

Wilshire



Illinois Municipal Retirement Fund

Monthly Investment Summary

Nov-2022

IMRF Performance Summary

- The Illinois Municipal Retirement Fund (“IMRF”) ended November 2022 with a market value of \$49.4 billion, up for the month by approximately \$2.11 billion. IMRF returned 4.75% during the month, outperforming the Total Fund Benchmark, which returned 4.52%. Growth and defensive assets were both positive for the month on the back of lowered inflation and interest rates.
- The broad U.S. Equity market was up for the month, with large cap outperforming small cap. The U.S. Equity Portfolio outperformed the benchmark during November, returning 5.51% versus 5.40%. In aggregate, investment manager performance in Small Cap was the largest contributor to relative outperformance.
- International Equity markets were up for the month. Emerging markets outperformed developed, primarily driven by the easing of Covid restrictions in China. The International Equity Portfolio underperformed the benchmark during November, returning 11.76% versus 11.80%. Investment manager performance in Large Cap Growth and Core were the largest detractors.
- U.S. Treasury yields fell and spreads narrowed in November. The Fixed Income Portfolio outperformed the benchmark during the month, returning 3.26% versus 3.21%. Investment manager performance in Core Fixed was the largest contributor to relative outperformance.
- As of November month-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.

Performance referenced above is Net of Fees.

Market Dashboard

Returns through Wednesday November 30, 2022

Portfolio Allocations	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Global 60/40	6.13	3.10	(7.47)	9.42	(5.94)	(13.83)	(11.85)	3.23	4.23
Wilshire Risk Parity (12%)	2.99	3.43	(9.21)	6.52	(9.03)	(19.35)	(17.15)	(0.68)	3.56

Strategic Allocation Themes *	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Growth ¹	7.76	6.03	(9.57)	14.26	(6.82)	(15.02)	(11.62)	6.63	6.41
Defensive Growth ²	3.84	3.79	(6.44)	7.78	(3.54)	(12.00)	(8.96)	5.76	7.04
Diversified Credit ³	4.32	1.30	(4.72)	5.67	(2.03)	(12.44)	(11.14)	(1.18)	1.07
Real Assets ⁴	5.30	2.70	(11.42)	8.14	(9.14)	(7.45)	(3.14)	6.72	5.87
Defensive ⁵	3.68	(1.30)	(4.32)	2.33	(4.75)	(12.62)	(12.84)	(2.59)	0.21

Major Asset Classes	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
FT Wilshire 5000	5.15	8.21	(9.34)	13.78	(4.45)	(13.99)	(10.65)	10.66	10.56
MSCI ACWI-ex-USA (Net)	11.80	2.99	(10.00)	15.15	(9.91)	(15.37)	(11.87)	1.75	1.48
Bloomberg U.S. Aggregate	3.68	(1.30)	(4.32)	2.33	(4.75)	(12.62)	(12.84)	(2.59)	0.21
Bloomberg U.S. Corporate High Yield	2.17	2.60	(3.97)	4.83	(0.65)	(10.63)	(8.96)	0.92	2.50
Wilshire Global Real Estate Securities	6.93	3.51	(12.54)	10.69	(11.20)	(21.85)	(16.08)	(1.23)	2.64
Bloomberg Commodity	2.74	1.99	(8.11)	4.78	(4.11)	19.01	23.20	15.46	7.60

Source: Bloomberg, All returns are in USD

*Strategic Allocations are comprised of the following asset mixes (rebalanced monthly)

¹ Growth : 100% Global Equity

² Defensive Growth : 60% Low Vol Global Equity, 40% US Convertibles

³ Diversified Credit : 42.5% U.S. High Yield, 42.5% EMD, 15% Banks Loans

⁴ Real Assets : 43% Global REITS/GLI, 33% Commodities, 48% TIPS, 9% Gold, -31% Cash

⁵ Defensive : 100% US Core Bonds

Market Returns

Returns through Wednesday November 30, 2022

US Equity	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
FT Wilshire 5000	5.15	8.21	(9.34)	13.78	(4.45)	(13.99)	(10.65)	10.66	10.56
Standard & Poor's 500	5.59	8.10	(9.21)	14.14	(4.88)	(13.10)	(9.21)	10.91	10.98
Wilshire 4500 Completion	3.44	8.65	(9.68)	12.39	(2.48)	(18.76)	(17.76)	8.42	7.68
Wilshire US Large Cap	5.34	7.95	(9.25)	13.72	(4.52)	(13.99)	(10.58)	10.98	11.01
Wilshire US Large-Cap Growth	4.18	5.10	(9.77)	9.49	(3.27)	(23.43)	(21.72)	11.16	12.00
Wilshire US Large-Cap Value	6.51	10.99	(8.67)	18.21	(5.84)	(1.80)	4.44	10.58	9.89
Wilshire US Small Cap	3.54	11.00	(10.21)	14.93	(3.54)	(13.36)	(10.56)	7.69	6.39
Wilshire US Small-Cap Growth	3.66	10.10	(9.45)	14.13	(2.04)	(18.00)	(16.63)	6.28	6.49
Wilshire US Small-Cap Value	3.44	11.82	(10.89)	15.67	(4.86)	(8.70)	(4.30)	9.03	6.24
Non-US Equity	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
MSCI ACWI-ex-USA (Net)	11.80	2.99	(10.00)	15.15	(9.91)	(15.37)	(11.87)	1.75	1.48
MSCI EAFE (Net)	11.26	5.38	(9.35)	17.25	(9.36)	(14.52)	(10.14)	1.92	1.85
MSCI EM (Net)	14.83	(3.10)	(11.72)	11.27	(11.57)	(18.95)	(17.43)	0.14	(0.42)
MSCI ACWI-ex-US Small cap (Net)	9.56	3.25	(11.04)	13.12	(8.37)	(20.11)	(16.73)	2.65	1.25
Global Equity	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
MSCI ACWI (Net)	7.76	6.03	(9.57)	14.26	(6.82)	(15.02)	(11.62)	6.63	6.41
MSCI ACWI Minimum Volatility (Net)	6.26	4.15	(6.75)	10.67	(6.03)	(8.50)	(3.27)	2.92	5.12
Fixed Income	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Bloomberg U.S. Aggregate	3.68	(1.30)	(4.32)	2.33	(4.75)	(12.62)	(12.84)	(2.59)	0.21
Bloomberg Long Term Treasury	7.07	(5.55)	(7.90)	1.13	(9.63)	(28.03)	(29.05)	(7.74)	(1.52)
Bloomberg U.S. TIPS	1.83	1.24	(6.62)	3.09	(5.14)	(10.94)	(10.66)	1.68	2.50
Bloomberg U.S. Corporate High Yield	2.17	2.60	(3.97)	4.83	(0.65)	(10.63)	(8.96)	0.92	2.50
Credit Suisse Leveraged Loan	1.11	0.85	(2.17)	1.97	1.19	(1.41)	(0.79)	2.76	3.24
Bloomberg US Convertibles Index	1.91	2.59	(5.89)	4.55	(0.31)	(16.56)	(16.93)	10.30	9.59
JPM EMBI Global Diversified	7.59	0.15	(6.36)	7.76	(4.57)	(18.05)	(16.90)	(4.75)	(1.23)
Real Assets	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Wilshire Global Real Estate Securities	6.93	3.51	(12.54)	10.69	(11.20)	(21.85)	(16.08)	(1.23)	2.64
FTSE Global Core Infrastructure 50/50	7.94	3.39	(11.70)	11.59	(8.87)	(2.08)	5.13	4.55	5.72
Alerian Midstream Energy	3.85	11.05	(9.86)	15.33	(0.98)	29.32	30.78	13.79	9.10
Bloomberg Commodity	2.74	1.99	(8.11)	4.78	(4.11)	19.01	23.20	15.46	7.60
Gold	8.26	(1.63)	(2.95)	6.50	(8.12)	(3.32)	(0.34)	6.50	6.76
Bitcoin	(16.18)	5.05	(3.82)	(11.95)	3.70	(63.08)	(70.06)	30.42	16.03

Source: Bloomberg, All returns are in USD

Factor/Relative Returns

Returns though Wednesday November 30, 2022

Asset Class Differentials	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Stocks (ACWI) > Bonds (BB US Aggregate)	4.08	7.33	(5.25)	11.92	(2.07)	(2.40)	1.22	9.22	6.21
Stocks (ACWI) > Mkt Alts (Equity Hedged)	4.41	2.14	(5.16)	6.89	(3.30)	(10.79)	(9.31)	2.83	3.97
Mkt Alts (Relative Value) > Bonds (BB US Aggregate)	(1.59)	0.83	1.57	(0.73)	2.55	4.95	5.32	1.65	(0.14)

Equity & Real Assets Differentials	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
US Small > Large	(1.80)	3.05	(0.96)	1.22	0.98	0.63	0.01	(3.29)	(4.61)
US Value > Growth	2.33	5.89	1.10	8.72	(2.57)	21.63	26.16	(0.58)	(2.12)
ACWI-ex-US > US	6.66	(5.22)	(0.66)	1.37	(5.46)	(1.38)	(1.22)	(8.91)	(9.08)
EM > EAFE	3.57	(8.48)	(2.37)	(5.98)	(2.21)	(4.43)	(7.29)	(1.78)	(2.27)
ACWI-ex-US Currency Impact	4.03	(0.03)	(3.01)	4.12	(5.06)	(8.44)	(8.09)	(2.79)	(2.60)
EAFE Currency Impact	4.84	0.05	(3.14)	5.15	(5.77)	(10.41)	(10.17)	(3.25)	(2.85)
EM Currency Impact	3.15	(0.48)	(2.34)	2.52	(3.39)	(5.14)	(4.89)	(2.57)	(2.63)
Global Low Volatility > ACWI	(1.50)	(1.88)	2.82	(3.59)	0.79	6.52	8.35	(3.71)	(1.29)
Global RE > ACWI	(0.82)	(2.53)	(2.97)	(3.57)	(4.38)	(6.83)	(4.46)	(7.85)	(3.77)
Commodities > Global RE	(4.20)	(1.52)	4.44	(5.90)	7.09	40.86	39.28	16.69	4.96
Commodities > TIPS	0.91	0.75	(1.49)	1.69	1.04	29.94	33.86	13.78	5.10
Gold > Commodities	5.52	(3.62)	5.16	1.71	(4.01)	(22.32)	(23.54)	(8.96)	(0.84)

Fixed Income Differentials	MTD	OCT	SEP	QTD	Q3 2022	YTD	1 Year	3 Year	5 Year
Duration (US Core > US Core 1-3 Years)	2.85	(1.17)	(3.09)	1.64	(3.25)	(8.70)	(8.78)	(2.18)	(0.62)
IG Credit > Treasury	2.50	0.36	(1.80)	2.84	(0.71)	(3.38)	(3.00)	(0.00)	0.65
High Yield > IG Credit	(3.01)	3.63	1.28	0.73	4.41	4.76	6.50	3.56	1.78
High Yield > Loans	0.93	1.57	(1.71)	2.54	(2.01)	(9.59)	(8.55)	(2.02)	(0.80)
TIPS > Treasury	(1.76)	2.66	(1.93)	0.98	0.39	2.99	3.54	4.75	2.37
EMD > Dev Hdg	5.07	(1.39)	(3.24)	3.61	(1.85)	(7.92)	(6.60)	(1.60)	(1.42)
EMD > High Yield	4.46	(3.48)	(1.55)	0.87	(3.41)	(5.34)	(6.20)	(4.60)	(3.01)
Non-US > US Core	1.90	1.15	(1.55)	3.09	(4.10)	(7.13)	(6.97)	(3.42)	(3.47)
Non-US Hdg > US Core	(2.11)	1.80	2.03	(0.26)	2.55	4.56	4.28	0.51	0.70
FI Currency Impact	4.01	(0.65)	(3.58)	3.35	(6.64)	(11.69)	(11.25)	(3.93)	(4.18)

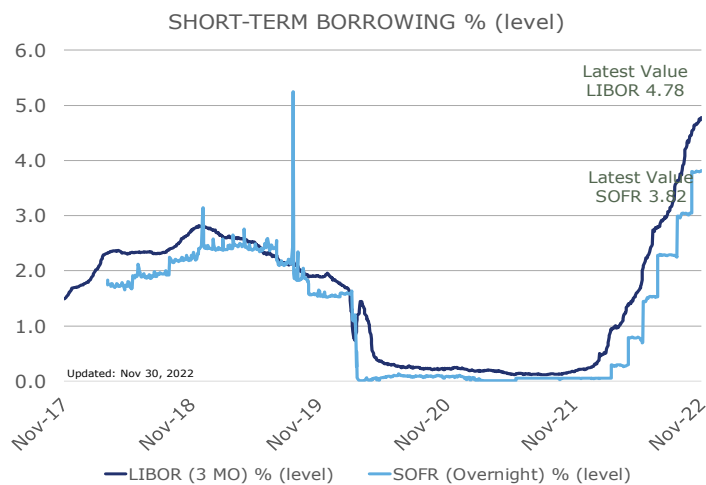
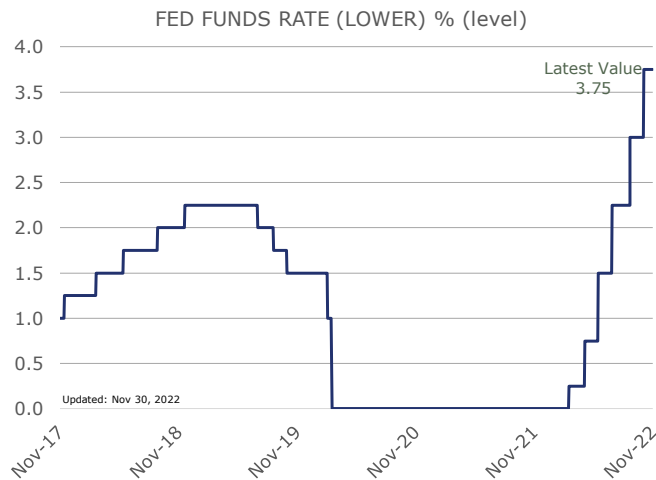
Source: Bloomberg, All returns are in USD

Market Yields & Breakeven Inflation

Market Yields	Previous 3 Month-ends				Previous 2 Quarter-ends		EOY Prior	1 Yr Ago	3 Yrs Ago	5 Yrs Ago
Govt/Treasury Yields	11/30/22	10/31/22	09/30/22	08/31/22	09/30/22	06/30/22	12/31/21	11/30/21	11/29/19	11/30/17
Fed Funds Target Rate (Upper)	4.00	3.25	3.25	2.50	3.25	1.75	0.25	0.25	1.75	1.25
2-Year Treasury	4.31	4.49	4.28	3.50	4.28	2.96	0.73	0.57	1.61	1.78
5-Year Treasury	3.74	4.23	4.09	3.35	4.09	3.04	1.26	1.16	1.63	2.14
10-Year Treasury	3.61	4.05	3.83	3.20	3.83	3.02	1.51	1.45	1.78	2.41
30-Year Treasury	3.74	4.17	3.78	3.29	3.78	3.19	1.90	1.79	2.21	2.83
10-Year Real Treasury	1.24	1.54	1.68	0.71	1.68	0.67	(1.10)	(1.08)	0.16	0.54
Term Spreads	11/30/22	10/31/22	09/30/22	08/31/22	09/30/22	06/30/22	12/31/21	11/30/21	11/29/19	11/30/17
5 - 2 Year Treasury Spread	(0.58)	(0.26)	(0.19)	(0.14)	(0.19)	0.08	0.53	0.59	0.01	0.35
10 - 5 Year Treasury Spread	(0.13)	(0.18)	(0.26)	(0.16)	(0.26)	(0.03)	0.25	0.28	0.15	0.27
10 - 2 Year Treasury Spread	(0.71)	(0.44)	(0.45)	(0.30)	(0.45)	0.05	0.77	0.87	0.16	0.62
30 - 10Year Treasury Spread	0.13	0.11	(0.06)	0.09	(0.06)	0.16	0.39	0.34	0.43	0.42
30 - 2Year Treasury Spread	(0.58)	(0.32)	(0.51)	(0.20)	(0.51)	0.22	1.17	1.22	0.59	1.04
Market Yields	11/30/22	10/31/22	09/30/22	08/31/22	09/30/22	06/30/22	12/31/21	11/30/21	11/29/19	11/30/17
Bloomberg U.S. Treasury YTW	4.05	4.39	4.13	3.42	4.13	3.09	1.23	1.12	1.76	2.15
Bloomberg U.S. Aggregate YTW	4.56	5.01	4.75	3.96	4.75	3.72	1.75	1.69	2.30	2.71
Bloomberg U.S. Long Treasury YTW	3.96	4.37	4.00	3.48	4.00	3.33	1.89	1.81	2.17	2.78
Bloomberg U.S. Long Govt/Credit YTW	4.79	5.33	5.03	4.40	5.03	4.30	2.58	2.53	2.99	3.60
Credit Spreads	11/30/22	10/31/22	09/30/22	08/31/22	09/30/22	06/30/22	12/31/21	11/30/21	11/29/19	11/30/17
Bloomberg Investment Grade OAS	1.33	1.58	1.59	1.40	1.59	1.55	0.92	0.99	1.05	0.97
Bloomberg High Yield OAS	4.48	4.64	5.52	4.84	5.52	5.69	2.83	3.37	3.70	3.44
Breakeven Inflation Rates	11/30/22	10/31/22	09/30/22	08/31/22	09/30/22	06/30/22	12/31/21	11/30/21	11/29/19	11/30/17
1-Year Breakeven Inflation	2.38	2.73	1.72	2.12	1.72	4.28	3.43	3.75	1.18	0.42
2-Year Breakeven Inflation	2.53	2.86	1.98	2.39	1.98	3.29	3.22	3.24	1.24	1.32
5-Year Breakeven Inflation	2.48	2.66	2.16	2.64	2.16	2.62	2.91	2.81	1.53	1.77
10-Year Breakeven Inflation	2.37	2.51	2.15	2.48	2.15	2.34	2.59	2.51	1.63	1.88
5-Year 5-Year Forward Breakeven Inflation	2.23	2.32	2.12	2.33	2.12	2.03	2.27	2.22	1.70	1.91

Source: Bloomberg

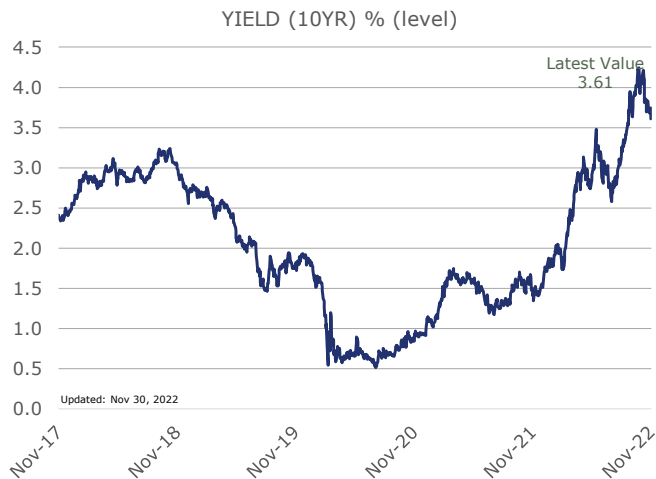
Short Rates



Data Source: Bloomberg

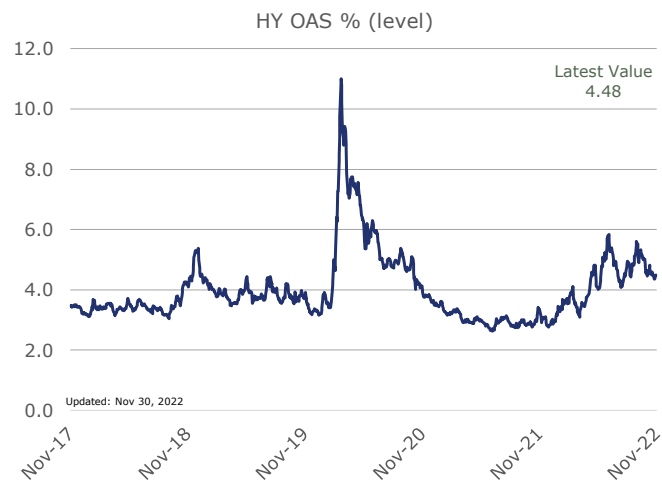
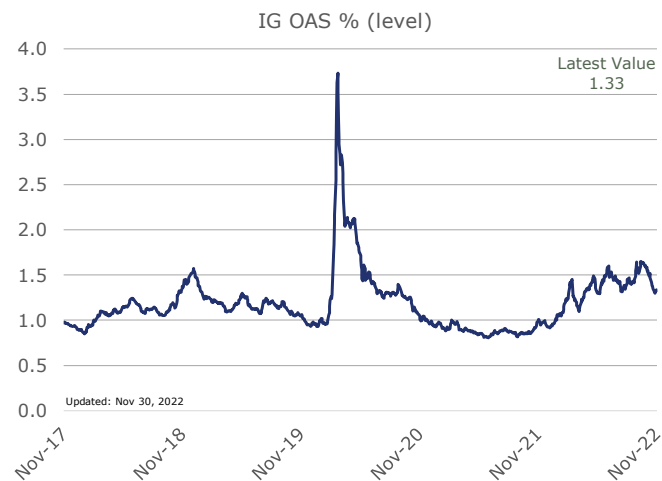
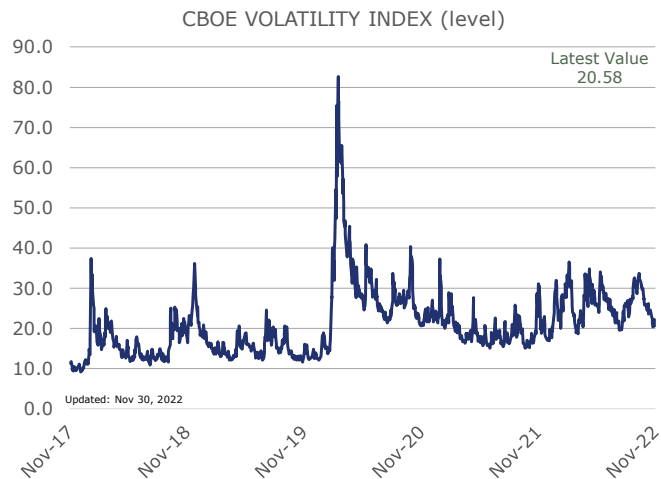
LIBOR: London Inter-bank Offered Rate
 SOFR: Federal Reserve Bank NY Secured Overnight Financing Rate

Treasury Rates

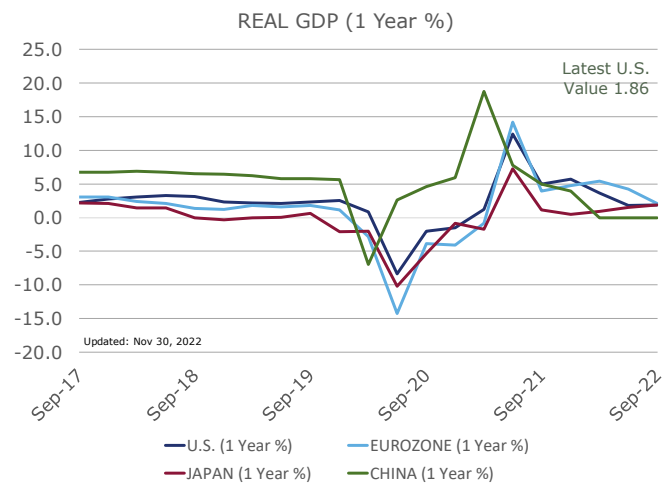
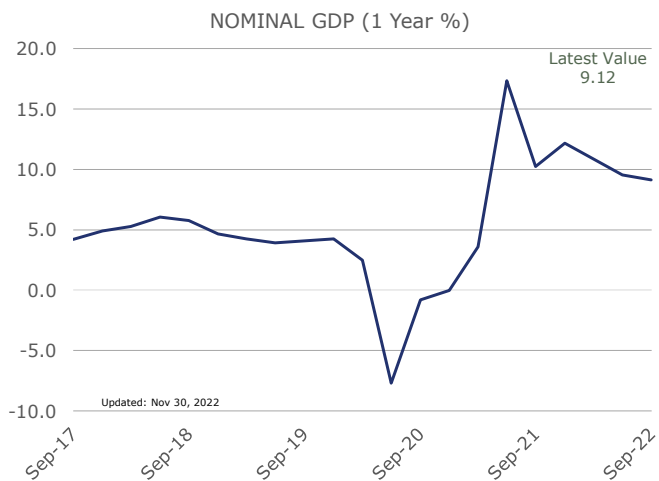
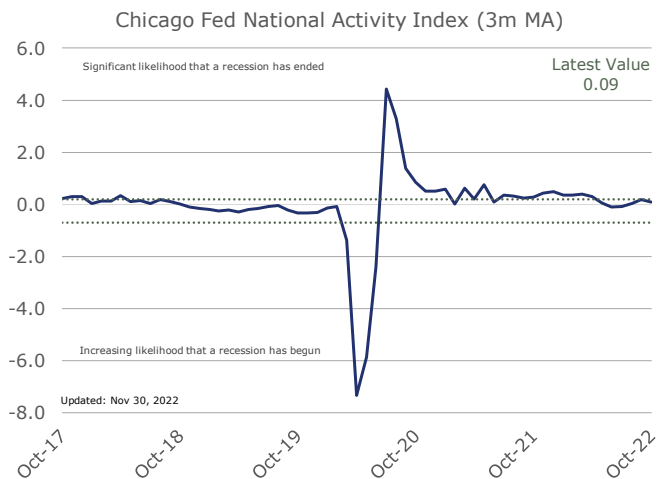


Data Sources: Bloomberg

Volatility & Credit Risk

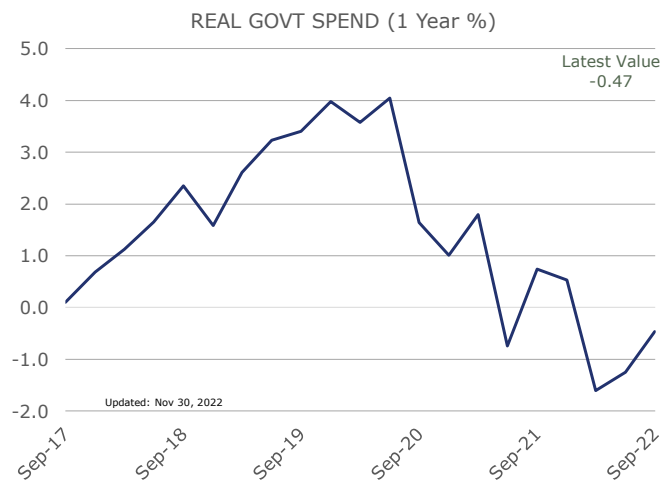
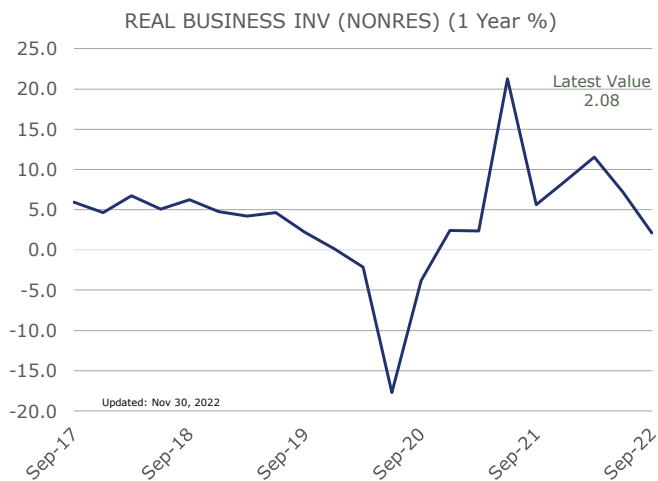
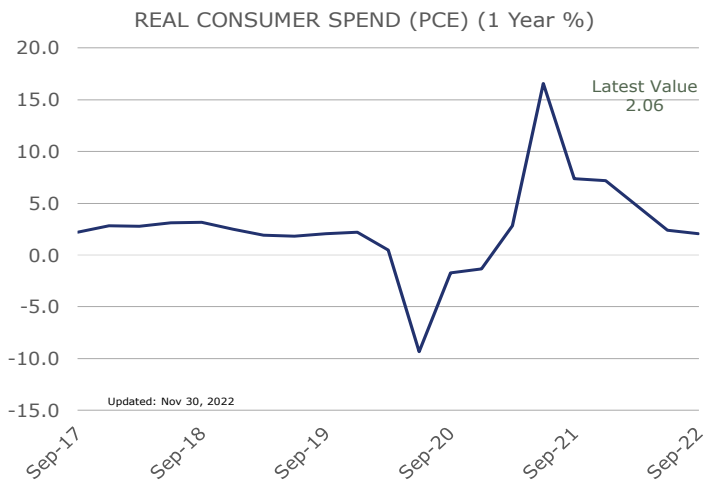


Economic Growth

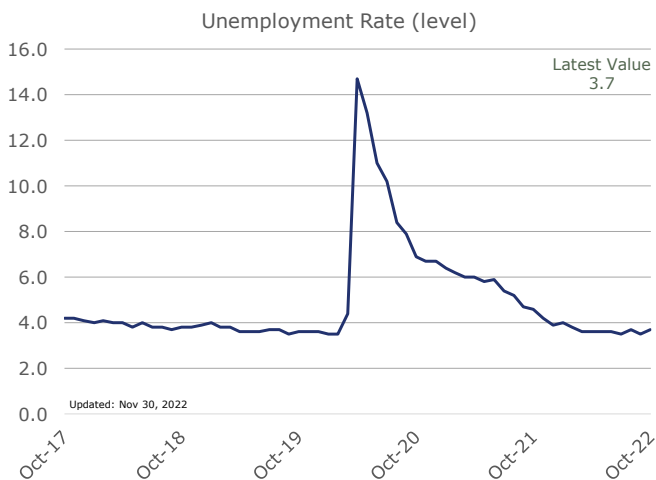
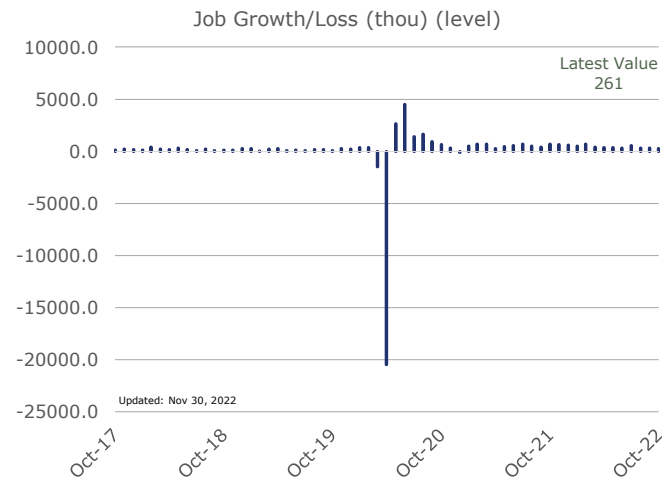
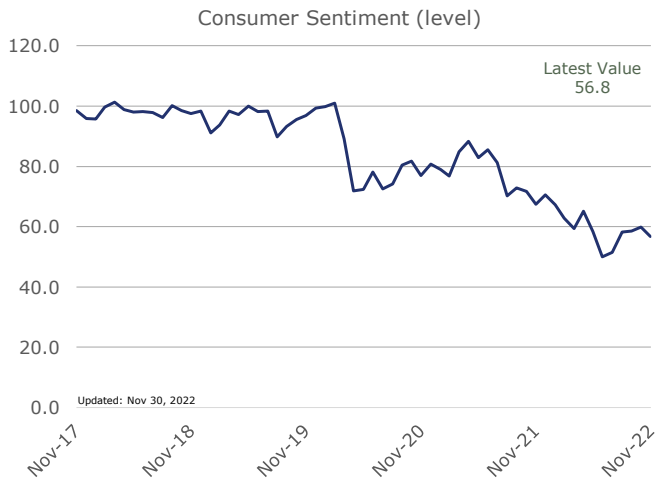


Data Sources: Bloomberg

Economic Growth

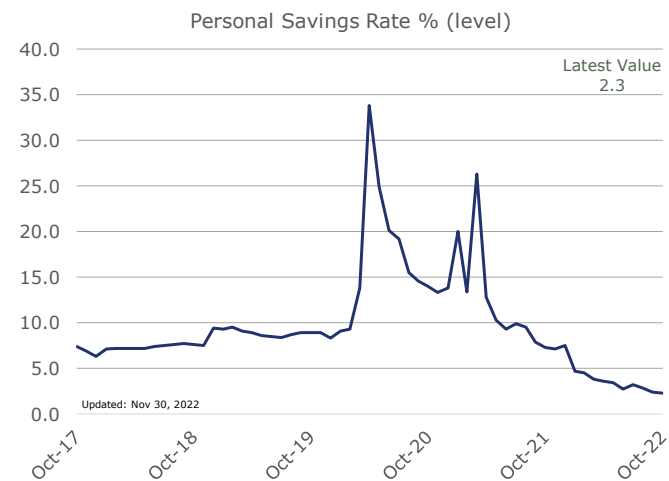
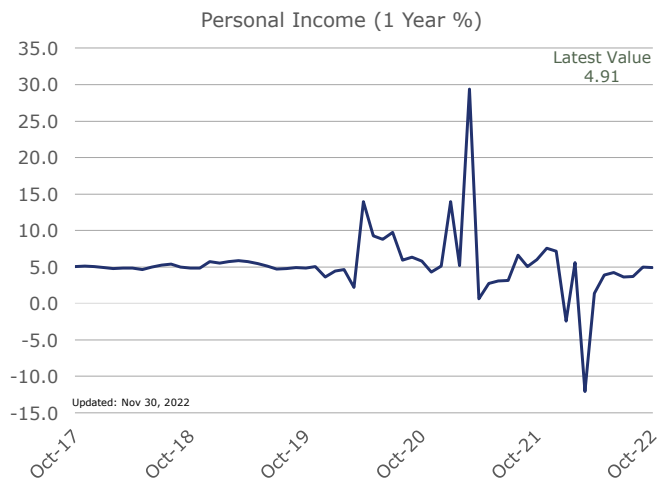


Consumers & Employment



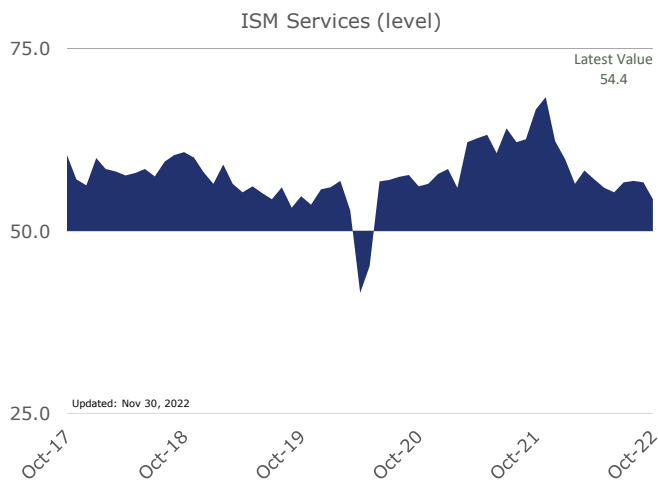
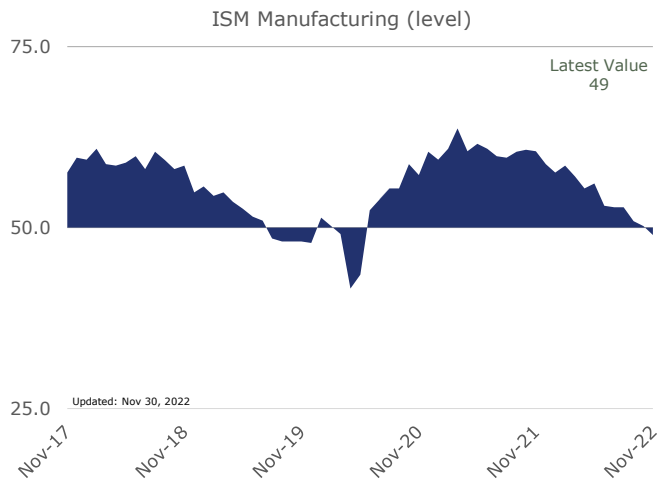
Data Sources: Bloomberg

Income & Spending

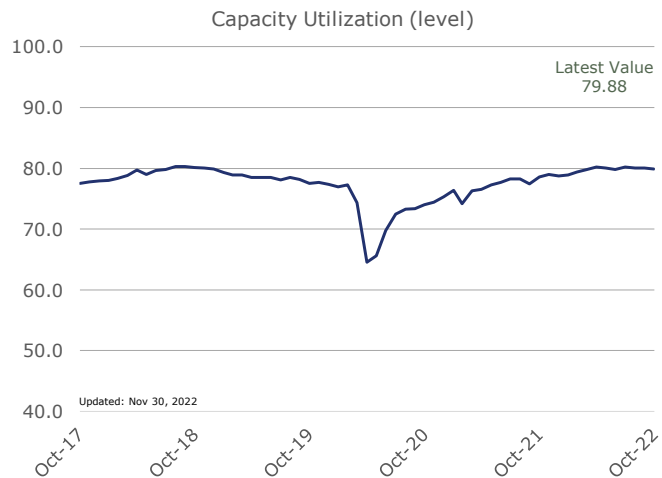


Data Sources: Bloomberg

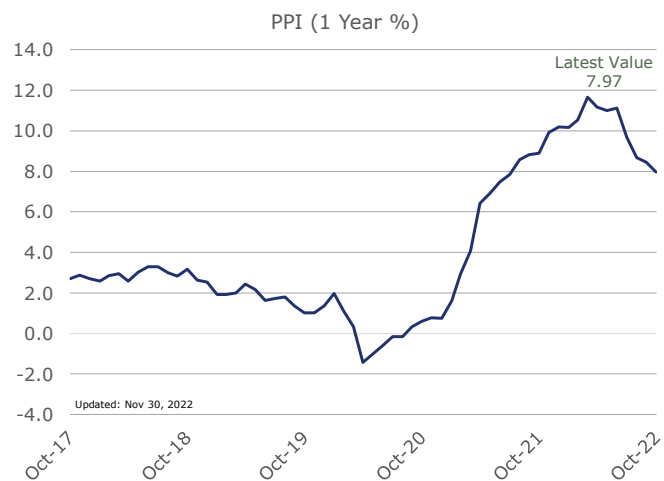
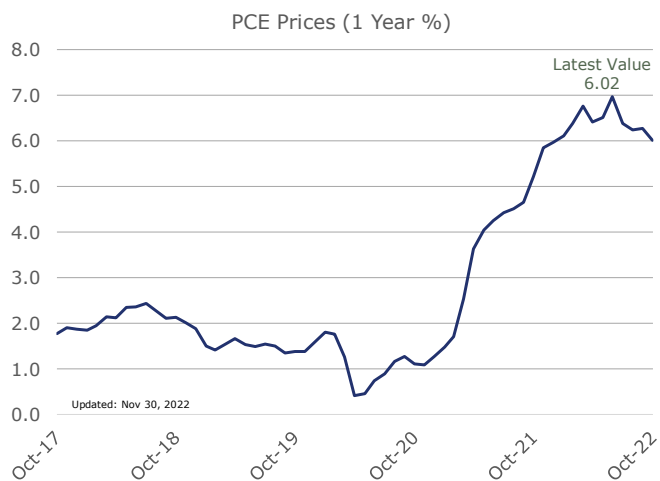
ISM Surveys



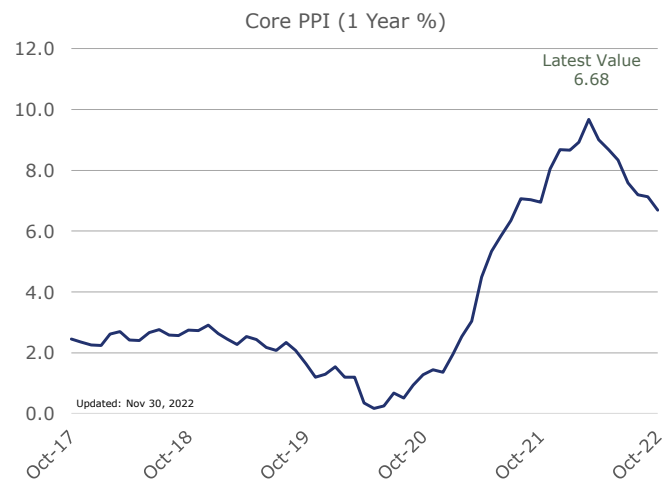
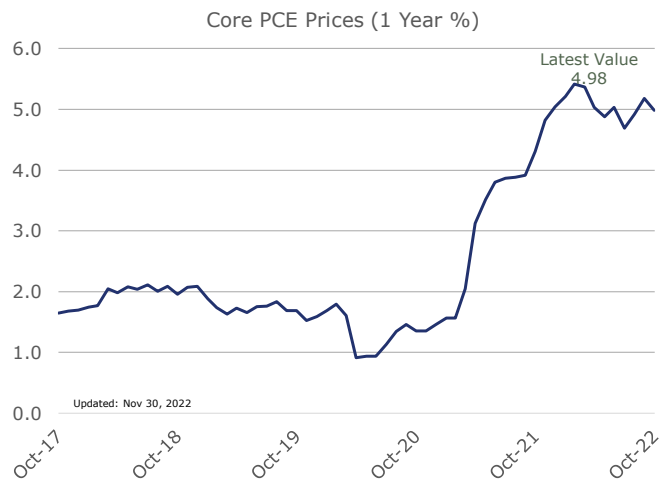
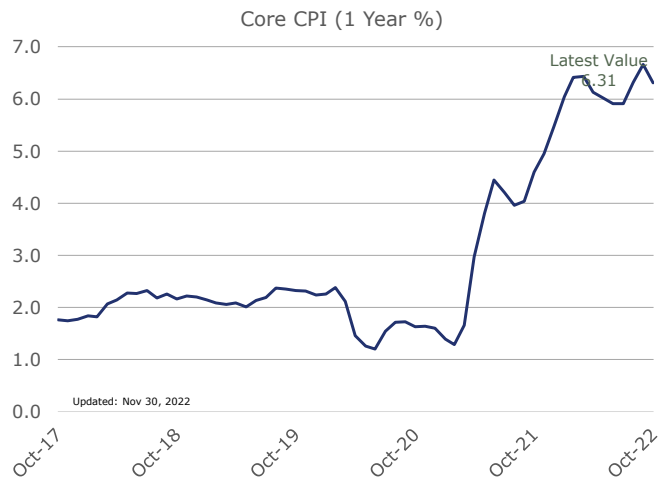
Manufacturing Activity



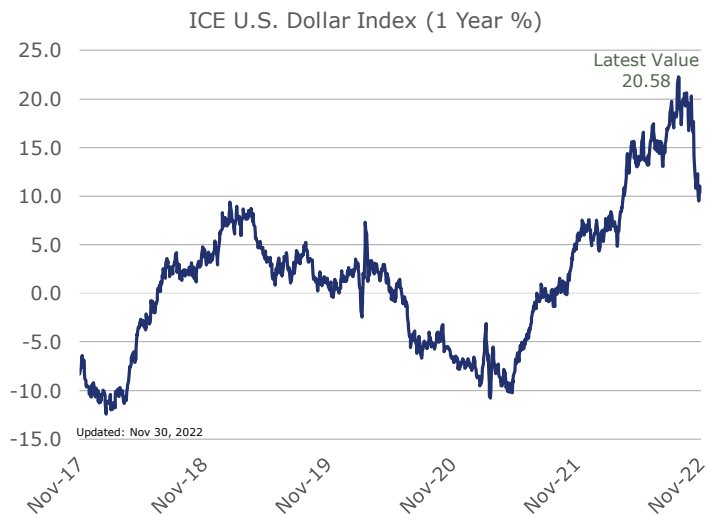
Price Indexes



Core Price Indexes



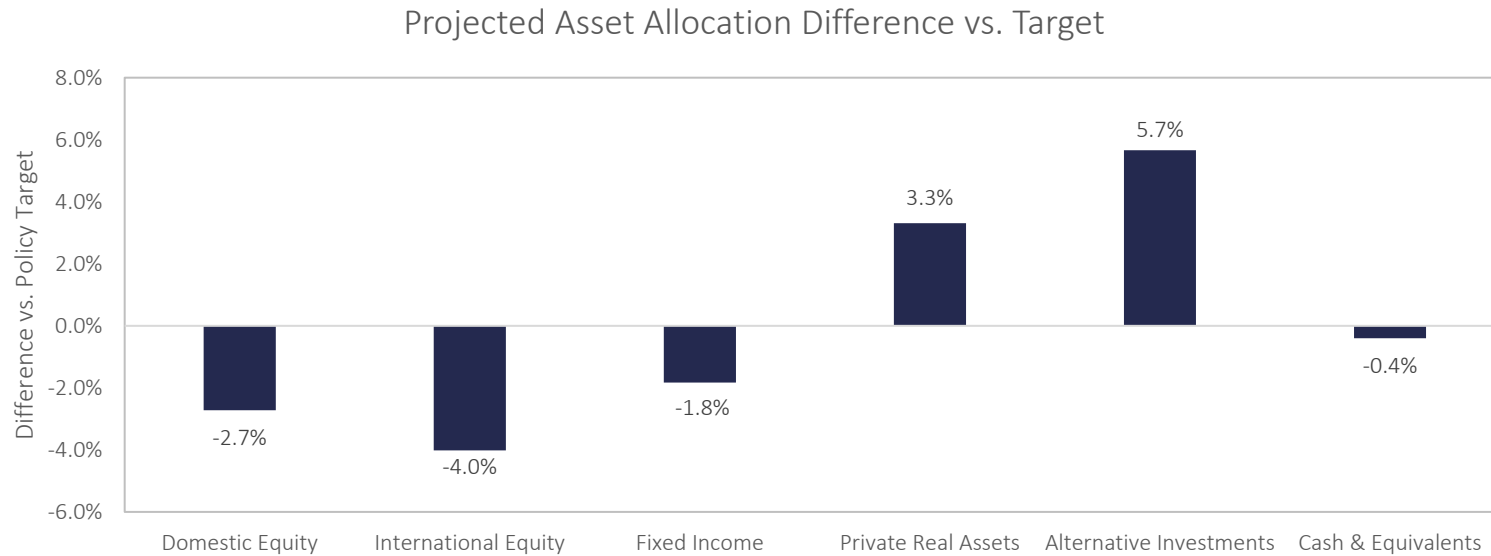
U.S. Dollar



IMRF Performance

Projected Deviations from the Benchmark

As of November 30, 2022



- Includes committed, but unfunded amounts for Real Assets (\$2.01 billion) and Alternatives (\$2.43 billion). Assumes Real Assets and Alternatives allocations are fully funded as of month-end.
- Assumes that outstanding commitments are funded from a basket of public markets asset classes (Domestic Equity, International Equity and/or Fixed Income) that best reflects the expectations of risk, yield and regional allocations of the asset class.

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

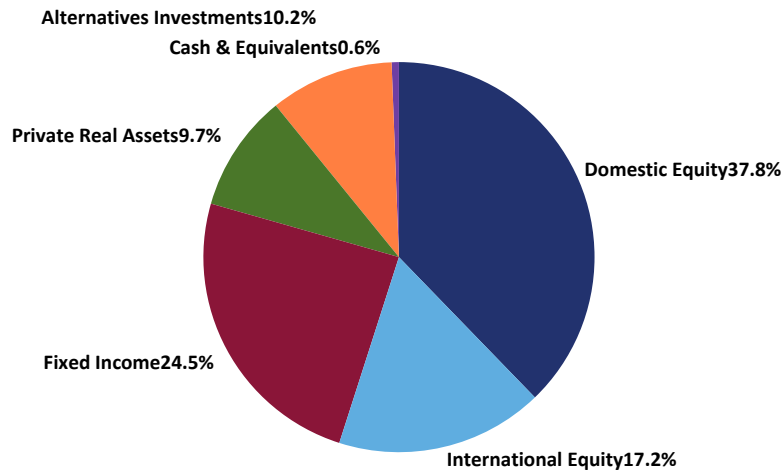
Real Assets Proxy: 50% Domestic Equity, 30% International Equity, 20% Fixed Income

Asset Allocation

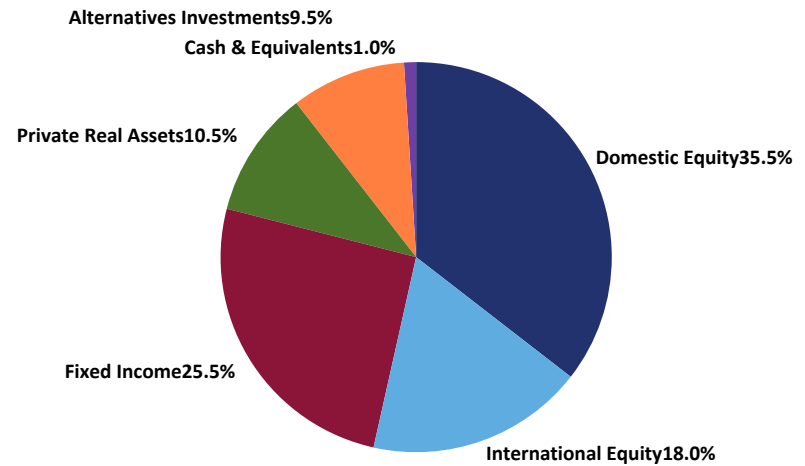
Total Fund

Periods Ended As of November 30, 2022

Actual Allocation



Target Allocation



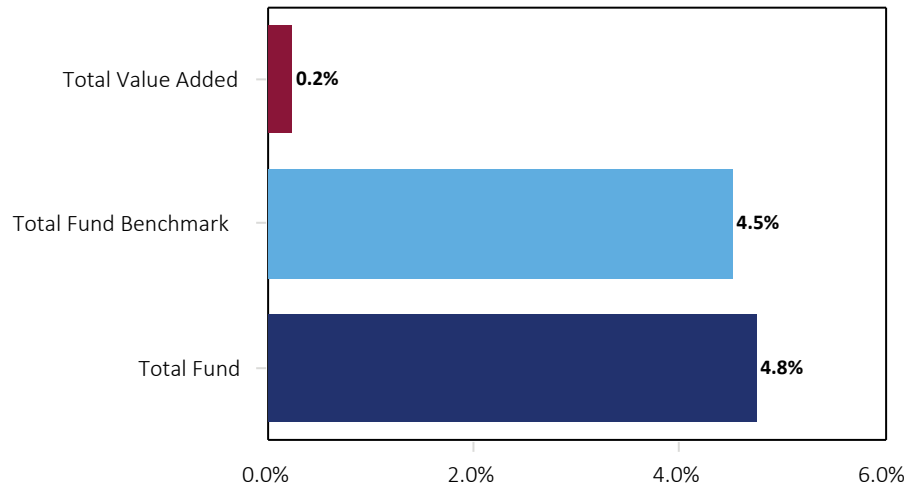
	Actual Allocation \$Millions	Actual Allocation %	Target Allocation %	Differences %	Differences \$Millions
Total Fund	49,398	100.0	100.0	0.0	
Domestic Equity	18,656	37.8	35.5	2.3	1,120
International Equity	8,483	17.2	18.0	-0.8	-408
Fixed Income	12,094	24.5	25.5	-1.0	-503
Private Real Assets	4,810	9.7	10.5	-0.8	-376
Alternatives Investments	5,058	10.2	9.5	0.7	365
Cash & Equivalents	297	0.6	1.0	-0.4	-197

Total Fund Attribution

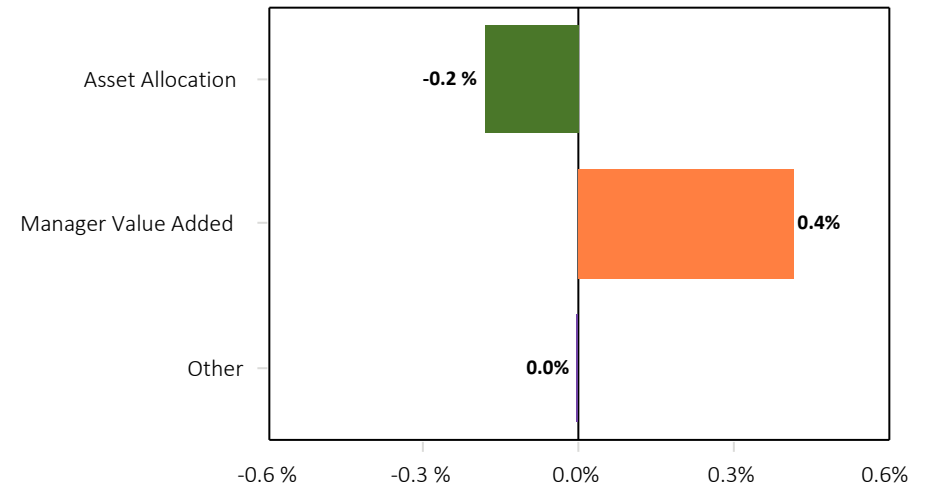
Total Fund

1 Month Ending November 30, 2022

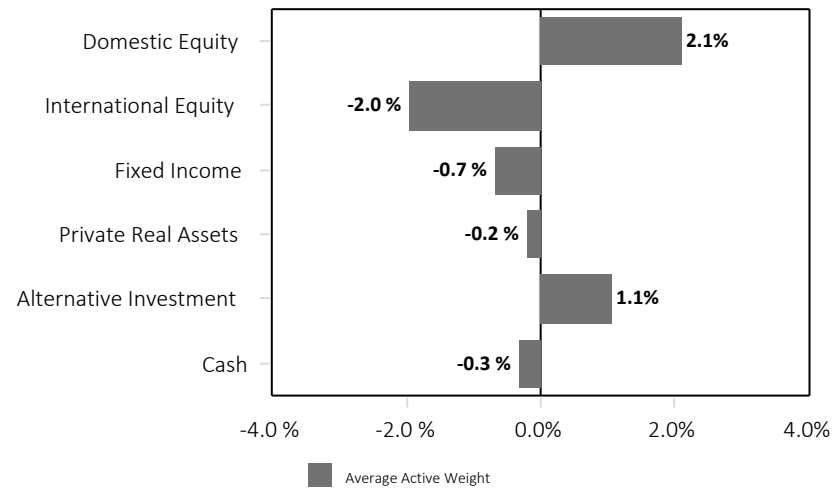
Total Fund Performance



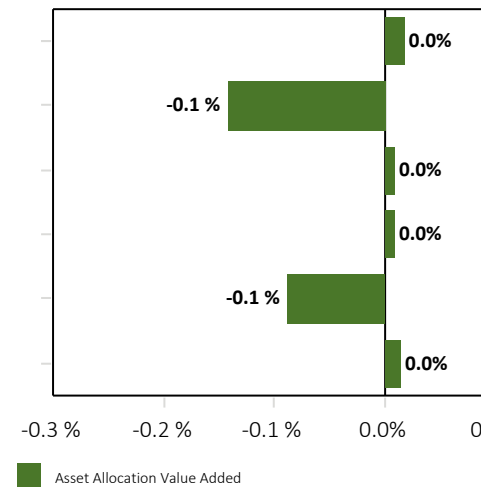
Total Value Added:0.2%



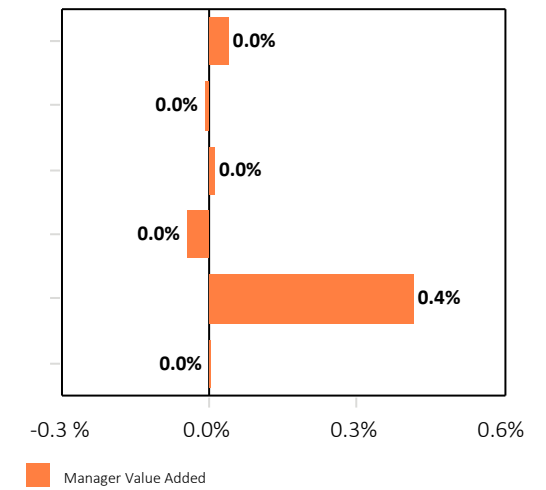
Asset Class Under or Overweighting



Asset Allocation Value Added:-0.2 %



Total Manager Value Added:0.4%



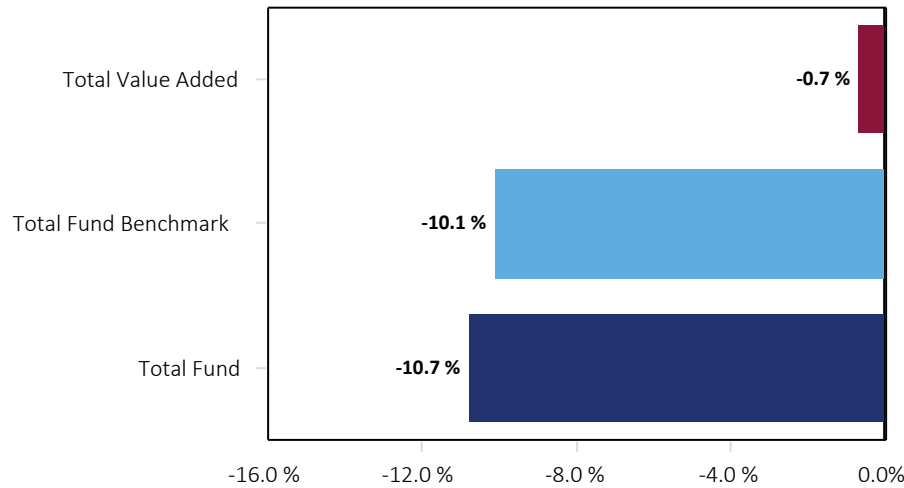
Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% MSCI AC World ex USA (Net), 10.5% Private Real Assets Custom Benchmark, 9.5% Alternatives Custom Benchmark, 1% 90 Day US Treasury Bill.

Total Fund Attribution

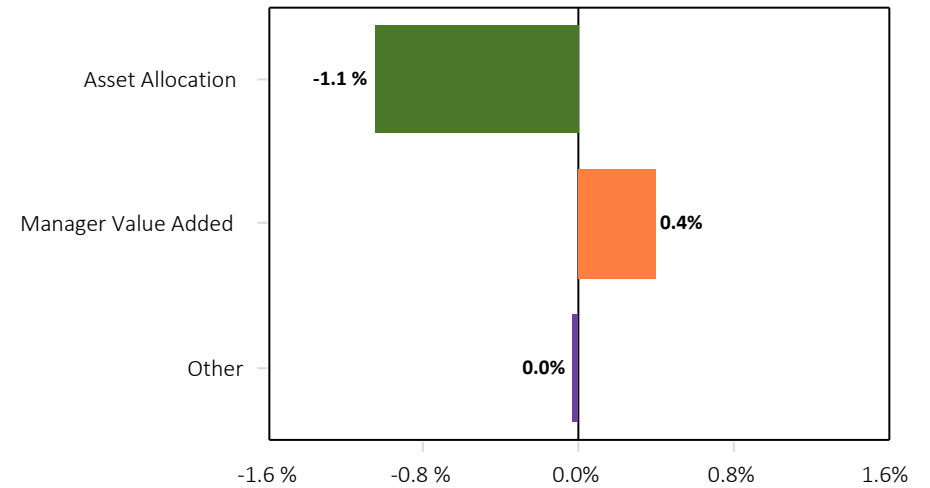
Total Fund

Year To Date Ending November 30, 2022

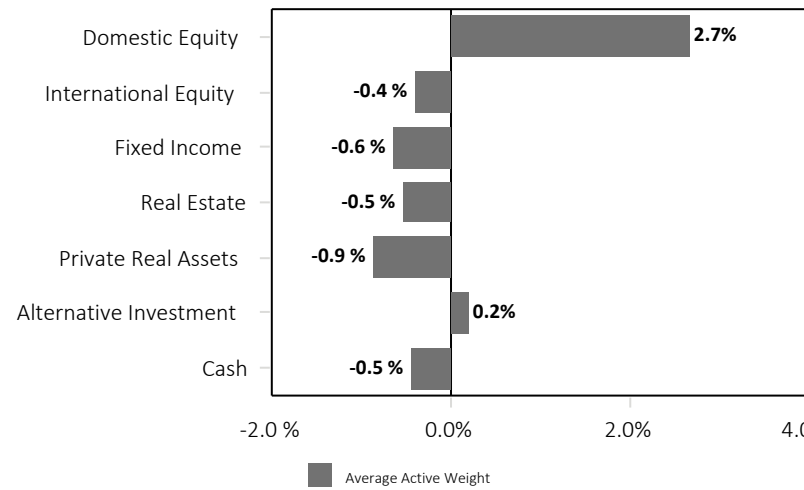
Total Fund Performance



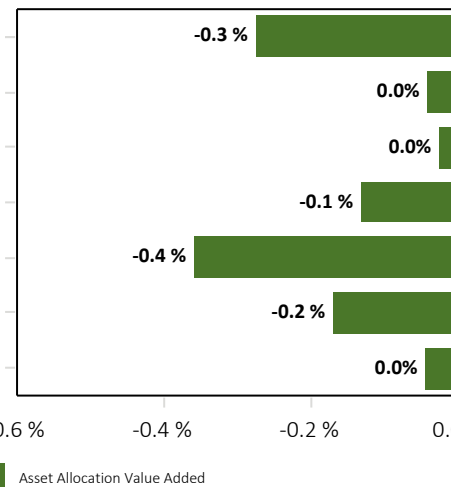
Total Value Added:-0.7 %



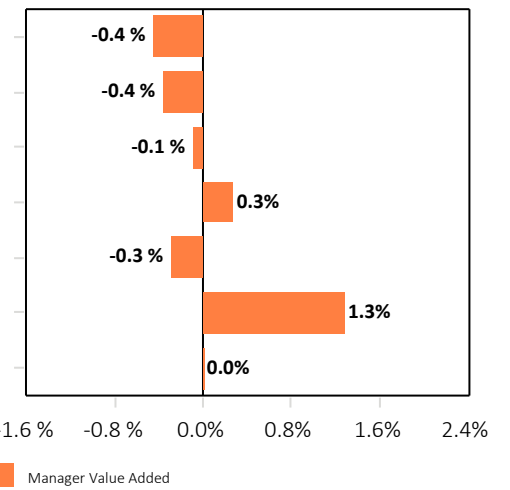
Asset Class Under or Overweighting



Asset Allocation Value Added:-1.1 %



Total Manager Value Added:0.4%



Total Fund Benchmark = 35.5% Domestic Equity Custom Benchmark, 25.5% Fixed Income Custom Benchmark, 18.0% 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 November 30, 2022

	Performance (%)										
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Total Fund	4.78	8.68	-10.62	-8.45	7.01	6.84	8.43	8.21	8.29	9.65	1/1/1982
Total Fund - Net	4.75	8.64	-10.75	-8.59	6.83	6.66	8.22				
Total Fund Benchmark	4.52	8.61	-10.07	-7.44	5.58	6.04	7.65	7.55			
Domestic Equity	5.53	15.07	-14.57	-11.60	10.26	9.77	12.62	10.13	10.14	11.51	1/1/1982
Domestic Equity - Net	5.51	15.03	-14.70	-11.74	10.08	9.58	12.39				
Custom Benchmark (U.S. Equity)	5.40	13.69	-13.70	-10.30	10.49	10.45	13.00	10.06	9.89		
U.S. Equity IMRF Custom Benchmark	5.35	14.39	-13.65	-10.22	9.67	9.29					
International Equity	11.82	16.07	-16.93	-13.69	2.52	2.39	5.62	7.60	7.36	7.31	9/1/1986
International Equity - Net	11.76	15.99	-17.20	-13.98	2.15	2.04	5.26				
MSCI AC World ex USA (Net)	11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	6.59			
International Equity IMRF Custom Benchmark	11.99	14.58	-16.07	-12.83	1.55	1.27					
Fixed Income	3.27	2.46	-11.53	-11.47	-1.61	0.85	1.89	4.20	5.24	7.46	1/1/1982
Fixed Income - Net	3.26	2.44	-11.60	-11.55	-1.71	0.74	1.76				
Custom Benchmark (Fixed Income)	3.21	2.53	-11.26	-11.49	-2.09	0.51	1.24	3.31	4.67	6.94	
Fixed Income IMRF Custom Benchmark	3.21	2.54	-11.66	-11.70	-2.00	0.58					
Private Real Assets	-0.43	0.14								8.03	3/1/2022
Private Real Assets - Net	-0.44	0.12								7.98	
Custom Benchmark (Private Real Assets)	0.01	0.05								12.14	
Real Estate	-0.67	-0.13	13.16	14.70	12.98	11.58	11.23	8.37	7.14	6.14	5/1/1985
Real Estate - Net	-0.67	-0.14	13.09	14.63	12.92	11.54	11.20				
Blended Benchmark (Real Estate)	0.00	0.00	12.35	20.96	11.38	9.00	9.79	7.98	7.79	7.97	
Agriculture	3.58	3.58	4.86	6.51	4.08	1.22	7.69	7.41		6.64	10/1/1997
NCREIF Farmland Index	0.00	0.00	6.18	10.21	6.50	6.33	9.47	12.54		11.10	
Timberland	0.00	6.40	7.65	9.19	3.06	1.90	3.07	3.26	6.96	6.93	10/1/1992
NCREIF Timberland Index	0.00	0.00	7.64	12.54	5.80	4.69	5.90	6.76	8.41	8.36	
Unlisted Infrastructure	0.00	-0.14	6.65	6.68	11.34					11.14	4/1/2018
Blended Benchmark (Unlisted Infrastructure)	0.23	0.96	9.63	10.42	9.47					9.30	

Benchmark definitions on next page.

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

Asset Class Returns

Periods Ended November 30, 2022

	Performance (%)										
	1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date
Alternatives Investments	0.30	0.60	4.65	6.43	20.07	17.64	13.48	10.65	12.95	11.59	2/1/1986
Alternatives Investments - Net	0.30	0.60	4.64	6.42	20.04	17.58	13.28				
Custom Benchmark (Alternative Investments)	-3.66	3.94	-10.39	-9.74	2.36	4.96	6.96	9.15	11.07	11.79	
Private Equity	0.31	0.62	5.62	7.53	23.36	20.92	16.24	13.25	15.68	13.90	2/1/1986
Blended Benchmark (Private Equity)	-3.94	3.94	-11.08	-10.44	2.09	4.80	6.88	9.11			
Cash	0.32	0.65	2.87	3.12	2.74	2.83	1.67	1.37	3.00	3.73	7/1/1986
90 Day US Treasury Bill	0.32	0.48	1.09	1.10	0.65	1.21	0.72	1.22	2.34	3.07	

Benchmark definitions on next page.

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	1/1/2013	Present	100% NCREIF Fund Index-ODCE (VW) (Net)**
Benchmark	1/1/2007	12/31/2012	100% NPI + 1%
	1/1/2005	12/31/2016	100% Consumer Price Index + 5%
Alternatives Custom	3/1/2022	Present	95% MSCI World World Index (Net) 1 Qtr Lagged +3%, 5% S&P LSTA Leveraged Loan 100 Index +2%
Benchmark	7/1/2010	2/28/2022	100% Annualized rate of 9.0%
	1/1/2004	6/30/2010	100% Annualized rate of 12.0%
	1/1/2003	12/31/2003	100% Annualized rate of 13.0%
	2/1/1986	12/31/2002	100% Annualized rate of 15.0%
U.S. Equity IMRF Custom Benchmark			Blend of the U.S. Equity Style benchmarks returns, dollar weighted by the actual allocation at pervious month end.
International Equity IMRF Custom Benchmark			Blend of the the International Equity Style benchmarks returns, dollar weighted by the actual allocation at previous month end.
Fixed Income IMRF Custom Benchmark			Blend of the the Fixed Income Style benchmarks returns, dollar weighted by the actual allocation at previous month end.

**ODCE returns are updated quarterly.

Benchmark Definitions

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

**ODCE returns are updated quarterly.

Benchmark Definitions

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

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
Domestic Equity	17,780,840,991	37.60	18,655,880,260	37.77
Large Cap Growth	3,068,511,936	6.49	3,172,800,575	6.42
Sands Capital	1,262,923,398	2.67	1,285,191,259	2.60
Xponance Russell 1000 G	1,805,588,537	3.82	1,887,609,315	3.82
Large Cap Value	4,573,865,824	9.67	4,862,562,804	9.84
Dodge & Cox	1,708,407,247	3.61	1,815,767,864	3.68
LSV Asset	1,402,033,173	2.96	1,497,361,970	3.03
NTGI S&P 500 Value	1,463,425,404	3.09	1,549,432,970	3.14
Large Cap Pass. Core	2,264,196,159	4.79	2,280,571,134	4.62
NTGI MarketCap Idx.	2,264,196,159	4.79	2,280,571,134	4.62
Factor Diversity Strategies	2,326,379,557	4.92	2,459,448,328	4.98
U.S. Large Cap FDP-GSAM	2,326,379,557	4.92	2,459,448,328	4.98
Quantitative Factor Strategies	2,116,571,306	4.48	2,246,661,752	4.55
Quantitative US Equity - SciBeta	2,116,571,306	4.48	2,246,661,752	4.55
Small Cap Growth	695,363,575	1.47	727,478,983	1.47
Frontier Capital	695,363,575	1.47	727,478,983	1.47
Small Cap Value	1,426,925,587	3.02	1,492,974,896	3.02
Channing	298,072,717	0.63	308,721,865	0.62
DFA Small Cap Val.	534,328,774	1.13	562,042,183	1.14
William Blair Small Cap Value	594,524,096	1.26	622,210,849	1.26
Public Real Assets	1,309,027,048	2.77	1,413,381,788	2.86
Brookfield	370,293,270	0.78	396,595,761	0.80
Cohen & Steers	938,733,778	1.99	1,016,786,027	2.06

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
International Equity	7,586,708,647	16.04	8,483,157,034	17.17
Intl Large Cap Growth	1,309,844,761	2.77	1,426,452,489	2.89
EARNEST Part. Intl	530,340,605	1.12	581,187,928	1.18
William Blair	779,504,155	1.65	845,264,561	1.71
Intl Large Cap Value	1,130,977,078	2.39	1,261,093,156	2.55
Brandes Investment	509,150,944	1.08	563,559,446	1.14
Mondrian	509,680,731	1.08	573,613,710	1.16
Lazard	112,145,403	0.24	123,920,000	0.25
Intl Large Cap Core	3,685,191,615	7.79	4,109,449,941	8.32
Arrowstreet Capital	906,346,411	1.92	1,012,395,380	2.05
Brown Capital	441,685,342	0.93	472,593,364	0.96
GlobeFlex Capital	727,115,012	1.54	795,096,619	1.61
Xponance Intl EQ	79,657,074	0.17	88,890,023	0.18
Progress Intl Equity	544,150	0.00	570,044	0.00
Transition Account	188,069	0.00	188,282	0.00
NTGI ACWI ex US Index Fund	1,529,655,557	3.23	1,739,716,230	3.52
Intl All Cap Developed	133,799,825	0.28	145,527,223	0.29
Ativo International	133,799,825	0.28	145,527,223	0.29
International Small Cap	461,168,865	0.98	509,191,084	1.03
Franklin Templeton	180,392,392	0.38	200,174,494	0.41
William Blair IntSC	280,776,473	0.59	309,016,590	0.63

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
Emerging Mkt Equity	865,726,503	1.83	1,031,443,141	2.09
Genesis Investment Management, LLP.	865,726,503	1.83	1,031,443,141	2.09

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
Fixed Income	11,735,937,974	24.82	12,093,544,413	24.48
Domestic Fixed Core	3,641,409,157	7.70	3,767,694,423	7.63
Attucks Fixed Income	83,605,924	0.18	86,585,533	0.18
Brandes FI Core	326,008,800	0.69	334,398,290	0.68
EARNEST Partners	868,476,167	1.84	895,329,810	1.81
Garcia Hamilton	920,633,152	1.95	963,768,011	1.95
Ramirez Asset Management	504,784,551	1.07	520,212,662	1.05
Xponance Yield Advantage Agg.	937,900,563	1.98	967,400,116	1.96
Domestic Fixed Passive Core	2,618,485,050	5.54	2,715,010,625	5.50
NTGI Blmbg Agg.	1,066,627,195	2.26	1,106,002,561	2.24
BlackRock US Debt I	1,551,857,855	3.28	1,609,008,064	3.26
Domestic Fixed Core Plus	2,829,793,945	5.98	2,930,301,935	5.93
LM Capital Group FI	814,854,201	1.72	842,186,944	1.70
Progress Inv. FI	1,012	0.00	1,064	0.00
Loop Capital Management	551,011,952	1.17	571,157,886	1.16
Western Asset	914,741,787	1.93	951,699,903	1.93
Longfellow Core Plus	549,184,993	1.16	565,256,138	1.14
Bank Loans	1,587,889,154	3.36	1,608,938,020	3.26
Barings Global Loan Fund	1,587,889,154	3.36	1,608,938,020	3.26
Emerging Markets Debt	424,730	0.00	434,270	0.00
Standish-Mellon EMD	424,730	0.00	434,270	0.00
High Yield	1,057,935,938	2.24	1,071,165,140	2.17
MacKay Shields	1,057,935,938	2.24	1,071,165,140	2.17

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
Private Real Assets	4,862,214,118	10.28	4,810,480,821	9.74
Real Estate	4,445,715,752	9.40	4,393,962,227	8.90
Real Estate Core Cmp	2,450,129,239	5.18	2,373,458,736	4.80
TA Assoc. Buckhead	990,254,880	2.09	900,720,750	1.82
Barings Euro Core Property	132,621,940	0.28	136,907,905	0.28
Blackstone Property Euro	166,820,429	0.35	178,351,539	0.36
INVESCO Core Real Estate	263,729,304	0.56	263,729,304	0.53
INVESCO European real estate	55,111,454	0.12	57,407,480	0.12
AEW Core Property Tr	305,726,614	0.65	303,433,229	0.61
CBRE Core Partners	333,822,479	0.71	333,822,479	0.68
JPM Strategic Property Fund	202,042,139	0.43	199,086,050	0.40
RE Non-Core Cmp	1,995,586,512	4.22	2,020,503,491	4.09
Artemis MWBE Spruce	314,549,102	0.67	317,416,747	0.64
Franklin T. EMREFF	3,953,769	0.01	2,870,680	0.01
Security Capital	93,867,301	0.20	99,921,260	0.20
Dune II	8,031,504	0.02	7,607,645	0.02
Non-Core Real Estate Funds	1,348,910,910	2.85	1,358,946,362	2.75
Non-Core Intl Real Estate	226,192,102	0.48	233,661,080	0.47
Almanac ARS V	81,825	0.00	79,717	0.00
Agriculture	241,046,653	0.51	249,673,444	0.51
Premiere Partners IV	241,046,653	0.51	249,673,444	0.51
Timberland	60,922,439	0.13	60,922,439	0.12
Forest Investment	60,922,439	0.13	60,922,439	0.12
Unlisted Infrastructure	114,529,274	0.24	105,922,711	0.21
Unlisted Infrastructure Funds	114,529,274	0.24	105,922,711	0.21

Investment Manager Asset Allocation

Periods Ended November 30, 2022

	Oct-2022		Nov-2022	
	\$	%	\$	%
Alternatives Investments	5,004,465,699	10.58	5,057,765,922	10.24
Absolute Return	109,329	0.00	84,432	0.00
Aurora Investment	109,329	0.00	84,432	0.00
Private Equity	4,835,971,572	10.23	4,889,760,121	9.90
Abbott S/A Comp.	518,722,718	1.10	519,430,702	1.05
Muller Monroe MPEFF	1	0.00	1	0.00
Pantheon S/A Comp.	439,918,309	0.93	439,824,853	0.89
Private Equity Fund - Domestic	3,194,159,236	6.75	3,205,042,958	6.49
Private Equity Fund - International	476,446,619	1.01	523,275,249	1.06
Oakbrook Opportunities Fund	206,724,689	0.44	202,186,358	0.41
Private Credit	168,384,798	0.36	167,921,369	0.34
Private Credit Fund - Domestic	168,384,798	0.36	167,921,369	0.34
Cash & Equivalents	317,654,568	0.67	296,732,225	0.60
Total Fund	47,287,821,997	100.00	49,397,560,674	100.00

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Total Fund	49,397,560,674	4.78	8.68	-10.62	-8.45	7.01	6.84	8.43	9.65	1/1/1982
Total Fund - Net		4.75	8.64	-10.75	-8.59	6.83	6.66	8.22		
Total Fund Benchmark		4.52	8.61	-10.07	-7.44	5.58	6.04	7.65		
Domestic Equity	18,655,880,260	5.53	15.07	-14.57	-11.60	10.26	9.77	12.62	11.51	1/1/1982
Domestic Equity - Net		5.51	15.03	-14.70	-11.74	10.08	9.58	12.39		
Custom Benchmark (U.S. Equity)		5.40	13.69	-13.70	-10.30	10.49	10.45	13.00		
Russell 3000 Index		5.22	13.85	-14.18	-10.80	10.28	10.33	12.95	11.44	
U.S. Equity IMRF Custom Benchmark		5.35	14.39	-13.65	-10.22	9.67	9.29			
Large Cap Equity	12,775,382,840	5.32	14.85	-17.00	-14.55	10.03	10.05	12.89	11.20	1/1/1982
Large Cap Equity - Net		5.31	14.82	-17.07	-14.64	9.94	9.95	12.77		
Russell 1000 Index		5.41	13.86	-14.13	-10.66	10.56	10.69	13.17	11.59	
Large Cap Growth	3,172,800,575	3.40	9.84	-29.53	-29.10	9.59	12.03	13.71	11.81	1/1/1982
Large Cap Growth - Net		3.37	9.81	-29.60	-29.18	9.50	11.92	13.57		
LCG Blended Benchmark		4.56	10.67	-23.26	-21.64	11.79	12.92	15.01		
Russell 1000 Growth Index		4.56	10.67	-23.26	-21.64	11.79	12.92	15.01	11.30	
Xpounce Russell 1000 G	1,887,609,315	4.54	10.65	-23.26	-21.64	11.78			11.18	10/1/2018
Xpounce Russell 1000 G - Net		4.54	10.65	-23.27	-21.65	11.76			11.16	
Russell 1000 Growth Index		4.56	10.67	-23.26	-21.64	11.79			11.19	
Sands Capital	1,285,191,259	1.76	8.66	-45.36	-47.52	0.41	7.10	11.15	10.36	11/1/2003
Sands Capital - Net		1.70	8.60	-45.50	-47.70	0.18	6.86	10.90		
LCG Blended Benchmark		4.56	10.67	-23.26	-21.64	11.79	12.92	15.01	10.47	
Russell 1000 Growth Index		4.56	10.67	-23.26	-21.64	11.79	12.92	15.01	10.51	
Large Cap Value	4,862,562,804	6.44	19.05	-1.55	4.63	10.21	8.65	12.33	10.36	10/1/1982
Large Cap Value - Net		6.42	19.01	-1.70	4.47	10.05	8.48	12.15		
LCV Blended Benchmark		6.25	17.14	-3.65	2.42	8.40	7.86	10.97		
Russell 1000 Value Index		6.25	17.14	-3.65	2.42	8.40	7.86	10.97	11.61	

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Dodge & Cox	1,815,767,864	6.34	18.51	-2.50	2.98	12.58	10.36	13.41	10.07	9/1/2003
Dodge & Cox - Net		6.28	18.46	-2.70	2.76	12.35	10.13	13.17		
LCV Blended Benchmark		6.25	17.14	-3.65	2.42	8.40	7.86	10.97	8.49	
Russell 1000 Value Index		6.25	17.14	-3.65	2.42	8.40	7.86	10.97	8.63	
LSV Asset	1,497,361,970	7.00	20.64	-0.42	5.89	8.98	7.59	12.41	10.76	2/1/2003
LSV Asset - Net		7.00	20.57	-0.66	5.64	8.72	7.32	12.14		
LCV Blended Benchmark		6.25	17.14	-3.65	2.42	8.40	7.86	10.97	9.26	
Russell 1000 Value Index		6.25	17.14	-3.65	2.42	8.40	7.86	10.97	9.26	
NTGI S&P 500 Value	1,549,432,970	6.02	18.17	-1.50	5.40	8.83	8.84	11.61	6.54	8/1/1999
NTGI S&P 500 Value - Net		6.02	18.17	-1.50	5.40	8.83	8.84	11.61		
S&P 500 Value		6.02	18.22	-1.36	5.59	8.79	8.81	11.54	6.51	
Large Cap Pass. Core	2,280,571,134	5.27	13.88	-14.47	-11.20	10.13	10.23	12.92	11.14	1/1/1985
Large Cap Pass. Core - Net		5.27	13.88	-14.47	-11.21	10.12	10.22	12.92		
Dow Jones US Total Stock Market Index		5.28	13.87	-14.50	-11.25	10.11	10.20	12.85		
NTGI MarketCap Idx.	2,280,571,134	5.27	13.88	-14.47	-11.20	10.13	10.23	12.92	10.93	2/1/1985
NTGI MarketCap Idx. - Net		5.27	13.88	-14.47	-11.21	10.12	10.22	12.92		
Dow Jones US Total Stock Market Index		5.28	13.87	-14.50	-11.25	10.11	10.20	12.85		
Factor Diversity Strategies	2,459,448,328	5.72	14.52	-13.49	-9.79				9.55	8/18/2020
U.S. Large Cap FDP-GSAM	2,459,448,328	5.72	14.52	-13.49	-9.79				9.55	8/18/2020
U.S. Large Cap FDP-GSAM - Net		5.72	14.52	-13.52	-9.82				9.50	
Solactive GBS U.S. 1000 Index		5.32	13.77	-14.54	-11.23				9.06	
GSAM Active Beta US. Large Cap FDC Index		5.73	14.57	-13.45	-9.74				9.54	
Quantitative Factor Strategies	2,246,661,752	6.15	16.11	-7.27	-2.28	9.30			9.53	9/17/2019
Quantitative US Equity - SciBeta	2,246,661,752	6.15	16.11	-7.27	-2.28	9.30			9.53	9/17/2019
Quantitative US Equity - SciBeta - Net		6.14	16.11	-7.32	-2.33	9.09			9.34	
SciBeta US Hi-Fctr-Intst Div Multi-Beta Multi-Strat Index		6.12	16.24	-8.28	-3.11	8.34			8.54	

Benchmark definitions in glossary.

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Small Cap	2,220,453,880	4.63	17.25	-7.18	-2.62	11.56	8.88	11.92	12.03	7/1/1988
Small Cap Composite - Net		4.56	17.13	-7.83	-3.31	10.85	8.24	11.30		
Russell 2000 Index		2.34	13.60	-14.91	-13.01	6.44	5.45	10.13	9.15	
Small Cap Growth	727,478,983	4.62	13.90	-15.43	-12.75	10.89	11.24	13.08	12.85	7/1/1988
Small Cap Growth - Net		4.62	13.76	-16.46	-13.81	9.78	10.35	12.34		
Russell 2000 Growth Index		1.63	11.27	-21.31	-20.96	3.68	4.91	10.24	7.80	
Frontier Capital	727,478,983	4.62	13.90	-15.43	-12.75	11.70	13.86	13.98	13.20	8/1/1988
Frontier Capital - Net		4.62	13.76	-16.46	-13.81	10.52	12.85	13.17		
Russell 2000 Growth Index		1.63	11.27	-21.31	-20.96	3.68	4.91	10.24	7.88	
Small Cap Value	1,492,974,896	4.63	18.95	-2.54	3.21	12.02	7.45	11.53	11.69	9/1/1989
Small Cap Value - Net		4.54	18.85	-2.96	2.77	11.51	6.94	10.99		
Russell 2000 Value Index		3.06	16.03	-8.48	-4.75	8.33	5.35	9.67	9.80	
Channing	308,721,865	3.57	16.20	-9.96	-4.60	9.49	5.47	10.60	9.91	7/1/2011
Channing - Net		3.45	16.06	-10.41	-5.09	8.96	4.95	10.06	9.33	
Russell 2000 Value Index		3.06	16.03	-8.48	-4.75	8.33	5.35	9.67	8.71	
DFA Small Cap Val.	562,042,183	5.19	20.92	3.86	9.83	16.27	8.88	12.04	12.17	2/1/1996
DFA Small Cap Val. - Net		5.12	20.85	3.54	9.49	15.79	8.40	11.52		
Russell 2000 Value Index		3.06	16.03	-8.48	-4.75	8.33	5.35	9.67	9.30	
William Blair Small Cap Value	622,210,849	4.66	18.60	-3.98	1.81	9.94	7.26	12.05	11.32	5/1/1999
Inv. Couns. Maryland - Net		4.56	18.49	-4.45	1.31	9.41	6.73	11.51		
Russell 2000 Value Index		3.06	16.03	-8.48	-4.75	8.33	5.35	9.67	8.87	
Public Real Assets	1,413,381,788	7.97	12.14	-0.71	6.04	5.74	6.55	6.76	6.76	8/1/2017
Public Real Assets - Net		7.89	12.05	-1.02	5.71	5.36	6.12		6.34	
Public Real Assets Benchmark		7.78	12.03	-2.34	4.72	3.92	4.74		4.85	
Brookfield	396,595,761	7.10	12.17	3.00	9.68	6.17	5.97	5.57	5.57	8/1/2017
Brookfield - Net		6.99	12.05	2.59	9.24	5.65	5.44		5.05	
Dow Jones Brookfield Global Infrastructure Composite Index		7.64	13.14	-1.64	5.39	4.12	4.34		4.02	

Benchmark definitions in glossary.

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Cohen & Steers	1,016,786,027	8.31	12.13	-1.50	5.26	5.88	7.03		7.53	8/1/2017
Cohen & Steers - Net		8.24	12.05	-1.77	4.97	5.54	6.64		7.14	
FTSE Global Core Infrastructure 50/50 Index (Net)		7.85	11.47	-2.72	4.35	3.78	4.91		5.23	

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
International Equity	8,483,157,034	11.82	16.07	-16.93	-13.69	2.52	2.39	5.62	7.31	9/1/1986
International Equity - Net		11.76	15.99	-17.20	-13.98	2.15	2.04	5.26		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23		
International Equity IMRF Custom Benchmark		11.99	14.58	-16.07	-12.83	1.55	1.27			
Intl LargeCap Equity	6,796,995,585	10.95	16.61	-14.62	-10.80	3.83	3.12	6.08	7.42	9/1/1986
Intl LargeCap Equity - Net		10.89	16.54	-14.84	-11.04	3.52	2.83	5.79		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23		
Intl Large Cap Grwth	1,426,452,489	8.90	16.04	-19.67	-17.27	5.19	3.83	6.06	7.90	9/1/2002
Intl Large Cap Grwth - Net		8.85	15.96	-19.91	-17.52	4.85	3.54	5.75		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	6.44	
MSCI AC World ex USA Growth (Net)		12.43	14.64	-21.86	-19.51	1.48	2.24	5.13	6.67	
EARNEST Part. Intl	581,187,928	9.59	17.14	-8.21	-3.87	6.56	3.89	5.51	8.48	10/1/2004
EARNEST Part. Intl - Net		9.59	17.08	-8.40	-4.07	6.33	3.69	5.30		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	5.20	
MSCI AC World ex USA Growth (Net)		12.43	14.64	-21.86	-19.51	1.48	2.24	5.13	5.79	
William Blair	845,264,561	8.44	15.30	-26.02	-24.51	4.23	3.90	6.62	8.88	10/1/2002
William Blair - Net		8.34	15.19	-26.29	-24.79	3.84	3.52	6.23		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	7.06	
MSCI AC World ex USA Growth (Net)		12.43	14.64	-21.86	-19.51	1.48	2.24	5.13	7.19	
Intl Large Cap Val.	1,261,093,156	11.50	17.34	-9.33	-4.64	1.66	1.68	5.03	7.83	10/1/1995
Intl Large Cap Val. - Net		11.42	17.26	-9.62	-4.93	1.35	1.36	4.66		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	4.84	
MSCI AC World ex USA Value		11.20	15.72	-8.03	-3.10	2.17	1.02	3.75		
Brandes Investment	563,559,446	10.69	19.09	-7.12	-1.68	2.63	2.29	5.71	8.06	1/1/1996
Brandes Investment - Net		10.63	19.03	-7.32	-1.89	2.41	2.07	5.47		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	4.75	
MSCI AC World ex USA Value		11.20	15.72	-8.03	-3.10	2.17	1.02	3.75		

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Mondrian	573,613,710	12.54	16.28	-10.63	-6.39	0.97	1.29	4.51	4.28	4/1/2012
Mondrian - Net		12.43	16.16	-10.91	-6.68	0.59	0.87	4.03	3.80	
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	4.11	
MSCI AC World ex USA Value		11.20	15.72	-8.03	-3.10	2.17	1.02	3.75	3.69	
Lazard	123,920,000	10.50	14.58	-12.97	-9.21	1.49	1.57	4.77	4.97	4/1/2012
Lazard - Net		10.43	14.51	-13.14	-9.38	1.25	1.33	4.31	4.53	
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	4.11	
MSCI AC World ex USA Value		11.20	15.72	-8.03	-3.10	2.17	1.02	3.75	3.69	
Intl Large Cap Active Core	2,369,733,711	9.94	15.71	-14.77	-10.13	5.53	4.29	7.53	5.09	2/1/2008
Intl Large Cap Active Core - Net		9.84	15.60	-15.11	-10.48	4.99	3.79	6.99		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	2.29	
Arrowstreet Capital	1,012,395,380	11.70	17.27	-9.16	-3.37	11.54	8.08	9.68	6.44	3/1/2008
Arrowstreet Capital - Net		11.57	17.13	-9.59	-3.83	11.03	7.59	9.17	5.95	
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	2.11	
Brown Capital	472,593,364	7.00	13.33	-29.22	-26.69	-0.66	1.46	6.36	6.54	10/1/2004
Brown Capital - Net		6.93	13.26	-29.41	-26.88	-1.34	0.93	5.53		
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	5.20	
GlobeFlex Capital	795,096,619	9.35	15.14	-10.48	-5.29	4.96	2.52	6.46	4.86	3/1/2006
GlobeFlex Capital - Net		9.25	15.04	-10.78	-5.62	4.57	2.13	6.05	4.42	
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87	1.75	1.48	4.23	3.40	
Xponance Intl EQ	88,890,023	11.59	16.46	-18.41	-14.29				-4.09	2/1/2021
Xponance Intl EQ - Net		11.59	16.27	-18.95	-14.86				-4.67	
MSCI EAFE Index (Net)		11.26	17.25	-14.52	-10.14				-2.13	
Progress Intl Equity	570,044									
Intl Large Cap Passive Core	1,739,716,230	13.73	17.81	-13.61	-10.18	2.40	2.30	5.42	3.71	2/1/2000
Intl Large Cap Passive Core - Net		13.73	17.81	-13.62	-10.19	2.39	2.30	5.41		
International Large Cap Passive Core Benchmark		11.80	15.15	-15.37	-11.87	1.29	1.47	4.80	3.22	

Benchmark definitions in glossary.

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
NTGI ACWI ex US Index	1,739,716,230	13.73	17.81	-13.61	-10.19				-10.09	10/1/2021
NTGI ACWI ex US Index - Net		13.73	17.81	-13.62	-10.20				-10.10	
MSCI AC World ex USA (Net)		11.80	15.15	-15.37	-11.87				-11.98	
Intl All Cap Developed	145,527,223	8.76	15.52	-18.59	-13.61	0.17			3.19	2/1/2019
Intl All Cap Developed - Net		8.76	15.37	-19.02	-14.06	-0.33			2.70	
MSCI EAFE + Canada (Net)		10.65	16.75	-13.87	-9.50	2.50			4.71	
Ativo International	145,527,223	8.76	15.53	-18.59	-13.62	0.17			3.19	2/1/2019
Ativo International - Net		8.76	15.37	-19.02	-14.06	-0.33			2.70	
MSCI EAFE + Canada (Net)		10.65	16.75	-13.87	-9.50	2.50			4.71	
Intl Small Cap Eqty	509,191,084	10.41	16.05	-29.39	-27.31	0.82	0.75	5.95	4.21	12/1/2005
Intl Small Cap Eqty - Net		10.28	15.92	-29.91	-27.84	0.06	0.01	5.16		
MSCI AC World ex USA Small Cap (Net)		9.56	13.12	-20.11	-16.73	2.65	1.25	5.64	5.40	
Custom Benchmark (Intl Small Cap)		9.56	13.12	-20.11	-16.73	2.65	1.25	5.64	4.81	
Franklin Templeton	200,174,494	10.97	15.26	-22.14	-18.57	0.38	0.27	5.60	4.69	8/1/2011
Franklin Templeton - Net		10.97	15.26	-22.58	-19.03	-0.34	-0.43	4.86	3.95	
MSCI AC World ex USA Small Cap (Net)		9.56	13.12	-20.11	-16.73	2.65	1.25	5.64	4.14	
William Blair IntSC	309,016,590	10.06	16.57	-33.41	-32.04	1.10	1.07	6.18	7.27	9/1/2010
William Blair IntSC - Net		9.84	16.35	-33.97	-32.60	0.32	0.30	5.37	6.45	
MSCI AC World ex USA Small Cap (Net)		9.56	13.12	-20.11	-16.73	2.65	1.25	5.64	5.83	
Custom Benchmark (Intl Small Cap)		9.56	13.12	-20.11	-16.73	2.65	1.25	5.64	6.07	
Emerging Mkt Equity	1,031,443,141	19.19	12.67	-23.64	-22.98	-3.64	-0.58	2.39	7.75	2/1/1992
Emerging Mkt Equity - Net		19.14	12.57	-24.02	-23.40	-4.18	-1.14	1.81		
MSCI Emerging Markets Index		14.85	11.30	-18.64	-17.07	0.51	-0.04	2.44	6.30	
Genesis Investment Management, LLP.	1,031,443,141	19.19	12.67	-23.64	-22.99	-3.64	-0.58	2.39	8.60	5/1/2004
Genesis Investment Management, LLP. - Net		19.14	12.57	-24.02	-23.40	-4.18	-1.14	1.81		
MSCI Emerging Markets Index		14.85	11.30	-18.64	-17.07	0.51	-0.04	2.44	7.24	

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Fixed Income	12,093,544,413	3.27	2.46	-11.53	-11.47	-1.61	0.85	1.89	7.46	1/1/1982
Fixed Income - Net		3.26	2.44	-11.60	-11.55	-1.71	0.74	1.76		
Custom Benchmark (Fixed Income)		3.21	2.53	-11.26	-11.49	-2.09	0.51	1.24	6.94	
Fixed Income IMRF Custom Benchmark		3.21	2.54	-11.66	-11.70	-2.00	0.58			
Active Fixed Core	3,767,694,423	3.75	2.20	-11.87	-12.07	-1.95	0.61	1.52	3.68	4/1/2001
ActiveCore Fixed Inc - Net		3.74	2.17	-11.97	-12.18	-2.05	0.51	1.39		
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	3.59	
Attucks Fixed Income	86,585,533	3.56	1.98	-13.22	-13.54				-7.52	2/1/2021
Attucks Fixed Income - Net		3.48	1.89	-13.51	-13.83				-7.81	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84				-7.51	
Brandes FI Core	334,398,290	3.15	2.48	-10.09	-10.15	-1.53	0.62		0.90	3/1/2016
Brandes FI Core - Net		3.15	2.47	-10.12	-10.18	-1.55	0.61		0.89	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20		0.68	
EARNEST Partners	895,329,810	3.32	1.81	-12.06	-12.35	-2.12	0.61	1.53	3.46	5/1/2005
EARNEST Partners - Net		3.32	1.77	-12.18	-12.47	-2.25	0.47	1.36	3.28	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	3.02	
Garcia Hamilton	963,768,011	4.82	2.97	-10.95	-11.21	-1.98	0.64		1.33	6/1/2015
Garcia Hamilton - Net		4.82	2.95	-11.02	-11.28	-2.06	0.56		1.24	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20		0.83	
Ramirez Asset Management	520,212,662	3.64	2.11	-12.58	-12.92				-2.89	5/1/2020
Ramirez Asset Management - Net		3.60	2.08	-12.70	-13.04				-3.02	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84				-4.78	
Xponance Yield Advantage Agg.	967,400,116	3.39	1.78	-12.67	-12.72	-1.83	0.59	1.51	3.31	6/1/2005
Xponance Yield Advantage Agg. - Net		3.36	1.74	-12.79	-12.84	-1.96	0.46	1.36	3.14	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	2.97	
Pass. Core Fixed Inc	2,715,010,625	3.69	2.36	-12.47	-12.73	-2.51	0.27	1.14	5.15	1/1/1990
Pass. Core Fixed Inc - Net		3.69	2.36	-12.47	-12.73	-2.52	0.27	1.13		
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	5.12	

Benchmark definitions in glossary.

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
BlackRock US Debt I	1,609,008,064	3.68	2.35	-12.46	-12.74	-2.49	0.29		1.53	10/1/2013
BlackRock US Debt I - Net		3.68	2.35	-12.46	-12.74	-2.50	0.29		1.52	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20		1.41	
NTGI Blmbg Agg.	1,106,002,561	3.69	2.36	-12.47	-12.72	-2.53	0.26	1.12	5.19	2/1/1990
NTGI Blmbg Agg. - Net		3.69	2.36	-12.48	-12.72	-2.54	0.25	1.11		
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	5.18	
Core Plus Fixed Income	2,930,301,935	3.88	2.85	-13.43	-13.29	-1.91	0.69	1.82	7.30	1/1/1982
Core Plus Fixed Inc. - Net		3.85	2.81	-13.56	-13.43	-2.07	0.52	1.64		
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	6.90	
LM Capital Group FI	842,186,944	3.74	3.01	-11.45	-11.30	-1.07	0.99	1.82	3.85	5/1/2005
LM Capital Group FI - Net		3.74	2.96	-11.59	-11.45	-1.23	0.83	1.66	3.68	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	3.02	
Progress Inv. FI	1,064									
Loop Capital Management	571,157,886	3.96	3.06	-13.19	-13.17	-2.03	0.57	1.93	3.81	5/1/2005
Loop Capital Management - Net		3.92	3.02	-13.31	-13.29	-2.16	0.43	1.80	3.68	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	3.02	
Western Asset	951,699,903	4.28	3.16	-15.42	-15.13	-2.66	0.43	1.98	4.34	11/1/2001
Western Asset - Net		4.25	3.12	-15.54	-15.28	-2.79	0.30	1.85		
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84	-2.59	0.20	1.09	3.34	
Longfellow Core Plus	565,256,138	3.34	1.87	-13.13	-13.16				-3.10	5/1/2020
Longfellow Core Plus - Net		3.30	1.83	-13.25	-13.28				-3.25	
Blmbg. U.S. Aggregate		3.68	2.33	-12.62	-12.84				-4.78	
Bank Loans	1,608,938,020	1.33	1.20	-4.16	-3.43	1.97	2.72		3.53	8/1/2014
Bank Loans - Net		1.33	1.24	-4.08	-3.35	2.00	2.59		3.21	
Custom Benchmark		1.35	2.21	-1.52	-0.91	2.77	3.37		3.59	

Performance

Periods Ended November 30, 2022

	Market Value \$	Performance (%)								
		1 Month	QTD	YTD	1 Year	3 Years	5 Years	10 Years	Since Inception	Inception Date
Barings Global Loan Fund	1,608,938,020	1.33	1.20	-4.16	-3.43	1.97	2.72		3.53	8/1/2014
Barings Global Loan Fund - Net		1.33	1.24	-4.08	-3.35	2.00	2.59		3.21	
Custom Benchmark		1.35	2.21	-1.52	-0.91	2.77	3.37		3.59	
Emerging Markets Debt	434,270									
Standish-Mellon EMD	434,270									
High Yield	1,071,165,140	1.90	4.46	-7.02	-5.33	2.45	3.87	5.18	8.94	4/1/1986
High Yield - Net		1.90	4.46	-7.22	-5.62	2.13	3.54	4.84		
ICE BofAML US High Yield, Cash Pay Index		1.93	4.87	-10.45	-8.73	0.73	2.34	4.18	7.64	
MackKay Shields	1,071,165,140	1.90	4.46	-7.00	-5.34	2.46	3.88	5.25	7.94	11/1/2000
MackKay Shields - Net		1.90	4.46	-7.20	-5.62	2.13	3.54	4.91		
ICE BofAML US High Yield, Cash Pay Index		1.93	4.87	-10.45	-8.73	0.73	2.34	4.18	6.58	

Benchmark History

Account Name	From Date	To Date	Benchmark
Total Fund			The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset classes:
	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
Domestic Equity	3/1/2022	Present	93% Russell 3000 Index, 7% FTSE Global Core Infrastructure 50/50 Index (Net)
	1/1/2015	2/28/2022	100% Russell 3000 Index
	1/1/1982	12/31/2014	100% Dow Jones US Total Stock Market Index
Large Cap Growth	1/1/2006	Present	100% Russell 1000 Growth Index
	11/1/2003	12/13/2005	100% S&P 500 Growth
Large Cap Value	1/1/2006	Present	100% Russell 1000 Value Index
	2/1/2001	12/31/2005	100% S&P 500 Value
Public Real Assets	8/1/2017	Present	33.3% Dow Jones Brookfield Global Infrastructure Composite, 66.7% FTSE GLOBAL CORE INFRASTRUCTURE 50/50 INDEX (Net)

Benchmark History

Account Name	From Date	To Date	Benchmark
Intl Small Cap Eqty	6/1/2011	Present	100% MSCI AC World ex USA Small Cap (Net)
	12/1/2005	5/31/2011	100% S&P Developed Ex-U.S. SmallCap (Net)
Barings Global Loan Fund	8/1/2014	Present	Comprised of the Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.