Wilshire Advisors

Executive Summary of Investment Performance

As of March 31, 2023
IMRF Performance Summary

- IMRF market value as of March 2023: $49.49 billion
- IMRF total fund return for 1Q 2023: 4.30% vs the Total Fund Benchmark return of 5.11%
- U.S. equity markets posted strong returns for the quarter on the back of positive inflation and employment data
- IMRF U.S. Equity Portfolio underperformed the benchmark during the quarter, returning 6.09% versus 6.71%
- International equity markets advanced in the first quarter of the year despite increased volatility in the global banking sector
- IMRF International Equity Portfolio outperformed the benchmark during the quarter, returning 7.68% versus 6.87%
- Fixed income markets were largely positive for the quarter as rates fell, and the collapse of SVB and Credit Suisse resulted in a flight-to-quality
- IMRF Fixed Income Portfolio outperformed the benchmark during the quarter, returning 3.24% versus 3.08%
- All asset class allocations remain within the rebalancing range in the Investment Policy

Performance referenced above is Net of Fees.
Market Commentary

U.S. Equity

The U.S. stock market was up 7.3% for the first quarter but is down -8.6% for the past 12 months. The best performing sectors were IT (+21.2%) and Communication Services (+19.8%). The worst performing were Financials (-5.2%) and Energy (-4.6%). From a size perspective, large-cap outperformed small-cap by 400 basis points. Growth stocks vastly outperformed value for the quarter but still trail meaningfully for the one-year return.

The yield curve inversion that began during the third quarter of last year worsened during the first quarter of 2023. The spread between the 10-year Treasury and 3-month T-Bill, arguably the strongest predictor of a pending recession, is at a level not seen since the early 1980’s. The Federal Reserve’s aggressive action has pushed the short-term rate to a spread of 1.37% above the benchmark ten-year. The probability of a recession in the next 12 months, according to the Federal Reserve Bank of New York, currently stands at 62%. The short end of the curve had been rising this quarter until early March when the FDIC announced that they had closed the failing Silicon Valley Bank. Market action quickly pushed the curve mostly below year-end 2022 levels.

Non-U.S. Equity

Banking weakness appeared in Europe as the Swiss bank, Credit Suisse, saw billions in depositor outflows in one day due to concerns of instability within the organization. Swiss authorities quickly pressed a plan for rival UBS to acquire the smaller bank at a reduced price, with Credit Suisse investors and creditors losing nearly everything. China is quickly seeing benefits from its relaxed COVID-related restrictions as a key index measuring their services sector jumped in March to its highest level in more than a decade.

Fixed Income

The U.S. Treasury yield curve was up in the short-end (below 1-year) but fell across the remainder of the curve. The 10-year Treasury yield ended the quarter at 3.47%, down 41 basis points from December. The FOMC increased the overnight rate by 0.25% in both January and March, targeting a range of 4.75% to 5.00%. The Fed’s “dot plot” is messaging that the current expectation is for another 25 basis point increase before the end of 2023 while markets are pricing a year-end rate that would be approximately 50 basis points lower than the current rate.
### March 2023 Asset Class Assumptions

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<td>0.47</td>
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Regional Banks Under Stress

Data Source: Bloomberg
Fed Response: “Dovish Hike” - End of QT?

Data Source: Bloomberg
Fed Funds Discounting Goes into “Charlie Brown” Mode

Data Source: Bloomberg
Extreme Interest Rate Volatility

Data Source: Bloomberg
Credit Spreads Widen (but remain below Sept ‘22 levels)

Data Source: Bloomberg
Many Risk-Assets Showing Resilience

Data Source: Bloomberg
Economic/Market Activity
Economic Growth

Real GDP Growth

Chicago Fed. National Activity Index (3M MA)

Data Sources: Bloomberg
Consumer Activity

University of Michigan: Consumer Sentiment

Real Personal Consumption Expenditures

Average Hourly Earnings

Data Sources: Bloomberg
Business Activity

ISM Report on Business

- Indicates expansion of manufacturing
- Indicates contraction of manufacturing

Industrial Production Index

- Index Change (6-mo annualized)

Durable Goods New Orders

- Durable Goods (6-mo annualized)

Data Sources: Bloomberg
Inflation and Employment

**Inflation: Actual & Expected**

- Headline CPI (6-mo annualized)
- Core CPI (6-mo annualized)
- 10-year Breakeven

**Employment Gains / Losses**

- Job Growth (Loss)
- Unemployment Rate
- 6M MA

Data Sources: Bloomberg
# U.S. Equity Market

## U.S. Sector Weight and Return (%)

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<th>Sector</th>
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<th>Return (%)</th>
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<td>Health Care</td>
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<td>FT Wilshire 5000</td>
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## As of 3/31/2023

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## Large Cap vs Small Cap

### Quarterly Excess

Mar-13: 15.2%
Mar-15: 20.0%
Mar-17: 15.0%
Mar-19: 10.0%
Mar-21: 5.0%
Mar-23: 0.0%

### Rolling 3-Year Excess

-20.0%
-15.0%
-10.0%
-5.0%
0.0%
5.0%
10.0%
15.0%
20.0%

## Large Growth vs Large Value

### Quarterly Excess

Mar-13: 21.2%
Mar-15: 15.2%
Mar-17: 10.0%
Mar-19: 5.0%
Mar-21: 0.0%
Mar-23: -5.0%

### Rolling 3-Year Excess

-20.0%
-15.0%
-10.0%
-5.0%
0.0%
5.0%
10.0%
15.0%
20.0%

Data Sources: Bloomberg, Wilshire Atlas
U.S. Factor Returns

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

Yield Curve Slope vs Recessions (IN GRAY)

Bloomberg Credit Indexes

St. Louis Fed. Financial Stress Index

CBOE Volatility Index

Data Sources: Bloomberg
Non-U.S. Growth and Inflation

Developed Markets Real GDP Growth YoY (%)

-30.0 -20.0 -10.0 0.0 10.0 20.0 30.0
Dec-17 Dec-18 Dec-19 Dec-20 Dec-21 Dec-22
USA Eurozone Japan UK

Emerging Markets Real GDP Growth YoY (%)

-30.0 -25.0 -20.0 -15.0 -10.0 -5.0 0.0 5.0 10.0 15.0 20.0 25.0
Dec-17 Dec-18 Dec-19 Dec-20 Dec-21 Dec-22
China India Brazil Russia South Korea

Developed Markets CPI Growth YoY (%)

-2.0 0.0 2.0 4.0 6.0 8.0 10.0 12.0
Feb-18 Feb-19 Feb-20 Feb-21 Feb-22 Feb-23
USA Eurozone Japan UK

Emerging Markets CPI Growth YoY (%)

-5.0 0.0 5.0 10.0 15.0 20.0
Feb-18 Feb-19 Feb-20 Feb-21 Feb-22 Feb-23
China India Brazil Russia South Korea

Data Sources: Bloomberg
### Non-U.S. Equity Market

**As of 3/31/2023**

<table>
<thead>
<tr>
<th>Index</th>
<th>Quarter</th>
<th>YTD</th>
<th>1 Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 Year</th>
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<td>MSCI ACWI ex-US ($G)</td>
<td>7.0</td>
<td>7.0</td>
<td>-4.6</td>
<td>12.3</td>
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<td>4.7</td>
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<td>8.6</td>
<td>8.6</td>
<td>-0.9</td>
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<td>4.0</td>
<td>5.5</td>
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**Developed Markets Weight and Return (%)**

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<td>Japan</td>
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<td>France</td>
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<td>Switzerland</td>
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**Emerging Markets Weight and Return (%)**

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<tr>
<td>India</td>
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<tr>
<td>South Korea</td>
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<td>Brazil</td>
<td>4.9</td>
<td>3.1</td>
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<td>Saudi Arabia</td>
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<tr>
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**Data Sources:** Bloomberg
U.S. Fixed Income

As of 3/31/2023

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<td>Bloomberg Gov’t-Rel.</td>
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<td>2.9</td>
<td>-3.3</td>
<td>-1.6</td>
<td>1.1</td>
<td>1.4</td>
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<td>Bloomberg Corporate</td>
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<td>7.2</td>
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<td>Bloomberg LT Gov’t/Credit</td>
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<td>Bloomberg LT Gov’t-Rel.</td>
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<td>11.7</td>
<td>5.2</td>
<td>5.2</td>
<td>-9.9</td>
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<td>Bloomberg LT Corporate</td>
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<td>5.4</td>
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<td>1.1</td>
<td>3.0</td>
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<tr>
<td>Bloomberg U.S. TIPS *</td>
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<td>7.6</td>
<td>3.3</td>
<td>3.3</td>
<td>-6.1</td>
<td>1.8</td>
<td>2.9</td>
<td>1.5</td>
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<tr>
<td>Bloomberg High Yield</td>
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<td>3.7</td>
<td>3.6</td>
<td>3.6</td>
<td>-3.3</td>
<td>5.9</td>
<td>3.2</td>
<td>4.1</td>
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<td>S&amp;P/LSTA Leveraged Loan</td>
<td>9.4</td>
<td>0.3</td>
<td>3.2</td>
<td>3.2</td>
<td>2.5</td>
<td>8.5</td>
<td>3.6</td>
<td>3.8</td>
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<td>0.8</td>
<td>1.4</td>
<td>0.9</td>
</tr>
</tbody>
</table>

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

Fixed Income Option Adjusted Spread (bps)

Treasury Yield Curve (%)
Federal Reserve

- After total increases of 425 basis points in the Fed-funds rate last year, the FOMC increased the rate an additional 50 basis points during Q1

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

- After a steady decline in the Fed’s balance sheet during 2022, total assets moved higher in March

<table>
<thead>
<tr>
<th></th>
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<th>Closed</th>
<th>Amount (bil)</th>
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<tr>
<td>QE1</td>
<td>11/25/2008</td>
<td>3/31/2010</td>
<td>$1,403</td>
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<td>QE3</td>
<td>9/13/2012</td>
<td>10/29/2014</td>
<td>$1,674</td>
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<tr>
<td>QE4</td>
<td>3/23/2020</td>
<td>3/15/2022</td>
<td>$4,779</td>
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Data Sources: Bloomberg
Non-U.S. Fixed Income

As of 3/31/2023

<table>
<thead>
<tr>
<th>Developed Markets</th>
<th>Quarter</th>
<th>YTD</th>
<th>1 Year</th>
<th>3 Year</th>
<th>5 Year</th>
<th>10 Year</th>
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<tbody>
<tr>
<td>Bloomberg Global Aggregate xUS</td>
<td>3.1</td>
<td>3.1</td>
<td>-10.7</td>
<td>-4.1</td>
<td>-3.2</td>
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<tr>
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<td>2.9</td>
<td>-3.3</td>
<td>-1.8</td>
<td>0.9</td>
<td>2.3</td>
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<tr>
<td>Bloomberg Global Inflation Linked xUS</td>
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<td>5.4</td>
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<tr>
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<td>4.0</td>
<td>4.0</td>
<td>-15.6</td>
<td>-2.0</td>
<td>0.3</td>
<td>2.7</td>
</tr>
</tbody>
</table>

| Emerging Markets (Hard Currency) | | | | | | |
| Bloomberg EM USD Aggregate | 2.1 | 2.1 | -4.6 | 0.1 | 0.3 | 2.1 |

| Emerging Markets (Foreign Currency) | | | | | | |
| Bloomberg EM Local Currency Gov’t | 3.1 | 3.1 | -3.5 | 1.9 | 0.1 | 0.5 |
| Bloomberg EM Local Currency Gov’t * | 2.2 | 2.2 | 3.1 | 0.2 | 2.2 | 2.0 |

| Euro vs. Dollar | 1.3 | 1.3 | -2.1 | -0.6 | -2.5 | -1.7 |
| Yen vs. Dollar | -1.3 | -1.3 | -8.4 | -6.8 | -4.4 | -3.4 |
| Pound vs. Dollar | 2.1 | 2.1 | -6.1 | -0.2 | -2.5 | -2.1 |

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

Global Fixed Income Yield to Worst (%)

[Graph showing global fixed income yield to worst (%)]

U.S. Dollar Index: Advanced Economies

[Graph showing U.S. dollar index: advanced economies]

Data Sources: Bloomberg
Global Interest Rates

Short-term rates have turned positive in most larger countries; longer-term rates around 3.5% in the U.K. and the U.S.

Data Sources: Bloomberg
## High Yield Bond Market

**As of 3/31/2023**

<table>
<thead>
<tr>
<th></th>
<th>YTW</th>
<th>QTR</th>
<th>YTD</th>
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<tr>
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<td>Ba U.S. High Yield</td>
<td>48.8%</td>
<td>6.8</td>
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<td>3.4</td>
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<td>B U.S. High Yield</td>
<td>39.6%</td>
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<td>Caa U.S. High Yield</td>
<td>10.7%</td>
<td>13.4</td>
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<td>Ca to D U.S. High Yield</td>
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Data Sources: Bloomberg

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**Fixed Income Option Adjusted Spread (bps)**

![Fixed Income Option Adjusted Spread Chart]

- HY Index
- Ba
- B
- Caa
# Real Assets

## As of 3/31/2023

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<th>Data Source</th>
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<td>FTSE Global Core Infrastructure 50/50</td>
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<td>63.6</td>
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</table>

## Real Estate Valuation (%)

- **NPI Cap Rate / Income over MV**
- **FTSE NAREIT Current Yield**
- **10-Year Treasury Constant Maturity Rate**

## NCREIF ODCE Fund Index Return (%)

- **Appreciation**
- **Income**
- **Total Return**

Data Sources: Bloomberg, National Council of Real Estate Investment Fiduciaries
### Asset Class Performance

#### Asset Class Returns - Best to Worst

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<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023 YTD</th>
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<td>U.S. Equity</td>
<td>31.0%</td>
<td>U.S. Equity</td>
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<td>REITs</td>
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<td>Core Bond</td>
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<td>REITs</td>
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<td>18.7%</td>
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<td>U.S. TIPS</td>
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<td>8.3%</td>
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<td>REITs</td>
<td>-4.8%</td>
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<td>14.3%</td>
<td>Core Bond</td>
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<td>U.S. TIPS</td>
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<td>U.S. Equity</td>
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<td>U.S. TIPS</td>
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#### Annualized 5-Year

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<td>U.S. Equity</td>
<td>10.7%</td>
<td>REITs</td>
<td>5.7%</td>
<td>Commodities</td>
<td>5.4%</td>
<td>Developed</td>
</tr>
<tr>
<td>Core Bond</td>
<td>4.0%</td>
<td>Core Bond</td>
<td>3.2%</td>
<td>U.S. TIPS</td>
<td>2.9%</td>
<td>T-Bills</td>
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<tr>
<td>U.S. TIPS</td>
<td>2.3%</td>
<td>Emrg Mrktse</td>
<td>0.9%</td>
<td>Core Bond</td>
<td>0.9%</td>
<td>Emrg Mrktse</td>
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</tbody>
</table>

**Data Sources:** Bloomberg  
**Note:** Developed asset class is developed equity markets ex-U.S., ex-Canada
Total Fund
Projected Deviations from the Benchmark
As of March 31, 2023

- Includes committed, but unfunded amounts for Real Assets ($2.19 billion) and Alternatives ($2.46 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 March 31, 2023

### Actual Allocation

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Actual Allocation</th>
<th>Actual Allocation</th>
<th>Target Allocation</th>
<th>Differences</th>
<th>Differences</th>
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<tbody>
<tr>
<td></td>
<td>$Millions</td>
<td>%</td>
<td>$Millions</td>
<td>%</td>
<td>$Millions</td>
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<td>100.0</td>
<td>0.0</td>
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<td>18,038</td>
<td>36.4</td>
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<td>131</td>
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<tr>
<td>International Equity</td>
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<td>18.3</td>
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<td>Fixed Income</td>
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<td>Private Real Assets</td>
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<td>Alternatives Investments</td>
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<td>Cash &amp; Equivalents</td>
<td>97</td>
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<td>-0.8</td>
<td>-398</td>
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Composite Performance Summary

Total Fund
*Periods Ended March 31, 2023*

### Comparative Performance

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

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<tr>
<th>Quarter</th>
<th>Return</th>
<th>Year</th>
<th>Years</th>
<th>Years</th>
<th>Years</th>
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<th>Years</th>
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<td>4.3</td>
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<tr>
<td>3</td>
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<td>1</td>
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<td>8.0</td>
<td>6.0</td>
<td>5.1</td>
<td>4.3</td>
</tr>
<tr>
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<td>6.0</td>
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<td>4.3</td>
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<tr>
<td>9</td>
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<td>6.0</td>
<td>5.1</td>
<td>4.3</td>
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<td>3</td>
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<td>8.2</td>
<td>8.0</td>
<td>6.0</td>
<td>5.1</td>
<td>4.3</td>
</tr>
<tr>
<td>11</td>
<td>7.8</td>
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<td>7.8</td>
<td>8.2</td>
<td>8.0</td>
<td>6.0</td>
<td>5.1</td>
<td>4.3</td>
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<td>8.2</td>
<td>3</td>
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<td>6.0</td>
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<td>8.2</td>
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<td>6.0</td>
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<td>4.3</td>
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<tr>
<td>14</td>
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<td>6.0</td>
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<td>4.3</td>
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### Added Value History

<table>
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<tr>
<th>Quarter</th>
<th>Added Value (%)</th>
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<tr>
<td>6/18</td>
<td>0.0</td>
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<tr>
<td>12/18</td>
<td>1.2</td>
</tr>
<tr>
<td>6/19</td>
<td>2.0</td>
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<tr>
<td>12/19</td>
<td>3.0</td>
</tr>
<tr>
<td>6/20</td>
<td>4.0</td>
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</table>

### Risk and Return 04/01/18 - 03/31/23

<table>
<thead>
<tr>
<th>Risk (Standard Deviation %)</th>
<th>Return (%)</th>
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<tr>
<td>10.2</td>
<td>6.0</td>
</tr>
<tr>
<td>10.5</td>
<td>6.3</td>
</tr>
<tr>
<td>10.8</td>
<td>6.6</td>
</tr>
<tr>
<td>11.1</td>
<td>6.9</td>
</tr>
<tr>
<td>11.4</td>
<td>7.2</td>
</tr>
<tr>
<td>11.7</td>
<td>10.5</td>
</tr>
<tr>
<td>12.0</td>
<td>11.7</td>
</tr>
</tbody>
</table>

### Risk and Return Percentile Rank

- **Total Fund:**
  - Total Period: 10
  - 5-25 Count: 2 (20%)
  - 25-Median Count: 6 (60%)
  - Median-75 Count: 2 (20%)
  - 75-95 Count: 0 (0%)

- **Total Fund Benchmark:**
  - Total Period: 10
  - 5-25 Count: 1 (10%)
  - 25-Median Count: 2 (20%)
  - Median-75 Count: 5 (50%)
  - 75-95 Count: 2 (20%)
### Plan Sponsor Peer Group Analysis

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

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th></th>
<th>QTD 1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fund</strong></td>
<td>4.35 (29)</td>
<td>12.18 (36)</td>
<td>7.00 (31)</td>
<td>7.84 (26)</td>
</tr>
<tr>
<td><strong>Total Fund - Net</strong></td>
<td>4.30 (31)</td>
<td>12.00 (42)</td>
<td>6.82 (44)</td>
<td>7.63 (33)</td>
</tr>
<tr>
<td><strong>Total Fund Benchmark</strong></td>
<td>5.11 (4)</td>
<td>9.69 (90)</td>
<td>6.23 (64)</td>
<td>7.14 (56)</td>
</tr>
<tr>
<td><strong>5th Percentile</strong></td>
<td>5.02</td>
<td>13.93</td>
<td>8.54</td>
<td>8.49</td>
</tr>
<tr>
<td><strong>1st Quartile</strong></td>
<td>4.41</td>
<td>12.50</td>
<td>7.19</td>
<td>7.84</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>3.89</td>
<td>11.61</td>
<td>6.72</td>
<td>7.22</td>
</tr>
<tr>
<td><strong>3rd Quartile</strong></td>
<td>3.35</td>
<td>10.56</td>
<td>5.72</td>
<td>6.49</td>
</tr>
<tr>
<td><strong>95th Percentile</strong></td>
<td>1.71</td>
<td>7.60</td>
<td>4.35</td>
<td>5.40</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>105</td>
<td>98</td>
<td>96</td>
<td>95</td>
</tr>
</tbody>
</table>

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

Total Fund
1 Quarter Ending March 31, 2023

Total Fund Performance

Total Value Added: -0.81%

Asset Class Under or Overweighting

Domestic Equity: -0.26%
International Equity: -0.73%
Fixed Income: -0.74%
Private Real Assets: -0.74%
Alternative Investment: -0.51%
Cash: -2.00%

Average Active Weight

Asset Allocation Value Added: 0.12%

Domestic Equity: 0.02%
International Equity: 0.01%
Fixed Income: 0.05%
Private Real Assets: 0.03%
Alternative Investment: 0.03%
Cash: -0.08%

Asset Allocation

Manager Value Added: -0.91%

Domestic Equity: -1.04%
International Equity: 0.14%
Fixed Income: 0.04%
Private Real Assets: 0.17%
Alternative Investment: 0.00%
Cash: -1.60%

Manager Value Added

Total Manager Value Added: -0.91%

Domestic Equity: -0.23%
International Equity: 0.14%
Fixed Income: 0.04%
Private Real Assets: 0.17%
Alternative Investment: 0.00%
Cash: -1.60%

Manager Value Added

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

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## Asset Class Returns

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th></th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>20 Years</th>
<th>30 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fund</strong></td>
<td>4.35</td>
<td>-4.79</td>
<td>12.18</td>
<td>7.00</td>
<td>7.84</td>
<td>8.51</td>
<td>8.16</td>
<td>9.62</td>
<td>1/1/1982</td>
</tr>
<tr>
<td><strong>Total Fund - Net</strong></td>
<td>4.30</td>
<td>-4.93</td>
<td>12.00</td>
<td>6.82</td>
<td>7.63</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Fund Benchmark</strong></td>
<td>5.11</td>
<td>-6.01</td>
<td>9.69</td>
<td>6.23</td>
<td>7.14</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Domestic Equity - Net</strong></td>
<td>6.09</td>
<td>-8.65</td>
<td>19.04</td>
<td>9.45</td>
<td>11.06</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Custom Benchmark (U.S. Equity)</strong></td>
<td>6.71</td>
<td>-8.48</td>
<td>18.63</td>
<td>10.54</td>
<td>11.76</td>
<td>10.59</td>
<td>9.70</td>
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<tr>
<td><strong>U.S. Equity IMRF Custom Benchmark</strong></td>
<td>5.50</td>
<td>-8.95</td>
<td>18.12</td>
<td>9.37</td>
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<td></td>
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<tr>
<td><strong>International Equity</strong></td>
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<td>13.20</td>
<td>3.22</td>
<td>5.45</td>
<td>8.63</td>
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<td>7.43</td>
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<td><strong>International Equity - Net</strong></td>
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<td><strong>MSCI AC World ex USA (Net)</strong></td>
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<td><strong>International Equity IMRF Custom Benchmark</strong></td>
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<td><strong>Fixed Income</strong></td>
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<td>-0.67</td>
<td>1.53</td>
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<td>5.11</td>
<td>7.47</td>
<td>1/1/1982</td>
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<td><strong>Custom Benchmark (Fixed Income)</strong></td>
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<td><strong>Fixed Income IMRF Custom Benchmark</strong></td>
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<td><strong>Private Real Assets</strong></td>
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<td>3.94</td>
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<td><strong>Blended Benchmark (Real Estate)</strong></td>
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<td>6.57</td>
<td>8.48</td>
<td>7.34</td>
<td>7.39</td>
<td>7.65</td>
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<td><strong>Agriculture</strong></td>
<td>1.67</td>
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<td>5.19</td>
<td>7.71</td>
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<td>6.56</td>
<td>8.48</td>
<td>12.57</td>
<td>11.18</td>
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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 March 31, 2023**

<table>
<thead>
<tr>
<th></th>
<th>Performance (%)</th>
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<tr>
<td></td>
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<td>Custom Benchmark (Alternative Investments)</td>
<td>10.23</td>
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<tr>
<td>Private Equity</td>
<td>0.52</td>
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<td>Blended Benchmark (Private Equity)</td>
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<tr>
<td>Cash</td>
<td>1.20</td>
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<tr>
<td>90 Day U.S. Treasury Bill</td>
<td>1.07</td>
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</table>

Benchmark definitions are on the following pages.
Real Estate, Private Equity, Agriculture, Timberland, Unlisted Infrastructure returns shown are gross of fees.
Private Equity and Blended Benchmark (Private Equity) returns are 1 quarter lagged.
## Investment Manager Asset Allocation

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th>Category</th>
<th>Dec-2022</th>
<th>Mar-2023</th>
</tr>
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<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Domestic Equity</td>
<td>17,448,903,100</td>
<td>18,037,864,656</td>
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<tr>
<td>Large Cap Growth</td>
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<td>3,411,535,102</td>
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<tr>
<td>Sands Capital</td>
<td>1,201,012,297</td>
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<tr>
<td>Xponance Russell 1000 G</td>
<td>1,743,276,376</td>
<td>1,993,615,462</td>
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<tr>
<td>Large Cap Value</td>
<td>4,631,558,697</td>
<td>4,371,812,163</td>
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<tr>
<td>Dodge &amp; Cox</td>
<td>1,728,993,204</td>
<td>1,747,504,129</td>
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<tr>
<td>LSV Asset</td>
<td>1,418,302,933</td>
<td>1,257,641,452</td>
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<tr>
<td>NTGI S&amp;P 500 Value</td>
<td>1,484,262,560</td>
<td>1,366,666,582</td>
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<tr>
<td>Large Cap Pass. Core</td>
<td>1,945,750,947</td>
<td>1,986,032,436</td>
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<tr>
<td>NTGI MarketCap Idx.</td>
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<td>1,986,032,436</td>
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<td>Factor Diversity Strategies</td>
<td>2,318,030,533</td>
<td>2,484,085,458</td>
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<tr>
<td>U.S. Large Cap FDP-GSAM</td>
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<td>Quantitative Factor Strategies</td>
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<td>2,224,054,962</td>
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<td>Quantitative US Equity - SciBeta</td>
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<td>2,224,054,962</td>
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<tr>
<td>Small Cap Growth</td>
<td>679,167,546</td>
<td>734,171,475</td>
</tr>
<tr>
<td>Frontier Capital</td>
<td>679,167,546</td>
<td>734,171,475</td>
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<tr>
<td>Small Cap Value</td>
<td>1,399,941,970</td>
<td>1,427,016,424</td>
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<tr>
<td>Channing</td>
<td>285,902,968</td>
<td>296,972,560</td>
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<tr>
<td>DFA Small Cap Val.</td>
<td>532,395,280</td>
<td>536,804,731</td>
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<tr>
<td>William Blair Small Cap Value</td>
<td>581,643,721</td>
<td>593,239,133</td>
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## Investment Manager Asset Allocation

### Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Public Real Assets</th>
<th>Dec-2022</th>
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<th>Mar-2023</th>
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<td>$1,375,013,095</td>
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<tr>
<td>Brookfield</td>
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<td>Cohen &amp; Steers</td>
<td>990,429,018</td>
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<td>1,000,295,151</td>
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<table>
<thead>
<tr>
<th>International Equity</th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
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<td>$8,387,346,009</td>
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<td>$9,038,362,962</td>
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<table>
<thead>
<tr>
<th>Intl Large Cap Growth</th>
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<th>Mar-2023</th>
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<tr>
<td>$1,392,016,238</td>
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<td>$1,508,036,352</td>
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<tr>
<td>EARNEST Part. Intl</td>
<td>568,088,257</td>
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<td>609,641,109</td>
<td>1.23</td>
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<tr>
<td>William Blair</td>
<td>823,927,981</td>
<td>1.72</td>
<td>898,395,243</td>
<td>1.82</td>
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<table>
<thead>
<tr>
<th>Intl Large Cap Value</th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
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<tbody>
<tr>
<td>$1,267,341,613</td>
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<td>$1,395,967,617</td>
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<tr>
<td>Brandes Investment</td>
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<td>635,988,594</td>
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<tr>
<td>Mondrian</td>
<td>572,193,568</td>
<td>1.20</td>
<td>623,129,087</td>
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<td>Lazard</td>
<td>123,929,296</td>
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<td>136,849,936</td>
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<table>
<thead>
<tr>
<th>Intl Large Cap Core</th>
<th>Dec-2022</th>
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<th>Mar-2023</th>
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<tr>
<td>$4,049,262,218</td>
<td>8.46</td>
<td>$4,346,698,640</td>
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<tr>
<td>Arrowstreet Capital</td>
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<td>1,072,670,685</td>
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<td>Brown Capital</td>
<td>464,085,668</td>
<td>0.97</td>
<td>513,762,612</td>
<td>1.04</td>
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<tr>
<td>GlobeFlex Capital</td>
<td>790,620,542</td>
<td>1.65</td>
<td>841,043,484</td>
<td>1.70</td>
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<tr>
<td>Xponance Intl EQ</td>
<td>88,657,644</td>
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<td>97,014,762</td>
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<td>Transition Account</td>
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<td>69,599</td>
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<td>Progress Intl Equity</td>
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<td>0.00</td>
<td>599,172</td>
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<td>NTGI ACWI ex US Index Fund</td>
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<td>1,821,538,327</td>
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<table>
<thead>
<tr>
<th>Intl All Cap Developed</th>
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<tr>
<td>$144,466,592</td>
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<td>$155,475,320</td>
<td>0.31</td>
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<tr>
<td>Ativo International</td>
<td>144,466,592</td>
<td>0.30</td>
<td>155,475,320</td>
<td>0.31</td>
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<table>
<thead>
<tr>
<th>International Small Cap</th>
<th>Dec-2022</th>
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<th>Mar-2023</th>
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<tr>
<td>$502,629,501</td>
<td>1.05</td>
<td>$542,865,440</td>
<td>1.10</td>
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<tr>
<td>Franklin Templeton</td>
<td>199,582,016</td>
<td>0.42</td>
<td>215,855,333</td>
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## Investment Manager Asset Allocation

### Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Fund</th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
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<tbody>
<tr>
<td>William Blair IntSC</td>
<td>303,047,485</td>
<td>0.63</td>
<td>327,010,107</td>
<td>0.66</td>
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<td>Emerging Mkt Equity</td>
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<td>2.15</td>
<td>1,089,319,592</td>
<td>2.20</td>
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<tr>
<td>Genesis Investment Management, LLP.</td>
<td>1,031,629,847</td>
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<td>683,979,442</td>
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<tr>
<td>Arrowstreet EME</td>
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<td>405,340,151</td>
<td>0.82</td>
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# Investment Manager Asset Allocation

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th></th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td><strong>Fixed Income</strong></td>
<td>12,027,573,713</td>
<td>25.12</td>
<td>12,309,642,246</td>
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<td>Domestic Fixed Core</td>
<td>3,738,475,455</td>
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<td>3,822,644,684</td>
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<td>- Attucks Fixed Income</td>
<td>86,159,511</td>
<td>0.18</td>
<td>89,026,673</td>
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<td>- Brandes FI Core</td>
<td>332,122,012</td>
<td>0.69</td>
<td>339,521,154</td>
<td>0.69</td>
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<tr>
<td>- EARNEST Partners</td>
<td>888,905,464</td>
<td>1.86</td>
<td>906,895,810</td>
<td>1.83</td>
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<td>- Garcia Hamilton</td>
<td>954,134,051</td>
<td>1.99</td>
<td>980,726,152</td>
<td>1.98</td>
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<td>- Ramirez Asset Management</td>
<td>517,063,703</td>
<td>1.08</td>
<td>529,455,223</td>
<td>1.07</td>
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<tr>
<td>- Xponance Yield Advantage Agg.</td>
<td>960,090,715</td>
<td>2.01</td>
<td>977,019,672</td>
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<td>Domestic Fixed Passive Core</td>
<td>2,699,434,195</td>
<td>5.64</td>
<td>2,782,322,635</td>
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<td>- NTGI Blmbg Agg.</td>
<td>1,100,651,759</td>
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<td>1,132,899,530</td>
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<td>- BlackRock US Debt I</td>
<td>1,598,782,435</td>
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<td>1,649,423,105</td>
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<tr>
<td>Domestic Fixed Core Plus</td>
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<td>2,971,071,147</td>
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<td>- LM Capital Group Fl</td>
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<td>852,931,652</td>
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<td>- Progress Inv. FI</td>
<td>1,101</td>
<td>0.00</td>
<td>1,121</td>
<td>0.00</td>
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<td>- Loop Capital Management</td>
<td>567,833,210</td>
<td>1.19</td>
<td>580,170,820</td>
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<td>- Western Asset</td>
<td>941,743,453</td>
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<td>962,326,994</td>
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<td>- Longfellow Core Plus</td>
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<td>575,640,560</td>
<td>1.16</td>
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<td><strong>Bank Loans</strong></td>
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<td>1,643,191,238</td>
<td>3.32</td>
</tr>
<tr>
<td>- Barings Global Loan Fund</td>
<td>1,616,072,322</td>
<td>3.38</td>
<td>1,643,191,238</td>
<td>3.32</td>
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<tr>
<td><strong>Emerging Markets Debt</strong></td>
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<td>362,578</td>
<td>0.00</td>
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<tr>
<td>- Standish-Mellon EMD</td>
<td>413,942</td>
<td>0.00</td>
<td>362,578</td>
<td>0.00</td>
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<tr>
<td><strong>High Yield</strong></td>
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<td>2.22</td>
<td>1,090,049,964</td>
<td>2.20</td>
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<tr>
<td>- MacKay Shields</td>
<td>1,064,487,054</td>
<td>2.22</td>
<td>1,090,049,964</td>
<td>2.20</td>
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# Investment Manager Asset Allocation

## Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Category</th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td><strong>Private Real Assets</strong></td>
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<td><strong>Real Estate Core Cmp</strong></td>
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<td>$2,289,223,276</td>
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<td>TA Assoc. Buckhead</td>
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<td>886,346,978</td>
<td>1.79</td>
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<td>Barings Euro Core</td>
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<td>137,906,644</td>
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<td>Blackstone Property</td>
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<td>INVESCO European</td>
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<td>AEW Core Property Tr</td>
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<td>CBRE Core Partners</td>
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<td>JPM Strategic Property</td>
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<td><strong>RE Non-Core Cmp</strong></td>
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<td>$2,083,150,275</td>
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<td>Artemis MWBE Spruce</td>
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<td>Franklin T. EMREFF</td>
<td>2,870,680</td>
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<td>Security Capital</td>
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<td>Non-Core Intl Real</td>
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<td>257,192,826</td>
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<td>Almanac ARS V</td>
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<td>76,735</td>
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<td><strong>Agriculture</strong></td>
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<td>$251,723,757</td>
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<td>Premiere Partners IV</td>
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<td><strong>Timberland</strong></td>
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<td><strong>Unlisted Infrastructure</strong></td>
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<td>Unlisted Infrastructure Funds</td>
<td>$118,131,202</td>
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<td>$113,071,132</td>
<td>0.23</td>
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## Investment Manager Asset Allocation

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th>Category</th>
<th>Dec-2022</th>
<th>%</th>
<th>Mar-2023</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Alternatives Investments</td>
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<td>5,203,863,529</td>
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<td>Absolute Return</td>
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<td>77,994</td>
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<tr>
<td>Aurora Investment</td>
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<td>Private Equity</td>
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<td>5,023,846,983</td>
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<td>Abbott S/A Comp.</td>
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<td>Muller Monroe MPEFF</td>
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<td>1 0.00</td>
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<tr>
<td>Pantheon S/A Comp.</td>
<td>416,250,559</td>
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<td>408,891,982</td>
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<td>Private Equity Fund - Domestic</td>
<td>3,255,891,125</td>
<td>6.80</td>
<td>3,309,737,538</td>
<td>6.69</td>
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<tr>
<td>Private Equity Fund - International</td>
<td>536,451,555</td>
<td>1.12</td>
<td>585,413,600</td>
<td>1.18</td>
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<tr>
<td>Oakbrook Opportunities Fund</td>
<td>208,935,917</td>
<td>0.44</td>
<td>221,939,948</td>
<td>0.45</td>
</tr>
<tr>
<td>Private Credit</td>
<td>172,821,721</td>
<td>0.36</td>
<td>179,938,552</td>
<td>0.36</td>
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<tr>
<td>Private Credit Fund - Domestic</td>
<td>172,821,721</td>
<td>0.36</td>
<td>179,938,552</td>
<td>0.36</td>
</tr>
<tr>
<td>Cash &amp; Equivalents</td>
<td>121,363,972</td>
<td>0.25</td>
<td>97,300,539</td>
<td>0.20</td>
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<tr>
<td>Total Fund</td>
<td>47,874,713,254</td>
<td>100.00</td>
<td>49,486,884,647</td>
<td>100.00</td>
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Domestic Equity
Composite Performance Summary

Domestic Equity
Periods Ended March 31, 2023

Comparative Performance

<table>
<thead>
<tr>
<th>Quarter</th>
<th>1</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Inc. 1/1/05</th>
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<tbody>
<tr>
<td>Return</td>
<td>6.1</td>
<td>6.7</td>
<td>19.0</td>
<td>18.6</td>
<td>9.5</td>
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<td>Added Value History</td>
<td></td>
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<tr>
<td>Quarterly Added Value (up market)</td>
<td></td>
<td></td>
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<tr>
<td>Quarterly Added Value (down market)</td>
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<tr>
<td>Annualized Added Value</td>
<td></td>
<td></td>
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Rolling Percentile Rank: All Public Plans > $1B-US Equity Segment

<table>
<thead>
<tr>
<th>Period</th>
<th>5-25 Count</th>
<th>25-Median Count</th>
<th>Median-75 Count</th>
<th>75-95 Count</th>
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</thead>
<tbody>
<tr>
<td>Domestic Equity</td>
<td>10</td>
<td>1 (10%)</td>
<td>7 (70%)</td>
<td>2 (20%)</td>
</tr>
<tr>
<td>Benchmark</td>
<td>10</td>
<td>7 (70%)</td>
<td>3 (30%)</td>
<td>0 (0%)</td>
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Risk and Return 04/1/18 - 03/31/23

<table>
<thead>
<tr>
<th>Risk (Standard Deviation %)</th>
<th>Return (%)</th>
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<tbody>
<tr>
<td>0.0</td>
<td>4.0</td>
</tr>
<tr>
<td>8.0</td>
<td>12.0</td>
</tr>
<tr>
<td>16.0</td>
<td>20.0</td>
</tr>
<tr>
<td>24.0</td>
<td>20.0</td>
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Domestic Equity
Benchmark
90 Day U.S. Treasury Bill

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Plan Sponsor Peer Group Analysis

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

Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Period</th>
<th>Domestic Equity</th>
<th>Domestic Equity - Net</th>
<th>Blended Benchmark (U.S. Equity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTD</td>
<td>6.15 (67)</td>
<td>6.09 (70)</td>
<td>6.71 (53)</td>
</tr>
<tr>
<td>1 Year</td>
<td>-8.50 (66)</td>
<td>-8.65 (70)</td>
<td>-8.48 (66)</td>
</tr>
<tr>
<td>3 Years</td>
<td>19.24 (24)</td>
<td>19.04 (25)</td>
<td>18.63 (42)</td>
</tr>
<tr>
<td>5 Years</td>
<td>9.65 (41)</td>
<td>9.45 (45)</td>
<td>10.54 (18)</td>
</tr>
<tr>
<td>10 Years</td>
<td>11.29 (35)</td>
<td>11.06 (43)</td>
<td>11.76 (17)</td>
</tr>
</tbody>
</table>

5th Percentile 11.08 -4.64 20.66 11.38 12.09
1st Quartile 7.41 -6.74 19.01 10.28 11.45
Median 6.96 -7.91 18.45 9.32 10.76
3rd Quartile 5.71 -8.81 16.81 8.29 9.82
95th Percentile 4.86 -11.97 15.09 6.67 7.88

Population 46 43 38 37 28
Asset Class Attribution

Domestic Equity

Periods Ended 1 Quarter Ending March 31, 2023

1 Quarter
## Performance

### Domestic Equity

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th></th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Equity</td>
<td>18,037,864,656</td>
<td>6.15</td>
<td>-8.50</td>
<td>19.24</td>
<td>9.65</td>
<td>11.29</td>
<td>11.43</td>
<td>1/1/1982</td>
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<tr>
<td>Domestic Equity - Net</td>
<td>6.09</td>
<td>-8.65</td>
<td>19.04</td>
<td>9.45</td>
<td>11.06</td>
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<tr>
<td>Blended Benchmark (U.S. Equity)</td>
<td>6.71</td>
<td>-8.48</td>
<td>18.63</td>
<td>10.54</td>
<td>11.76</td>
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<td></td>
<td></td>
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<tr>
<td>Russell 3000 Index</td>
<td>7.18</td>
<td>-8.58</td>
<td>18.48</td>
<td>10.45</td>
<td>11.73</td>
<td>11.37</td>
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<tr>
<td>U.S. Equity IMRF Custom Benchmark</td>
<td>5.50</td>
<td>-8.95</td>
<td>18.12</td>
<td>9.37</td>
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<tr>
<td>Large Cap Equity</td>
<td>12,253,465,159</td>
<td>7.59</td>
<td>-9.20</td>
<td>18.23</td>
<td>10.05</td>
<td>11.78</td>
<td>11.14</td>
<td>1/1/1982</td>
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<tr>
<td>Large Cap Equity - Net</td>
<td>7.57</td>
<td>-9.28</td>
<td>18.13</td>
<td>9.95</td>
<td>11.66</td>
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<tr>
<td>Russell 1000 Index</td>
<td>7.46</td>
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<td>18.55</td>
<td>10.87</td>
<td>12.01</td>
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<td>Large Cap Growth</td>
<td>3,411,535,102</td>
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<td>-13.75</td>
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<td>12.34</td>
<td>13.59</td>
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<tr>
<td>Large Cap Growth - Net</td>
<td>15.84</td>
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<td>16.17</td>
<td>12.24</td>
<td>13.45</td>
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<tr>
<td>Russell 1000 Growth Index</td>
<td>14.37</td>
<td>-10.90</td>
<td>18.58</td>
<td>13.66</td>
<td>14.59</td>
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<tr>
<td>Xponance Russell 1000 G</td>
<td>1,993,615,462</td>
<td>14.36</td>
<td>-10.90</td>
<td>18.57</td>
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<td>11.66</td>
<td>10/1/2018</td>
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<tr>
<td>Xponance Russell 1000 G - Net</td>
<td>14.35</td>
<td>-10.91</td>
<td>18.55</td>
<td></td>
<td>11.64</td>
<td></td>
<td></td>
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<tr>
<td>Russell 1000 Growth Index</td>
<td>14.37</td>
<td>-10.90</td>
<td>18.58</td>
<td></td>
<td>11.66</td>
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<tr>
<td>Sands Capital</td>
<td>1,417,919,641</td>
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<td>-23.10</td>
<td>6.14</td>
<td>7.19</td>
<td>11.48</td>
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<td>11/1/2003</td>
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<tr>
<td>Sands Capital - Net</td>
<td>18.00</td>
<td>-23.28</td>
<td>5.90</td>
<td>6.95</td>
<td>11.24</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

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

**Domestic Equity**

### Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Fund/Index</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Cap Value</td>
<td>4,371,812,163</td>
<td>2.70</td>
<td>-3.44</td>
<td>21.18</td>
<td>8.36</td>
<td>10.54</td>
<td>10.22</td>
<td>10/1/1982</td>
</tr>
<tr>
<td>Large Cap Value - Net</td>
<td>2.67</td>
<td>-3.58</td>
<td>21.01</td>
<td>8.19</td>
<td>10.36</td>
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<tr>
<td>LCV Blended Benchmark**</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
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<tr>
<td>Russell 1000 Value Index</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
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<tr>
<td>Dodge &amp; Cox</td>
<td>1,747,504,129</td>
<td>1.55</td>
<td>-6.43</td>
<td>23.05</td>
<td>9.50</td>
<td>11.52</td>
<td>9.71</td>
<td>9/1/2003</td>
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<tr>
<td>Dodge &amp; Cox - Net</td>
<td>1.50</td>
<td>-6.63</td>
<td>22.80</td>
<td>9.27</td>
<td>11.29</td>
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<tr>
<td>LCV Blended Benchmark**</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russell 1000 Value Index</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
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<tr>
<td>LSV Asset - Net</td>
<td>1.43</td>
<td>-3.26</td>
<td>21.02</td>
<td>6.51</td>
<td>10.00</td>
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<tr>
<td>LCV Blended Benchmark**</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
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<tr>
<td>Russell 1000 Value Index</td>
<td>1.01</td>
<td>-5.91</td>
<td>17.93</td>
<td>7.50</td>
<td>9.13</td>
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<tr>
<td>NTGI S&amp;P 500 Value</td>
<td>1,366,666,582</td>
<td>5.21</td>
<td>-0.24</td>
<td>19.12</td>
<td>9.50</td>
<td>10.24</td>
<td>6.49</td>
<td>8/1/1999</td>
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<td>5.20</td>
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<tr>
<td>Large Cap Pass. Core</td>
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<td>-8.76</td>
<td>18.35</td>
<td>10.35</td>
<td>11.71</td>
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<td>1/1/1985</td>
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<td>Large Cap Pass. Core - Net</td>
<td>7.23</td>
<td>-8.76</td>
<td>18.34</td>
<td>10.34</td>
<td>11.70</td>
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<tr>
<td>Dow Jones U.S. Total Stock Market Index</td>
<td>7.24</td>
<td>-8.77</td>
<td>18.34</td>
<td>10.32</td>
<td>11.64</td>
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<tr>
<td>NTGI MarketCap Idx. - Net</td>
<td>7.23</td>
<td>-8.76</td>
<td>18.34</td>
<td>10.34</td>
<td>11.70</td>
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<td></td>
<td></td>
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<td>Dow Jones U.S. Total Stock Market Index</td>
<td>7.24</td>
<td>-8.77</td>
<td>18.34</td>
<td>10.32</td>
<td>11.64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## Performance

### Domestic Equity

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th>Factor Diversity Strategies</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Large Cap FDP-GSAM</td>
<td>2,484,085,458</td>
<td>7.16</td>
<td>-7.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.72</td>
</tr>
<tr>
<td>U.S. Large Cap FDP-GSAM - Net</td>
<td>2,484,085,458</td>
<td>7.16</td>
<td>-7.02</td>
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<td></td>
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<td>8.72</td>
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<tr>
<td>Solactive GBS U.S. 1000 Index</td>
<td>7.06</td>
<td>-8.51</td>
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<td>8.39</td>
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<td>GSAM Active Beta US. Large Cap FDC Index</td>
<td>7.20</td>
<td>-6.98</td>
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<td>8.70</td>
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<table>
<thead>
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<th>Quantitative Factor Strategies</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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<tbody>
<tr>
<td>Quantitative US Equity - SciBeta</td>
<td>2,224,054,962</td>
<td>3.20</td>
<td>-4.18</td>
<td>18.08</td>
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<td>Quantitative US Equity - SciBeta - Net</td>
<td>3.18</td>
<td>-4.23</td>
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<td>17.91</td>
<td></td>
<td>8.12</td>
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<td>SciBeta US Hi-Fctr-Inst Div Multi-Beta Multi-Strat Index</td>
<td>2.86</td>
<td>-5.41</td>
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<td>16.90</td>
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<td></td>
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</tr>
</tbody>
</table>

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## Performance
### Domestic Equity
#### Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small Cap</strong></td>
<td>2,161,187,899</td>
<td>3.94</td>
<td>-5.97</td>
<td>26.32</td>
<td>8.23</td>
<td>9.89</td>
<td>11.82</td>
<td>7/1/1988</td>
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<tr>
<td>Small Cap Composite - Net</td>
<td>3.64</td>
<td>-6.56</td>
<td>25.49</td>
<td>7.56</td>
<td>9.26</td>
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<tr>
<td>Russell 2000 Index</td>
<td>2.74</td>
<td>-11.61</td>
<td>17.51</td>
<td>4.71</td>
<td>8.04</td>
<td>8.93</td>
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</tr>
<tr>
<td><strong>Small Cap Growth</strong></td>
<td>734,171,475</td>
<td>8.09</td>
<td>-7.01</td>
<td>25.44</td>
<td>10.54</td>
<td>11.52</td>
<td>12.74</td>
<td>7/1/1988</td>
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<tr>
<td>Small Cap Growth - Net</td>
<td>7.34</td>
<td>-8.01</td>
<td>24.13</td>
<td>9.53</td>
<td>10.72</td>
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<td>Russell 2000 Growth Index</td>
<td>6.07</td>
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<td>4.26</td>
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<tr>
<td>Russell 2000 Value Index</td>
<td>-0.66</td>
<td>-12.96</td>
<td>21.01</td>
<td>4.55</td>
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<td>Russell 2000 Value Index</td>
<td>-0.66</td>
<td>-12.96</td>
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<td>7.22</td>
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* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Growth Index.
** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.
*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.
Performance
Domestic Equity
*Periods Ended March 31, 2023*

<table>
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<tr>
<th></th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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<tr>
<td><strong>Public Real Assets</strong></td>
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<td>Public Real Assets - Net</td>
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<td>Public Real Assets Benchmark**</td>
<td>1.41</td>
<td>-7.18</td>
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<td>5.78</td>
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<tr>
<td><strong>Brookfield</strong></td>
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<td>7.37</td>
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<td>Brookfield - Net</td>
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<tr>
<td>Dow Jones Brookfield Global Infrastructure Composi</td>
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<td>5.64</td>
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<tr>
<td><strong>Cohen &amp; Steers</strong></td>
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<td>-6.24</td>
<td>11.05</td>
<td>7.72</td>
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<td>-6.48</td>
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* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those the S&P 500/Citigroup Growth Index.
** The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.
*** Public Real Assets benchmark is 1/3 Dow Jones Global Infrastructure Composite Index + 2/3 FTSE Global Core Infrastructure 50/50 Net Tax Index.
International Equity
Composite Performance Summary
International Equity
Periods Ended March 31, 2023

Comparative Performance

Added Value History

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

Risk and Return 04/1/18 - 03/31/23
Plan Sponsor Peer Group Analysis
International Equity vs All Public Plans > $1B-Intl. Equity Segment (Gross)
Periods Ended March 31, 2023

<table>
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<th>Periods</th>
<th>QTD</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
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<td>5.56</td>
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<td>10.80</td>
<td>1.02</td>
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Population

45 45 41 40 32
Asset Class Attribution
International Equity
Periods Ended 1 Quarter Ending March 31, 2023

1 Quarter
### Performance

#### International Equity

*Periods Ended March 31, 2023*

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<th>Fund Category</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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<tr>
<td>MSCI AC World ex USA (Net)</td>
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<td>-5.07</td>
<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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<tr>
<td>MSCI AC World ex USA (Net)</td>
<td>6.87</td>
<td>-5.07</td>
<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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<td>-6.35</td>
<td>9.49</td>
<td>3.36</td>
<td>5.08</td>
<td>6.07</td>
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<tr>
<td>MSCI AC World ex USA (Net)</td>
<td>6.87</td>
<td>-5.07</td>
<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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<tr>
<td>MSCI AC World ex USA Growth (Net)</td>
<td>8.59</td>
<td>-6.35</td>
<td>9.49</td>
<td>3.36</td>
<td>5.08</td>
<td>7.25</td>
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<td>11.80</td>
<td>2.47</td>
<td>4.17</td>
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</tbody>
</table>

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.
** Genesis is NOF NAV commingled fund.
## Performance

### International Equity

### Periods Ended March 31, 2023

<table>
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<th>Fund</th>
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<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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</table>

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.
** Genesis is NOF NAV commingled fund.
Performance
International Equity
Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Fund</th>
<th>Market Value</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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<td><strong>GlobeFlex Capital</strong></td>
<td>841,043,484</td>
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<td>4.17</td>
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<td><strong>MSCI EAFE (Net)</strong></td>
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<td>3.13</td>
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<td>3.86</td>
<td>2/1/2000</td>
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<td><strong>International Large Cap Passive Core Benchmark</strong></td>
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<tr>
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<td>-5.07</td>
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<td>-5.82</td>
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<td><strong>Intl All Cap Developed</strong></td>
<td>155,475,320</td>
<td>7.62</td>
<td>-6.22</td>
<td>11.95</td>
<td></td>
<td>4.58</td>
<td>2/1/2019</td>
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<tr>
<td><strong>Intl All Cap Developed - Net</strong></td>
<td>7.50</td>
<td>-6.70</td>
<td>11.39</td>
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<td></td>
<td>4.09</td>
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<tr>
<td><strong>MSCI EAFE + Canada (Net)</strong></td>
<td>8.02</td>
<td>-2.74</td>
<td>13.49</td>
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<td></td>
<td>6.16</td>
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<tr>
<td><strong>Ativo International</strong></td>
<td>155,475,320</td>
<td>7.62</td>
<td>-6.22</td>
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<td></td>
<td>4.58</td>
<td>2/1/2019</td>
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<tr>
<td><strong>Ativo International - Net</strong></td>
<td>7.50</td>
<td>-6.70</td>
<td>11.39</td>
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<tr>
<td><strong>MSCI EAFE + Canada (Net)</strong></td>
<td>8.02</td>
<td>-2.74</td>
<td>13.49</td>
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<td><strong>Intl Small Cap Eqty - Net</strong></td>
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<td>11.67</td>
<td>0.63</td>
<td>4.65</td>
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<td></td>
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<tr>
<td><strong>MSCI AC World ex USA Small Cap (Net)</strong></td>
<td>4.70</td>
<td>-10.37</td>
<td>15.04</td>
<td>1.67</td>
<td>5.06</td>
<td>5.58</td>
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<tr>
<td><strong>Custom Benchmark (Intl Small Cap)</strong></td>
<td>4.70</td>
<td>-10.37</td>
<td>15.04</td>
<td>1.67</td>
<td>5.06</td>
<td>5.00</td>
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</table>

* Custom benchmark is calculated as a weighted average of each funds respective benchmark until 12/2017. After 12/2017 the benchmark is MSCI ACWI ex US - Net.
** Genesis is NOF NAV commingled fund.
# Performance

**International Equity**

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th>Fund</th>
<th>Market Value $</th>
<th>1 Quarter (%)</th>
<th>1 Year (%)</th>
<th>3 Years (%)</th>
<th>5 Years (%)</th>
<th>10 Years (%)</th>
<th>Since Inception (%)</th>
<th>Inception Date</th>
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<tbody>
<tr>
<td>Franklin Templeton</td>
<td>215,855,333</td>
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<td>Franklin Templeton - Net</td>
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<tr>
<td>MSCI AC World ex USA Small Cap (Net)</td>
<td>4.70</td>
<td>-10.37</td>
<td>15.04</td>
<td>1.67</td>
<td>5.06</td>
<td>4.44</td>
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<tr>
<td>William Blair IntSC</td>
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<td>1.68</td>
<td>5.63</td>
<td>7.55</td>
<td>9/1/2010</td>
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<td>William Blair IntSC - Net</td>
<td>7.72</td>
<td>-13.07</td>
<td>10.37</td>
<td>0.90</td>
<td>4.82</td>
<td>6.74</td>
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<tr>
<td>MSCI AC World ex USA Small Cap (Net)</td>
<td>4.70</td>
<td>-10.37</td>
<td>15.04</td>
<td>1.67</td>
<td>5.06</td>
<td>6.07</td>
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<tr>
<td>Custom Benchmark (Intl Small Cap)</td>
<td>4.70</td>
<td>-10.37</td>
<td>15.04</td>
<td>1.67</td>
<td>5.06</td>
<td>6.31</td>
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<td>Genesis Investment Management, LLP.*</td>
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<td>-0.53</td>
<td>2.37</td>
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<td>Arrowstreet EME</td>
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</tr>
</tbody>
</table>

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** Genesis is NOF NAV commingled fund.
Fixed Income
Composite Performance Summary

Fixed Income

Periods Ended March 31, 2023

Comparative Performance

![Comparative Performance Chart]

Added Value History

![Added Value History Chart]

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

![Rolling Percentile Rank Chart]

Risk and Return 04/1/18 - 03/31/23

![Risk and Return Chart]
### Plan Sponsor Peer Group Analysis

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

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th></th>
<th>QTD</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Income</td>
<td>3.26 (28)</td>
<td>-3.64 (25)</td>
<td>-0.67 (46)</td>
<td>1.53 (51)</td>
<td>2.12 (33)</td>
</tr>
<tr>
<td>Fixed Income - Net</td>
<td>3.24 (30)</td>
<td>-3.72 (27)</td>
<td>-0.76 (51)</td>
<td>1.42 (59)</td>
<td>1.99 (45)</td>
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<tr>
<td>Custom Benchmark (Fixed Income)</td>
<td>3.08 (37)</td>
<td>-3.64 (25)</td>
<td>-2.20 (77)</td>
<td>1.26 (71)</td>
<td>1.54 (86)</td>
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</table>

<table>
<thead>
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<th>Percentile</th>
<th>QTD</th>
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<td>1.96</td>
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<td>-2.06</td>
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<td>1.63</td>
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<td>95th Percentile</td>
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<td>0.48</td>
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<td>49</td>
<td>42</td>
<td>40</td>
<td>34</td>
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</tbody>
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Asset Class Attribution
Fixed Income
*Periods Ended 1 Quarter Ending March 31, 2023*

1 Quarter

- **Total Excess Return**: 0.16%
- **Cash Flow Effect**: -0.01%
- **Benchmark Effect**: 0.00%
- **Attucks Fixed Income**: 0.01%
- **Brandes FI Core**: 0.00%
- **EARNEST Partners**: 0.00%
- **Xponance Yield Advantage Agg.**: -0.03%
- **Garcia Hamilton**: 0.06%
- **Ramirez Asset Management**: 0.00%
- **NTGI Blmbg Agg.**: 0.00%
- **BlackRock US Debt I**: 0.00%
- **LM Capital Group FI**: 0.03%
- **Progress Inv. FI**: 0.00%
- **Loop Capital Management**: 0.00%
- **Western Asset**: 0.00%
- **Longfellow Core Plus**: 0.03%
- **Barings Global Loan Fund**: 0.00%
- **Standish-Mellon EMD**: 0.02%
- **MacKay Shields**: 0.02%

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### Performance

**Fixed Income**

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th></th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
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<td>-3.72</td>
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<td>1.99</td>
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<td>-2.20</td>
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<td>1.54</td>
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<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
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<td>2/1/2021</td>
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<td>0.90</td>
<td>1.36</td>
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<td>-5.45</td>
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<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
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<td>-5.32</td>
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<td>Blmbg. U.S. Aggregate Index</td>
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<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.00</td>
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<td><strong>EARNEST Partners</strong></td>
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<td>1.27</td>
<td>1.77</td>
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<td>5/1/2005</td>
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<td>EARNEST Partners - Net</td>
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<tr>
<td>Blmbg. U.S. Aggregate Index</td>
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<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
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<td>6/1/2005</td>
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<td>-5.53</td>
<td>-1.46</td>
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<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
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<td>-1.75</td>
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<td>1.64</td>
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<td>6/1/2015</td>
</tr>
<tr>
<td>Garcia Hamilton - Net</td>
<td>3.66</td>
<td>-3.78</td>
<td>-1.83</td>
<td>1.17</td>
<td>1.56</td>
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<tr>
<td>Blmbg. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.11</td>
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<td></td>
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</tr>
</tbody>
</table>

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 sector.
## Performance

### Fixed Income

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ramirez Asset Management</strong></td>
<td>529,455,223</td>
<td>3.29</td>
<td>-4.11</td>
<td></td>
<td></td>
<td>-1.57</td>
<td>5/1/2020</td>
</tr>
<tr>
<td>Ramirez Asset Management - Net</td>
<td>3.25</td>
<td>-4.24</td>
<td></td>
<td></td>
<td></td>
<td>-1.70</td>
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<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td></td>
<td></td>
<td></td>
<td>-3.44</td>
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<tr>
<td><strong>Pass. Core Fixed Income</strong></td>
<td>2,782,322,635</td>
<td>3.07</td>
<td>-4.69</td>
<td>-2.72</td>
<td>0.97</td>
<td>1.42</td>
<td>5.17</td>
</tr>
<tr>
<td>Pass. Core Fixed Income - Net</td>
<td>3.07</td>
<td>-4.69</td>
<td>-2.73</td>
<td>0.97</td>
<td>1.41</td>
<td></td>
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<tr>
<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>5.15</td>
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<tr>
<td><strong>BlackRock US Debt I</strong></td>
<td>1,649,423,105</td>
<td>3.17</td>
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<td>-2.67</td>
<td>1.00</td>
<td>1.74</td>
<td>10/1/2013</td>
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<td>BlackRock US Debt I - Net</td>
<td>3.17</td>
<td>-4.71</td>
<td>-2.68</td>
<td>0.99</td>
<td>1.74</td>
<td></td>
<td></td>
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<tr>
<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.63</td>
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<tr>
<td><strong>NTGI Blmgb Agg.</strong></td>
<td>1,132,899,530</td>
<td>2.93</td>
<td>-4.68</td>
<td>-2.78</td>
<td>0.94</td>
<td>1.39</td>
<td>5.21</td>
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<td>NTGI Blmgb Agg. - Net</td>
<td>2.93</td>
<td>-4.69</td>
<td>-2.78</td>
<td>0.94</td>
<td>1.39</td>
<td></td>
<td></td>
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<tr>
<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>5.20</td>
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</tr>
<tr>
<td><strong>Core Plus Fixed Income</strong></td>
<td>2,971,071,147</td>
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<td>-4.80</td>
<td>-1.15</td>
<td>1.39</td>
<td>2.07</td>
<td>7.31</td>
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<tr>
<td>Core Plus Fixed Income - Net</td>
<td>3.16</td>
<td>-4.95</td>
<td>-1.30</td>
<td>1.22</td>
<td>1.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>6.91</td>
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</tr>
<tr>
<td><strong>LM Capital Group FI</strong></td>
<td>852,931,652</td>
<td>3.03</td>
<td>-4.07</td>
<td>-0.94</td>
<td>1.72</td>
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<td>3.93</td>
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<td>2.99</td>
<td>-4.22</td>
<td>-1.10</td>
<td>1.56</td>
<td>1.90</td>
<td></td>
<td>3.76</td>
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<tr>
<td>Blmgb. U.S. Aggregate Index</td>
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<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>3.11</td>
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<tr>
<td><strong>Progress Inv. FI</strong></td>
<td>1,121</td>
<td>3.24</td>
<td>-4.57</td>
<td>-1.61</td>
<td>1.26</td>
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<td>3.91</td>
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<tr>
<td>Progress Inv. FI - Net</td>
<td>3.21</td>
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<td>-1.74</td>
<td>1.12</td>
<td>2.06</td>
<td></td>
<td>3.78</td>
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<tr>
<td>Blmgb. U.S. Aggregate Index</td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>3.11</td>
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</tbody>
</table>

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 sector.

---

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# Performance

**Fixed Income**

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th>Fund</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Asset</td>
<td>962,326,994</td>
<td>3.31</td>
<td>-5.60</td>
<td>-1.12</td>
<td>1.07</td>
<td>2.17</td>
<td>4.40</td>
<td>11/1/2001</td>
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<td>Western Asset - Net</td>
<td></td>
<td>3.28</td>
<td>-5.74</td>
<td>-1.25</td>
<td>0.94</td>
<td>2.04</td>
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<tr>
<td>Blmbg. U.S. Aggregate Index</td>
<td></td>
<td>2.96</td>
<td>-4.78</td>
<td>-2.77</td>
<td>0.90</td>
<td>1.36</td>
<td>3.40</td>
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</tr>
<tr>
<td>Longfellow Core Plus</td>
<td>575,640,560</td>
<td>3.18</td>
<td>-4.77</td>
<td>-1.74</td>
<td>0.94</td>
<td>2.04</td>
<td>-1.74</td>
<td>5/1/2020</td>
</tr>
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<td>Longfellow Core Plus - Net</td>
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<td>3.14</td>
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<td>-1.89</td>
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<td>Blmbg. U.S. Aggregate Index</td>
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<td>2.96</td>
<td>-4.78</td>
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<td></td>
<td></td>
<td>-3.44</td>
<td></td>
</tr>
<tr>
<td>Bank Loans</td>
<td>1,643,191,238</td>
<td>3.53</td>
<td>-0.21</td>
<td>8.21</td>
<td>3.17</td>
<td>3.85</td>
<td>8/1/2014</td>
<td></td>
</tr>
<tr>
<td>Bank Loans - Net</td>
<td></td>
<td>3.53</td>
<td>-0.12</td>
<td>8.26</td>
<td>3.09</td>
<td>3.55</td>
<td></td>
<td></td>
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<tr>
<td>Barings Custom Benchmark</td>
<td></td>
<td>3.35</td>
<td>2.35</td>
<td>8.57</td>
<td>3.74</td>
<td>3.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barings Global Loan Fund</td>
<td>1,643,191,238</td>
<td>3.53</td>
<td>-0.21</td>
<td>8.21</td>
<td>3.17</td>
<td>3.85</td>
<td>8/1/2014</td>
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<tr>
<td>Barings Global Loan Fund - Net</td>
<td></td>
<td>3.53</td>
<td>-0.12</td>
<td>8.26</td>
<td>3.09</td>
<td>3.55</td>
<td></td>
<td></td>
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<tr>
<td>Barings Custom Benchmark*</td>
<td></td>
<td>3.35</td>
<td>2.35</td>
<td>8.57</td>
<td>3.74</td>
<td>3.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emerging Markets Debt</td>
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<tr>
<td>Standish-Mellon EMD</td>
<td>362,578</td>
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<tr>
<td>High Yield</td>
<td>1,090,049,964</td>
<td>3.88</td>
<td>-0.36</td>
<td>7.25</td>
<td>4.57</td>
<td>5.11</td>
<td>8.96</td>
<td>4/1/1986</td>
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<tr>
<td>High Yield - Net</td>
<td></td>
<td>3.88</td>
<td>-0.57</td>
<td>6.95</td>
<td>4.25</td>
<td>4.76</td>
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<tr>
<td>ICE BofA US High Yield, Cash Pay Index</td>
<td></td>
<td>3.68</td>
<td>-3.50</td>
<td>5.82</td>
<td>3.06</td>
<td>4.02</td>
<td>7.65</td>
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</tr>
<tr>
<td>MacKay Shields</td>
<td>1,090,049,964</td>
<td>3.88</td>
<td>-0.36</td>
<td>7.26</td>
<td>4.57</td>
<td>5.21</td>
<td>7.99</td>
<td>11/1/2000</td>
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<tr>
<td>MacKay Shields - Net</td>
<td></td>
<td>3.88</td>
<td>-0.57</td>
<td>6.95</td>
<td>4.25</td>
<td>4.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICE BofA US High Yield, Cash Pay Index</td>
<td></td>
<td>3.68</td>
<td>-3.50</td>
<td>5.82</td>
<td>3.06</td>
<td>4.02</td>
<td>6.61</td>
<td></td>
</tr>
</tbody>
</table>

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 sector.
Private Real Assets
### Plan Sponsor Peer Group Analysis

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

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th>Period</th>
<th>QTD 1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Estate</td>
<td>-1.61 (49)</td>
<td>11.05 (50)</td>
<td>10.41 (43)</td>
<td>10.60 (63)</td>
</tr>
<tr>
<td>Real Estate - Net</td>
<td>-1.63 (49)</td>
<td>10.98 (52)</td>
<td>10.37 (44)</td>
<td>10.57 (64)</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33 (89)</td>
<td>7.47 (100)</td>
<td>6.57 (100)</td>
<td>8.48 (100)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentile</th>
<th>5th</th>
<th>1st Quartile</th>
<th>Median</th>
<th>3rd Quartile</th>
<th>95th Percentile</th>
<th>Population</th>
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</thead>
<tbody>
<tr>
<td>QTD 1 Year</td>
<td>0.39</td>
<td>-0.37</td>
<td>-1.67</td>
<td>-3.17</td>
<td>-3.93</td>
<td>38</td>
</tr>
<tr>
<td>3 Years</td>
<td>13.16</td>
<td>9.56</td>
<td>7.27</td>
<td>2.75</td>
<td>-3.54</td>
<td>36</td>
</tr>
<tr>
<td>5 Years</td>
<td>14.06</td>
<td>12.27</td>
<td>11.03</td>
<td>9.47</td>
<td>7.60</td>
<td>28</td>
</tr>
<tr>
<td>10 Years</td>
<td>12.90</td>
<td>10.84</td>
<td>9.59</td>
<td>8.24</td>
<td>7.49</td>
<td>23</td>
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</table>

Population:
- 38
- 36
- 28
- 23
- 13
<table>
<thead>
<tr>
<th>Asset Allocation &amp; Performance</th>
<th>Private Real Assets</th>
<th>Periods Ended March 31, 2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market Value $</strong></td>
<td>1 Quarter</td>
<td>1 Year</td>
</tr>
<tr>
<td>Private Real Assets</td>
<td>4,799,850,715</td>
<td>-1.25</td>
</tr>
<tr>
<td>Private Real Assets- Net</td>
<td>-1.27</td>
<td>3.94</td>
</tr>
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<td>Custom Benchmark (Private Real Assets)</td>
<td>-3.03</td>
<td>-3.24</td>
</tr>
<tr>
<td>Real Estate</td>
<td>4,372,373,550</td>
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</tr>
<tr>
<td>Real Estate - Net</td>
<td>-1.63</td>
<td>3.59</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
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<tr>
<td>Real Estate Core Cmp</td>
<td>2,289,223,276</td>
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<tr>
<td>TA Assoc. Buckhead</td>
<td>886,346,978</td>
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<td>Blended Benchmark (Real Estate)</td>
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<td>-3.87</td>
</tr>
<tr>
<td>Barings Euro Core Property</td>
<td>137,906,644</td>
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</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
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<td>-3.87</td>
</tr>
<tr>
<td>Blackstone Property Euro</td>
<td>183,870,646</td>
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<td>Blended Benchmark (Real Estate)</td>
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<td>-3.87</td>
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<tr>
<td>INVESCO Core Real Estate</td>
<td>248,625,899</td>
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<td>Blended Benchmark (Real Estate)</td>
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<td>-3.87</td>
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<tr>
<td>INVESCO European real estate</td>
<td>57,897,583</td>
<td>1.79</td>
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<td>Blended Benchmark (Real Estate)</td>
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<td>AEW Core Property Tr</td>
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<td>-3.87</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
</tr>
</tbody>
</table>

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%. 

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## Asset Allocation & Performance

### Private Real Assets

**Periods Ended March 31, 2023**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPM Strategic Property Fund</td>
<td>185,221,668</td>
<td>-4.27</td>
<td>-1.89</td>
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<td></td>
<td></td>
<td>9.83</td>
<td>1/1/2021</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.29</td>
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</tr>
<tr>
<td>RE Non-Core Cmp</td>
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<td>2.61</td>
<td>9.30</td>
<td>8.95</td>
<td>10.37</td>
<td>11.16</td>
<td>1/1/2010</td>
</tr>
<tr>
<td>Artemis MWBE Spruce</td>
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<td>-0.02</td>
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<td>7.49</td>
<td>-0.12</td>
<td>-0.03</td>
<td>6/1/2016</td>
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<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td>7.47</td>
<td>6.57</td>
<td></td>
<td></td>
<td>6.73</td>
<td></td>
</tr>
<tr>
<td>Franklin T. EMREFF</td>
<td>2,771,341</td>
<td>-3.46</td>
<td>-35.61</td>
<td>-19.51</td>
<td>-13.82</td>
<td>-0.12</td>
<td>-0.03</td>
<td>9/1/2011</td>
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<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
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<td>7.47</td>
<td>6.57</td>
<td>8.48</td>
<td>8.92</td>
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<td>Security Capital</td>
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<td>4.27</td>
<td>8.58</td>
<td>4.82</td>
<td></td>
<td>7/1/1997</td>
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<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td>7.47</td>
<td>6.57</td>
<td>8.48</td>
<td>7.35</td>
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<tr>
<td>Dune II</td>
<td>7,650,902</td>
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<td>0.80</td>
<td>1.41</td>
<td>3.33</td>
<td>8.66</td>
<td>5.50</td>
<td>2/1/2009</td>
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<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td>7.47</td>
<td>6.57</td>
<td>8.48</td>
<td>7.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Core Real Estate Funds</td>
<td>1,407,253,987</td>
<td>-0.13</td>
<td>6.08</td>
<td>11.55</td>
<td>10.91</td>
<td>11.72</td>
<td>11.27</td>
<td>10/1/2011</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td>7.47</td>
<td>6.57</td>
<td>8.48</td>
<td>8.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almanac ARS V</td>
<td>76,735</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Core Intl Real Estate</td>
<td>257,192,826</td>
<td>-0.96</td>
<td>-3.03</td>
<td>2.30</td>
<td>0.75</td>
<td>-0.83</td>
<td>-0.83</td>
<td>8/1/2014</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
<td>-3.87</td>
<td>7.47</td>
<td>6.57</td>
<td></td>
<td>7.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

## Private Real Assets

*Periods Ended March 31, 2023*

<table>
<thead>
<tr>
<th></th>
<th>Market Value $</th>
<th>1 Quarter</th>
<th>1 Year</th>
<th>3 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>Since Inception</th>
<th>Inception Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture</strong></td>
<td>251,723,757</td>
<td>1.67</td>
<td>4.24</td>
<td>2.77</td>
<td>1.54</td>
<td>5.19</td>
<td>6.58</td>
<td>10/1/1997</td>
</tr>
<tr>
<td>NCREIF Farmland Index</td>
<td>2.08</td>
<td>9.05</td>
<td>7.59</td>
<td>6.56</td>
<td>8.48</td>
<td>11.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premiere Partners IV</td>
<td>251,723,757</td>
<td>1.67</td>
<td>4.24</td>
<td>2.77</td>
<td>1.54</td>
<td>2.57</td>
<td>3/1/2015</td>
<td></td>
</tr>
<tr>
<td><strong>Timberland</strong></td>
<td>62,682,276</td>
<td>-1.05</td>
<td>14.59</td>
<td>2.84</td>
<td>1.89</td>
<td>3.56</td>
<td>6.95</td>
<td>10/1/1992</td>
</tr>
<tr>
<td>NCREIF Timberland Index</td>
<td>1.75</td>
<td>11.31</td>
<td>8.09</td>
<td>5.54</td>
<td>5.82</td>
<td>8.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Investment</td>
<td>62,682,276</td>
<td>-1.05</td>
<td>14.59</td>
<td>2.84</td>
<td>1.89</td>
<td>3.69</td>
<td>7.09</td>
<td>10/1/1992</td>
</tr>
<tr>
<td>Blended Benchmark (Timberland)</td>
<td>2.70</td>
<td>9.18</td>
<td>6.86</td>
<td>4.82</td>
<td>5.46</td>
<td>8.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unlisted Infrastructure</strong></td>
<td>113,071,132</td>
<td>5.92</td>
<td>11.39</td>
<td>15.42</td>
<td>12.68</td>
<td>12.68</td>
<td>12.68</td>
<td>4/1/2018</td>
</tr>
<tr>
<td><strong>Unlisted Infrastructure Funds</strong></td>
<td>113,071,132</td>
<td>5.92</td>
<td>11.39</td>
<td>15.42</td>
<td>12.68</td>
<td>12.68</td>
<td>12.68</td>
<td>4/1/2018</td>
</tr>
</tbody>
</table>

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 March 31, 2023*

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Allocation</th>
<th>Performance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Market</td>
<td>1 Quarter</td>
</tr>
<tr>
<td>Alternatives Investments</td>
<td>$5,203,863,529</td>
<td>0.54</td>
</tr>
<tr>
<td>Custom Benchmark (Alternatives Investments)</td>
<td>10.23</td>
<td>-14.68</td>
</tr>
<tr>
<td>Absolute Return</td>
<td>77,994</td>
<td></td>
</tr>
<tr>
<td>Aurora Investment</td>
<td>77,994</td>
<td></td>
</tr>
<tr>
<td>Private Equity</td>
<td>$5,023,846,983</td>
<td>0.52</td>
</tr>
<tr>
<td>Blended Benchmark (Private Equity)</td>
<td>10.58</td>
<td>-15.69</td>
</tr>
<tr>
<td>Muller Monroe MPEFF</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pantheon S/A Comp.</td>
<td>408,891,982</td>
<td>-1.52</td>
</tr>
<tr>
<td>Private Equity Fund - Domestic</td>
<td>3,309,737,538</td>
<td>-0.37</td>
</tr>
<tr>
<td>Private Equity Fund - International</td>
<td>585,413,600</td>
<td>9.08</td>
</tr>
<tr>
<td>Oakbrook Opportunities Fund</td>
<td>221,939,948</td>
<td>-0.13</td>
</tr>
<tr>
<td>Private Credit</td>
<td>179,938,552</td>
<td>1.26</td>
</tr>
<tr>
<td>Private Credit Fund - Domestic</td>
<td>179,938,552</td>
<td>1.26</td>
</tr>
</tbody>
</table>

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

As of March 31, 2023

<table>
<thead>
<tr>
<th>Investment Manager</th>
<th>Asset Class</th>
<th>Effective Date</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genesis</td>
<td>Equity Emerging Markets</td>
<td>July 2022</td>
<td></td>
</tr>
</tbody>
</table>
Appendix
## Asset Class Returns

### Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Performance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fund</strong></td>
<td></td>
</tr>
<tr>
<td>Total Fund</td>
<td>4.35</td>
</tr>
<tr>
<td>Total Fund - Net</td>
<td>4.30</td>
</tr>
<tr>
<td>Total Fund Benchmark</td>
<td>5.11</td>
</tr>
<tr>
<td><strong>Domestic Equity</strong></td>
<td></td>
</tr>
<tr>
<td>Domestic Equity</td>
<td>6.15</td>
</tr>
<tr>
<td>Domestic Equity - Net</td>
<td>6.09</td>
</tr>
<tr>
<td>Blended Benchmark (U.S. Equity)</td>
<td>6.71</td>
</tr>
<tr>
<td>U.S. Equity IMRF Custom Benchmark</td>
<td>5.50</td>
</tr>
<tr>
<td><strong>International Equity</strong></td>
<td></td>
</tr>
<tr>
<td>International Equity</td>
<td>7.77</td>
</tr>
<tr>
<td>MSCI AC World ex USA (Net)</td>
<td>6.87</td>
</tr>
<tr>
<td><strong>Fixed Income</strong></td>
<td></td>
</tr>
<tr>
<td>Fixed Income</td>
<td>3.26</td>
</tr>
<tr>
<td>Fixed Income - Net</td>
<td>3.24</td>
</tr>
<tr>
<td>Blmbg. U.S. Aggregate Index</td>
<td>2.96</td>
</tr>
<tr>
<td>Fixed Income IMRF Custom Benchmark</td>
<td>3.07</td>
</tr>
<tr>
<td><strong>Private Real Assets</strong></td>
<td></td>
</tr>
<tr>
<td>Custom Benchmark (Private Real Assets)</td>
<td>-1.27</td>
</tr>
<tr>
<td>Real Estate</td>
<td>-1.61</td>
</tr>
<tr>
<td>Real Estate - Net</td>
<td>-1.63</td>
</tr>
<tr>
<td>Blended Benchmark (Real Estate)</td>
<td>-3.33</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1.67</td>
</tr>
<tr>
<td>NCREIF Farmland Index</td>
<td>2.08</td>
</tr>
<tr>
<td>Timberland</td>
<td>-1.05</td>
</tr>
<tr>
<td>NCREIF Timberland Index</td>
<td>1.75</td>
</tr>
<tr>
<td>Unlisted Infrastructure</td>
<td>5.92</td>
</tr>
<tr>
<td>Blended Benchmark (Unlisted Infrastructure)</td>
<td>2.70</td>
</tr>
</tbody>
</table>

Benchmark definitions are on the following pages.

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

Periods Ended March 31, 2023

<table>
<thead>
<tr>
<th></th>
<th>Performance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternatives Investments</td>
<td>0.54</td>
</tr>
<tr>
<td>Alternative Investments - Net</td>
<td>0.54</td>
</tr>
<tr>
<td>Custom Benchmark (Alternative Investments)</td>
<td>10.23</td>
</tr>
<tr>
<td>Private Equity</td>
<td>0.52</td>
</tr>
<tr>
<td>Blended Benchmark (Private Equity)</td>
<td>10.58</td>
</tr>
<tr>
<td>Cash</td>
<td>1.20</td>
</tr>
<tr>
<td>90 Day U.S. Treasury Bill</td>
<td>1.07</td>
</tr>
</tbody>
</table>

Benchmark definitions are on the following pages.

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

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

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

**ODCE returns are updated quarterly.
**Benchmark Definitions**

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

**ODCE returns are updated quarterly.**
## Benchmark Definitions

<table>
<thead>
<tr>
<th>Account Name</th>
<th>From Date</th>
<th>To Date</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fund Benchmark</td>
<td>3/1/2022</td>
<td>Present</td>
<td>The total fund benchmark is a blend of the asset class benchmark returns weighted by the target allocation for each asset class:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>1/1/2021</td>
<td>2/28/2022</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>3/1/2018</td>
<td>12/31/2020</td>
<td>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.</td>
</tr>
</tbody>
</table>