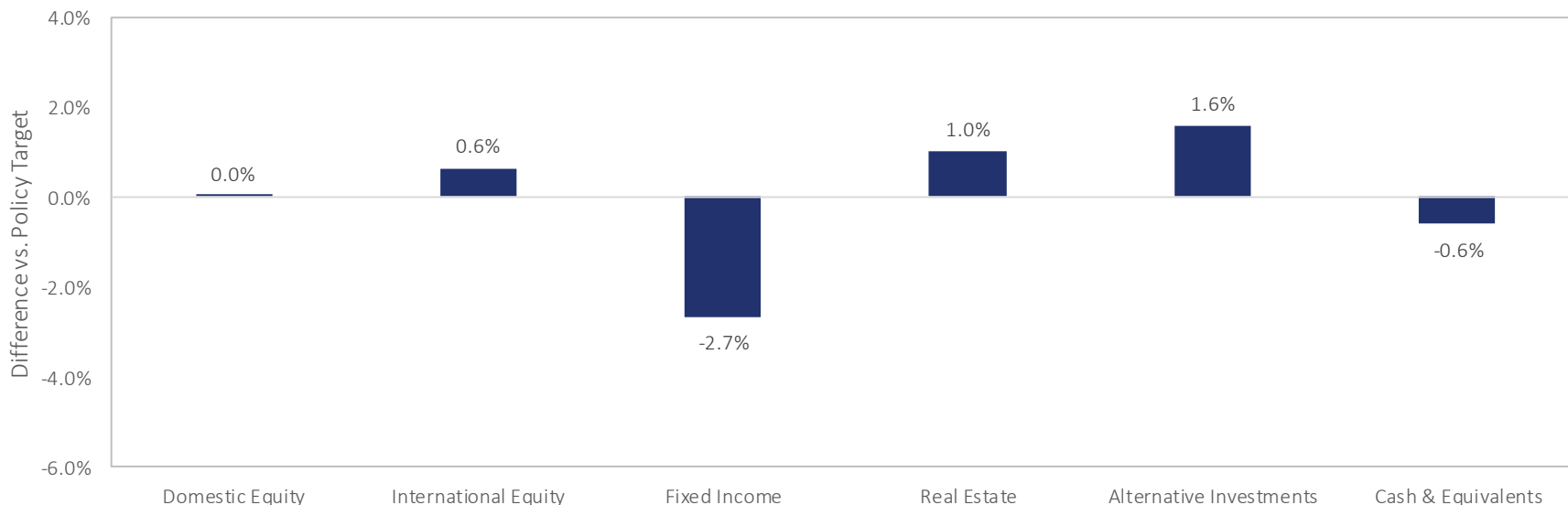


	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	56,806	100.0	100.0	0.0	
Domestic Equity	24,264	42.7	39.0	3.7	2,109
International Equity	10,213	18.0	15.0	3.0	1,693
Fixed Income	13,160	23.2	25.0	-1.8	-1,042
Real Estate	3,918	6.9	10.0	-3.1	-1,763
Alternatives Investments	5,015	8.8	10.0	-1.2	-666
Cash & Equivalents	236	0.4	1.0	-0.6	-332

Projected Deviations from the Benchmark

As of December 31, 2021

Projected Asset Allocation Difference vs. Target



- Includes committed, but unfunded amounts for real estate (\$1.55 billion) and alternatives (\$2.37 billion). Assumes real estate 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

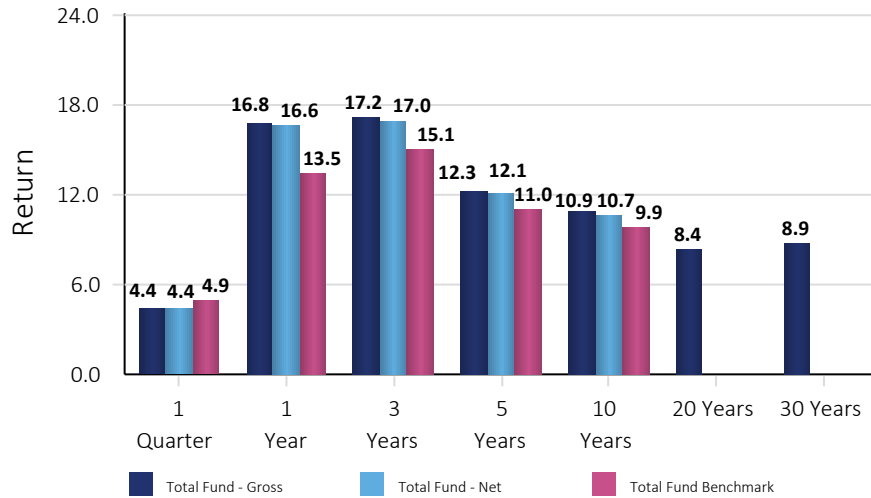
Private Equity Proxy: 60% Domestic Equity, 40% International Equity
 Real Estate Proxy: 50% Domestic Equity, 30% International Equity, 20% Fixed Income

Composite Performance Summary

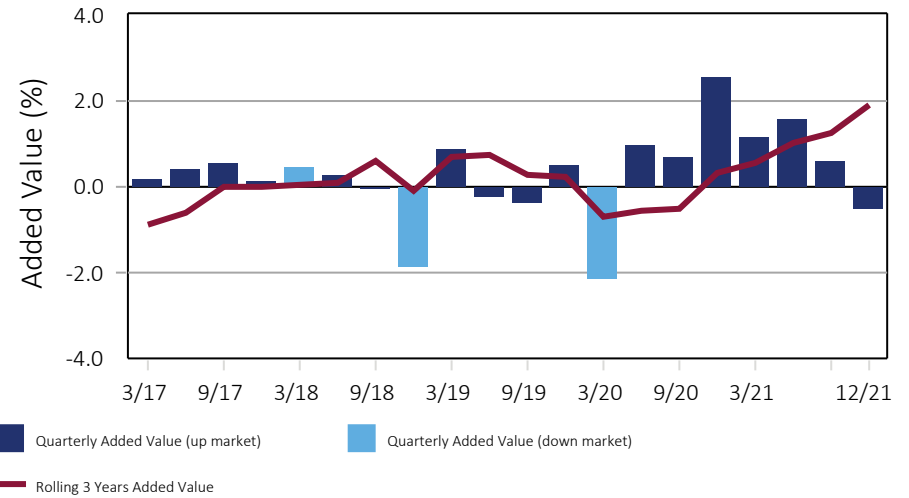
Total Fund

Periods Ended December 31, 2021

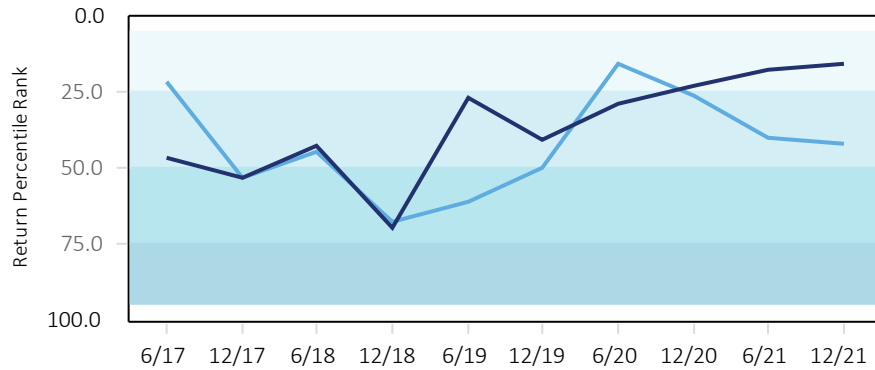
Comparative Performance



Added Value History

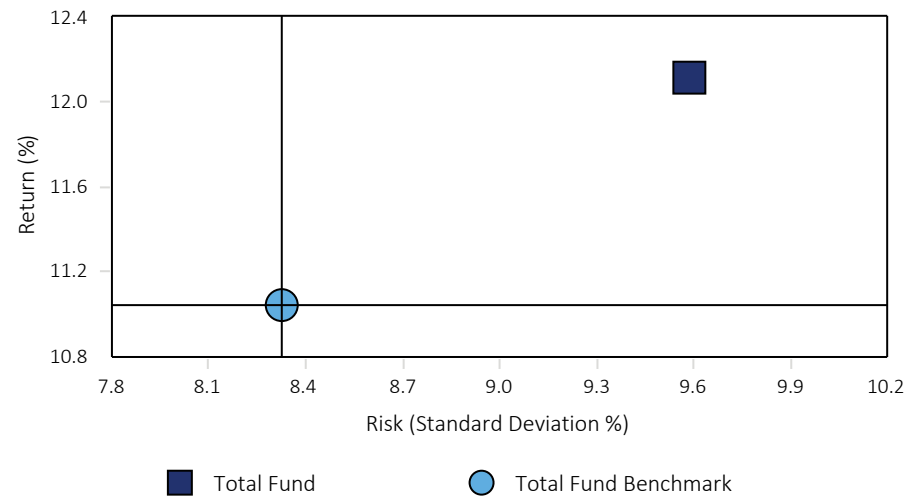


Rolling Percentile Rank : All Public Plans > \$1B - Total Fund



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

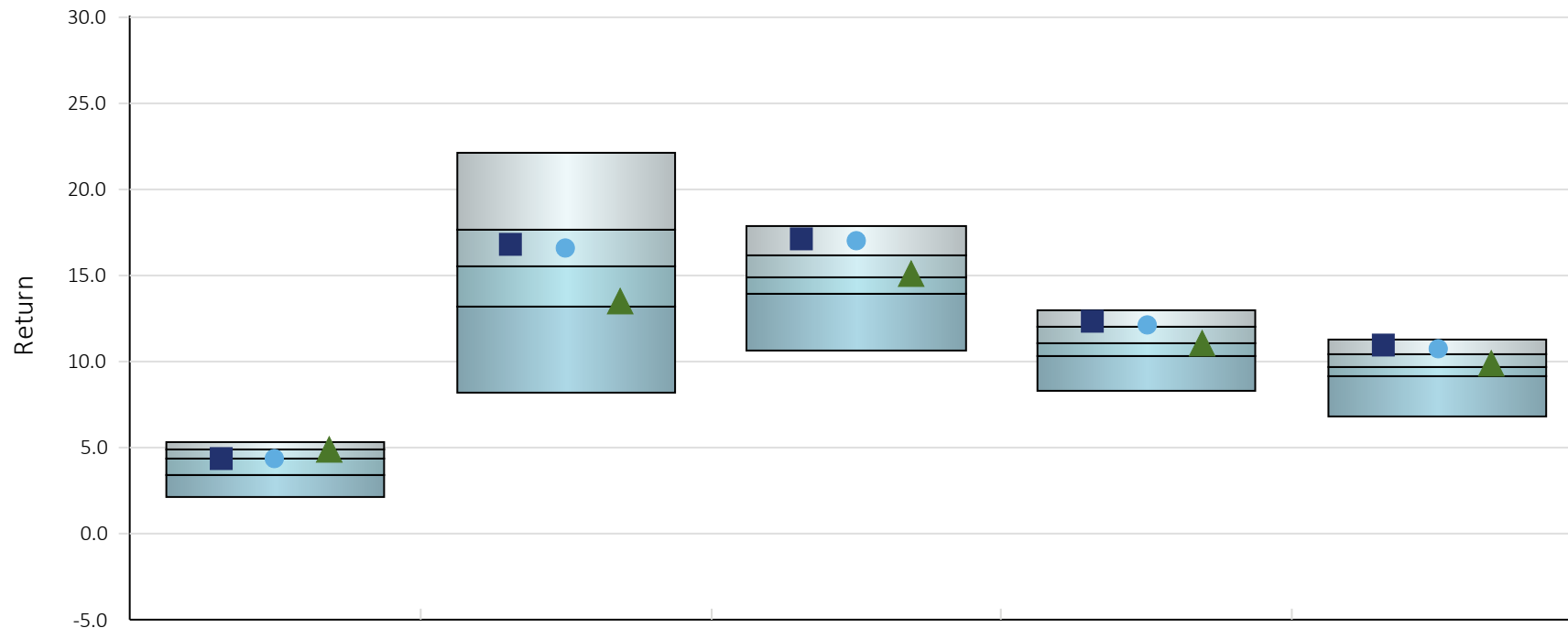
Risk and Return 01/01/17 - 12/31/21



Plan Sponsor Peer Group Analysis

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

Periods Ended December 31, 2021



	QTD	1 Year	3 Years	5 Years	10 Years
■ Total Fund	4.41 (44)	16.82 (32)	17.18 (13)	12.32 (15)	10.92 (12)
● Total Fund - Net	4.36 (47)	16.63 (37)	16.98 (16)	12.12 (23)	10.70 (16)
▲ Total Fund Benchmark	4.89 (26)	13.48 (70)	15.08 (42)	11.05 (49)	9.92 (42)
5th Percentile	5.37	22.12	17.83	12.99	11.29
1st Quartile	4.89	17.70	16.18	11.97	10.41
Median	4.33	15.54	14.93	11.03	9.69
3rd Quartile	3.44	13.22	13.89	10.30	9.16
95th Percentile	2.11	8.14	10.65	8.34	6.82
Population	92	91	91	90	88

Total Fund Benchmark = 39.0% Russell 3000 Index, 25.0% Blmbg Aggregate, 15.0% MSCI ACWI ex US, 10.0% NCREIF NFI-ODCE Val Wt Nt, 10.0% 9% Annually and 1.0% 3-month Treasury Bill.

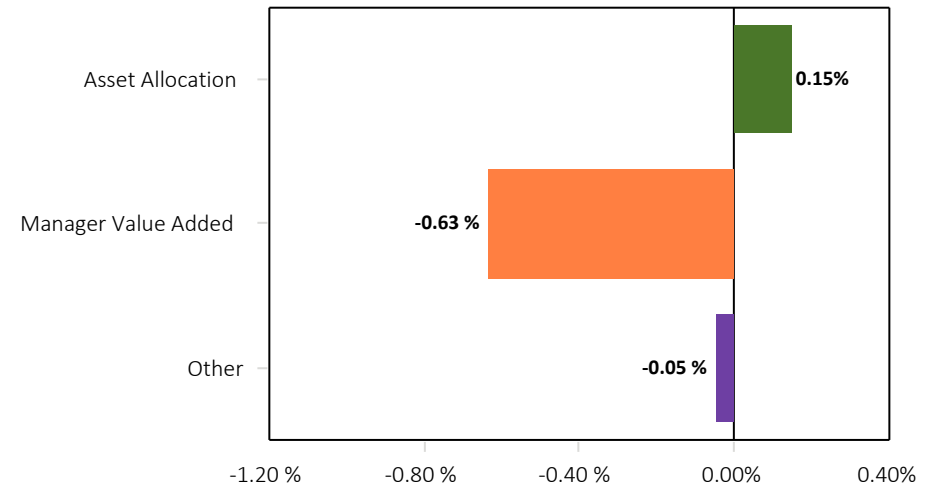
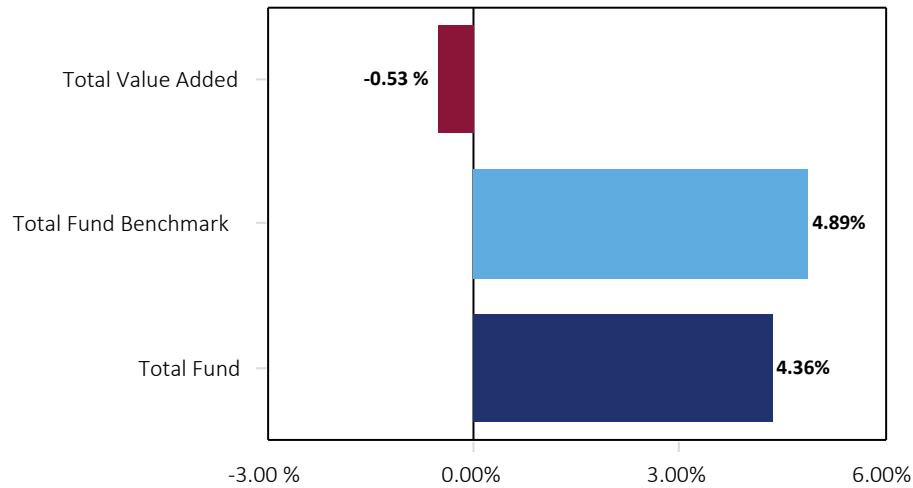
Total Fund Attribution

Total Fund

1 Quarter Ending December 31, 2021

Total Fund Performance

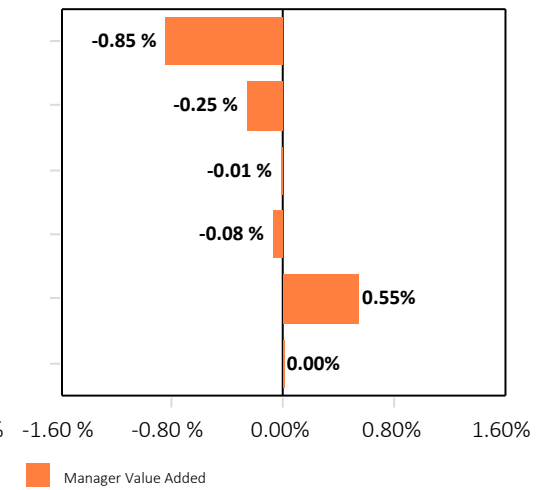
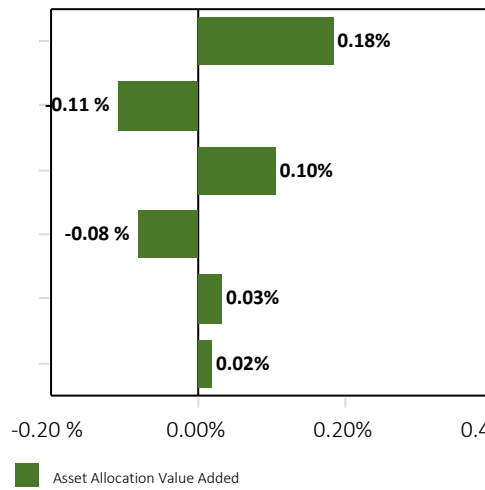
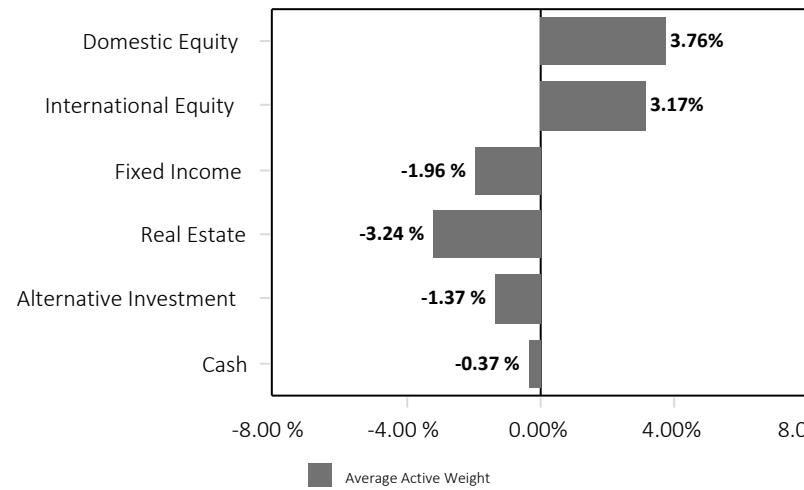
Total Value Added:-0.53 %



Asset Class Under or Overweighting

Asset Allocation Value Added:0.15%

Total Manager Value Added:-0.63 %



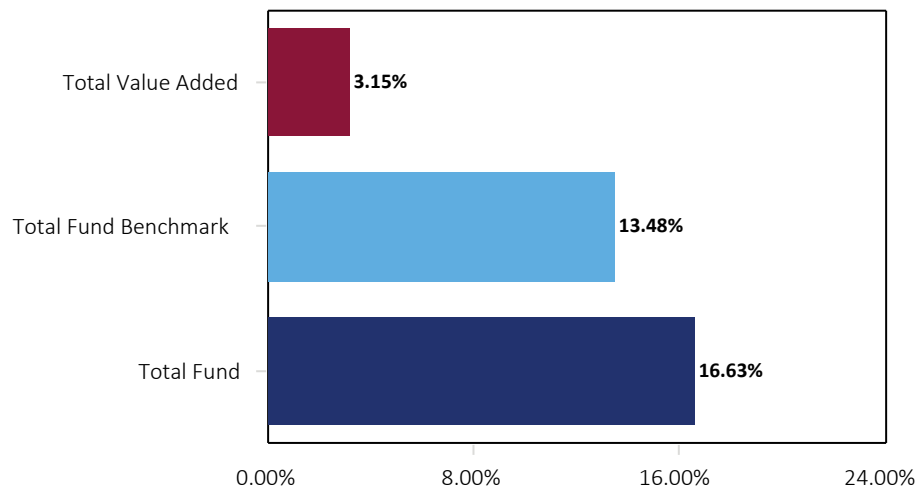
Total Fund Benchmark = 39.0% Russell 3000 Index, 25.0% Blmbg Aggregate, 15.0% MSCI ACWI ex US, 10.0% NCREIF NFI-ODCE Val Wt Nt, 10.0% 9% Annually and 1.0% 3-month Treasury Bill.

Total Fund Attribution

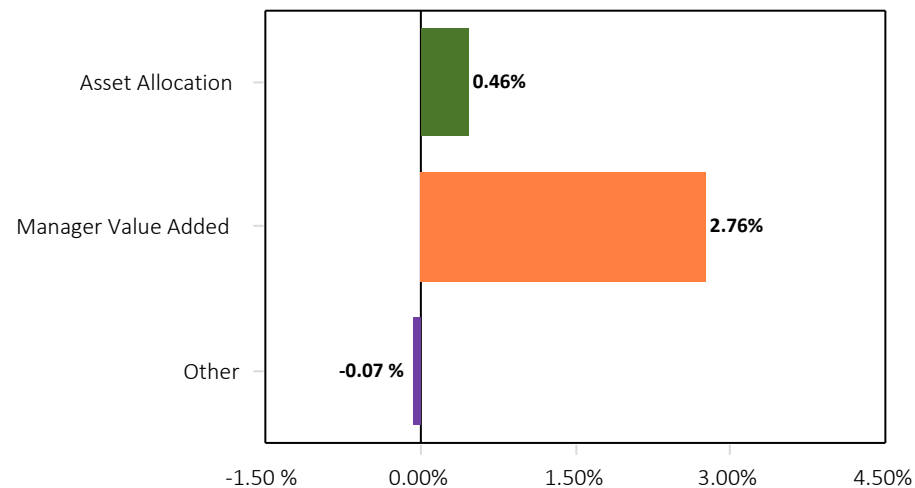
Total Fund

Year To Date Ending December 31, 2021

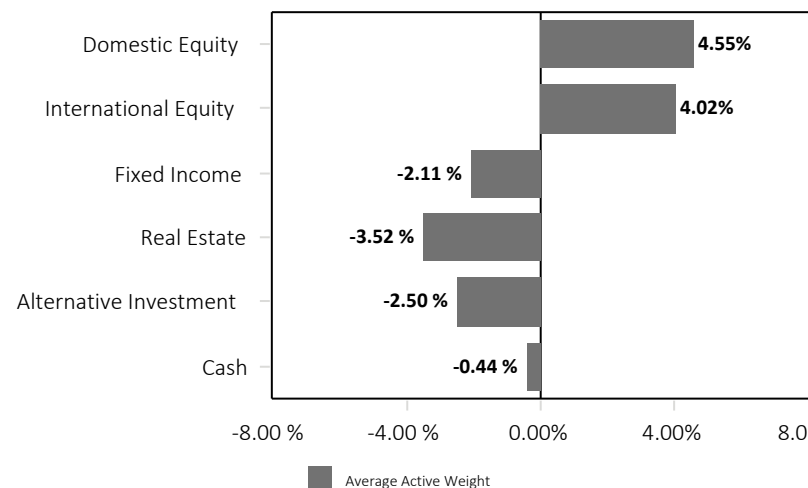
Total Fund Performance



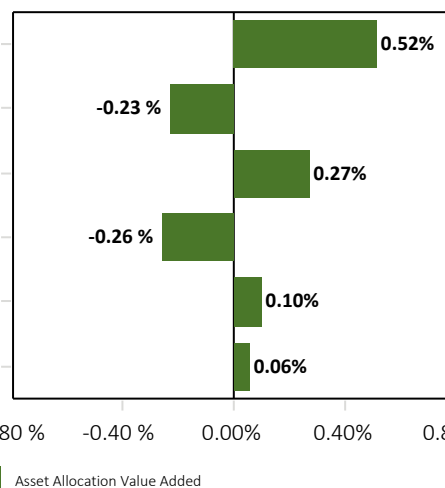
Total Value Added: 3.15%



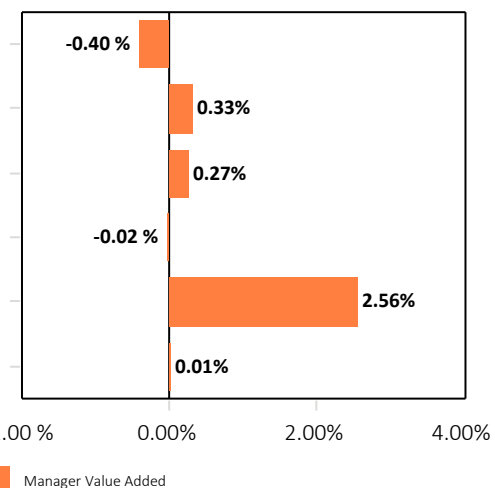
Asset Class Under or Overweighting



Asset Allocation Value Added: 0.46%



Total Manager Value Added: 2.76%



Total Fund Benchmark = 39.0% Russell 3000 Index, 25.0% Blmbg Aggregate, 15.0% MSCI ACWI ex US, 10.0% NCREIF NFI-ODCE Val Wt Nt, 10.0% 9% Annually and 1.0% 3-month Treasury Bill.

Asset Class Returns

Periods Ended December 31, 2021

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Total Fund	4.41	16.82	17.18	12.32	10.92	8.44	8.86	10.19	1/1/1982
Total Fund - Net	4.36	16.63	16.98	12.12	10.70				
Total Fund Benchmark	4.89	13.48	15.08	11.05	9.92				
Domestic Equity	7.29	24.89	25.36	17.27	16.06	9.99	11.01	12.23	1/1/1982
Domestic Equity - Net	7.25	24.69	25.15	17.05	15.81				
Blended Benchmark (U.S. Equity)	9.28	25.66	25.79	17.97	16.28	9.90	10.69		
U.S. Equity IMRF Custom Benchmark	9.42	25.68	24.35	16.18					
International Equity	0.59	9.78	15.54	11.12	9.13	7.83	7.76	8.08	9/1/1986
International Equity - Net	0.45	9.37	15.13	10.74	8.77				
MSCI AC World ex USA (Net)	1.82	7.82	13.18	9.61	7.28	6.80			
International Equity IMRF Custom Benchmark	1.34	7.30	13.17	9.67					
Fixed Income	0.00	-0.44	5.55	4.22	3.88	5.19	5.94	7.96	1/1/1982
Fixed Income - Net	-0.03	-0.53	5.44	4.09	3.73				
Blmbg. U.S. Aggregate	0.01	-1.55	4.79	3.57	2.90	4.33	5.29	7.42	
Fixed Income IMRF Custom Benchmark	0.07	-0.85	5.10	3.82					
Real Estate	6.90	21.95	11.74	10.72	11.17	8.02	6.31	5.94	5/1/1985
Blended Benchmark (Real Estate)	7.66	21.02	8.23	7.74	9.61	7.72	7.63	7.83	
Alternatives Investments	8.69	46.46	21.67	18.82	13.49	9.91	13.09	11.77	2/1/1986
Alternatives Investments - Net	8.69	46.44	21.62	18.72	13.26				
Alternatives Custom Benchmark	2.18	9.00	9.00	9.00	9.00	10.46	11.95	12.45	
Private Equity	9.35	54.15	25.42	22.61	16.16	11.97	15.85	14.10	2/1/1986
Alternatives Custom Benchmark	2.18	9.00	9.00	9.00	9.00	10.46	11.95	12.45	

Benchmark definitions are on the following pages.

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

Asset Class Returns

Periods Ended December 31, 2021

	Performance (%)								
	1 Quarter	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Agriculture	4.68	2.69	0.42	-0.63	7.51	7.19		6.69	10/1/1997
NCREIF Farmland Index	3.80	7.84	5.23	5.72	9.68	12.38		11.27	
Timberland	3.31	-2.72	0.89	0.71	2.11	3.33		6.88	10/1/1992
NCREIF Timberland Index	4.56	9.17	3.69	3.58	5.30	6.43		8.36	
Unlisted Infrastruct	1.80	11.68	12.38					12.10	4/1/2018
Alternatives Custom Benchmark	2.18	9.00	9.00					9.00	
Cash	0.64	2.44	2.86	2.52	1.40	1.43	3.03	3.75	7/1/1986
90 Day US Treasury Bill	0.01	0.05	0.99	1.14	0.61	1.25	2.41	3.12	

Asset Class Returns

Periods Ended December 31, 2021

	Performance (%)										
	YTD	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Total Fund	16.82	14.98	19.77	-4.23	16.02	8.01	0.53	6.15	20.20	13.84	-0.29
Total Fund - Net	16.63	14.79	19.57	-4.40	15.78	7.77	0.29	5.90	19.94	13.58	-0.50
Total Fund Benchmark	13.48	13.16	18.68	-3.12	14.37	7.89	1.37	7.33	15.84	12.19	1.47
Domestic Equity	24.89	22.07	29.23	-6.08	19.83	12.62	0.04	9.81	37.65	17.39	-0.74
Domestic Equity - Net	24.69	21.86	29.00	-6.25	19.59	12.35	-0.22	9.54	37.32	17.09	-0.99
Blended Benchmark (U.S. Equity)	25.66	20.89	31.02	-5.24	21.13	12.74	0.48	12.47	33.47	16.38	1.08
International Equity	9.78	13.52	23.76	-14.13	27.95	3.56	-1.90	-2.80	20.24	19.11	-12.27
International Equity - Net	9.37	13.08	23.39	-14.41	27.52	3.21	-2.23	-3.10	19.87	18.70	-12.50
MSCI AC World ex USA (Net)	7.82	10.65	21.51	-14.20	27.19	4.50	-5.66	-3.87	15.29	16.83	-13.71
Fixed Income	-0.44	7.87	9.50	-0.24	4.82	4.87	0.25	5.97	-0.59	7.41	7.60
Fixed Income - Net	-0.53	7.75	9.37	-0.39	4.66	4.71	0.10	5.81	-0.75	7.24	7.44
Blmbg. U.S. Aggregate	-1.55	7.51	8.72	0.01	3.54	2.65	0.55	5.97	-2.02	4.21	7.84
Real Estate	21.95	4.20	9.81	8.36	10.03	8.97	12.54	13.02	10.82	12.85	12.29
Real Estate - Net	21.88	4.16	9.76	8.36	10.03	8.97	12.46	13.02	10.82	12.85	12.29
Blended Benchmark (Real Estate)	21.02	0.34	4.39	7.36	6.66	7.79	13.95	11.46	12.90	11.54	15.26
Alternatives Investments	46.46	12.31	9.48	17.32	12.09	5.32	6.90	11.63	12.11	6.24	5.05
Alternative Investments - Net	46.44	12.27	9.43	17.14	11.91	5.00	6.47	11.16	11.86	6.00	4.84
Alternatives Custom Benchmark	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Private Equity	54.15	14.50	11.78	21.46	15.61	8.60	8.41	13.72	14.13	5.61	12.33
Alternatives Custom Benchmark	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Agriculture	2.69	4.69	-5.82	0.28	-4.58	-0.47	20.18	24.73	25.68	13.55	9.70
NCREIF Farmland Index	7.84	3.08	4.81	6.74	6.19	7.09	10.35	12.63	20.91	18.58	15.16
Timberland	-2.72	4.51	1.00	-3.62	4.68	-4.58	4.99	12.83	9.14	-3.59	3.20
NCREIF Timberland Index	9.17	0.81	1.30	3.21	3.63	2.59	4.97	10.48	9.69	7.75	1.57
Unlisted Infrastruct	11.68	15.90	9.65								
Alternatives Custom Benchmark	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 December 31, 2021

	Performance (%)										
	YTD	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Cash	2.44	2.56	3.59	2.36	1.67	0.63	0.29	0.17	0.11	0.23	0.24
90 Day US Treasury Bill	0.05	0.67	2.28	1.87	0.86	0.25	0.03	0.04	0.05	0.08	0.08

Benchmark Definitions

Account Name	From Date	To Date	Benchmark
Domestic Equity Blended	1/1/2015	Present	100% Russell 3000 Index
Benchmark	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)** 100%
Benchmark	1/1/2007	12/31/2012	100% NPI + 1%
	1/1/2005	12/31/2016	100% Consumer Price Index + 5%
Alternatives Custom	7/1/2010	Present	100% Annualized rate of 9.0%
Benchmark	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.

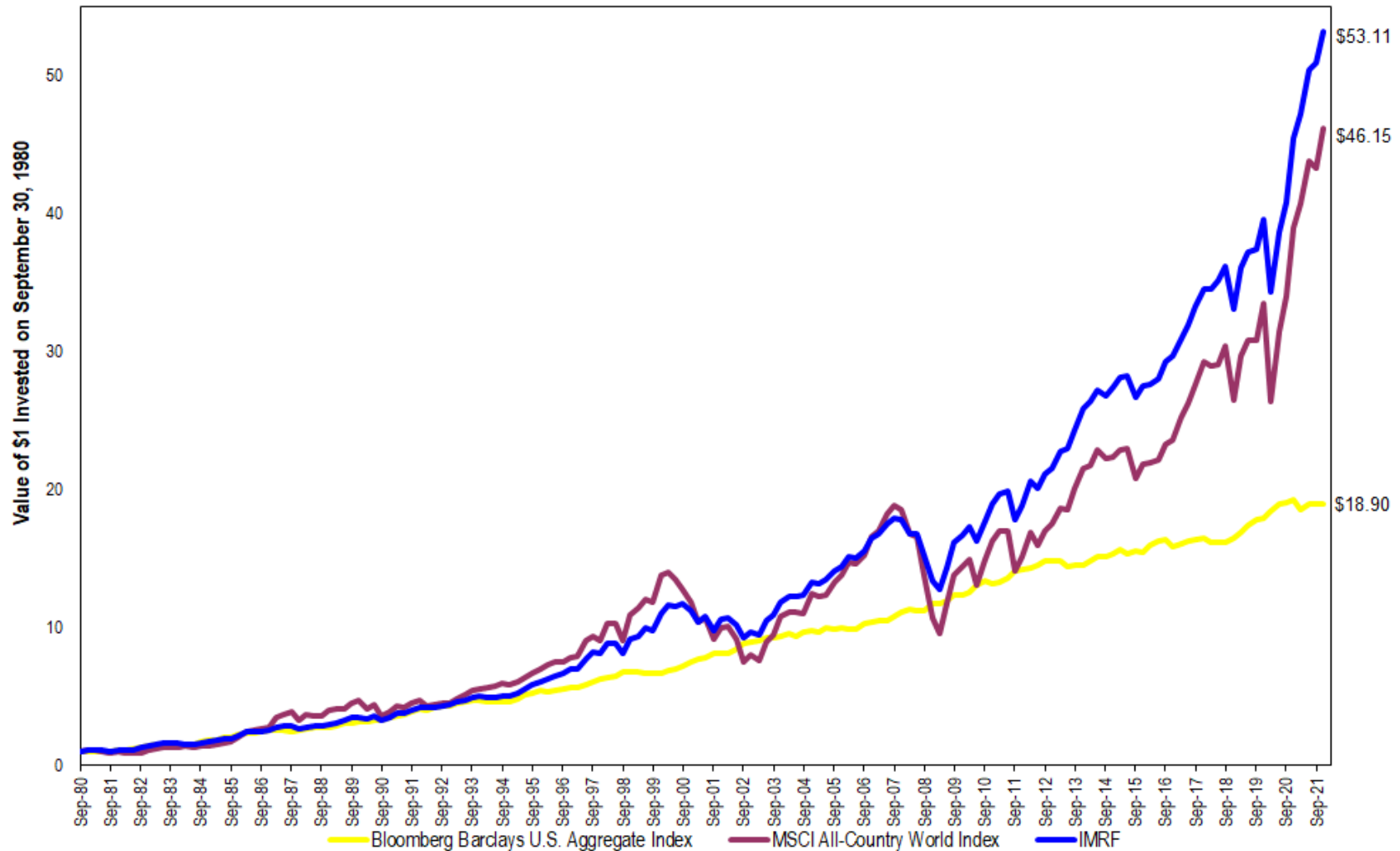
**ODCE returns are updated quarterly.

Benchmark Definitions

Account Name	From Date	To Date	Benchmark
Total Fund Benchmark	1/1/2021	Present	The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset class: 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 December 31, 2021



Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Domestic Equity	23,823,936,761	43.42	24,263,588,229	42.71
Large Cap Growth	9,097,310,568	16.58	8,966,966,722	15.79
NTGI S&P 500 Growth	3,759,065,046	6.85	4,155,109,642	7.31
Sands Capital	3,134,975,842	5.71	2,352,249,613	4.14
Xponance Russell 1000 G	2,203,269,679	4.02	2,459,607,467	4.33
Large Cap Value	4,741,665,170	8.64	5,044,517,266	8.88
Dodge & Cox	1,797,754,542	3.28	1,895,588,088	3.34
LSV Asset	1,457,680,469	2.66	1,543,467,846	2.72
NTGI S&P 500 Value	1,486,230,159	2.71	1,605,461,332	2.83
Large Cap Pass. Core	3,125,171,219	5.70	3,255,297,472	5.73
NTGI MarketCap Idx.	3,125,171,219	5.70	3,255,297,472	5.73
Factor Diversity Strategies	1,255,128,306	2.29	1,685,001,206	2.97
U.S. Large Cap FDP-GSAM	1,255,128,306	2.29	1,685,001,206	2.97
Quantitative Factor Strategies	1,470,400,831	2.68	1,895,279,823	3.34
Quantitative US Equity - SciBeta	1,470,400,831	2.68	1,895,279,823	3.34
Small Cap Growth	1,039,742,351	1.89	860,226,828	1.51
Frontier Capital	838,557,020	1.53	860,226,828	1.51
FIAM Small Cap	201,185,331	0.37		0.00
Small Cap Value	2,075,333,670	3.78	1,532,024,888	2.70
Channing	326,073,284	0.59	342,867,129	0.60
DFA Small Cap Val.	822,130,374	1.50	541,157,352	0.95
William Blair Small Cap Value	927,130,011	1.69	648,000,407	1.14

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Micro Cap	70,013,054	0.13	281	0.00
DFA Micro Cap (9-10)	70,013,054	0.13	281	0.00
Public Real Assets	949,171,592	1.73	1,024,266,931	1.80
Brookfield	181,361,077	0.33	193,837,513	0.34
Cohen & Steers	767,810,515	1.40	830,429,418	1.46
International Equity	10,206,160,855	18.60	10,213,451,507	17.98
Intl Large Cap Growth	1,806,557,256	3.29	1,775,800,868	3.13
EARNEST Part. Intl	626,468,256	1.14	633,247,732	1.11
William Blair	1,180,088,999	2.15	1,142,553,136	2.01
Intl Large Cap Value	1,383,392,712	2.52	1,391,290,279	2.45
Brandes Investment	606,476,291	1.11	606,793,349	1.07
Mondrian	634,645,890	1.16	642,066,919	1.13
Lazard	142,270,532	0.26	142,430,011	0.25
Intl Large Cap Core	4,702,338,776	8.57	4,788,394,708	8.43
Arrowstreet Capital	1,092,980,252	1.99	1,108,573,867	1.95
Brown Capital	659,844,686	1.20	667,668,782	1.18
GlobeFlex Capital	872,450,610	1.59	888,587,956	1.56
Xponance Intl EQ	106,599,287	0.19	108,889,659	0.19
NTGI MSCI EAFE		0.00		0.00
NTGI ACWI ex US Index Fund	1,969,603,898	3.59	2,013,848,731	3.55
Progress Intl Equity	740,326	0.00	705,844	0.00
Transition Account	119,717	0.00	119,870	0.00

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Intl All Cap Developed	169,525,470	0.31	178,770,019	0.31
Ativo International	169,525,470	0.31	178,770,019	0.31
International Small Cap	721,812,535	1.32	721,707,021	1.27
Franklin Templeton	255,537,841	0.47	257,093,975	0.45
William Blair IntSC	466,274,694	0.85	464,613,046	0.82
Emerging Mkt Equity	1,422,534,105	2.59	1,357,488,612	2.39
Genesis Asset Mngrs.	1,422,534,105	2.59	1,357,488,612	2.39

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Fixed Income	12,226,422,984	22.28	13,159,667,791	23.17
Domestic Fixed Core	3,829,440,865	6.98	4,300,008,101	7.57
Attucks Fixed Income	99,754,469	0.18	99,778,376	0.18
Brandes FI Core	374,691,783	0.68	374,372,550	0.66
EARNEST Partners	1,024,056,560	1.87	1,024,001,258	1.80
Xponance Yield Advantage Agg.	1,111,078,480	2.02	1,113,223,206	1.96
Garcia Hamilton	1,086,780,228	1.98	1,088,146,596	1.92
Ramirez Asset Management	133,079,345	0.24	600,486,115	1.06
Domestic Fixed Passive Core	3,656,423,449	6.66	3,654,995,037	6.43
NTGI Blmbg Agg.	1,817,507,000	3.31	1,817,007,757	3.20
BlackRock US Debt I	1,838,916,449	3.35	1,837,987,280	3.24
Domestic Fixed Core Plus	2,940,543,448	5.36	3,407,077,560	6.00
LM Capital Group FI	960,213,087	1.75	959,042,988	1.69
Progress Inv. FI	1,668	0.00	1,650	0.00
BMO - TCH	662,419,279	1.21	661,962,167	1.17
Western Asset	1,131,457,873	2.06	1,130,766,162	1.99
Longfellow Core Plus	186,451,541	0.34	655,304,594	1.15
Bank Loans	735,502,538	1.34	734,087,200	1.29
Barings Global Loan Fund	735,502,538	1.34	734,087,200	1.29
Emerging Markets Debt	228,557,725	0.42	223,383,314	0.39
Standish-Mellon EMD	228,557,725	0.42	223,383,314	0.39
High Yield	835,954,960	1.52	839,906,376	1.48
MacKay Shields	835,939,057	1.52	839,715,134	1.48

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
FIAM High Yield	15,903	0.00	191,242	0.00

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Real Estate	3,645,191,985	6.64	3,917,928,441	6.90
Real Estate Core Cmp	1,961,523,098	3.57	2,126,788,357	3.74
TA Assoc. Buckhead	743,116,202	1.35	817,726,253	1.44
Barings Euro Core Property	145,789,868	0.27	145,452,455	0.26
Blackstone Property Euro	161,281,845	0.29	162,085,823	0.29
INVESCO Core Real Estate	212,036,109	0.39	239,614,476	0.42
INVESCO European real estate	57,943,196	0.11	58,120,223	0.10
AEW Core Property Tr	243,116,484	0.44	252,746,615	0.44
CBRE Core Partners	229,724,994	0.42	282,528,121	0.50
JPM Strategic Property Fund	168,514,400	0.31	168,514,391	0.30
RE Non-Core Cmp	1,683,668,887	3.07	1,791,140,084	3.15
Artemis MWBE Spruce	295,920,495	0.54	311,927,332	0.55
Franklin T. EMREFF	6,865,209	0.01	4,776,924	0.01
Security Capital	70,192,975	0.13	69,456,897	0.12
Dune II	10,567,951	0.02	9,280,716	0.02
Non-Core Real Estate Funds	1,072,091,930	1.95	1,165,632,735	2.05
Non-Core Intl Real Estate	227,943,279	0.42	229,978,936	0.40
Almanac ARS V	87,048	0.00	86,544	0.00
Alternatives Investments	4,636,171,451	8.45	5,014,866,919	8.83
Absolute Return	117,832	0.00	115,896	0.00
Aurora Investment	117,832	0.00	115,896	0.00
Private Equity	4,061,245,044	7.40	4,415,124,940	7.77

Investment Manager Asset Allocation

Periods Ended December 31, 2021

	Sep-2021		Dec-2021	
	\$	%	\$	%
Abbott S/A Comp.	521,595,639	0.95	536,294,967	0.94
Muller Monroe MPEFF	522,930	0.00	520,309	0.00
Pantheon S/A Comp.	396,576,222	0.72	430,276,910	0.76
Private Equity Fund - Domestic	2,507,130,404	4.57	2,749,033,772	4.84
Private Equity Fund - International	544,426,113	0.99	556,840,434	0.98
Oakbrook Opportunities Fund	90,993,736	0.17	142,158,549	0.25
Private Credit	190,976,623	0.35	197,053,744	0.35
Private Credit Fund - Domestic	190,976,623	0.35	197,053,744	0.35
Agriculture	218,013,625	0.40	228,223,321	0.40
Premiere Partners IV	218,013,625	0.40	228,223,321	0.40
Timberland	67,577,675	0.12	65,271,284	0.11
Forest Investment	67,577,675	0.12	65,271,284	0.11
Unlisted Infrastructure	98,240,652	0.18	109,077,734	0.19
Unlisted Infrastructure Funds	98,240,652	0.18	109,077,734	0.19
Cash & Equivalents	336,529,831	0.61	236,077,684	0.42
Total Fund	54,874,413,867	100.00	56,805,580,572	100.00

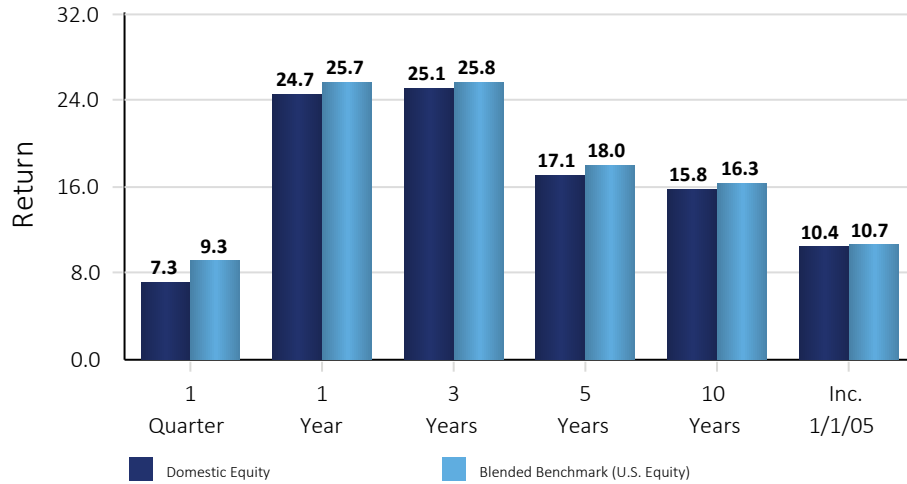
Domestic Equity

Composite Performance Summary

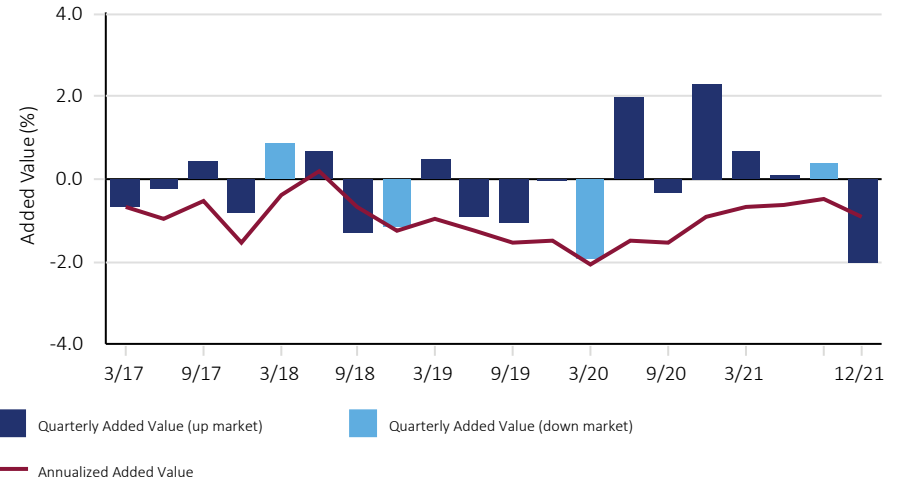
Domestic Equity

Periods Ended December 31, 2021

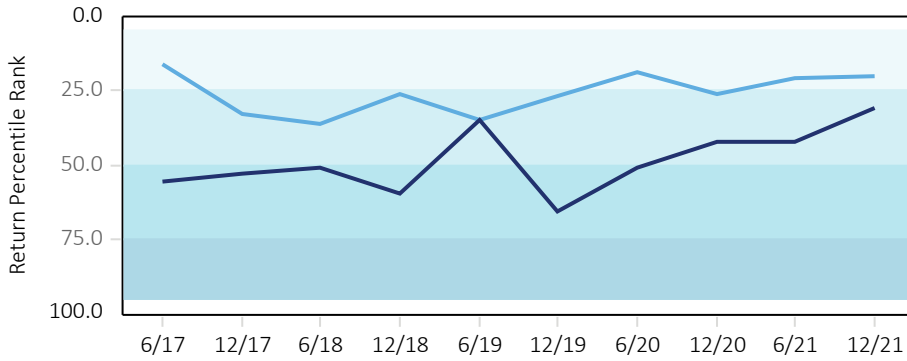
Comparative Performance



Added Value History

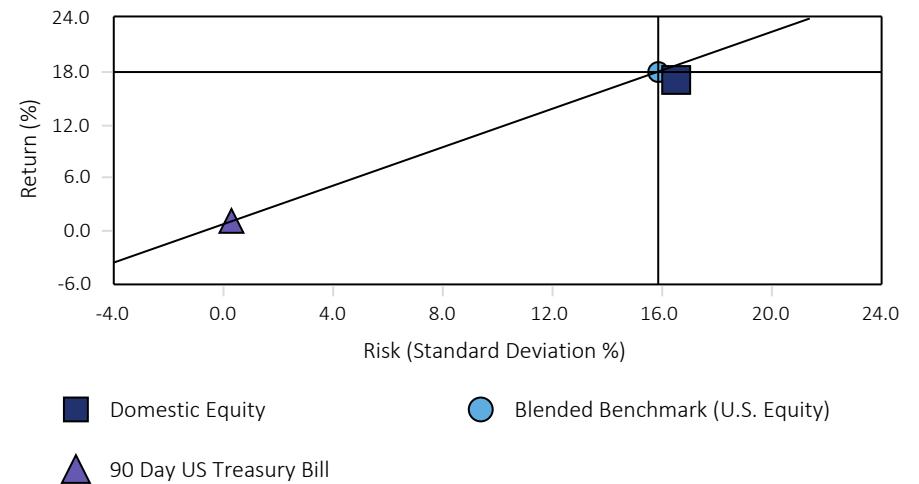


Rolling Percentile Rank: All Public Plans > \$1B-US Equity Segment



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

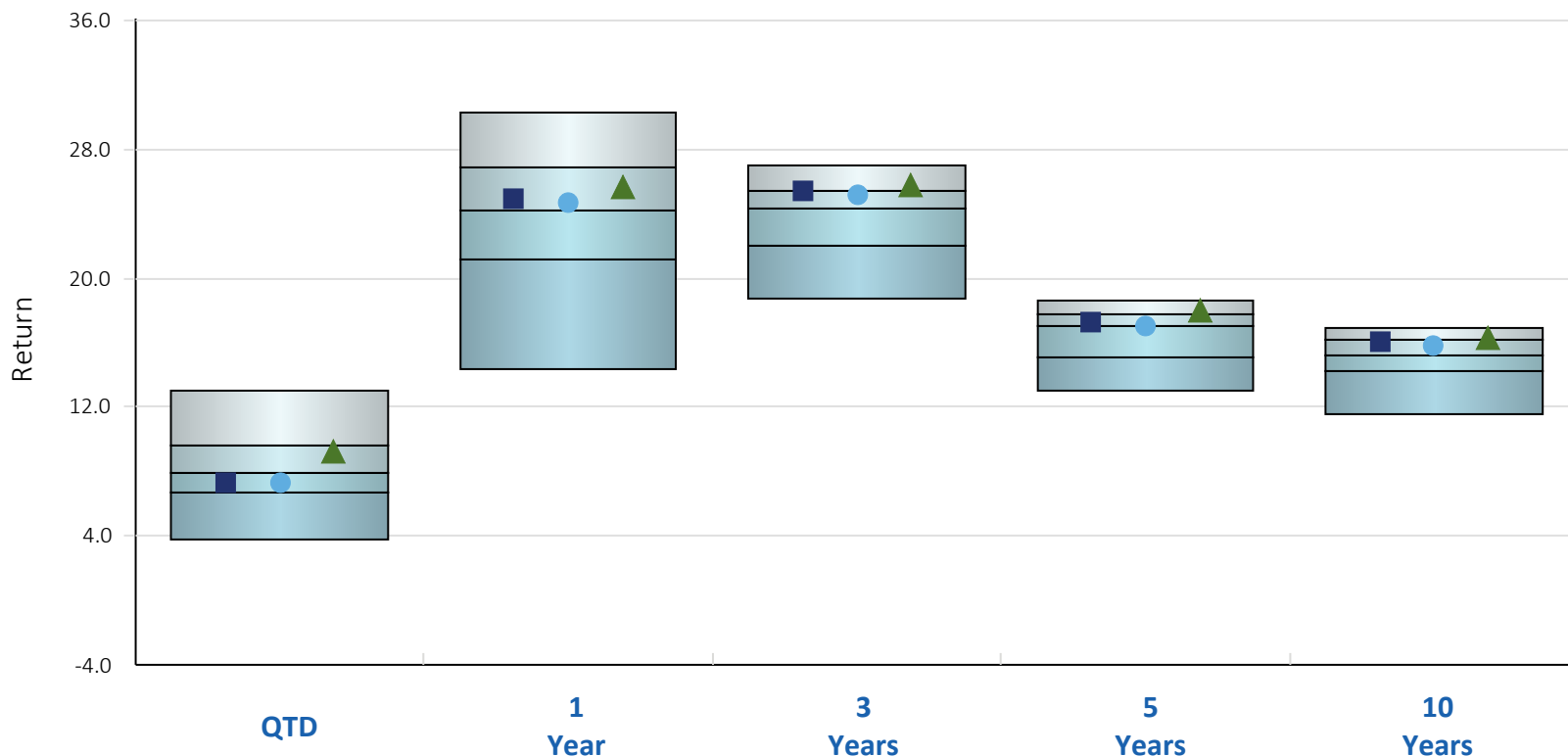
Risk and Return 01/1/17 - 12/31/21



Plan Sponsor Peer Group Analysis

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

Periods Ended December 31, 2021



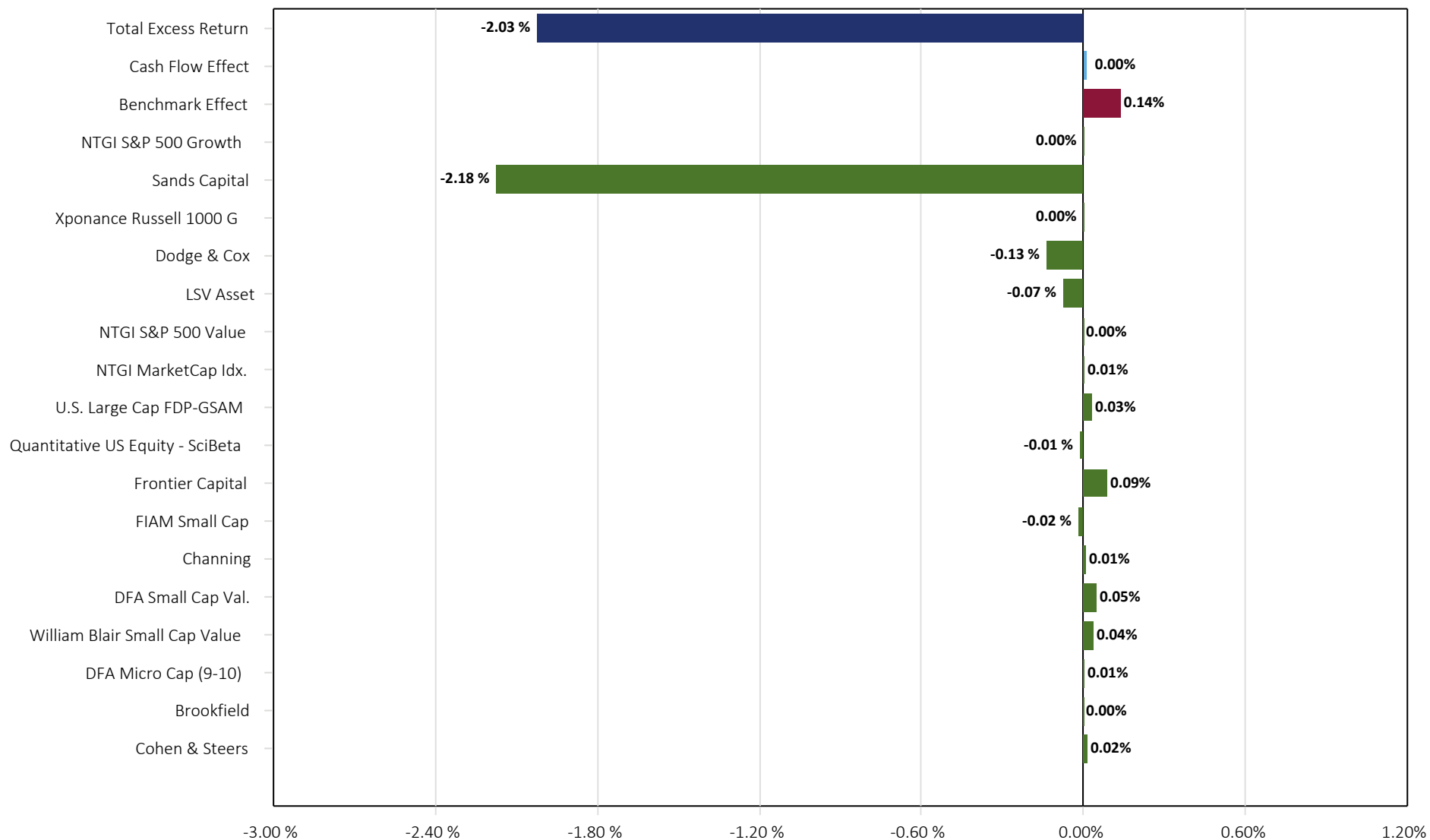
Domestic Equity	7.29 (66)	24.89 (39)	25.36 (27)	17.27 (38)	16.06 (28)
Domestic Equity - Net	7.25 (67)	24.69 (40)	25.15 (31)	17.05 (50)	15.81 (33)
Blended Benchmark (U.S. Equity)	9.28 (28)	25.66 (36)	25.79 (20)	17.97 (19)	16.28 (20)
5th Percentile	12.99	30.28	26.97	18.65	16.87
1st Quartile	9.57	26.86	25.39	17.79	16.17
Median	7.92	24.16	24.36	17.05	15.25
3rd Quartile	6.76	21.19	22.01	15.04	14.27
95th Percentile	3.84	14.36	18.77	13.04	11.57
Population	47	44	38	36	28

Asset Class Attribution

Domestic Equity

Periods Ended 1 Quarter Ending December 31, 2021

1 Quarter



Performance

Domestic Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Domestic Equity	24,263,588,229	7.29 (66)	24.89 (39)	25.36 (27)	17.27 (38)	16.06 (28)	12.23	1/1/1982
Domestic Equity - Net		7.25 (67)	24.69 (40)	25.15 (31)	17.05 (50)	15.81 (33)		
Blended Benchmark (U.S. Equity)		9.28 (28)	25.66 (36)	25.79 (20)	17.97 (19)	16.28 (20)		
Russell 3000 Index		9.28 (28)	25.66 (36)	25.79 (20)	17.97 (19)	16.30 (19)	12.15	
U.S. Equity IMRF Custom Benchmark		9.42 (27)	25.68 (36)	24.35 (51)	16.18 (69)			
Large Cap Equity	18,951,782,665	7.46 (85)	24.63 (71)	26.49 (14)	18.67 (13)	16.74 (8)	11.99 (38)	1/1/1982
Large Cap Equity - Net		7.43 (85)	24.52 (71)	26.38 (15)	18.56 (14)	16.60 (10)		
Russell 1000 Index		9.78 (54)	26.45 (52)	26.21 (17)	18.43 (18)	16.54 (12)	12.30 (24)	
Large Cap Growth	8,966,966,722	6.66 (61)	22.11 (50)	34.17 (12)	26.35 (12)	19.60 (18)	13.09 (19)	1/1/1982
Large Cap Growth - Net		6.63 (62)	22.00 (51)	34.06 (13)	26.22 (13)	19.44 (20)		
LCG Blended Benchmark*		11.64 (11)	27.60 (17)	34.08 (12)	25.32 (20)	19.79 (15)		
Russell 1000 Growth Index		11.64 (11)	27.60 (17)	34.08 (12)	25.32 (20)	19.79 (15)	12.32 (34)	
NTGI S&P 500 Growth	4,155,109,642	13.36 (3)	31.99 (3)	32.15 (27)	24.05 (35)	19.22 (23)	10.43 (24)	8/1/2001
NTGI S&P 500 Growth - Net		13.36 (3)	31.98 (3)	32.14 (27)	24.04 (35)	19.21 (23)		
S&P 500 Growth		13.37 (3)	32.01 (3)	32.20 (27)	24.11 (34)	19.23 (23)	10.42 (24)	
Xponance Russell 1000 G	2,459,607,467	11.63 (11)	27.58 (18)	34.05 (13)			24.27 (14)	10/1/2018
Xponance Russell 1000 G - Net		11.63 (11)	27.56 (18)	34.02 (13)			24.25 (14)	
Russell 1000 Growth Index		11.64 (11)	27.60 (17)	34.08 (12)			24.29 (14)	
Sands Capital	2,352,249,613	-7.02 (99)	5.20 (96)	34.03 (13)	28.40 (5)	20.71 (7)	14.66 (4)	11/1/2003
Sands Capital - Net		-7.09 (99)	4.96 (96)	33.75 (15)	28.13 (6)	20.45 (9)		
LCG Blended Benchmark*		11.64 (11)	27.60 (17)	34.08 (12)	25.32 (20)	19.79 (15)	12.66 (22)	
Russell 1000 Growth Index		11.64 (11)	27.60 (17)	34.08 (12)	25.32 (20)	19.79 (15)	12.70 (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 December 31, 2021

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Large Cap Value	5,044,517,266	6.96 (78)	28.93 (21)	18.66 (35)	12.35 (35)	14.21 (10)	10.66 (75)	10/1/1982
Large Cap Value - Net		6.92 (78)	28.74 (23)	18.49 (38)	12.18 (38)	14.02 (13)		
LCV Blended Benchmark**		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)		
Russell 1000 Value Index		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)	12.01 (8)	
Dodge & Cox	1,895,588,088	6.08 (89)	32.20 (7)	20.73 (15)	14.27 (12)	15.74 (2)	10.75 (6)	9/1/2003
Dodge & Cox - Net		6.03 (89)	31.94 (7)	20.48 (17)	14.03 (13)	15.50 (2)		
LCV Blended Benchmark**		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)	9.15 (44)	
Russell 1000 Value Index		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)	9.30 (37)	
LSV Asset	1,543,467,846	6.64 (83)	28.96 (21)	17.21 (60)	11.15 (60)	14.09 (12)	11.33 (6)	2/1/2003
LSV Asset - Net		6.57 (84)	28.67 (23)	16.93 (64)	10.89 (65)	13.82 (15)		
LCV Blended Benchmark**		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)	9.94 (39)	
Russell 1000 Value Index		7.77 (58)	25.16 (62)	17.64 (52)	11.16 (60)	12.97 (36)	9.95 (38)	
NTGI S&P 500 Value	1,605,461,332	8.34 (49)	24.90 (66)	18.75 (34)	11.99 (42)	13.38 (24)	6.89 (65)	8/1/1999
NTGI S&P 500 Value - Net		8.34 (49)	24.90 (66)	18.74 (34)	11.98 (42)	13.37 (24)		
S&P 500 Value		8.31 (49)	24.90 (66)	18.65 (35)	11.90 (43)	13.29 (27)	6.85 (66)	
Large Cap Pass. Core	3,255,297,472	9.18 (67)	25.71 (68)	25.75 (46)	17.96 (54)	16.32 (53)	11.90 (72)	1/1/1985
Large Cap Pass. Core - Net		9.18 (67)	25.70 (68)	25.74 (46)	17.95 (54)	16.31 (53)		
Dow Jones US Total Stock Market Index		9.14 (69)	25.66 (71)	25.72 (46)	17.92 (54)	16.24 (54)		
NTGI MarketCap Idx.	3,255,297,472	9.18 (67)	25.71 (68)	25.75 (46)	17.96 (54)	16.32 (53)	11.69 (71)	2/1/1985
NTGI MarketCap Idx. - Net		9.18 (67)	25.70 (68)	25.74 (46)	17.95 (54)	16.31 (53)		
Dow Jones US Total Stock Market Index		9.14 (69)	25.66 (71)	25.72 (46)	17.92 (54)	16.24 (54)		

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

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

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

Performance

Domestic Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Factor Diversity Strategies	1,685,001,206	9.97	25.70				28.73	8/18/2020
U.S. Large Cap FDP-GSAM	1,685,001,206	9.97	25.70				28.73	8/18/2020
U.S. Large Cap FDP-GSAM - Net		9.96	25.63				28.65	
Solactive GBS U.S. 1000 Index		9.51	26.19				28.88	
GSAM Active Beta US. Large Cap FDC Index		9.97	25.77				28.67	
Quantitative Factor Strategies	1,895,279,823	9.47	26.05				17.24	9/17/2019
Quantitative US Equity - SciBeta	1,895,279,823	9.47	26.05				17.24	9/17/2019
Quantitative US Equity - SciBeta - Net		9.45	25.97				16.99	
SciBeta US Hi-Fctr-Intst Div Multi-Beta Multi-Strat Index		9.66	24.80				16.33	

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

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

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

Performance

Domestic Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Small Cap	2,392,251,997	4.95 (58)	26.72 (41)	22.81 (38)	13.14 (48)	14.17 (53)	12.62 (48)	7/1/1988
Small Cap Composite - Net		4.78 (60)	25.96 (44)	22.10 (44)	12.54 (51)	13.56 (64)		
Russell 2000 Index		2.14 (82)	14.82 (79)	20.02 (67)	12.02 (59)	13.23 (72)	9.94 (96)	
Small Cap Growth	860,226,828	2.68 (47)	17.15 (26)	28.76 (25)	18.16 (45)	16.30 (31)	13.79 (3)	7/1/1988
Small Cap Growth - Net		2.47 (50)	16.07 (29)	27.76 (32)	17.43 (49)	15.63 (45)		
Russell 2000 Growth Index		0.01 (72)	2.83 (81)	21.17 (79)	14.53 (76)	14.14 (73)	8.79 (98)	
Frontier Capital	860,226,828	2.58 (48)	16.16 (29)	29.76 (20)	22.28 (19)	17.14 (19)	14.16 (1)	8/1/1988
Frontier Capital - Net		2.45 (50)	15.13 (33)	28.58 (26)	21.38 (25)	16.39 (30)		
Russell 2000 Growth Index		0.01 (72)	2.83 (81)	21.17 (79)	14.53 (76)	14.14 (73)	8.88 (98)	
Small Cap Value	1,532,024,888	6.33 (53)	32.25 (44)	20.24 (22)	10.39 (21)	13.35 (16)	12.13 (8)	9/1/1989
Small Cap Value - Net		6.18 (55)	31.68 (48)	19.66 (28)	9.84 (34)	12.80 (24)		
Russell 2000 Value Index		4.36 (82)	28.27 (64)	17.99 (60)	9.07 (51)	12.03 (43)	10.39 (52)	
Channing	342,867,129	5.15 (75)	20.53 (98)	21.24 (16)	9.90 (33)	13.64 (11)	11.94 (12)	7/1/2011
Channing - Net		5.02 (77)	19.97 (98)	20.65 (20)	9.36 (44)	13.04 (19)	11.35 (20)	
Russell 2000 Value Index		4.36 (82)	28.27 (64)	17.99 (60)	9.07 (51)	12.03 (43)	10.44 (43)	
DFA Small Cap Val.	541,157,352	6.68 (46)	40.60 (6)	20.15 (22)	9.72 (36)	13.47 (14)	12.46 (2)	2/1/1996
DFA Small Cap Val. - Net		6.53 (49)	39.98 (7)	19.59 (28)	9.18 (48)	12.93 (22)		
Russell 2000 Value Index		4.36 (82)	28.27 (64)	17.99 (60)	9.07 (51)	12.03 (43)	10.02 (74)	

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

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

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

Performance

Domestic Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
William Blair Small Cap Value	648,000,407	6.75 (44)	30.17 (56)	20.09 (23)	11.35 (12)	13.86 (9)	12.00 (12)	5/1/1999
Inv. Couns. Maryland - Net		6.60 (48)	29.64 (57)	19.50 (29)	10.79 (16)	13.33 (16)		
Russell 2000 Value Index		4.36 (82)	28.27 (64)	17.99 (60)	9.07 (51)	12.03 (43)	9.67 (69)	
Micro Cap	281							7/1/1984
Micro Cap - Net								
Russell Microcap Index								
DFA Micro Cap (9-10)	281							8/1/1987
DFA Micro Cap (9-10) - Net								
Russell 2000 Index								
Russell 2000 Value Index								
Public Real Assets	1,024,266,931	7.91	18.27	13.19			8.39	8/1/2017
Public Real Assets - Net		7.83	17.84	12.72			7.96	
Public Real Assets Benchmark***		7.26	16.65	11.31			6.45	
Brookfield	193,837,513	6.88	21.06	11.86			6.05	8/1/2017
Brookfield - Net		6.74	20.45	11.28			5.52	
Dow Jones Brookfield Global Infrastructure Composi		6.70	20.23	11.24			5.27	
Cohen & Steers	830,429,418	8.16	17.32	13.83			9.53	8/1/2017
Cohen & Steers - Net		8.08	16.94	13.40			9.13	
FTSE GLOBAL CORE INFRASTRUCTURE 50/50 INDEX (Net)		7.54	14.88	11.31			7.01	

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

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

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

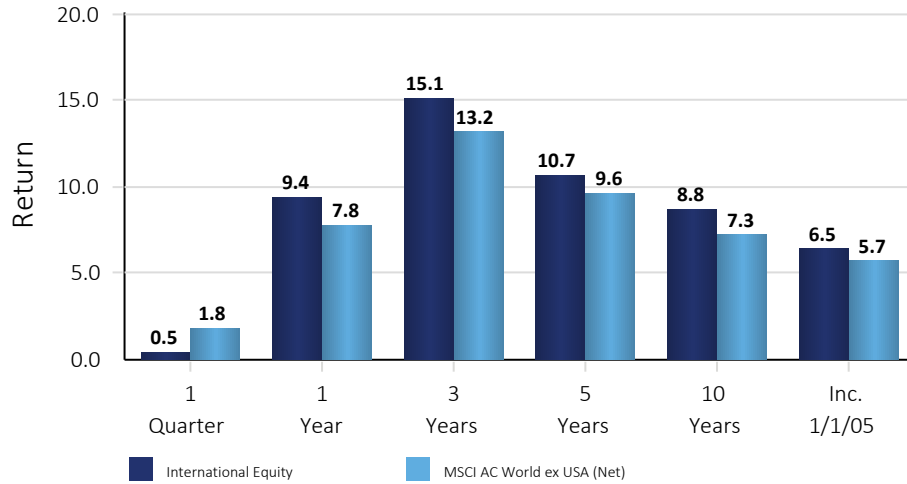
International Equity

Composite Performance Summary

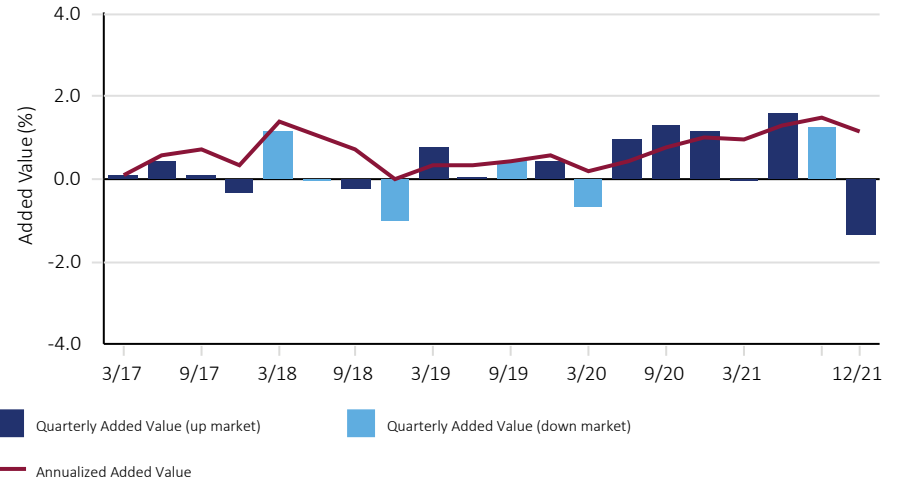
International Equity

Periods Ended December 31, 2021

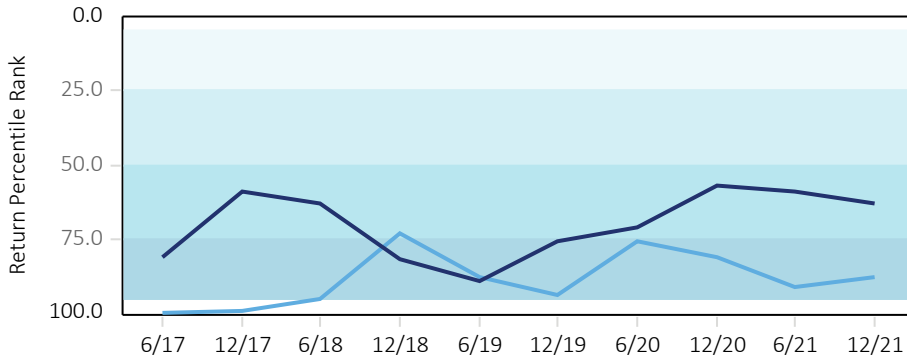
Comparative Performance



Added Value History

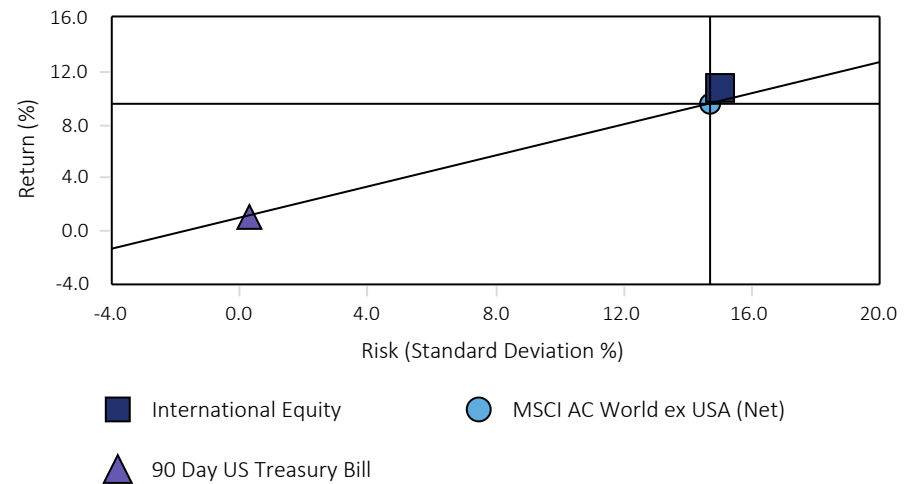


Rolling Percentile Rank: All Public Plans > \$1B-Intl. Equity Segment



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
International Equity	10	0 (0%)	0 (0%)	6 (60%)	4 (40%)
Benchmark	10	0 (0%)	0 (0%)	1 (10%)	9 (90%)

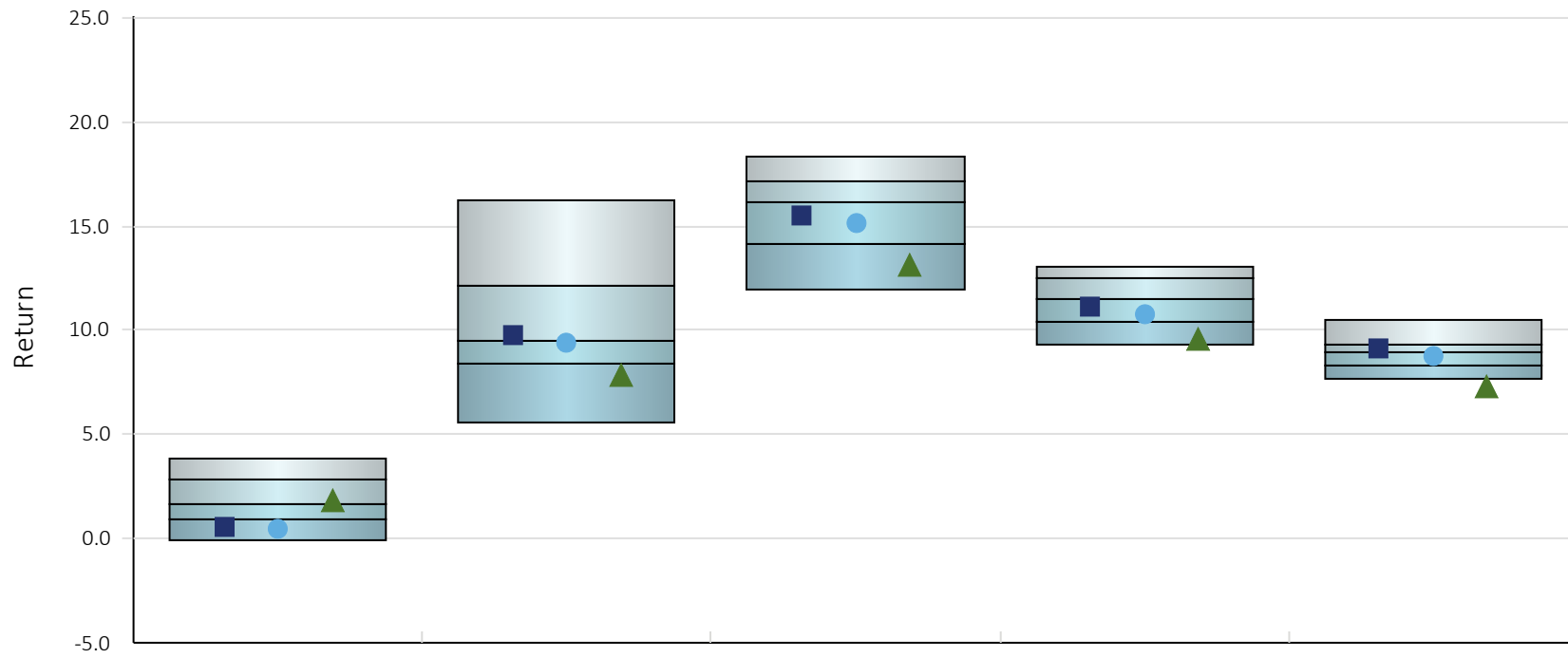
Risk and Return 01/1/17 - 12/31/21



Plan Sponsor Peer Group Analysis

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

Periods Ended December 31, 2021



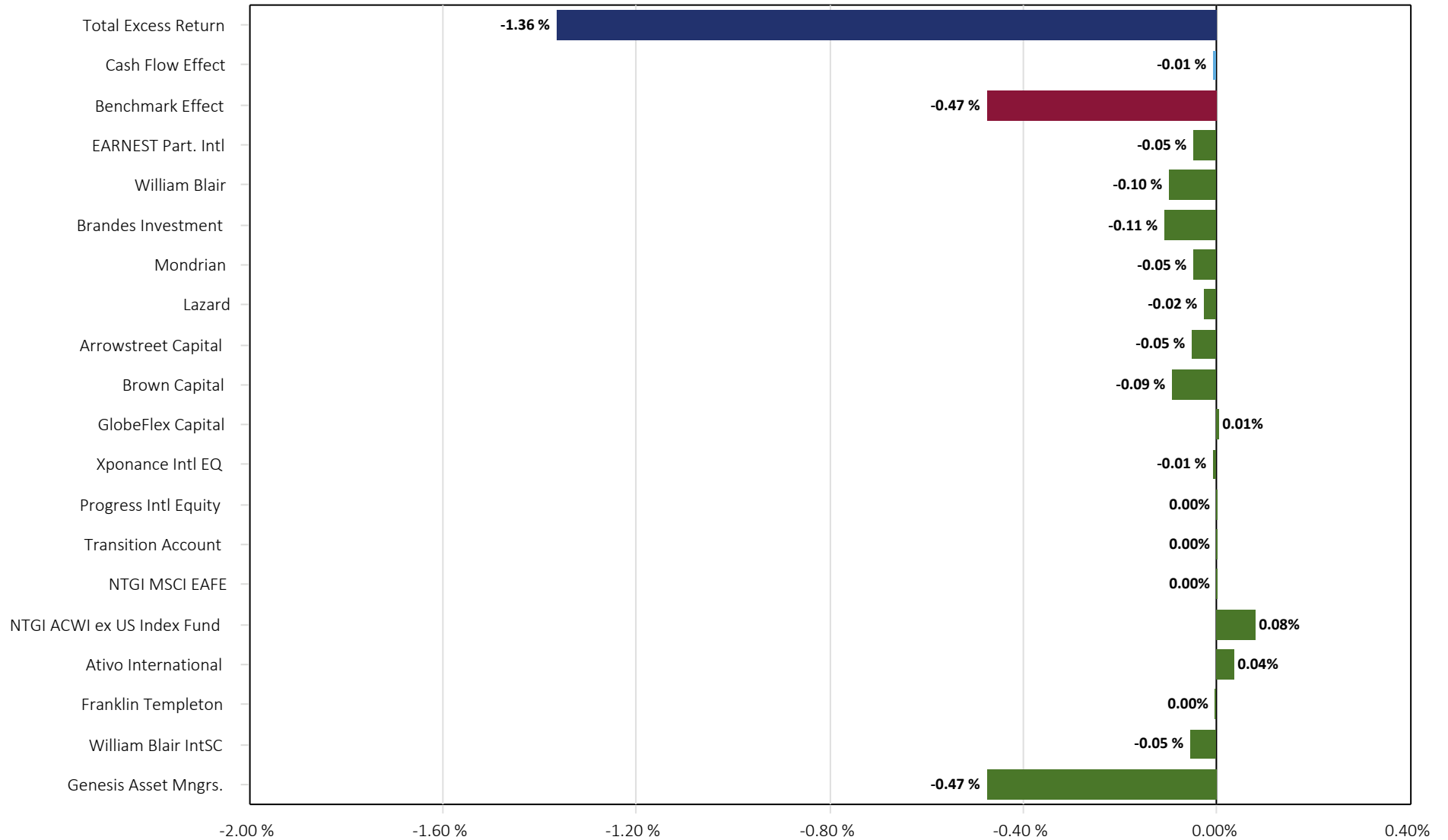
	QTD	1 Year	3 Years	5 Years	10 Years
■ International Equity	0.59 (81)	9.78 (48)	15.54 (59)	11.12 (59)	9.13 (36)
● International Equity - Net	0.45 (87)	9.37 (52)	15.13 (63)	10.74 (63)	8.77 (59)
▲ MSCI AC World ex USA (Net)	1.82 (47)	7.82 (81)	13.18 (88)	9.61 (93)	7.28 (100)
5th Percentile	3.81	16.25	18.38	13.05	10.54
1st Quartile	2.85	12.14	17.19	12.55	9.33
Median	1.66	9.50	16.15	11.54	8.94
3rd Quartile	0.97	8.36	14.13	10.45	8.31
95th Percentile	-0.04	5.59	12.01	9.33	7.69
Population	46	45	41	41	30

Asset Class Attribution

International Equity

Periods Ended 1 Quarter Ending December 31, 2021

1 Quarter



Performance

International Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
International Equity	10,213,451,507	0.59 (81)	9.78 (48)	15.54 (59)	11.12 (59)	9.13 (36)	8.08	9/1/1986
International Equity - Net		0.45 (87)	9.37 (52)	15.13 (63)	10.74 (63)	8.77 (59)		
MSCI AC World ex USA (Net)		1.82 (47)	7.82 (81)	13.18 (88)	9.61 (93)	7.28 (100)		
International Equity IMRF Custom Benchmark		1.34 (62)	7.30 (87)	13.17 (88)	9.67 (93)			
Intl Large Cap Equity	7,955,485,855	1.46 (76)	12.60 (34)	15.67 (57)	11.14 (55)	9.26 (51)	8.10 (99)	9/1/1986
Intl LargeCap Equity - Net		1.32 (77)	12.25 (39)	15.34 (59)	10.83 (58)	8.96 (58)		
MSCI AC World ex USA (Net)		1.82 (70)	7.82 (75)	13.18 (75)	9.61 (69)	7.28 (88)		
Intl Large Cap Grwth	1,775,800,868	1.09 (79)	11.63 (42)	20.89 (37)	13.93 (56)	10.24 (67)	9.52 (51)	9/1/2002
Intl Large Cap Grwth - Net		0.96 (80)	11.25 (47)	20.53 (41)	13.62 (59)	9.89 (70)		
MSCI AC World ex USA (Net)		1.82 (67)	7.82 (71)	13.18 (95)	9.61 (93)	7.28 (100)	7.68 (100)	
EARNEST Part. Intl	633,247,732	1.08 (79)	14.55 (20)	15.32 (86)	10.79 (86)	7.87 (96)	9.49 (34)	10/1/2004
EARNEST Part. Intl - Net		1.03 (79)	14.33 (22)	15.11 (86)	10.58 (87)	7.58 (97)		
MSCI AC World ex USA (Net)		1.82 (67)	7.82 (71)	13.18 (95)	9.61 (93)	7.28 (100)	6.51 (100)	
MSCI AC World ex USA Growth (Net)		2.37 (57)	5.09 (84)	17.82 (70)	13.06 (67)	9.13 (83)	7.64 (82)	
William Blair	1,142,553,136	1.10 (79)	10.16 (55)	24.72 (14)	16.08 (31)	12.06 (23)	11.05 (26)	10/1/2002
William Blair - Net		0.91 (80)	9.70 (58)	24.27 (15)	15.66 (35)	11.63 (28)		
MSCI AC World ex USA (Net)		1.82 (67)	7.82 (71)	13.18 (95)	9.61 (93)	7.28 (100)	8.34 (100)	
MSCI AC World ex USA Growth (Net)		2.37 (57)	5.09 (84)	17.82 (70)	13.06 (67)	9.13 (83)	8.93 (95)	
Intl Large Cap Val.	1,391,290,279	0.57 (71)	10.63 (57)	9.52 (83)	7.18 (74)	6.94 (82)	8.52 (23)	10/1/1995
Intl Large Cap Val. - Net		0.49 (74)	10.30 (60)	9.19 (86)	6.83 (82)	6.56 (88)		
MSCI AC World ex USA (Net)		1.82 (40)	7.82 (76)	13.18 (39)	9.61 (36)	7.28 (75)	5.68 (100)	

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

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Brandes Investment	606,793,349	0.05 (86)	14.33 (22)	8.94 (87)	6.62 (86)	7.17 (76)	8.66 (21)	1/1/1996
Brandes Investment - Net		0.00 (86)	14.08 (23)	8.71 (90)	6.37 (88)	6.92 (83)		
MSCI AC World ex USA (Net)		1.82 (40)	7.82 (76)	13.18 (39)	9.61 (36)	7.28 (75)	5.60 (100)	
MSCI AC World ex USA Value		1.34 (55)	11.13 (54)	8.90 (87)	6.64 (86)	5.90 (93)		
Mondrian	642,066,919	1.17 (56)	8.65 (70)	9.87 (76)	7.57 (63)		5.90 (87)	4/1/2012
Mondrian - Net		1.07 (59)	8.22 (73)	9.41 (84)	7.09 (76)		5.41 (92)	
MSCI AC World ex USA (Net)		1.82 (40)	7.82 (76)	13.18 (39)	9.61 (36)		6.31 (75)	
MSCI AC World ex USA Value		1.34 (55)	11.13 (54)	8.90 (87)	6.64 (86)		4.94 (94)	
Lazard	142,430,011	0.11 (84)	4.85 (96)	12.12 (48)	9.12 (39)		6.97 (57)	4/1/2012
Lazard - Net		0.05 (86)	4.59 (97)	11.84 (51)	8.85 (45)		6.49 (69)	
MSCI AC World ex USA (Net)		1.82 (40)	7.82 (76)	13.18 (39)	9.61 (36)		6.31 (75)	
MSCI AC World ex USA Value		1.34 (55)	11.13 (54)	8.90 (87)	6.64 (86)		4.94 (94)	
Intl Large Cap Active Core	2,774,545,977	1.56 (83)	15.50 (18)	17.70 (30)	12.93 (23)	11.05 (11)	6.65 (9)	2/1/2008
Intl Large Cap Active Core - Net		1.29 (86)	14.90 (21)	17.07 (36)	12.37 (27)	10.48 (17)		
MSCI AC World ex USA (Net)		1.82 (81)	7.82 (83)	13.18 (73)	9.61 (70)	7.28 (100)	3.68 (94)	
Arrowstreet Capital	1,108,573,867	1.43 (84)	18.23 (7)	21.67 (5)	15.33 (8)	12.35 (3)	7.63 (1)	3/1/2008
Arrowstreet Capital - Net		1.31 (86)	17.71 (8)	21.12 (8)	14.81 (9)	11.84 (6)	7.13 (2)	
MSCI AC World ex USA (Net)		1.82 (81)	7.82 (83)	13.18 (73)	9.61 (70)	7.28 (100)	3.49 (96)	
Brown Capital	667,668,782	1.19 (86)	8.90 (74)	18.85 (22)	13.28 (21)	12.09 (6)	9.06 (2)	10/1/2004
Brown Capital - Net		0.43 (89)	7.89 (82)	18.03 (26)	12.58 (26)	11.19 (11)		
MSCI AC World ex USA (Net)		1.82 (81)	7.82 (83)	13.18 (73)	9.61 (70)	7.28 (100)	6.51 (90)	

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

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
GlobeFlex Capital	888,587,956	1.95 (79)	18.39 (6)	14.09 (67)	10.46 (60)	9.49 (41)	5.88 (50)	3/1/2006
GlobeFlex Capital - Net		1.86 (80)	18.00 (7)	13.64 (71)	10.04 (65)	9.05 (56)	5.44 (70)	
MSCI AC World ex USA (Net)		1.82 (81)	7.82 (83)	13.18 (73)	9.61 (70)	7.28 (100)	4.70 (90)	
Xponance Intl EQ	108,889,659	2.15 (75)					13.52 (43)	2/1/2021
Xponance Intl EQ - Net		1.99 (78)					13.02 (46)	
MSCI EAFE Index (Net)		2.69 (63)					12.46 (52)	
Progress Intl Equity*	705,844							
Intl Large Cap Passive Core	2,013,848,731	2.26 (71)	11.19 (56)	13.80 (69)	9.88 (67)	8.40 (79)	4.57 (98)	2/1/2000
Intl Large Cap Passive Core - Net		2.26 (71)	11.18 (56)	13.79 (69)	9.87 (67)	8.40 (79)		
International Large Cap Passive Core Benchmark		1.82 (81)	10.32 (67)	13.22 (73)	9.36 (72)	7.94 (86)	4.15 (99)	
NTGI ACWI ex US Index Fund	2,013,848,731	2.25 (72)					2.25 (72)	10/1/2021
NTGI ACWI ex US Index Fund - Net		2.25 (72)					2.25 (72)	
MSCI AC World ex USA (Net)		1.82 (82)					1.82 (82)	
Intl All Cap Developed	178,770,019	5.45 (10)	16.33 (19)				11.83 (61)	2/1/2019
Intl All Cap Developed - Net		5.32 (11)	15.77 (21)				11.33 (66)	
MSCI EAFE + Canada (Net)		3.14 (32)	12.62 (42)				11.82 (61)	
Ativo International	178,770,019	5.45 (10)	16.33 (19)				11.83 (61)	2/1/2019
Ativo International - Net		5.32 (11)	15.77 (21)				11.33 (66)	
MSCI EAFE + Canada (Net)		3.14 (32)	12.62 (42)				11.82 (61)	
Intl Small Cap Eqty	721,707,021	-0.01 (68)	12.99 (59)	21.91 (25)	14.04 (37)	11.72 (51)	6.74 (99)	12/1/2005
Intl Small Cap Eqty - Net		-0.20 (76)	12.20 (67)	21.03 (26)	13.20 (44)	10.89 (68)		
MSCI AC World ex USA Small Cap (Net)		0.62 (55)	12.93 (59)	16.46 (56)	11.21 (64)	9.46 (91)	7.20 (94)	
Custom Benchmark (Intl Small Cap)		0.62 (55)	12.93 (59)	16.46 (56)	11.21 (64)	9.46 (91)	6.57 (99)	

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

** Genesis is NOF NAV commingled fund.

Performance

International Equity

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Franklin Templeton	257,093,975	0.61 (55)	12.74 (61)	15.57 (67)	11.48 (61)	10.42 (80)	7.67 (84)	8/1/2011
Franklin Templeton - Net		0.43 (58)	11.98 (68)	14.75 (75)	10.68 (78)	9.62 (89)	6.90 (94)	
MSCI AC World ex USA Small Cap (Net)		0.62 (55)	12.93 (59)	16.46 (56)	11.21 (64)	9.46 (91)	6.79 (94)	
William Blair IntSC	464,613,046	-0.36 (80)	13.13 (58)	26.17 (8)	15.58 (26)	12.50 (37)	11.82 (37)	9/1/2010
William Blair IntSC - Net		-0.55 (81)	12.32 (66)	25.24 (10)	14.71 (31)	11.64 (51)	10.98 (52)	
MSCI AC World ex USA Small Cap (Net)		0.62 (55)	12.93 (59)	16.46 (56)	11.21 (64)	9.46 (91)	8.45 (94)	
Custom Benchmark (Intl Small Cap)		0.62 (55)	12.93 (59)	16.46 (56)	11.21 (64)	9.46 (91)	8.71 (93)	
Emerging Mkt Equity	1,357,488,612	-4.44 (87)	-6.35 (80)	12.88 (53)	10.49 (59)	6.89 (54)	8.98 (49)	2/1/1992
Emerging Mkt Equity - Net		-4.57 (88)	-6.87 (82)	12.25 (60)	9.85 (69)	6.28 (67)		
MSCI Emerging Markets Index		-1.24 (53)	-2.22 (61)	11.33 (71)	10.26 (62)	5.87 (73)	7.23 (100)	
Genesis Asset Mngrs.**	1,357,488,612	-4.44 (87)	-6.35 (80)	12.88 (53)	10.49 (59)	6.89 (54)	10.75 (22)	5/1/2004
Genesis Asset Mngrs. - Net		-4.57 (88)	-6.87 (82)	12.25 (60)	9.85 (69)	6.28 (67)		
MSCI Emerging Markets Index		-1.24 (53)	-2.22 (61)	11.33 (71)	10.26 (62)	5.87 (73)	8.90 (75)	

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

** Genesis is NOF NAV commingled fund.

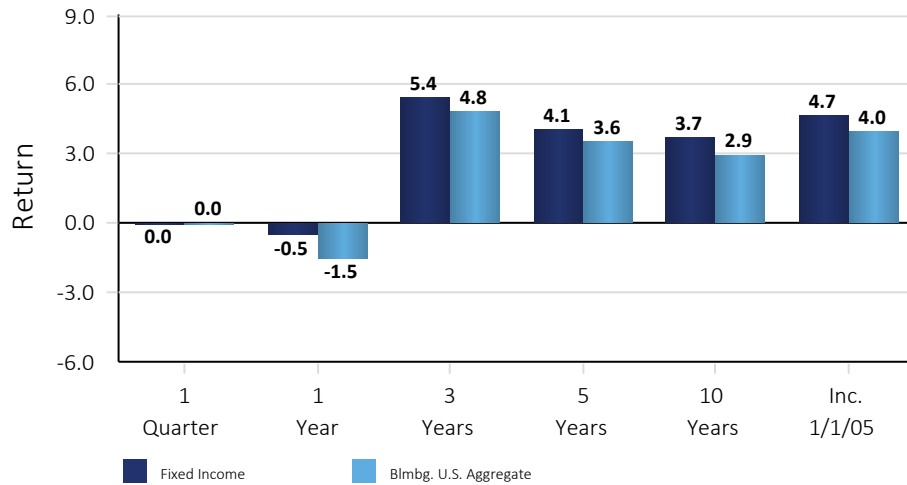
Fixed Income

Composite Performance Summary

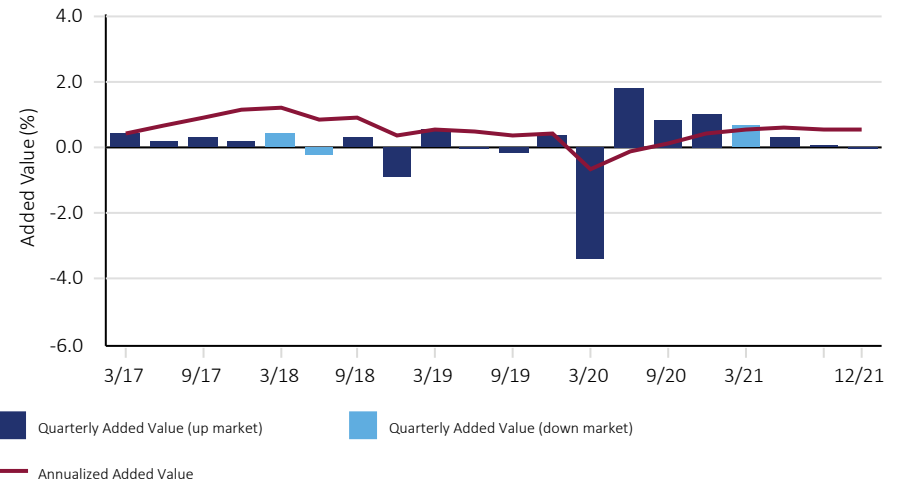
Fixed Income

Periods Ended December 31, 2021

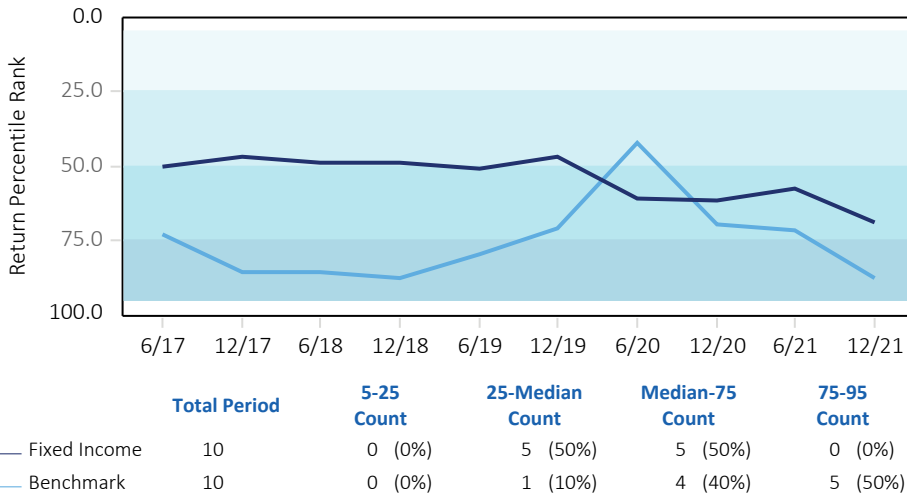
Comparative Performance



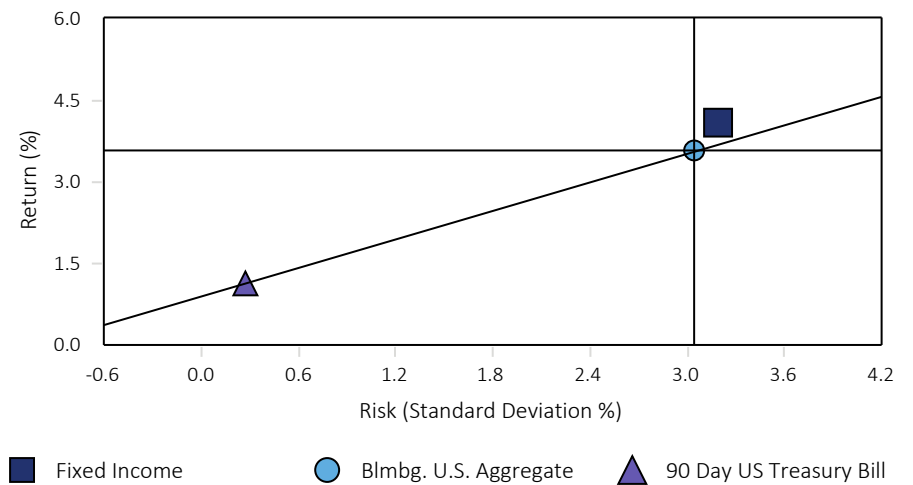
Added Value History



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



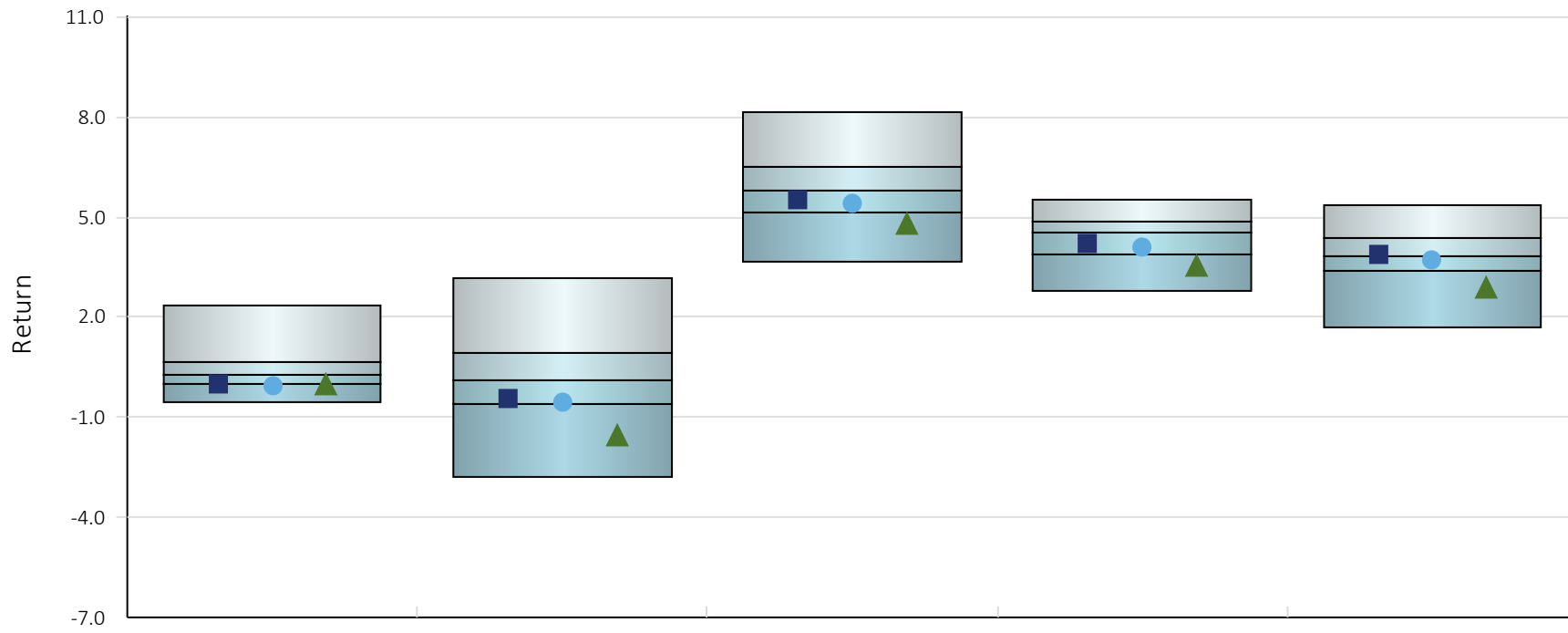
Risk and Return 01/1/17 - 12/31/21



Plan Sponsor Peer Group Analysis

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

Periods Ended December 31, 2021



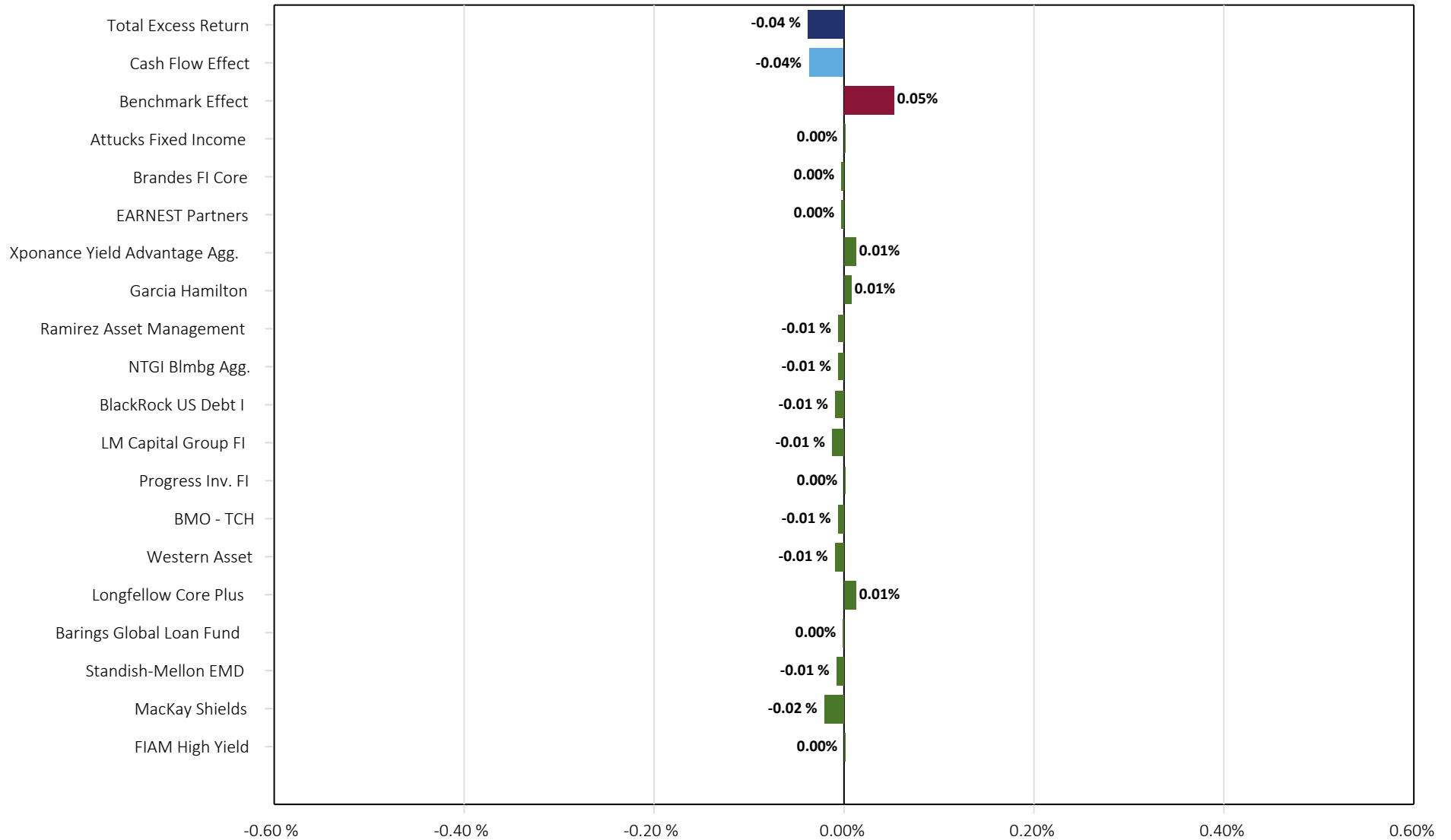
	QTD	1 Year	3 Years	5 Years	10 Years
■ Fixed Income	0.00 (76)	-0.44 (69)	5.55 (65)	4.22 (68)	3.88 (47)
● Fixed Income - Net	-0.03 (77)	-0.53 (72)	5.44 (69)	4.09 (72)	3.73 (61)
▲ Blmbg. U.S. Aggregate	0.01 (74)	-1.55 (91)	4.79 (88)	3.57 (85)	2.90 (87)
5th Percentile	2.34	3.15	8.13	5.55	5.36
1st Quartile	0.64	0.93	6.50	4.85	4.37
Median	0.25	0.09	5.82	4.53	3.84
3rd Quartile	0.00	-0.62	5.13	3.91	3.39
95th Percentile	-0.54	-2.77	3.69	2.79	1.71
Population	48	47	41	39	31

Asset Class Attribution

Fixed Income

Periods Ended 1 Quarter Ending December 31, 2021

1 Quarter



Performance

Fixed Income

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Fixed Income	13,159,667,791	0.00 (76)	-0.44 (69)	5.55 (65)	4.22 (68)	3.88 (47)	7.96	1/1/1982
Fixed Income - Net		-0.03 (77)	-0.53 (72)	5.44 (69)	4.09 (72)	3.73 (61)		
Blmbg. U.S. Aggregate		0.01 (74)	-1.55 (91)	4.79 (88)	3.57 (85)	2.90 (87)	7.42	
Fixed Income IMRF Custom Benchmark		0.07 (66)	-0.85 (82)	5.10 (77)	3.82 (78)			
Active Fixed Core	4,300,008,101	0.05 (25)	-0.91 (37)	5.06 (72)	3.90 (68)	3.45 (55)	4.48 (90)	4/1/2001
Active Fixed Core - Net		0.03 (32)	-1.01 (42)	4.95 (77)	3.79 (74)	3.31 (68)		
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)	2.90 (93)	4.43 (94)	
Attucks Fixed Income	99,778,376	0.03 (33)					-0.16 (27)	2/1/2021
Attucks Fixed Income - Net		-0.05 (58)					-0.40 (40)	
Blmbg. U.S. Aggregate		0.01 (34)					-0.83 (72)	
Brandes FI Core	374,372,550	-0.08 (65)	-1.28 (54)	4.56 (95)	3.41 (97)		2.90 (96)	3/1/2016
Brandes FI Core - Net		-0.10 (69)	-1.29 (54)	4.55 (95)	3.41 (97)		2.89 (96)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)		3.15 (92)	
EARNEST Partners	1,024,001,258	-0.01 (38)	-0.51 (22)	5.02 (75)	3.95 (65)	3.46 (54)	4.46 (55)	5/1/2005
EARNEST Partners - Net		-0.04 (50)	-0.64 (25)	4.89 (82)	3.81 (73)	3.28 (71)	4.27 (75)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)	2.90 (93)	4.03 (93)	
Xponance Yield Advantage Agg.	1,113,223,206	0.19 (6)	-0.13 (10)	5.63 (41)	4.08 (52)	3.56 (46)	4.35 (62)	6/1/2005
Xponance Yield Advantage Agg. - Net		0.16 (8)	-0.26 (15)	5.50 (49)	3.94 (66)	3.40 (59)	4.17 (80)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)	2.90 (93)	3.98 (93)	
Garcia Hamilton	1,088,146,596	0.13 (12)	-2.01 (95)	4.57 (95)	3.70 (78)		3.32 (72)	6/1/2015
Garcia Hamilton - Net		0.11 (12)	-2.09 (96)	4.49 (95)	3.61 (84)		3.23 (77)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)		3.04 (94)	

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 December 31, 2021

	Market Value \$	Performance (%)							
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date	
Ramirez Asset Management	600,486,115	-0.26 (88)	-0.16 (11)					3.59 (11)	5/1/2020
Ramirez Asset Management - Net		-0.26 (88)	-0.30 (16)					3.46 (13)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)					0.49 (88)	
Pass. Core Fixed Income	3,654,995,037	-0.04 (51)	-1.58 (74)	4.84 (86)	3.62 (83)	2.95 (87)	5.74 (97)		1/1/1990
Pass. Core Fixed Income - Net		-0.04 (51)	-1.58 (76)	4.83 (86)	3.62 (84)	2.94 (87)			
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)	2.90 (93)	5.72 (97)		
BlackRock US Debt I	1,837,987,280	-0.05 (54)	-1.57 (72)	4.86 (83)	3.65 (81)			3.35 (82)	10/1/2013
BlackRock US Debt I - Net		-0.05 (57)	-1.58 (74)	4.85 (84)	3.65 (81)			3.35 (82)	
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)			3.25 (95)	
NTGI Blmbg Agg.	1,817,007,757	-0.03 (47)	-1.58 (76)	4.82 (89)	3.60 (87)	2.93 (88)	5.78 (97)		2/1/1990
NTGI Blmbg Agg. - Net		-0.03 (48)	-1.59 (77)	4.81 (90)	3.59 (91)	2.92 (90)			
Blmbg. U.S. Aggregate		0.01 (34)	-1.55 (69)	4.79 (92)	3.57 (94)	2.90 (93)	5.77 (97)		
Core Plus Fixed Income	3,407,077,560	-0.04 (76)	-1.02 (87)	6.19 (54)	4.52 (60)	4.05 (62)	7.86 (100)		1/1/1982
Core Plus Fixed Income - Net		-0.07 (79)	-1.17 (91)	6.02 (64)	4.35 (68)	3.87 (71)			
Blmbg. U.S. Aggregate		0.01 (63)	-1.55 (99)	4.79 (96)	3.57 (96)	2.90 (98)	7.42 (100)		
LM Capital Group FI	959,042,988	-0.12 (84)	-1.50 (99)	6.17 (54)	4.25 (74)	3.78 (76)	4.83 (67)		5/1/2005
LM Capital Group FI - Net		-0.16 (90)	-1.65 (100)	6.01 (65)	4.09 (84)	3.62 (84)	4.66 (87)		
Blmbg. U.S. Aggregate		0.01 (63)	-1.55 (99)	4.79 (96)	3.57 (96)	2.90 (98)	4.03 (98)		
Progress Inv. FI	1,650								
Progress Inv. FI - Net									
BMO - TCH	661,962,167	-0.07 (78)	-0.41 (62)	5.75 (71)	4.41 (66)	4.30 (43)	4.91 (61)		5/1/2005
BMO - TCH - Net		-0.10 (83)	-0.55 (66)	5.61 (78)	4.27 (73)	4.16 (56)	4.78 (72)		
Blmbg. U.S. Aggregate		0.01 (63)	-1.55 (99)	4.79 (96)	3.57 (96)	2.90 (98)	4.03 (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 December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Western Asset	1,130,766,162	-0.05 (78)	-1.25 (93)	6.61 (42)	4.99 (34)	4.52 (31)	5.41 (37)	11/1/2001
Western Asset - Net		-0.09 (81)	-1.39 (97)	6.49 (47)	4.86 (40)	4.38 (38)		
Blmbg. U.S. Aggregate		0.01 (63)	-1.55 (99)	4.79 (96)	3.57 (96)	2.90 (98)	4.19 (99)	
Longfellow Core Plus	655,304,594	0.32 (13)	0.47 (32)				3.62 (59)	5/1/2020
Longfellow Core Plus - Net		0.31 (14)	0.30 (35)				3.47 (66)	
Blmbg. U.S. Aggregate		0.01 (63)	-1.55 (99)				0.49 (100)	
Bank Loans	734,087,200	0.79 (46)	6.63 (10)	5.58 (43)	4.56 (29)		4.57 (20)	8/1/2014
Bank Loans - Net		0.77 (50)	6.61 (10)	5.49 (44)	4.29 (47)		4.20 (42)	
Barings Custom Benchmark		0.78 (49)	5.43 (48)	5.53 (44)	4.51 (30)		4.25 (38)	
Barings Global Loan Fund	734,087,200	0.79 (46)	6.63 (10)	5.58 (43)	4.56 (29)		4.57 (20)	8/1/2014
Barings Global Loan Fund - Net		0.77 (50)	6.61 (10)	5.49 (44)	4.29 (47)		4.20 (42)	
Barings Custom Benchmark*		0.78 (49)	5.43 (48)	5.53 (44)	4.51 (30)		4.25 (38)	
Emerging Markets Debt	223,383,314	-2.23 (85)	-5.97 (78)	4.42 (73)	3.95 (76)		2.44 (64)	8/1/2014
Emerging Markets Debt - Net		-2.23 (85)	-6.22 (79)	4.09 (78)	3.60 (84)		2.11 (68)	
Custom Benchmark (EMD)		-1.80 (76)	-5.66 (76)	4.05 (79)	3.79 (80)		1.95 (69)	
Standish-Mellon EMD	223,383,314	-2.23 (85)	-5.97 (78)	4.42 (73)	3.95 (76)		2.44 (64)	8/1/2014
Standish EM MRK - Net		-2.23 (85)	-6.22 (79)	4.09 (78)	3.60 (84)		2.11 (68)	
Custom Benchmark**		-1.80 (76)	-5.66 (76)	4.05 (79)	3.79 (80)		1.95 (69)	
High Yield	839,906,376	0.47 (80)	6.53 (29)	9.40 (28)	6.91 (20)	7.28 (22)	9.40 (2)	4/1/1986
High Yield - Net		0.39 (84)	6.19 (36)	9.05 (38)	6.56 (34)	6.90 (48)		
ICE BofAML US High Yield, Cash Pay Index		0.69 (60)	5.28 (58)	8.55 (59)	6.09 (63)	6.69 (59)	8.17 (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 December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
MacKay Shields	839,715,134	0.45 (81)	6.51 (29)	9.40 (28)	6.90 (20)	7.32 (21)	8.67 (8)	11/1/2000
MacKay Shields - Net		0.37 (84)	6.16 (37)	9.05 (38)	6.54 (36)	6.94 (46)		
ICE BofAML US High Yield, Cash Pay Index		0.69 (60)	5.28 (58)	8.55 (59)	6.09 (63)	6.69 (59)	7.43 (64)	

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.

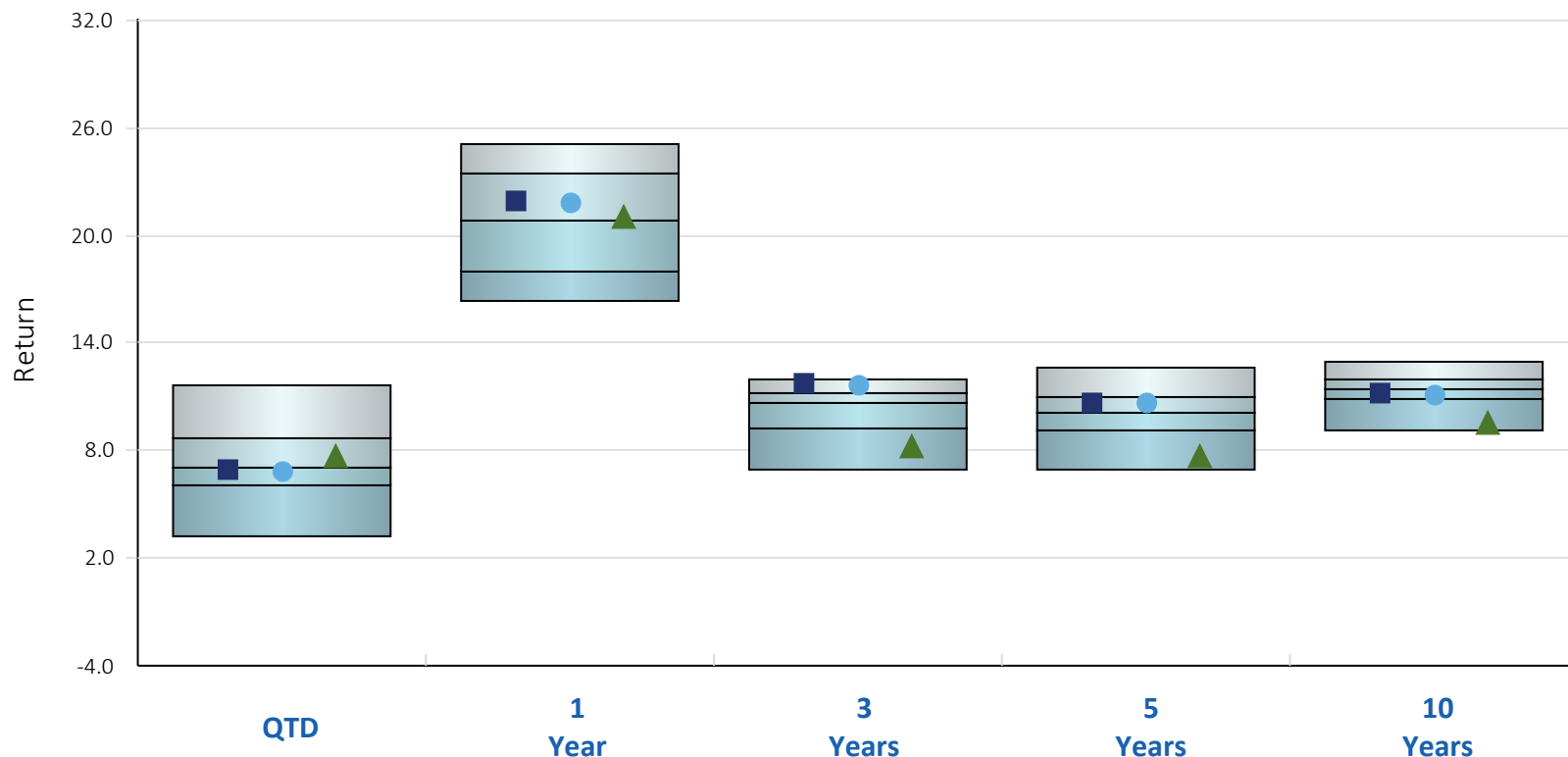
** Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Real Estate

Plan Sponsor Peer Group Analysis

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

Periods Ended December 31, 2021



	QTD	1 Year	3 Years	5 Years	10 Years
■ Real Estate	6.90 (56)	21.95 (41)	11.74 (18)	10.72 (28)	11.17 (72)
● Real Estate - Net	6.88 (57)	21.88 (42)	11.69 (18)	10.68 (28)	11.15 (73)
▲ Blended Benchmark (Real Estate)	7.66 (44)	21.02 (48)	8.23 (87)	7.74 (89)	9.61 (87)
5th Percentile	11.66	25.13	11.99	12.66	12.93
1st Quartile	8.66	23.45	11.18	10.99	11.99
Median	7.05	20.84	10.61	10.10	11.39
3rd Quartile	6.04	17.96	9.28	9.09	10.84
95th Percentile	3.26	16.38	6.98	6.97	9.12
Population	41	35	25	21	12

Asset Allocation & Performance

Real Estate

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						Inception Date
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	
Real Estate	3,917,928,441	6.90	21.95	11.74	10.72	11.17	5.94	5/1/1985
Real Estate - Net		6.88	21.88	11.69	10.68	11.15		
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74	9.61	7.83	
Real Estate Core Cmp	2,126,788,357	8.39	22.16	13.42	11.57	11.22	8.07	4/1/1999
TA Assoc. Buckhead	817,726,253	9.44	37.70	20.47	17.32	14.20	11.69	8/1/1995
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74	9.61	7.61	
Barings Euro Core Property	145,452,455	-0.23	2.33	18.61			13.90	3/1/2017
Blended Benchmark (Real Estate)		7.66	21.02	8.23			7.79	
Blackstone Property Euro	162,085,823	0.50	6.82	10.06			7.89	12/1/2017
Blended Benchmark (Real Estate)		7.66	21.02	8.23			8.00	
INVESCO Core Real Estate	239,614,476	13.66	20.21	7.19	7.51	8.96	9.33	4/1/2011
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74	9.61	10.00	
INVESCO European real estate	58,120,223	0.31	-10.38	0.90			-0.65	4/1/2018
Blended Benchmark (Real Estate)		7.66	21.02	8.23			8.00	
AEW Core Property Tr	252,746,615	4.86	11.30	5.69	6.12		7.90	10/1/2013
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74		9.06	
CBRE Core Partners	282,528,121	22.99	33.10	14.24	12.26		11.81	12/1/2013
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74		9.00	
JPM Strategic Property Fund	168,514,391	0.00	12.34				12.34	1/1/2021
Blended Benchmark (Real Estate)		7.66	21.02				21.02	
RE Non-Core Cmp	1,791,140,084	5.20	21.74	9.88	9.76	11.38	11.56	1/1/2010

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

Real Estate

Periods Ended December 31, 2021

	Market Value \$	Performance (%)						
		1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Artemis MWBE Spruce Blended Benchmark (Real Estate)	311,927,332	1.47 7.66	11.37 21.02	9.12 8.23	6.83 7.74		5.11 7.73	6/1/2016
Franklin T. EMREFF Blended Benchmark (Real Estate)	4,776,924							9/1/2011
Security Capital Blended Benchmark (Real Estate)	69,456,897	-0.26 7.66	29.06 21.02	16.82 8.23	10.83 7.74	9.11 9.61	7.61	7/1/1997
Dune II Blended Benchmark (Real Estate)	9,280,716							2/1/2009
Non-Core Real Estate Funds Blended Benchmark (Real Estate)	1,165,632,735	8.31 7.66	29.10 21.02	11.32 8.23	11.35 7.74	11.87 9.61	11.42 9.70	10/1/2011
Almanac ARS V	86,544							
Non-Core Intl Real Estate Blended Benchmark (Real Estate)	229,978,936	-2.53 7.66	1.37 21.02	4.06 8.23	5.74 7.74		-1.15 8.83	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%.

Alternative Investments

Asset Allocation & Performance

Alternatives Investments

Periods Ended December 31, 2021

	Allocation	Performance (%)						
	Market Value \$	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Alternatives Investments	5,014,866,919	8.69	46.46	21.67	18.82	13.49	11.77	2/1/1986
Alternatives Custom Benchmark		2.18	9.00	9.00	9.00	9.00	12.45	
Absolute Return	115,896	3.68	4.71	-23.11	-13.06	-4.43	-0.13	1/1/2002
Aurora Investment	115,896							11/1/2001
Private Equity	4,415,124,940	9.35	54.15	25.42	22.61	16.16	14.10	2/1/1986
Alternatives Custom Benchmark		2.18	9.00	9.00	9.00	9.00	12.45	
Abbott S/A Comp.	536,294,967	10.00	65.06	28.14	24.79	17.12	15.15	6/1/1987
Muller Monroe MPEFF	520,309							5/1/2008
Pantheon S/A Comp.	430,276,910	9.05	56.70	27.30	23.98	16.83	12.26	10/1/2000
Private Equity Fund - Domestic	2,749,033,772	10.30	55.01	27.58	23.64		16.25	6/1/2012
Private Equity Fund - International	556,840,434	4.06	39.58	18.12	20.37		-2.19	7/1/2015
Oakbrook Opportunities Fund	142,158,549	11.08	48.63				12.31	6/1/2019
Private Credit	197,053,744	5.07	15.97				5.20	10/1/2019
Private Credit Fund - Domestic	197,053,744	5.07	15.97				5.20	10/1/2019
Agriculture	228,223,321	4.68	2.69	0.42	-0.63	7.51	6.69	10/1/1997
NCREIF Farmland Index		3.80	7.84	5.23	5.72	9.68	11.27	
Premiere Partners IV	228,223,321	4.68	2.69	0.42	-0.63		2.21	3/1/2015
Timberland	65,271,284	3.31	-2.72	0.89	0.71	2.11	6.88	10/1/1992
Blended Benchmark (Real Estate)		7.66	21.02	8.23	7.74	9.61	7.61	

Returns are time-weighted and are reported net of fee for all real estate managers. The Alternatives Custom Benchmark is 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%.

Asset Allocation & Performance

Alternatives Investments

Periods Ended December 31, 2021

	Allocation	Performance (%)						
	Market Value \$	1 Quarter	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Forest Investment	65,271,284	3.31	-2.72	0.89	0.71	2.36	7.03	10/1/1992
Alternatives Custom Benchmark (Timberland)		4.56	9.17	3.69	3.58	5.30		
Unlisted Infrastructure	109,077,734	1.80	11.68	12.38			12.10	4/1/2018
Alternatives Custom Benchmark		2.18	9.00	9.00			9.00	
Unlisted Infrastructure Funds	109,077,734	1.80	11.68	12.38			12.10	4/1/2018
Alternatives Custom Benchmark		2.18	9.00	9.00			9.00	

Returns are time-weighted and are reported net of fee for all real estate managers. The Alternatives Custom Benchmark is 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%.

Manager Watch List

As of December 31, 2021

Organization

Investment Manager	Asset Class	Effective Date	Resolution
Standish-Mellon	Fixed Income Emerging Markets Debt	May 2021	Continue Monitoring