

June 30, 2023

**Pennsylvania SERS 401(a)**



**Investment Measurement Service  
Quarterly Review**

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### June 30, 2023

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## Is Recession Risk Really Off the Table?

### ECONOMY

**2** Economic forecasts have shifted tone, from one of certain recession to no recession this year or next. What happened? A robust job market, declining inflation, and a GDP rebound appear to point to a soft landing, but recession risks have not completely disappeared.

## Aggregate Falls with Rise in Interest Rates

### FIXED INCOME

**8** The Bloomberg Aggregate fell as interest rates increased, but investors' risk appetite and solid economic news spurred returns for spread sectors and lower quality bonds. The unhedged Global Aggregate fell but the hedged index showed gains.

## IRRs Stay Steady and Range from 8%-10%

### PRIVATE CREDIT

**12** Private credit has generated net IRRs of 8% to 10% for trailing periods ended 1Q23. Higher-risk strategies performed better than lower-risk strategies. Investors focused on relative value, downside protection, and managers' internal work-out resources.

## Equity Gains Power Positive Returns

### INSTITUTIONAL INVESTORS

**4** All investor types saw gains for the one year ended 2Q23 after equity gains in the quarter, but trailed a 60% stocks/40% bonds benchmark. Over the last 20 years, all investor types were within range of the 60%/40% benchmark, lagging U.S. equities but topping U.S. fixed income.

## Private RE Falls While REITs Lag Equities

### REAL ESTATE/REAL ASSETS

**10** The NCREIF Property Index fell 2.0% during 2Q23. The NCREIF Open-End Diversified Core Equity Index fell 2.7%. Global REITs underperformed, up 0.2% compared to a 6.8% rise for global equities (MSCI World). U.S. REITs rose 2.6%, compared to 8.7% for the S&P 500.

## Hedge Funds Gain but Lag Equity Indices

### HEDGE FUNDS/MACs

**13** Hedge funds ended 2Q higher but unable to keep up with soaring equity indices, as equity market volatility subsided from 1Q. For individual managers, equity hedge strategies, event-driven managers, and macro strategies all ended with gains for the quarter.

## Large Cap Growth Leads Indices Higher

### EQUITY

**6** All U.S. equity indices produced positive returns; large cap growth (led by big technology firms) helped power the gains. Global and global ex-U.S. indices also showed gains, while developed markets outperformed emerging markets, in part due to China.

## Headwinds in Market Slow Deal Liquidity

### PRIVATE EQUITY

**11** First-half private equity fundraising and deal activity continued a declining trend, with only IPOs increasing slightly. LPs are consolidating and upgrading portfolios, and GPs are focusing on existing portfolio management to increase exits and distributions.

## Index Starts off 2023 With a 5.3% Increase

### DEFINED CONTRIBUTION

**15** The Callan DC Index gained 5.3% in 1Q23, and balances within the index rose by the same amount. Target date funds continued to see the largest net inflows. U.S. large cap saw big gains in participant allocations; capital preservation fund options saw a decline.

## Broad Market Quarterly Returns

U.S. Equity  
Russell 3000



8.4%

Global ex-U.S. Equity  
MSCI ACWI ex USA



2.4%

U.S. Fixed Income  
Bloomberg Agg



-0.8%

Global ex-U.S. Fixed Income  
Bloomberg Global Agg ex US



-2.2%

Sources: Bloomberg, FTSE Russell, MSCI

# Is Recession Risk Really Off the Table?

ECONOMY | Jay Kloepfer

We saw a change in tone in economic forecasts coming in over the past six weeks, from one of certain recession in 2023 or at the least 2024, to one of “no recession here.” We see it in the tea leaves of the Fed’s releases after its last couple of meetings and in investment managers’ updates and strategy pieces, and now the professional forecasting community is, well, forecasting no recession this year or next.

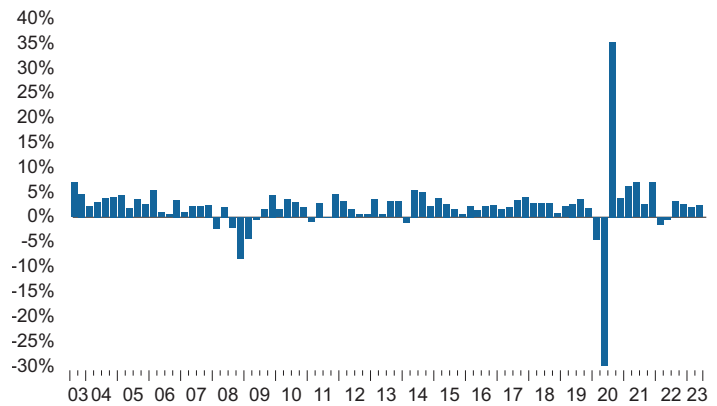
What happened? First, the job market remains robust, with unemployment stuck at a generational low. Second, inflation dropped from an alarming 9% rate last June to 3% in just one year. In the broad economy, GDP rebounded from two quarters of decline in 2022 to log four consecutive quarters of solid growth, notching 2.4% in 2Q23. Expectations established just six months ago had a recession hitting in 2Q or 3Q of *this* year. Now it is rare to find a shorter-term outlook (12-18 months) with a recession as the base case; we’re back to the notion of a soft landing, with GDP gently declining to 1%-1.5% growth in 2024. Did recession risk really disappear?

Interest rates could rise more in the second half of 2023, even though inflation is now down at 3%. The Fed has suggested two more rate hikes are in their cards. The strength remaining in the economy after rates rose 5% in one year gives the Fed headroom to further flex its inflation-fighting chops. The bond market has been expecting a recession since last July, when the yield curve inverted, and there is growing sentiment that perhaps this time, bond investors just might be wrong. The argument is that the bond market got ahead of itself in the spring of 2022, when it immediately and (almost) fully priced in the expected Fed moves by June last year. Then almost as quickly as the market believed the Fed would execute as telegraphed, the market began doubting the resolve of the Fed and the ability of the economy to absorb the historic jump in interest rates, and hence the inversion of the yield curve.

The strength of the job market has been Fed Chair Jerome Powell’s secret weapon, and we have been looking at the details of the job market with great interest. The U.S. economy recouped the nearly 20 million jobs lost in the first months of the pandemic by the middle

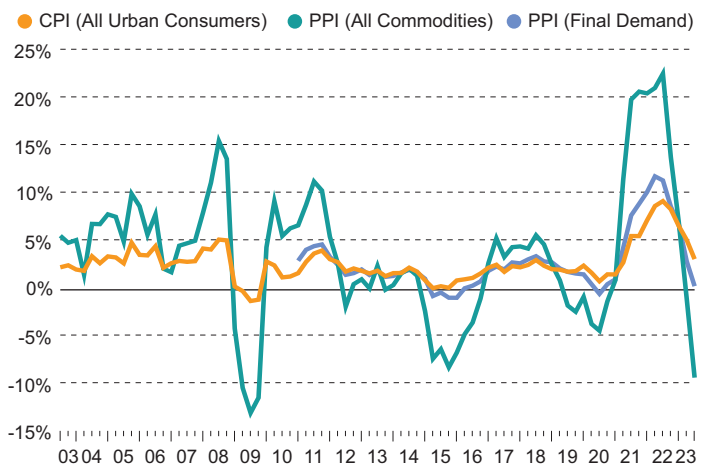
Quarterly Real GDP Growth

(20 Years)



Source: Bureau of Economic Analysis

Inflation Year-Over-Year



Source: Bureau of Labor Statistics

of 2022, and now supports 4.3 million more non-farm jobs than at the end of 2019. However, some sectors are still woefully short of workers, and many observers believed a recession was necessary to convince people to take the jobs they no longer wanted in hospitality (hotels and restaurants), retail trade, and state and local government. These three sectors make up 34% of the U.S. job market, but all three have yet to surpass their pre-pandemic levels of employment; in fact, they are still 300,000 behind. That means only two-thirds of the job market has accounted for the 4.3 million new jobs. These lagging sectors have large concentrations

of lower-paying jobs, so the differential growth in the job market is exacerbating pressure on lower-income workers.

Three threats that spurred recession fears earlier this year have not yet panned out: crypto, regional banks, and headline layoffs in technology. The collapse of FTX and the troubles across all manner of digital currencies have hurt investors but not taken a meaningful number of jobs, and the failure and takeover of three regional banks has not dented the exuberance of the stock market and the economic forecasters. The job cuts that made headlines at highly visible technology firms were large at the firm level, but small at the industry level, and the job-cutting was contained to technology.

So as recession fears fade, what does it mean for short interest rates, for long rates, and for the stock market? Longer term, the Fed telegraphs 2.5% as the anchor for the Federal Funds rate, but we may see 5%-5.5% for the next 18 months. The broad U.S. stock market (Russell 3000) dropped 24.6% in the first three quarters of 2022, but the index is up 24.5% in the three quarters through June 2023, and the total return since December 2021 is -3%. The backstory is that these gains came from just seven stocks; the rest of the stock market has been flat. Market expectations for stocks exclusive of these hot dots is subdued.

The risk of recession has not gone away, but the onset may have been delayed. One important economic rule of thumb to remember is that it takes about a year for a change in interest rates to work its way through the economy. The Fed started raising rates in March 2022, and has continued into 2023. We may be a year from seeing the full effect of higher rates on the economy.

### The Long-Term View

Index	2Q23	Periods Ended 6/30/23			
		1 Yr	5 Yrs	10 Yrs	25 Yrs
<b>U.S. Equity</b>					
Russell 3000	8.4	19.0	11.4	12.3	7.7
S&P 500	8.7	19.6	12.3	12.9	7.6
Russell 2000	5.2	12.3	4.2	8.3	7.3
<b>Global ex-U.S. Equity</b>					
MSCI EAFE	3.0	18.8	4.4	5.4	4.3
MSCI ACWI ex USA	2.4	12.7	3.5	4.7	--
MSCI Emerging Markets	0.9	1.7	0.9	3.0	--
MSCI ACWI ex USA Small Cap	2.0	10.9	2.6	5.8	6.7
<b>Fixed Income</b>					
Bloomberg Agg	-0.8	-0.9	0.8	1.5	3.9
90-Day T-Bill	1.2	3.6	1.6	1.0	1.9
Bloomberg Long G/C	-1.3	-2.6	0.7	2.9	5.3
Bloomberg GI Agg ex US	-2.2	-1.8	-2.7	-0.9	2.6
<b>Real Estate</b>					
NCREIF Property	-2.0	-6.6	5.9	7.8	8.5
FTSE Nareit Equity	2.6	-0.1	4.6	6.4	8.3
<b>Alternatives</b>					
CS Hedge Fund	2.2	5.0	5.0	4.7	6.1
Cambridge PE*	2.1	-4.6	16.0	15.0	13.8
Bloomberg Commodity	-2.6	-9.6	4.7	-1.0	2.0
Gold Spot Price	-2.9	6.8	9.0	4.7	7.8
<b>Inflation – CPI-U</b>	1.1	3.0	3.9	2.7	2.5

\*Data for most recent period lags. Data as of 1Q23.

Sources: Bloomberg, Bureau of Economic Analysis, Credit Suisse, FTSE Russell, MSCI, NCREIF, Refinitiv/Cambridge, S&P Dow Jones Indices

### Recent Quarterly Economic Indicators

	2Q23	1Q23	4Q22	3Q22	2Q22	1Q22
Employment Cost: Total Compensation Growth	4.5%	4.8%	5.1%	5.0%	5.1%	4.5%
Nonfarm Business: Productivity Growth	3.7%	-1.2%	1.6%	1.2%	-3.7%	-6.0%
GDP Growth	2.4%	2.0%	2.6%	3.2%	-0.6%	-1.6%
Manufacturing Capacity Utilization	78.3%	78.2%	78.5%	79.4%	79.6%	79.2%
Consumer Sentiment Index (1966=100)	62.4	64.6	58.8	56.1	57.8	63.1

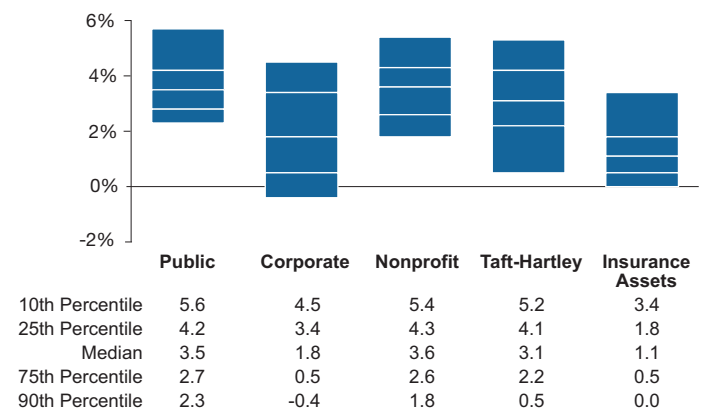
Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve, IHS Economics, Reuters/University of Michigan

# Equity Gains Power Positive Returns

## INSTITUTIONAL INVESTORS

- Strong equity gains helped all investor types report gains for the trailing year, compared to single-digit losses in the year ending 1Q23.
- Nonprofits reported the best results for the trailing one year, followed closely by public defined benefit plans. Corporate plans and insurance assets, with their typically higher allocations to fixed income, saw the lowest gains.
- All investor types crushed bonds but lagged a benchmark consisting of 60% stocks/40% bonds.
- Over the last 20 years, all investor types were within range of the 60%/40% benchmark, lagging U.S. equities but topping U.S. fixed income and global ex-U.S. equities.
- After a disastrous 2022, the S&P 500 and Bloomberg Aggregate are both up through 2Q23.
  - S&P 500 up 16.9%
  - Aggregate up 2.1%
  - Nasdaq 100 is up almost 40%
- However, seven stocks are leading the charge with most others being flat to negative.
- The yield curve has remained inverted implying a recession is on the horizon
- Investors are focused on how much the world has changed, and whether it alters how they should view and implement portfolios.

Quarterly Returns, Callan Database Groups (6/30/23)



Source: Callan

### Callan Database Median and Index Returns\* for Periods Ended 6/30/23

Database Group	Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Public Database	3.5	9.3	8.0	6.7	7.5	7.5
Corporate Database	1.8	5.0	2.5	4.7	6.3	7.0
Nonprofit Database	3.6	9.6	8.1	6.4	7.1	7.4
Taft-Hartley Database	3.1	8.4	8.1	6.5	7.7	7.1
Insurance Assets Database	1.1	3.4	1.3	3.1	3.8	4.8
All Institutional Investors	3.1	8.5	7.5	6.2	7.2	7.2
Large (>\$1 billion)	2.7	7.5	8.4	6.8	7.6	7.6
Medium (\$100mm - \$1bn)	3.3	8.7	7.6	6.3	7.3	7.2
Small (<\$100 million)	3.5	9.3	7.2	6.0	6.9	6.9
60% S&P 500/40% Bloomberg Agg	4.9	11.1	7.1	8.1	8.5	7.5

\*Returns less than one year are not annualized.

Source: Callan. Callan's database includes the following groups: public defined benefit (DB) plans, corporate DB plans, nonprofits, insurance assets, and Taft-Hartley plans. Approximately 10% to 15% of the database constituents are Callan's clients. All database group returns presented gross of fees. Past performance is no guarantee of future results. Reference to or inclusion in this report of any product, service, or entity should not be construed as a recommendation, approval, affiliation, or endorsement of such product, service, or entity by Callan.

### Corporate DB Plans

- Liabilities decreased slightly, reflecting a small increase in discount rates, but assets (both LDI and equities) were up, offsetting any negative liability impact.
- Total return-oriented plans continued to see their funded status improve as the equity market kept rallying.
- Plans that were fully hedged experienced minimal, if any, funded status volatility over the quarter.
- There is a disconnect between hedging the accounting funding ratio and the rules for the ERISA minimum required contributions (MRCs). Callan’s forecasted median ERISA rate (used for MRCs) lags the accounting rate by ~100 bps, which could trigger required contributions.

### Public DB Plans

- The trend of “de-risking,” moving to more fixed income, has somewhat abated.
- Plans have grown accustomed to their current level of risk; they lived through both the pandemic and 2022, and they would rather maintain this risk and collect a higher return.
- For plans that measure at 6/30, they should see a realized one-year return well in excess of their discount rate assumption. For those that smooth their assets, deferring the gains will help offset losses from FYE 2021, stabilizing future contribution requirements.

### Insurers

- Insurance companies are some of the few investors that fared well following the spike in yields during 2022.
- Typically invested to match short-term liabilities, they are focused on investment income and use it to offset operating expenses.
- As interest rates rose, insurers sold bonds with lower book yields and took losses, then re-invested at much higher book yields.

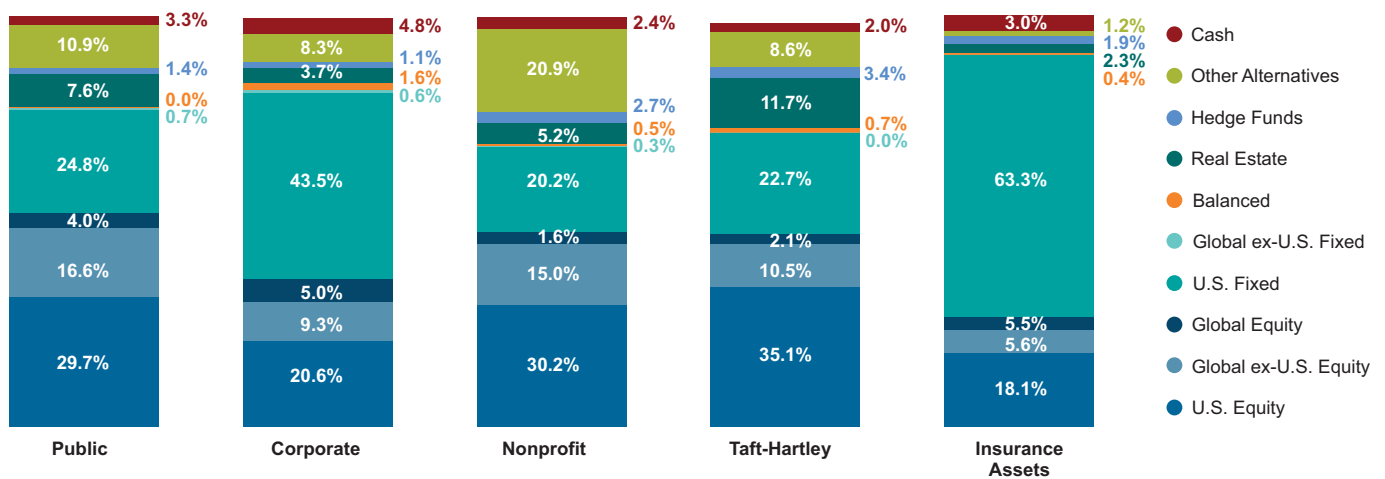
### Nonprofits

- Foundations and endowments are seeing effective spending rates coming down, to reflect the losses in 2022 (since current spending rates don’t yet reflect them, with lags and averages).

### Defined Contribution Plans

- Sponsors focused on these significant new issues:
  - SECURE 2.0: Digesting the new provisions and learning what they mean for them
  - Rate environment: Helping participants with options to manage higher inflation
  - Managed accounts and retirement income: Keeping terminated participants and retirees in plans

### Average Asset Allocation, Callan Database Groups



Note: Charts may not sum to 100% due to rounding. Other alternatives include but is not limited to: diversified multi-asset, private credit, private equity, and real assets. Source: Callan



# Equity

## U.S. Equities

### Large cap growth stocks lead broad indices higher

- The S&P 500 posted a second straight quarter of positive performance, gaining 8.7%; large cap growth led all styles, advancing 12.8%.
- All U.S. equity indices produced positive returns; small value and low volatility produced the lowest 2Q returns.
- Nine of the 11 S&P Index sectors produced a positive 2Q23 return.
- Similar to 1Q23, small caps (Russell 2000) underperformed large caps (Russell 1000) and growth outperformed value during the quarter, a reversal of trend from 2022.
- Financials (-1.1%) detracted from returns for the Russell 2000 (+5.2%) while Health Care was the only small cap sector to produce double-digit returns (+11.2%).

### Index concentration is a significant 2Q theme

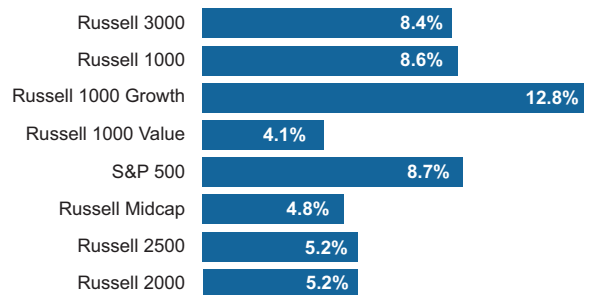
- 10 stocks within the S&P 500 Index contributed 80% of the 16.9% return YTD through 6/30; average appreciation is 82%, and these stocks had an average forward price/earnings ratio of 36x.
- 2Q return for the S&P 500 Index was 8.7%; the equal weight S&P 500 Index returned 4%.
- The YTD return difference is nearly 10 percentage points; if this gap holds through year-end, it would be the largest since 1998.

## Small cap valuations point to potential opportunity

- Small cap continues to trade at a meaningful discount to its historical valuations; large cap (particularly growth) continues to trade at a premium to its historical valuations.
- Favorable developments in the inflation data could give the small cap market a boost in performance.
- One recent issue that caused this relative valuation gap is debt; on average, small cap companies have a higher exposure to variable rate debt than large cap counterparts.

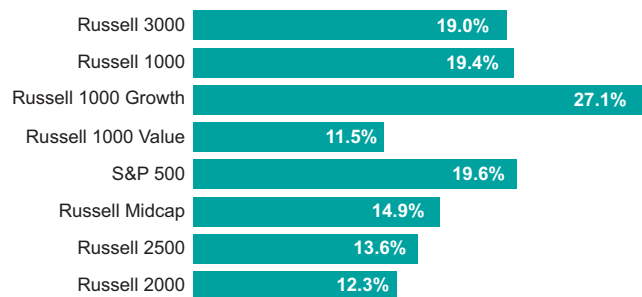
### U.S. Equity: Quarterly Returns

(6/30/23)



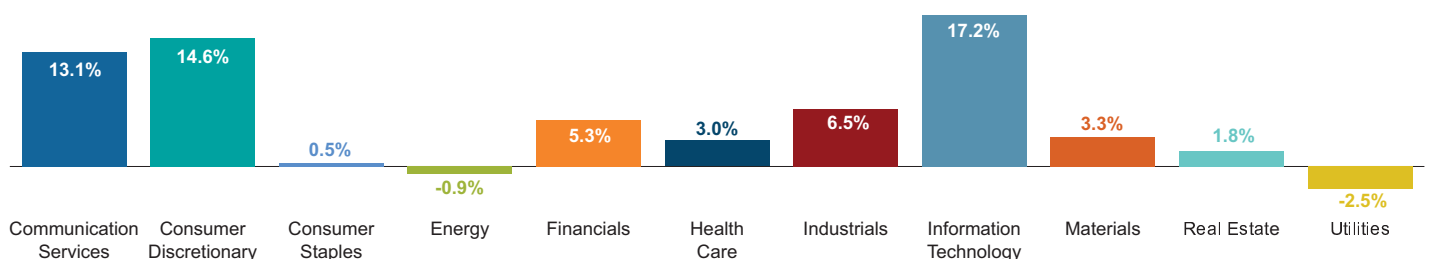
### U.S. Equity: One-Year Returns

(6/30/23)



Sources: FTSE Russell and S&P Dow Jones Indices

## Quarterly Performance of Industry Sectors (6/30/23)



Source: S&P Dow Jones Indices

## Global Equities

2Q23 continued global and global ex-U.S. equity markets' positive performance from the prior quarter.

### Technology stocks lead markets higher

- 2Q23 saw global markets led higher by mega cap technology stocks, in part due to increased optimism around artificial intelligence advancements.
- Market expectations of a recession decreased as inflation showed signs of abating while the Fed kept rates unchanged in June.
- Japan outperformed other regions in local currency as valuations continued to be attractive alongside the Bank of Japan's easy monetary policy.

### Developed vs. emerging markets

- Developed markets outperformed emerging markets as China weighed on EM indices.

### Growth vs. value

- Mega cap technology companies, which are primarily U.S.-based, led markets higher and resulted in large dispersions between U.S. growth and value indices. However, outside of the U.S., growth and value index returns were relatively balanced.

### Japan's turn

- Valuation below historical levels
- Economic recovery; in 1Q Japan transitioned out of a recession as GDP grew 2.7%.
- Next 12 months consensus earnings estimates show Japan outpacing China, EM, and Europe, and only trailing the U.S.

### India vs. China

#### Economics

- Chinese geopolitical tensions have, in part, driven outside investment elsewhere compared to India, with Prime Minister Modi's visit to the U.S. highlighting its place in the world economy.
- China's New Espionage Law (effective July 2023) likely contributing to less foreign investment; \$20 billion ended 1Q23 versus \$100 billion ended 1Q22.

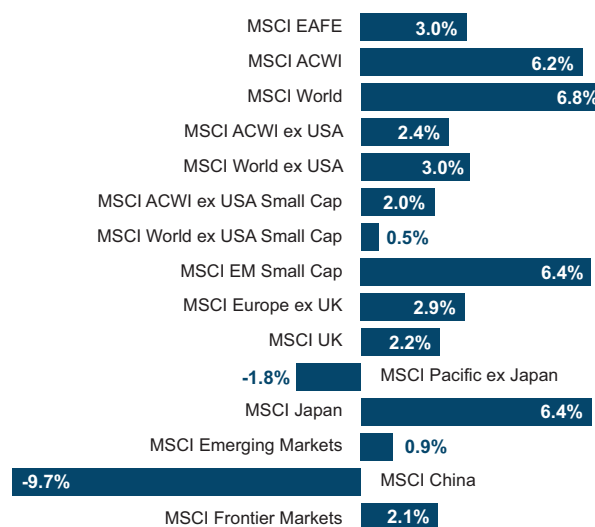
#### Asset flows

- India's equity market has more than doubled since 2010.

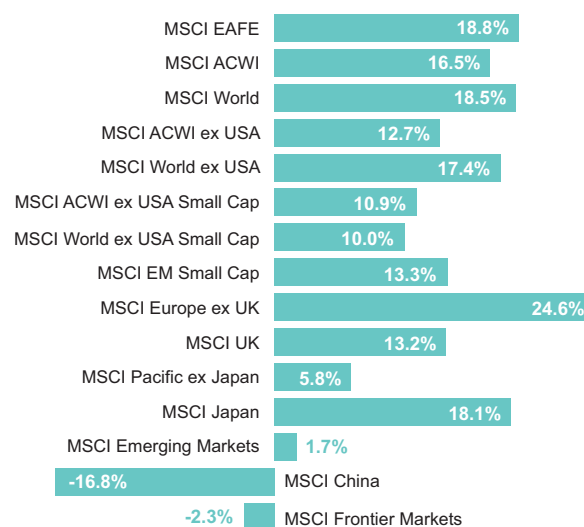
#### Growth

- India surpassing China with % of population in the middle class in 2030, and from 2023 to 2030 will contribute twice as much growth from this group than China in the Asia Pacific region.

### Global ex-U.S. Equity: Quarterly Returns (U.S. Dollar, 6/30/23)



### Global ex-U.S. Equity: One-Year Returns (U.S. Dollar, 6/30/23)



Source: MSCI

# Fixed Income

## U.S. Fixed Income

### Bloomberg Aggregate down as rates rose

Risk appetite and solid economic news spurred returns for spread sectors and lower quality.

- Corporate excess return: +131 bps
- Mortgage excess return: +76 bps
- High yield corporates excess return: +279 bps
- AA excess return: +84 bps
- BBB excess return: +157 bps

### Yield curve inversion steepened

- 2-year U.S. Treasury: 4.87%; 10-year: 3.81%

### TIPS performed in line with nominal U.S. Treasuries

- Five-year breakeven spreads narrowed to 2.18% from 2.40% on 3/31.
- Fed and markets expect inflation to trend down over longer periods.
- Fed Funds target raised to 5.00% - 5.25%
- Paused at June meeting but suggested that further hikes are likely
- Median expectation from Fed: 5.6% for year-end 2023
- Market expectations are similar at 5.4%; up sharply from expectations for cuts at the end of 1Q.

### Valuations fair

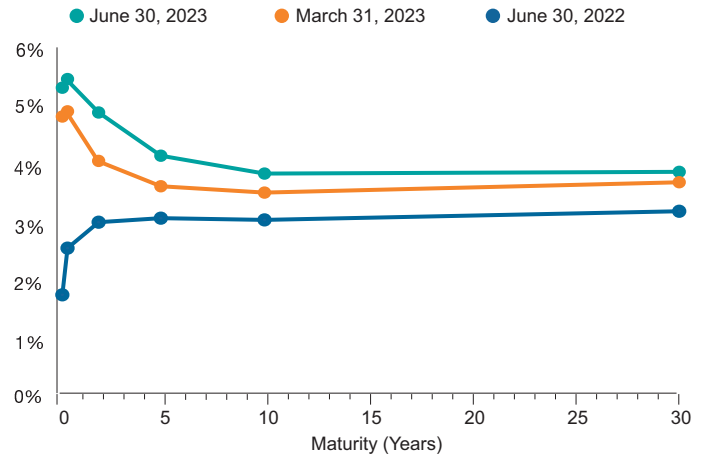
- Credit spreads have not widened materially and are close to historical averages.
- Demand has remained robust with muted issuance.

## Municipal Bonds

Municipal bonds outperformed U.S. Treasuries in 2Q

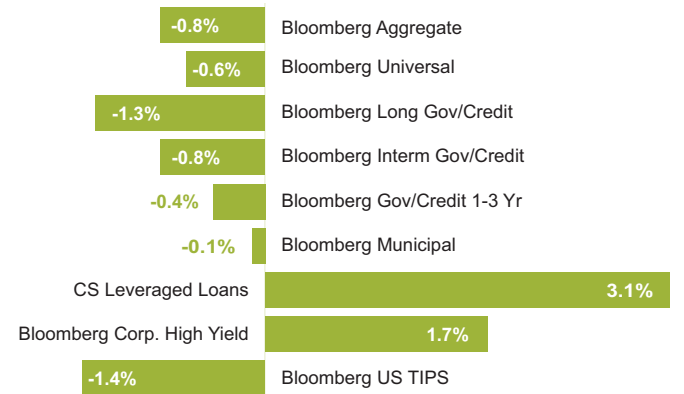
- Bloomberg Municipal Bond Index: -0.1%; Bloomberg U.S. Treasury Index: -1.4%
- Lower quality munis outperformed (AAA: -0.4%; AA: -0.2%; A: +0.2%; BBB: +0.7%)

## U.S. Treasury Yield Curves



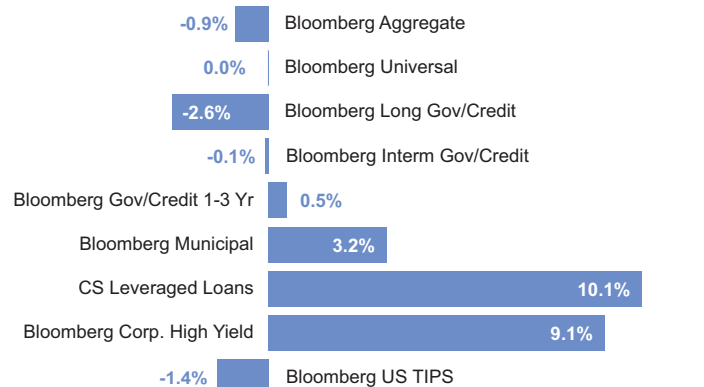
Source: Bloomberg

## U.S. Fixed Income: Quarterly Returns (6/30/23)



Sources: Bloomberg and Credit Suisse

## U.S. Fixed Income: One-Year Returns (6/30/23)



## FIXED INCOME (Continued)

### Muni curve inverted; less so than U.S. Treasury curve

- 2-year AAA Muni yield: 2.93%; 10-year AAA Muni yield: 2.56%

### Valuations relative to U.S. Treasuries remain rich

- 10-year AAA Muni/10-year U.S. Treasury yield ratio 67%; below 10-year median of 87%
- After-tax yield 5.95% (Bloomberg Municipal Bond Index)

### Supply/demand

- Outflows of roughly \$8 billion YTD, mostly from short-term bond funds (record was \$122 billion in 2022)
- Supply remained muted; YTD about 25% below 2022

### Fundamentals remain sound

- “Rainy Day” fund balances and state tax revenues continued to be robust.
- Upgrades continued to significantly outpace downgrades in 1Q.

## Global Fixed Income

### Global Aggregate down unhedged but up hedged

- Rates mixed; up in the U.S., Great Britain, and Australia and flat to slightly down across other developed markets
- Japan (-8%) worst performer on sharp yen depreciation
- Bank of England surprised markets with 50 bps increase to combat sticky inflation.

### U.S. dollar mixed

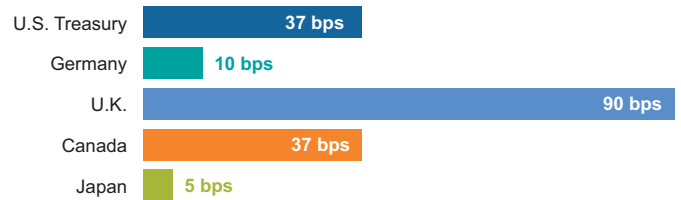
- Euro: +0.4% vs dollar
- British pound: +2.8% vs dollar
- Canadian dollar: +2.3% vs dollar
- Japanese yen: -7.9% vs dollar
- Australian dollar: -0.6% vs dollar
- Chinese yuan: -5.4% vs dollar
- Mexican peso: +5.3% vs dollar
- Brazilian real: +5.1% vs dollar

### Emerging market debt delivered solid results

- Growth differentials have improved as inflation has peaked in many markets

## Change in 10-Year Global Government Bond Yields

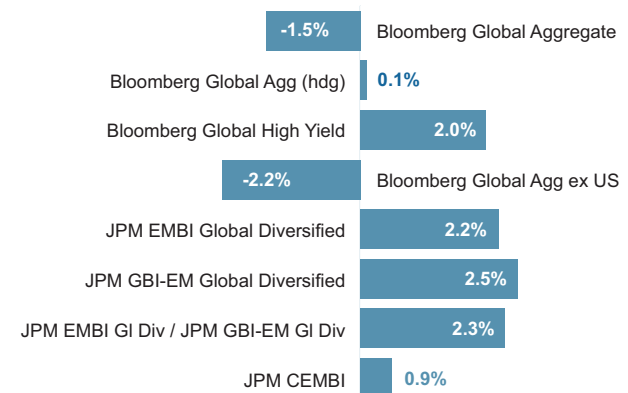
1Q23 to 2Q23



Source: Bloomberg

## Global Fixed Income: Quarterly Returns

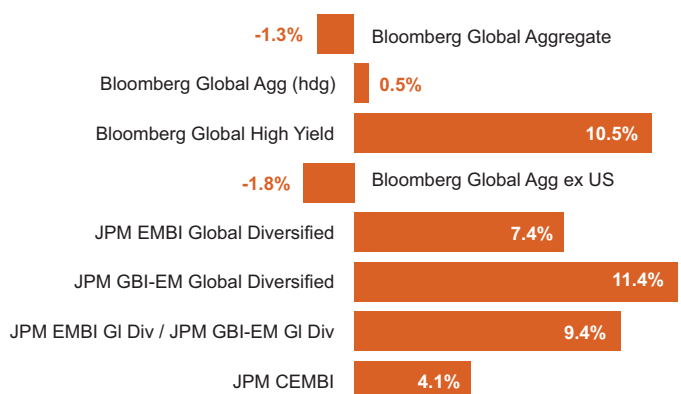
(6/30/23)



Sources: Bloomberg and JPMorgan Chase

## Global Fixed Income: One-Year Returns

(6/30/23)



Sources: Bloomberg and JPMorgan Chase

# Private Real Estate Falls While REITs Lag Equities

REAL ESTATE/REAL ASSETS | Kristin Bradbury, Munir Iman, and Aaron Quach

## Private RE falls but income returns were positive

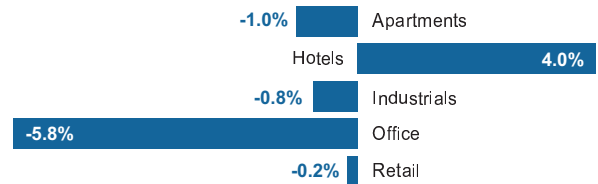
- The NCREIF Property Index, a measure of U.S. institutional real estate assets, fell 2.0% during 2Q23. The income return was 1.0% while the appreciation return was –3.0%.
- Hotels, which represent a small portion of the index, led property sector performance with a gain of 4.0%. Office finished last with a loss of 5.8%.
- Regionally, the South led with a loss of 0.8%, while the East was the worst performer with a loss of 2.7%.
- The NCREIF Open-End Diversified Core Equity Index, representing equity ownership positions in U.S. core real estate, fell 2.7% during 2Q, with an income return of 0.9% and an appreciation return of -3.6%.

## REITs underperform equities

- Global REITs underperformed in 2Q23, rising 0.3% compared to a 6.8% rise for global equities (MSCI World).
- U.S. REITs rose 2.6% in 2Q23, in contrast with the S&P 500 Index, which rose 8.7%.
- The outperformance in the U.S. was driven by the resilient U.S. economy but continued to face headwinds due to higher interest rates and negative sentiment in the capital markets.

## Sector Quarterly Returns by Property Type

(6/30/23)



Source: NCREIF

## Real Assets

- The S&P GSCI fell 2.7% in 2Q.
- WTI Crude ended the quarter at \$70.64/barrel, down from \$75.67/barrel on 3/31.
- Copper (-8%) fell on concerns over ebbing global demand and a slowdown in China, and gold (S&P Gold Spot Price: -2.9%) was hurt by lowered expectations for inflation and reduced safe-haven demand.
- TIPS (Bloomberg TIPS: -1.4%) were hurt by rising interest rates.

## Callan Database Median and Index Returns\* for Periods Ended 6/30/23

Private Real Assets	Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	15 Years
<b>Real Estate ODCE Style</b>	<b>-1.0</b>	<b>-4.9</b>	<b>-9.2</b>	<b>7.8</b>	<b>6.5</b>	<b>8.3</b>	<b>4.8</b>
NFI-ODCE (value-weighted, net)	-2.9	-6.2	-10.7	7.0	5.6	7.8	4.7
NCREIF Property	-2.0	-3.8	-6.6	6.8	5.9	7.8	6.1
NCREIF Farmland	0.8	2.9	8.2	7.6	6.5	8.3	9.9
NCREIF Timberland	1.7	3.5	11.1	8.7	5.8	5.9	4.6
<b>Public Real Estate</b>							
<b>Global Real Estate Style</b>	<b>0.8</b>	<b>2.8</b>	<b>-2.9</b>	<b>4.5</b>	<b>2.5</b>	<b>5.2</b>	<b>5.2</b>
FTSE EPRA Nareit Developed	0.3	1.0	-4.5	3.3	-0.1	2.9	3.2
<b>Global ex-U.S. Real Estate Style</b>	<b>-2.3</b>	<b>-2.5</b>	<b>-7.4</b>	<b>-1.1</b>	<b>-1.1</b>	<b>3.8</b>	<b>3.0</b>
FTSE EPRA Nareit Dev ex US	-3.1	-4.7	-9.3	-2.6	-3.8	0.6	1.2
<b>U.S. REIT Style</b>	<b>2.6</b>	<b>5.8</b>	<b>-0.7</b>	<b>8.6</b>	<b>6.0</b>	<b>7.3</b>	<b>7.7</b>
FTSE EPRA Nareit Equity REITs	2.6	5.4	-0.1	8.9	4.6	6.4	6.8

\*Returns less than one year are not annualized. Sources: Callan, FTSE Russell, NCREIF

# Headwinds Slow Liquidity

PRIVATE EQUITY | Gary Robertson

**Fundraising** ► Final closes for private equity partnerships in 2Q23 totaled \$170 billion of commitments in 470 partnerships. (Unless otherwise noted, all data in this commentary come from PitchBook.) The dollar volume was down 2% from 1Q23, but the number of funds rose 7%. For the first half, commitments are running 31% behind those of a year ago, with the number of funds down by 51%, and with venture capital commitment volumes falling most notably from about 34% a year ago.

**Buyouts** ► New buyout transactions by count fell 13% from 1Q23 to 2,462, and disclosed deal value declined 18% to \$122 billion. 1H23 numbers also saw declines of 30% in number of investments and 36% in disclosed value. YTD average buyout prices fell almost a turn (0.9x EBITDA) to 13.4x but remain high on an absolute basis. Average leverage levels YTD fell to only 31% of new deal capital structures, with interest costs rising and impinging company profitability.

**VC Investments** ► New rounds of financing in venture capital companies totaled 9,955, with \$86 billion of announced value. The number of investments preliminarily fell 20% from 1Q23, but announced value fell only 1%. 1H23 numbers plunged 33% for rounds and 48% for disclosed value compared to 1H22.

**Exits** ► There were 472 private M&A exits of private equity-backed companies, with disclosed values totaling \$90 billion. The

preliminary private sale count fell 21% and the announced dollar volume dropped 13%. There were 46 private equity-backed IPOs in 2Q23 raising an aggregate \$7 billion, up 15% by count, with issuance leaping 40% from 1Q23.

Venture-backed M&A exits totaled 541 transactions with disclosed value of \$14 billion. The number of sales declined 18% from 1Q23, and announced value plunged 50%. There were 86 VC-backed IPOs in 2Q23 with a combined float of \$12 billion; the count was up 19% and the issuance grew 71%.

**Returns** ► With an uptick in public equity markets in the last two quarters, private equity lagged in both periods but posted modestly positive returns in each.

## Funds Closed 1/1/23 to 6/30/23

Strategy	No. of Funds	Amt (\$mm)	Share
Venture Capital	554	59,101	17%
Growth Equity	53	47,704	14%
Buyouts	213	136,312	40%
Mezzanine Debt	11	29,663	9%
Distressed/Special Credit	15	24,043	7%
Energy	4	1,467	0%
Secondary and Other	53	42,486	12%
Fund-of-Funds	7	2,429	1%
<b>Totals</b>	<b>910</b>	<b>343,205</b>	<b>100%</b>

Source: PitchBook (Figures may not total due to rounding.)

## Private Equity Performance (%) (Pooled Horizon IRRs through 3/31/23\*)

Strategy	Quarter	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
All Venture	-0.70	-16.37	24.98	20.43	18.73	13.20	12.62	19.35
Growth Equity	1.27	-9.26	21.28	16.51	15.11	12.70	14.39	14.17
All Buyouts	3.52	0.69	23.86	16.00	15.24	10.84	15.07	12.82
Mezzanine	3.49	6.08	14.91	10.88	11.08	10.34	11.38	10.02
Credit Opportunities	2.01	4.00	13.42	7.30	7.86	9.17	9.79	9.53
Control Distressed	1.60	2.59	26.00	13.90	12.14	10.72	11.85	11.51
<b>All Private Equity</b>	<b>2.12</b>	<b>-4.57</b>	<b>22.98</b>	<b>16.20</b>	<b>15.12</b>	<b>11.36</b>	<b>13.95</b>	<b>13.37</b>
S&P 500	8.74	19.59	14.60	12.31	12.86	10.88	10.04	7.61
Russell 3000	8.39	18.95	13.89	11.39	12.34	10.61	10.05	7.72

Note: Private equity returns are net of fees. Sources: Refinitiv/Cambridge and S&P Dow Jones Indices

\*Most recent data available at time of publication

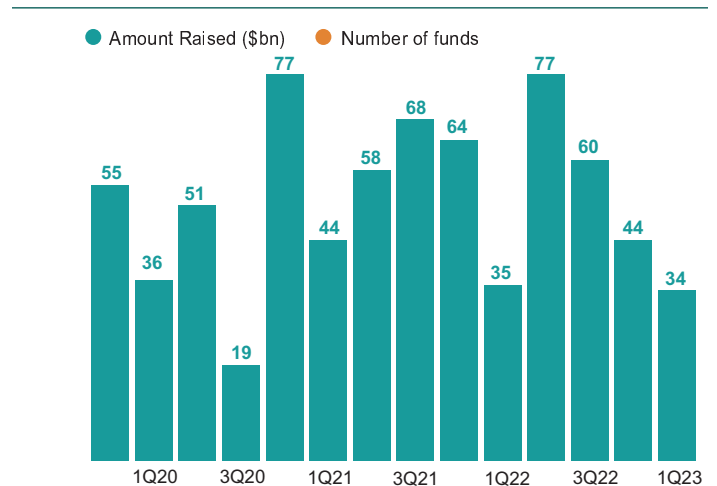
Note: Transaction count and dollar volume figures across all private equity measures are preliminary figures and are subject to update in subsequent versions of the *Capital Markets Review* and other Callan publications.

# IRRs Stay Steady and Range from 8%-10%

PRIVATE CREDIT | Catherine Beard

- Private credit performance varied across sub-asset class and underlying return drivers.
- On average, the asset class has generated net IRRs of 8% to 10% for trailing periods ended March 31, 2023.
- As interest rates declined after the GFC, private credit attracted increased interest from institutional investors.
- Private credit fundraising was robust leading into the COVID dislocation with a particular focus on direct lending, asset-based lending, and distressed strategies.
- Renewed focus on relative value, downside protection, and managers' internal workout resources
- Renewed interest in strategies with strong collateral protection such as asset-based lending as well as capital solutions and distressed/special situations strategies
- Larger sponsor-backed lending is seeing a new focus due to the high yield/broadly syndicated loans disintermediation by private credit.
- U.S. sub-investment grade corporate yields rose dramatically at the beginning of 2022 with yields peaking in September. This was a combination of higher interest rates due to tighter Fed policy and a widening of high yield spreads.
- Spreads widened during the first half of 2022 due to weaker credit conditions as the U.S. economic outlook worsened. This has since moderated.
- Default rates for U.S. corporate bonds ticked up in 2Q but remained well below the historical average of 3%-4%. Callan expects defaults to increase somewhat in coming months as economic growth slows and potentially turns negative.
- The Corporate Bond Market Distress Index (CMDI) rose rapidly during the first nine months of 2022, especially for investment grade bonds, highlighting market volatility and a drying

## Private Credit Fundraising (\$bn)



Source: Preqin

- up of liquidity, but has fallen since then.
- In 2023, as the IG distress index continued to fall, the HY bond indicator was roughly flat with the end of 2022. The CMDI incorporates a range of indicators, including new issuance and pricing for primary and secondary market bonds.
- During 2Q23, clients took a new look at upper-middle-market direct lending as all-in spreads have widened by over 500 bps and lenders are able to get tighter terms. Strong deal volume was driven partially by a shift from public to private market debt financings in the recent market environment.

## Private Credit Performance (%) (Pooled Horizon IRRs through 3/31/23\*)

Strategy	Quarter	1 Year	3 Years	5 Years	8 Years	10 Years	15 Years	20 Years
Senior Debt	2.8	4.3	8.8	5.9	7.0	6.8	7.0	6.9
Mezzanine	3.5	6.1	14.9	10.9	11.2	11	10.5	11.4
Credit Opportunities	2.0	4.0	13.4	7.3	7.3	7.9	9.2	9.4
Total Private Credit	2.5	4.5	12.8	7.9	8.2	8.4	9.2	9.6

Source: Refinitiv/Cambridge

\*Most recent data available at time of publication

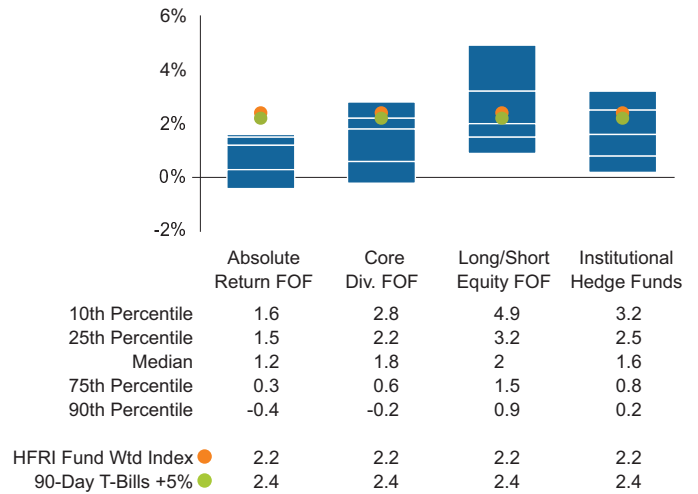
# Hedge Funds Gain but Lag Equity Indices

HEDGE FUNDS/MACs | Joe McGuane

Equity markets continued to march higher for the first half of this year, as growth equities surpassed expectations while the Federal Reserve paused the hiking cycle for the first time. Treasury yields moved higher across the curve and the spread between 2-year and 10-year Treasuries further inverted in 2Q23. Hedge funds ended 2Q higher but unable to keep up with soaring equity indices, as equity market volatility subsided from 1Q. Equity hedge strategies had another strong quarter, as managers focused on technology and biotechnology companies. Event-driven managers ended the quarter higher, aided by liquid corporate credit and equities. Macro strategies ended with gains, bouncing back from a difficult 1Q.

## Hedge Fund Style Group Returns

(6/30/23)



Sources: Callan, Credit Suisse, Federal Reserve

## Callan Peer Group Median and Index Returns\* for Periods Ended 6/30/23

Hedge Fund Universe	Quarter	1 Year	3 Years	5 Years	10 Years	15 Years
Callan Institutional Hedge Fund Peer Group	1.6	4.6	7.6	5.4	5.7	5.9
Callan Fund-of-Funds Peer Group	1.5	5.0	6.1	4.1	4.5	3.8
Callan Absolute Return FOF Style	1.2	3.8	7.0	4.1	4.6	3.7
Callan Core Diversified FOF Style	1.8	5.1	6.2	4.1	3.9	3.7
Callan Long/Short Equity FOF Style	2.0	5.9	3.6	3.8	5.0	4.2
HFRI Fund-Weighted Index	2.2	5.0	8.1	5.0	4.7	4.0
HFRI Fixed Convertible Arbitrage	1.4	7.2	7.7	5.6	5.0	5.5
HFRI Distressed/Restructuring	1.4	1.6	9.3	4.5	4.3	4.5
HFRI Emerging Markets	2.6	3.4	4.6	2.5	3.4	2.2
HFRI Equity Market Neutral	0.6	2.9	4.1	2.0	2.9	1.9
HFRI Event-Driven	1.1	5.3	8.5	4.3	4.5	4.5
HFRI Relative Value	1.2	4.0	5.9	3.6	4.0	4.6
HFRI Macro	1.7	-0.4	7.3	5.0	3.1	2.4
HFRI Equity Hedge	3.1	7.6	9.0	5.5	5.7	4.3
HFRI Multi-Strategy	0.7	1.9	4.2	2.5	2.7	2.9
HFRI Merger Arbitrage	-1.0	1.9	7.4	4.6	4.2	3.9
90-Day T-Bill + 5%	2.4	8.6	6.3	6.6	6.0	5.8

\*Net of fees. Sources: Callan, Credit Suisse, Hedge Fund Research



Serving as a proxy for large, broadly diversified hedge funds with low-beta exposure to equity markets, the median Callan Institutional Hedge Fund Peer Group rose 1.6%. Within this style group of 50 peers, the average hedged credit manager gained 2.1% as high yield credit performed positively due to tightening credit spreads. Meanwhile, the average hedged equity manager added 1.7%, as managers with a focus on growth-oriented equities drove performance.

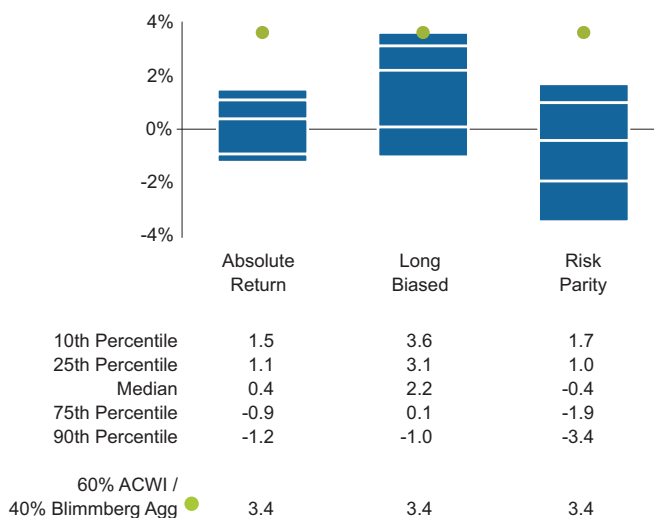
Within the HFRI indices, the best-performing strategy last quarter was the equity hedge index (3.1%), led by manager exposure to AI and growth-related sectors. Macro strategies finished up 1.7%, as managers went long equities and short rates across the U.S. and Europe.

Across the Callan Hedge FOF Database Group, the median Callan Long-Short Equity Fund-of-Funds (FOF) ended up 2.0%, as managers benefited from soaring large-cap technology companies. Meanwhile, the median Callan Core Diverse FOF gained 1.8%, as equity hedge, event-driven, and macro managers drove performance. The Callan Absolute Return FOF rose 1.2%, as a lower weight to equity hedge exposure led to a lower return compared to managers with more equity beta.

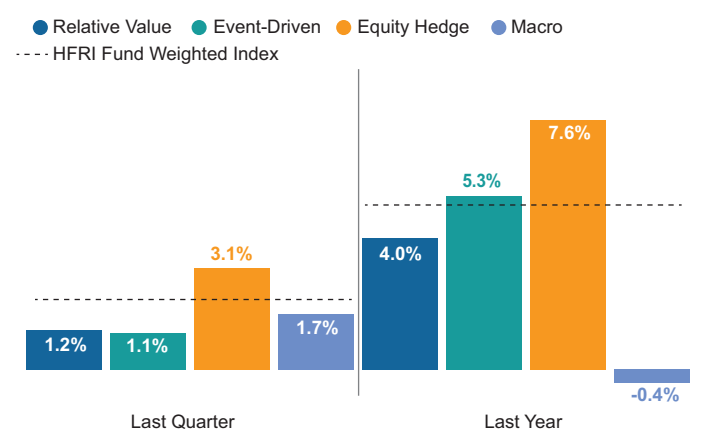
Within Callan's database, the median Callan Multi-Asset Class (MAC) Long Biased peer group gained 2.2%, the Callan MAC Absolute Return peer group was up 0.4%, and the Callan MAC Risk Parity peer group fell 0.4%.

The strong equity rally during the first half of this year has been hard for hedge funds to keep up with, as many managers came into 2023 more defensive. Throughout the second quarter we began to see managers taking on more risk to catch some of this broader market move higher. As the macro outlook appears to be more benign going into the second half of this year, we continue to think fundamental long/short equity managers are well positioned to profit from this current environment. Long/short credit managers will be able to opportunistically allocate capital to credits they believe are over- or undervalued in this current environment. We continue to believe macro managers are well positioned to allocate capital across the most attractive asset classes.

### MAC Style Group Returns (6/30/23)



### HFRI Hedge Fund-Weighted Strategy Returns (6/30/23)



Source: HFRI

Sources: Bloomberg, Callan, Eurekahedge, S&P Dow Jones Indices

# Index Starts off 2023 With a Gain

DEFINED CONTRIBUTION | [Scotty Lee](#)

## Performance: DC Index Rises 5.3% in 1Q23

- The Callan DC Index™ gained 5.3% in 1Q23, which brought the Index's trailing one-year loss to 5.2%.

## Growth Sources: Investment Gains Lead to Rise in Balances

- Balances within the DC Index rose by 5.3% after a 5.8% increase in the previous quarter.
- Investment gains (+5.3%) were the sole driver of the gain, while net flows (+0.03%) had a negligible effect.

## Turnover: Net Transfers Increase Again

- Turnover (i.e., net transfer activity levels within DC plans) jumped to 0.70% from the previous quarter's measure of 0.18%. The quarterly turnover figure marked the Index's highest level since 2020, when market volatility was heightened during the onset of the COVID-19 pandemic.

## Net Cash Flow Analysis: TDFs Remain in Top Spot

- Target date funds (TDFs) received the largest net inflows in the DC Index, as the asset allocation funds garnered 90.6% of quarterly net flows.

## Equity Allocation: Exposure Above Historical Average

- The Index's overall allocation to equity (70.8%) rose from the previous quarter's level (70.1%) and sits above the Index's historical average (68.4%).

## Asset Allocation: Capital Preservation Declines

- U.S. large cap (25.7%) and global ex-U.S. equity (5.2%) were among the asset classes with the largest percentage increases in allocation.
- Within capital preservation, stable value (9.2%) had a decrease in allocation from the previous quarter's level (10.0%), which was exacerbated by investor outflows.

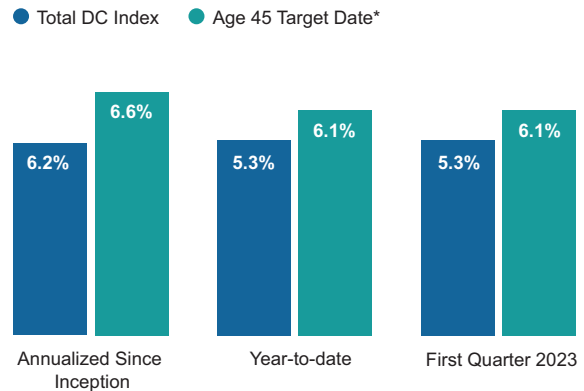
## Prevalence of Asset Class: Balanced Funds Rise

- The prevalence of a balanced fund (42.1%) rose by 1.3 percentage points, the first increase in two years.

*Underlying fund performance, asset allocation, and cash flows of more than 100 large defined contribution plans representing approximately \$400 billion in assets are tracked in the Callan DC Index.*

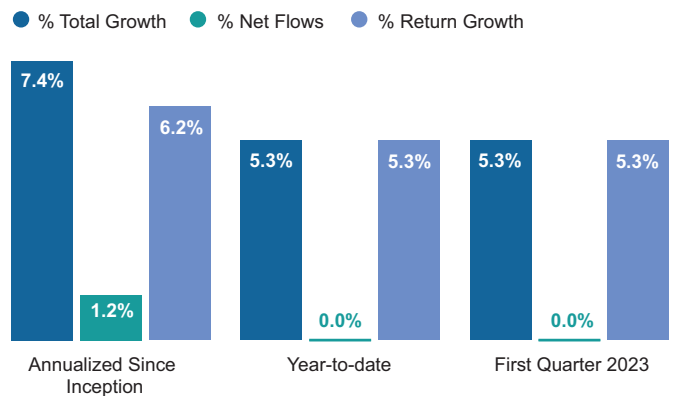
## Investment Performance

(3/31/23)



## Growth Sources

(3/31/23)



## Net Cash Flow Analysis (1Q23)

(Top Two and Bottom Two Asset Gatherers)

Asset Class	Flows as % of Total Net Flows
Target Date Funds	90.6%
Brokerage Window	5.6%
U.S. Large Cap	-34.0%
Stable Value	-37.7%
<b>Total Turnover**</b>	<b>0.7%</b>

Data provided here is the most recent available at time of publication.

Source: Callan DC Index

Note: DC Index inception date is January 2006.

\* The Age 45 Fund transitioned from the average 2035 TDF to the 2040 TDF in June 2018.

\*\* Total Index "turnover" measures the percentage of total invested assets (transfers only, excluding contributions and withdrawals) that moved between asset classes.



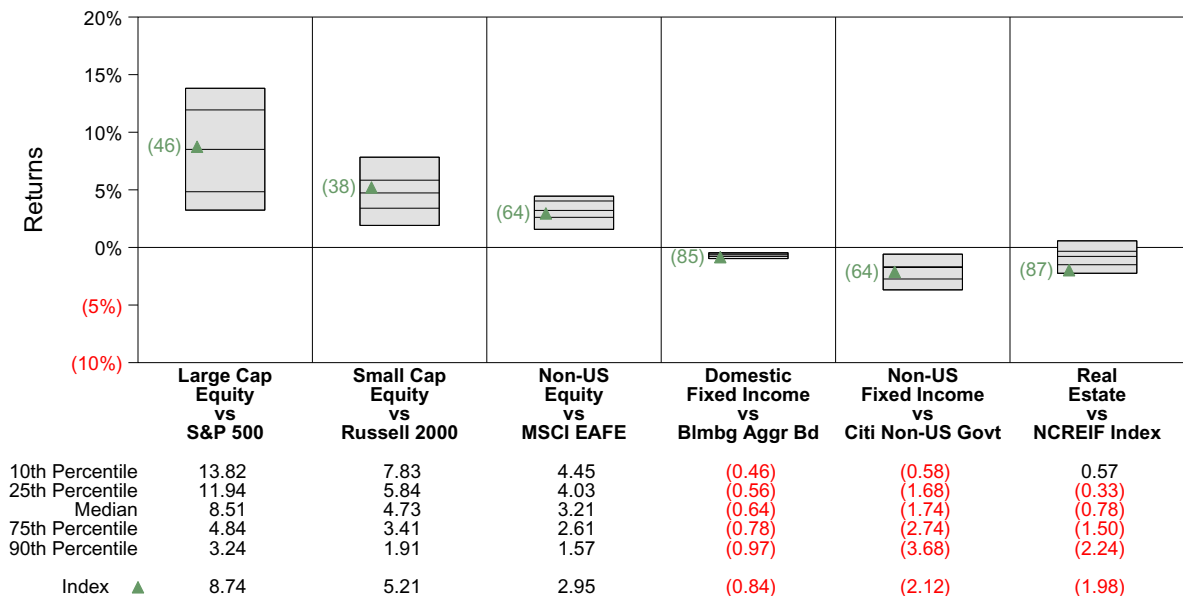
## Market Overview

### Active Management vs Index Returns

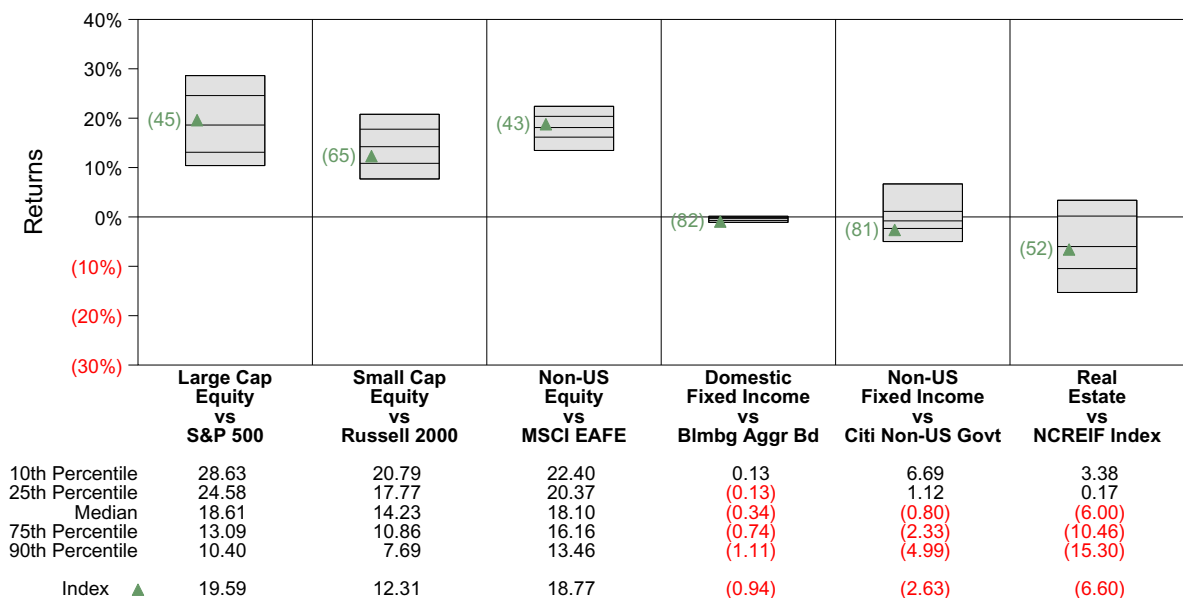
#### Market Overview

The charts below illustrate the range of returns across managers in Callan's Separate Account database over the most recent one quarter and one year time periods. The database is broken down by asset class to illustrate the difference in returns across those asset classes. An appropriate index is also shown for each asset class for comparison purposes. As an example, the first bar in the upper chart illustrates the range of returns for domestic equity managers over the last quarter. The triangle represents the S&P 500 return. The number next to the triangle represents the ranking of the S&P 500 in the Large Cap Equity manager database.

#### Range of Separate Account Manager Returns by Asset Class One Quarter Ended June 30, 2023



#### Range of Separate Account Manager Returns by Asset Class One Year Ended June 30, 2023

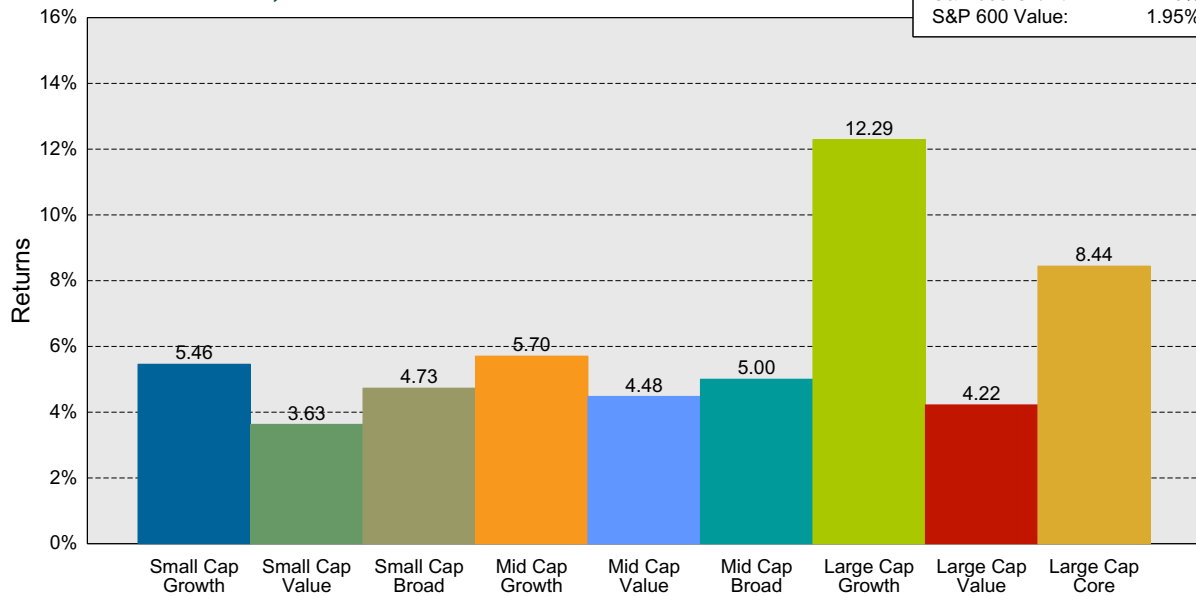


## Domestic Equity Active Management Overview

U.S. stock indices posted positive returns in 2Q with performance dominated by large cap technology stocks. The S&P 500 Index rose 8.7% while the tech-heavy Nasdaq Composite returned +13.1%. Within the S&P 500, Technology (+17.2%), Communication Services (+13.1%), and Consumer Discretionary (+14.6%) rose sharply while Energy (-0.9%) and Utilities (-2.5%) fell. Growth stocks trounced value for the quarter (Russell 1000 Growth: +12.8%; Russell 1000 Value: +4.1%) due largely to the sharp outperformance of Technology relative to Health Care, Energy, and Financials. Small cap stocks underperformed large (Russell 2000: +5.2%; Russell 1000: +8.6%) across the style spectrum. Index concentration continued to have a significant impact on returns in 2Q. The aptly named Magnificent Seven (Nvidia, Meta Platforms, Amazon, Tesla, Apple, Microsoft, Alphabet) comprise roughly 25% of the S&P 500 and have accounted for the vast majority of S&P 500 gains in 2023 (Mag 7 up 64% versus 3% for the rest of the Index).

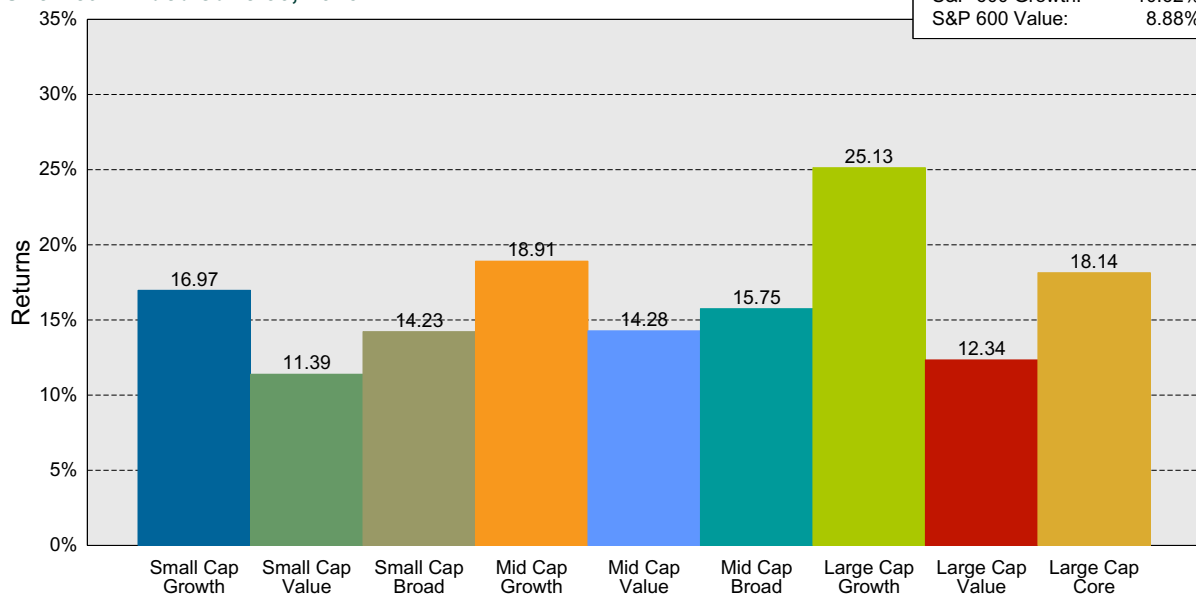
S&P 500:	8.74%
S&P 500 Growth:	10.59%
S&P 500 Value:	6.64%
S&P Mid Cap:	4.85%
S&P 600:	3.38%
S&P 600 Growth:	4.78%
S&P 600 Value:	1.95%

### Separate Account Style Group Median Returns for Quarter Ended June 30, 2023



S&P 500:	19.59%
S&P 500 Growth:	18.25%
S&P 500 Value:	19.99%
S&P Mid Cap:	17.61%
S&P 600:	9.75%
S&P 600 Growth:	10.62%
S&P 600 Value:	8.88%

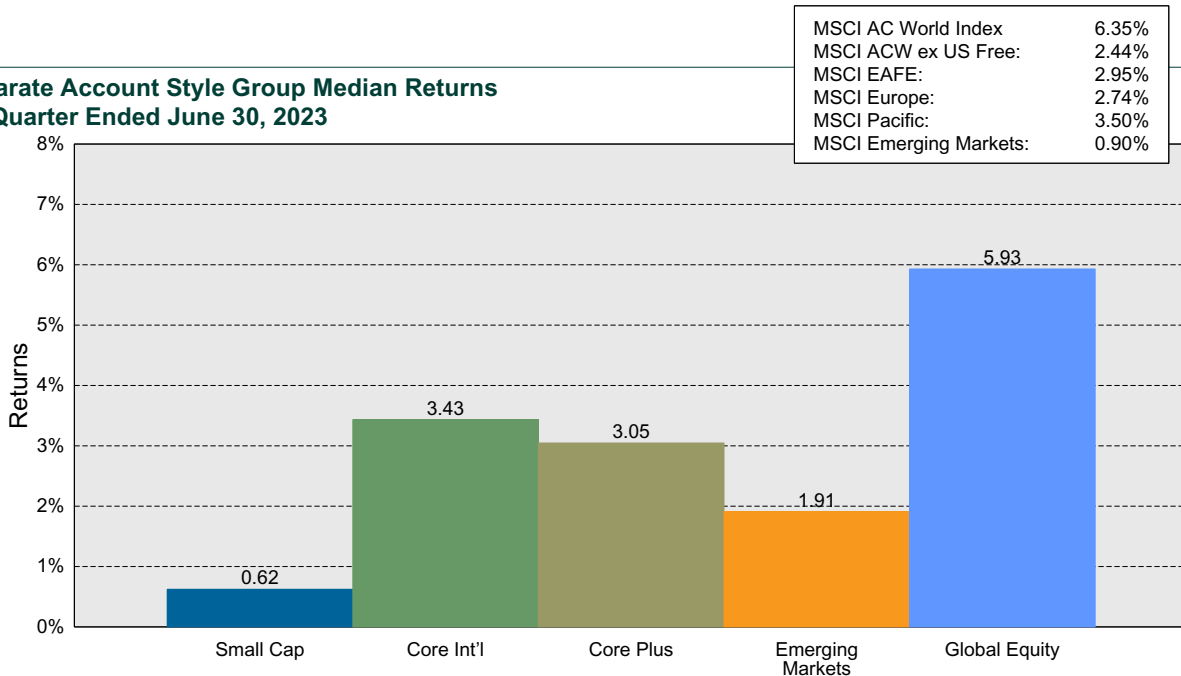
### Separate Account Style Group Median Returns for One Year Ended June 30, 2023



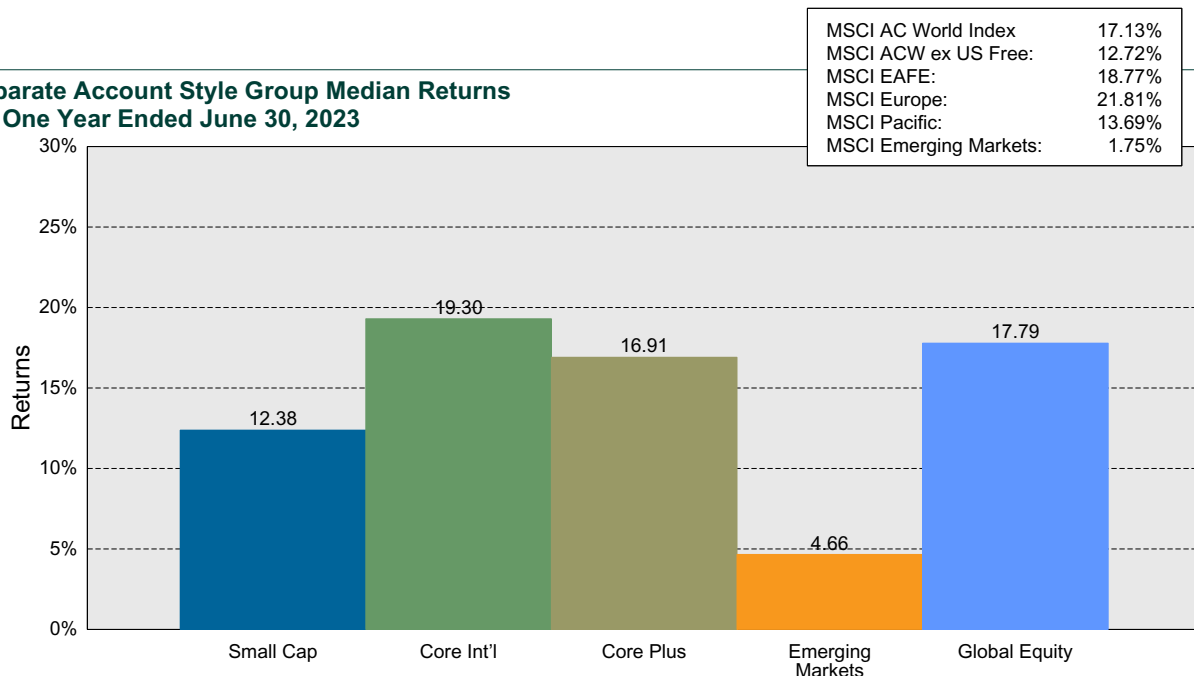
## International Equity Active Management Overview

Global ex-U.S. equity markets trailed U.S. equity markets given lower technology exposure. Lacking the U.S. markets exuberance for any company associated with Artificial Intelligence, style impacts in developed ex-U.S. equity were more muted with value (MSCI World ex USA Value: +3.1%) in line with growth (MSCI World ex USA Growth: +3.0%). Illustratively, Industrials (EAFE Industrials: +6.4%) outperformed Technology (EAFE Technology: +5.9%). Japan (+6.4%) was a top performer and the Nikkei 225 Index hit its highest level since 1990. Japan benefited from strong inflows from foreign investors, expectations for corporate governance reform and an improved outlook for the Japanese economy. The yen sank 8% versus the U.S. dollar as monetary policy was kept ultra-loose, but the dollar fell versus the British pound (+2.8%) and the euro (+0.4%). Emerging market equity underperformed developed market equity, but results varied widely. Emerging Europe (+11.2%) and Latin America (+14.0%) posted double-digit results while Emerging Asia (-0.8%) was hurt by poor performance from China (-9.7%) offsetting results from India (+12.2%). Poland (+24.5%) boosted the performance of Emerging Europe while Turkey (-10.7%) weighed on the regions results. In Latin America, Brazil (+20.7%) and Colombia (+11.7%) were top performers.

### Separate Account Style Group Median Returns for Quarter Ended June 30, 2023



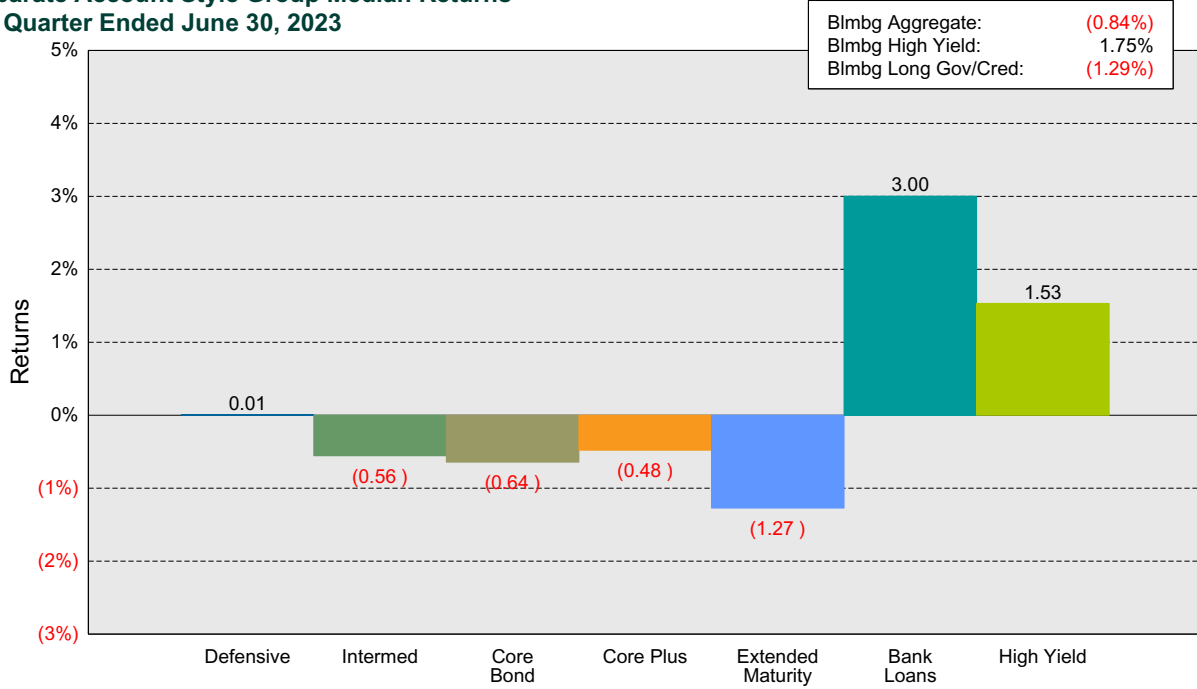
### Separate Account Style Group Median Returns for One Year Ended June 30, 2023



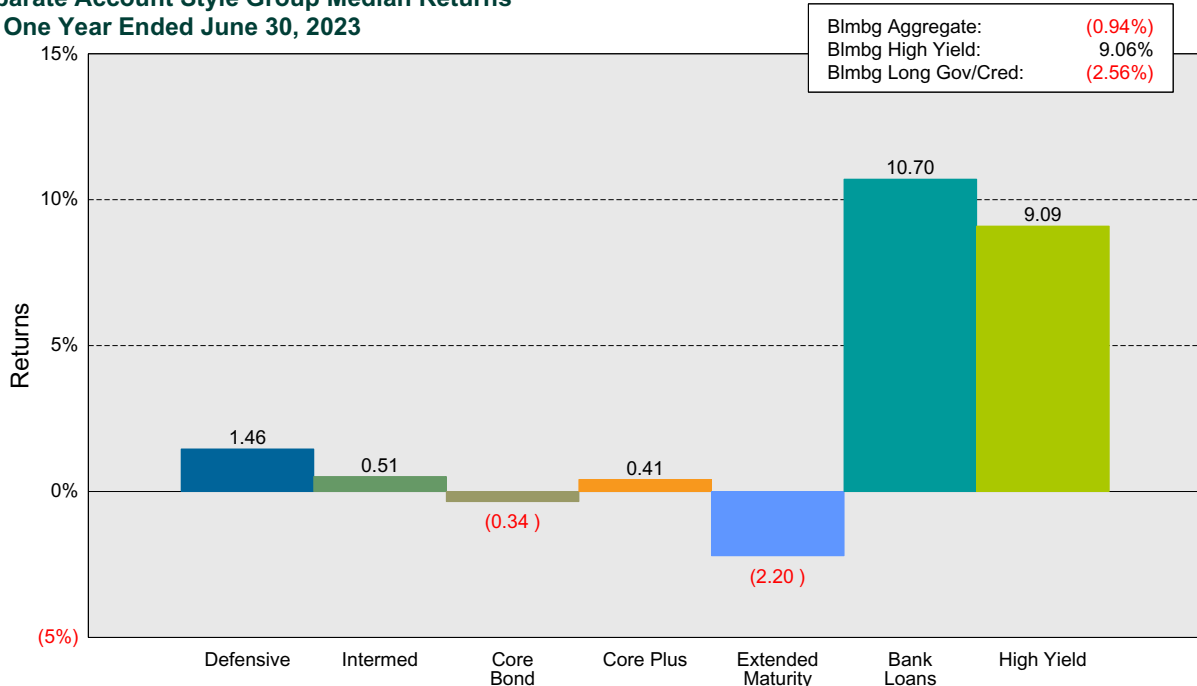
## Domestic Fixed Income Active Management Overview

The Bloomberg US Aggregate Bond Index fell 0.8% in 2Q as interest rates rose. A risk-on environment bolstered returns for credit and securitized sectors, both of which outperformed U.S. Treasuries on a duration-adjusted basis. The 10-year U.S. Treasury yield was 3.81% as of quarter-end, up from 3.48% as of 3/31. The yield curve was sharply inverted at quarter-end with the 2-year U.S. Treasury yielding 4.87%. High yield (Bloomberg High Yield Index: +1.8%) performed well amid robust risk appetite, muted issuance, and promising economic news.

### Separate Account Style Group Median Returns for Quarter Ended June 30, 2023



### Separate Account Style Group Median Returns for One Year Ended June 30, 2023



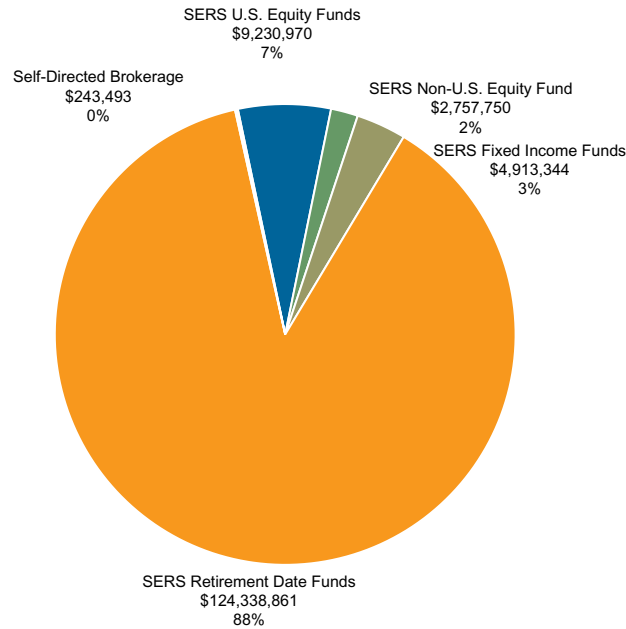




## Changes in Investment Fund Balances Period Ended June 30, 2023

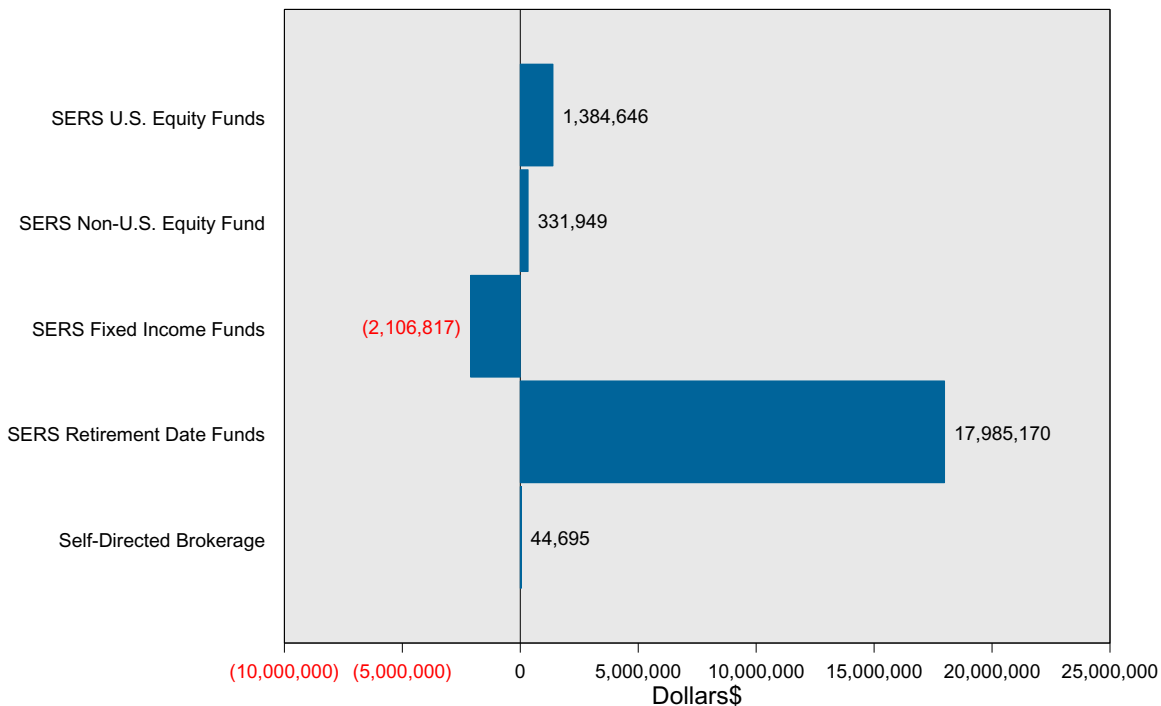
### Allocation Across Investment Options

The chart below illustrates the allocation of the aggregate fund assets across the various investment options for the quarter ended June 30, 2023.



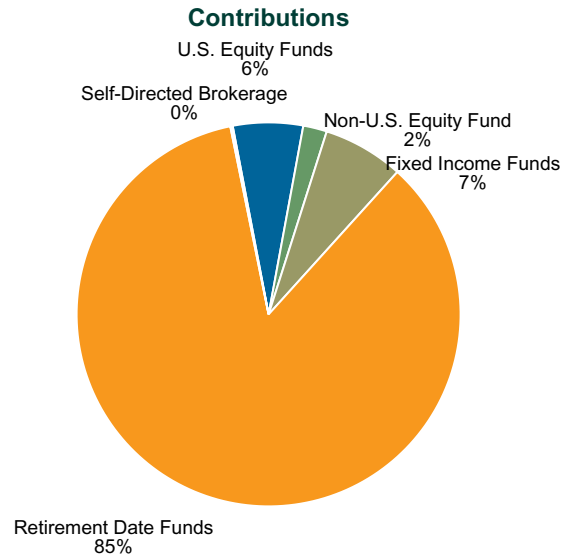
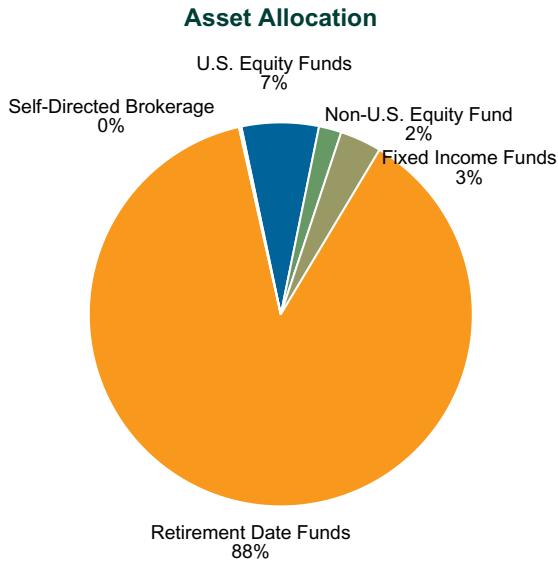
### Changes in Fund Values

The chart below shows the net change in fund values across the various investment options for the quarter ended June 30, 2023. The change in value for each fund is the result of a combination of 3 factors: 1) market movements; 2) contributions or disbursements into or out of the funds by the participants (and any matching done by the company); and 3) transfers between funds by the participants.

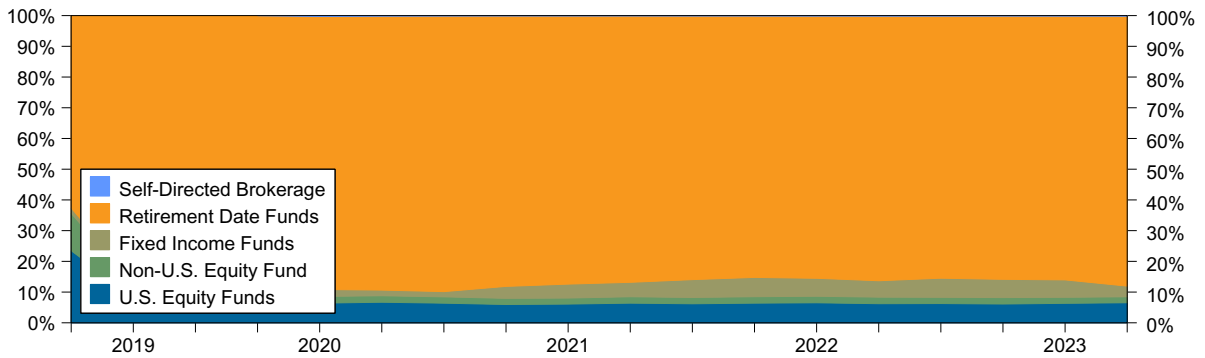


## Asset Allocation

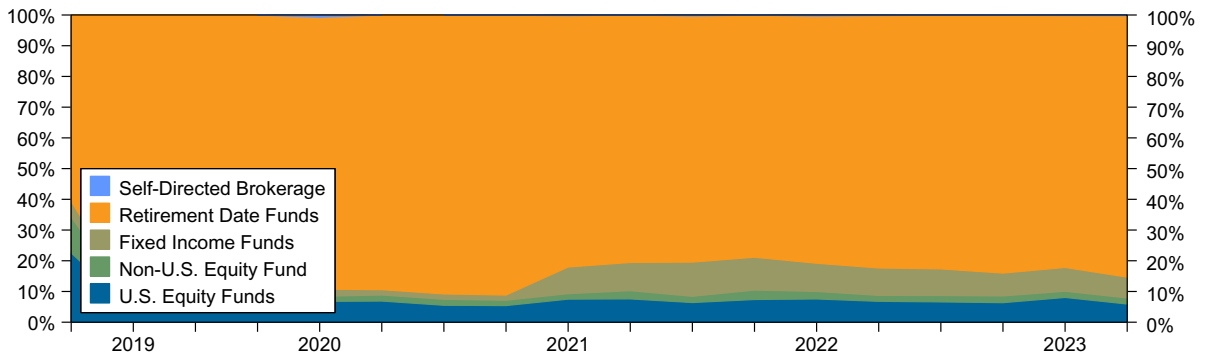
The charts below illustrate the historical asset allocation of the fund as well as the historical allocations of contributions to the fund. The pie charts on the top show the most recent allocations of both assets and contributions which include exchanges and transfers within the plan. The middle chart displays the historical allocation of fund assets. The bottom chart illustrates the historical allocation of contributions.



## Historical Asset Allocation



## Historical Allocation of Contributions



## Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of June 30, 2023, with the distribution as of March 31, 2023. The change in asset distribution is broken down into the dollar change due to Net New Investment and the dollar change due to Investment Return.

### Asset Distribution Across Investment Managers

	June 30, 2023		Net New Inv.	Inv. Return	March 31, 2023	
	Market Value	Weight			Market Value	Weight
<b>SERS Retirement Date Funds</b>	<b>\$124,338,861</b>	<b>87.88%</b>	<b>\$12,321,820</b>	<b>\$5,663,352</b>	<b>\$106,353,689</b>	<b>85.88%</b>
SERS Post Retirement Fund	1,899,955	1.34%	157,815	31,039	1,711,102	1.38%
SERS 2025 Retirement Fund	5,192,263	3.67%	456,336	102,156	4,633,772	3.74%
SERS 2030 Retirement Fund	12,043,304	8.51%	1,023,787	338,964	10,680,553	8.62%
SERS 2035 Retirement Fund	12,824,228	9.06%	1,353,112	453,670	11,017,447	8.90%
SERS 2040 Retirement Fund	14,808,993	10.47%	1,325,164	634,884	12,848,946	10.38%
SERS 2045 Retirement Fund	15,368,696	10.86%	1,568,214	749,754	13,050,728	10.54%
SERS 2050 Retirement Fund	16,754,933	11.84%	1,700,434	881,874	14,172,625	11.44%
SERS 2055 Retirement Fund	17,060,668	12.06%	1,729,208	929,155	14,402,305	11.63%
SERS 2060 Retirement Fund	15,902,758	11.24%	1,507,940	866,533	13,528,286	10.92%
SERS 2065 Retirement Fund	12,483,062	8.82%	1,499,812	675,325	10,307,925	8.32%
<b>SERS U.S. Equity</b>	<b>\$9,230,970</b>	<b>6.52%</b>	<b>\$779,711</b>	<b>\$604,935</b>	<b>\$7,846,324</b>	<b>6.34%</b>
SERS U.S. Large Company Index Fund	5,995,466	4.24%	487,518	468,062	5,039,885	4.07%
SERS U.S. All Company Index Fund	2,244,896	1.59%	232,554	76,844	1,935,497	1.56%
SERS U.S. SMID Company Index Fund	990,608	0.70%	59,639	60,028	870,942	0.70%
<b>SERS Non-U.S. Equity</b>	<b>\$2,757,750</b>	<b>1.95%</b>	<b>\$269,133</b>	<b>\$62,816</b>	<b>\$2,425,801</b>	<b>1.96%</b>
SERS Global Non-U.S. Index Fund	2,757,750	1.95%	269,133	62,816	2,425,801	1.96%
<b>SERS Fixed Income</b>	<b>\$4,913,344</b>	<b>3.47%</b>	<b>\$(2,391,308)</b>	<b>\$284,490</b>	<b>\$7,020,161</b>	<b>5.67%</b>
SERS Short Term Investment Fund	2,751,747	1.94%	(2,619,852)	303,825	5,067,774	4.09%
SERS U.S. Short Term Bond Index Fund	638,845	0.45%	125,494	(3,159)	516,510	0.42%
SERS U.S. TIPS Index Fund	393,636	0.28%	91,084	(5,387)	307,938	0.25%
SERS U.S. Bond Index Fund	1,129,117	0.80%	11,966	(10,789)	1,127,940	0.91%
<b>SERS Self-Directed Brokerage</b>	<b>\$243,493</b>	<b>0.17%</b>	<b>\$37,988</b>	<b>\$6,707</b>	<b>\$198,798</b>	<b>0.16%</b>
<b>Total Fund</b>	<b>\$141,484,418</b>	<b>100.0%</b>	<b>\$11,017,344</b>	<b>\$6,622,300</b>	<b>\$123,844,774</b>	<b>100.0%</b>

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
<b>Net Performance</b>					
<b>Target Date Funds</b>					
SERS Post Retirement Fund	1.70%	6.19%	5.03%	2.41%	3.97%
BlackRock Post Retirement Index	1.68%	6.03%	5.06%	2.41%	3.95%
Callan Tgt Date Ret Inc	1.55%	5.72%	4.80%	2.30%	3.49%
SERS 2025 Retirement Fund	2.05%	6.86%	5.95%	3.83%	4.57%
BlackRock 2025 Index	2.02%	6.67%	5.94%	3.81%	4.52%
Callan Target Date 2025	2.45%	7.27%	7.63%	4.79%	4.92%
SERS 2030 Retirement Fund	2.95%	8.36%	8.15%	5.62%	5.44%
BlackRock 2030 Index	2.90%	8.18%	8.15%	5.60%	5.39%
Callan Target Date 2030	3.20%	8.60%	9.22%	6.08%	5.55%
SERS 2035 Retirement Fund	3.77%	9.73%	10.20%	7.32%	6.26%
BlackRock 2035 Index	3.71%	9.55%	10.18%	7.26%	6.18%
Callan Target Date 2035	3.98%	9.82%	11.22%	7.48%	6.21%
SERS 2040 Retirement Fund	4.57%	11.06%	12.22%	8.87%	6.98%
BlackRock 2040 Index	4.50%	10.87%	12.16%	8.77%	6.88%
Callan Target Date 2040	4.63%	10.95%	12.66%	8.72%	6.77%
SERS 2045 Retirement Fund	5.29%	12.24%	14.05%	10.13%	7.59%
BlackRock 2045 Index	5.21%	12.05%	13.99%	10.02%	7.45%
Callan Target Date 2045	5.12%	11.80%	13.91%	9.59%	7.16%
SERS 2050 Retirement Fund	5.75%	12.95%	15.20%	10.80%	7.91%
BlackRock 2050 Index	5.67%	12.75%	15.11%	10.67%	7.77%
Callan Target Date 2050	5.30%	12.16%	14.54%	9.78%	7.28%
SERS 2055 Retirement Fund	5.91%	13.16%	15.53%	10.93%	8.00%
BlackRock 2055 Index	5.83%	12.97%	15.46%	10.82%	7.86%
Callan Target Date 2055	5.36%	12.40%	14.70%	9.94%	7.35%
SERS 2060 Retirement Fund	5.91%	13.18%	15.54%	10.93%	7.99%
BlackRock 2060 Index	5.83%	12.98%	15.47%	10.82%	7.86%
Callan Target Date 2060	5.33%	12.40%	14.66%	9.92%	7.35%
SERS 2065 Retirement Fund	5.92%	13.22%	15.57%	10.90%	-
BlackRock 2065 Index	5.84%	12.99%	15.48%	10.82%	-
Callan Target Date 2065	5.45%	12.60%	14.83%	9.86%	7.60%

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
<b>Net Performance</b>				
<b>Target Date Funds</b>				
SERS Post Retirement Fund	4.40%	4.54%	4.80%	-
BlackRock Post Retirement Index	4.37%	4.52%	4.77%	5.20%
Callan Tgt Date Ret Inc	3.78%	3.94%	4.27%	4.28%
SERS 2025 Retirement Fund	5.59%	5.63%	5.34%	-
BlackRock 2025 Index	5.53%	5.57%	5.29%	6.14%
Callan Target Date 2025	6.09%	6.09%	5.74%	-
SERS 2030 Retirement Fund	6.60%	6.42%	5.85%	-
BlackRock 2030 Index	6.53%	6.33%	5.78%	6.61%
Callan Target Date 2030	6.94%	6.86%	6.18%	6.91%
SERS 2035 Retirement Fund	7.57%	7.14%	6.31%	-
BlackRock 2035 Index	7.47%	7.04%	6.22%	7.01%
Callan Target Date 2035	7.75%	7.47%	6.76%	-
SERS 2040 Retirement Fund	8.42%	7.78%	6.71%	-
BlackRock 2040 Index	8.29%	7.66%	6.59%	7.37%
Callan Target Date 2040	8.41%	7.98%	7.09%	7.60%
SERS 2045 Retirement Fund	9.06%	8.29%	7.01%	-
BlackRock 2045 Index	8.90%	8.14%	6.88%	7.69%
Callan Target Date 2045	8.84%	8.27%	7.11%	-
SERS 2050 Retirement Fund	9.36%	8.56%	7.25%	-
BlackRock 2050 Index	9.21%	8.42%	7.13%	8.01%
Callan Target Date 2050	8.99%	8.35%	7.27%	-
SERS 2055 Retirement Fund	9.41%	8.66%	-	-
BlackRock 2055 Index	9.27%	8.52%	-	-
Callan Target Date 2055	9.04%	8.47%	8.03%	-
SERS 2060 Retirement Fund	9.40%	-	-	-
BlackRock 2060 Index	9.27%	-	-	-
Callan Target Date 2060	9.20%	8.79%	-	-

\*Funds not shown do not have longer term historical performance.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
<b>Net Performance</b>					
<b>Domestic Equity</b>					
SERS U.S. Large Company Index Fund	8.74%	16.89%	19.59%	14.60%	12.31%
S&P 500 Index	8.74%	16.89%	19.59%	14.60%	12.31%
Callan Lg Cap Broad MF	8.50%	16.48%	19.19%	13.07%	10.98%
SERS U.S. All Company Index Fund	3.50%	10.92%	13.58%	12.09%	10.31%
Russell 3000 Index	8.39%	16.17%	18.95%	13.89%	11.39%
Callan Multi Cap Brd MF	6.59%	13.10%	16.98%	12.57%	9.38%
SERS U.S. SMID Company Idx Fund	6.46%	12.68%	15.36%	9.59%	6.32%
Dow Jones US Completion	6.38%	12.57%	14.96%	9.16%	6.01%
Callan SMID Broad MFs	4.58%	10.15%	15.92%	11.63%	6.69%
<b>International Equity</b>					
SERS Global Non-U.S. Index Fund	2.54%	10.10%	13.10%	7.48%	3.85%
MSCI ACWI ex US	2.44%	9.47%	12.72%	7.22%	3.52%
Callan Non US Equity MFs	3.05%	12.71%	18.05%	8.42%	4.16%
<b>Domestic Fixed Income</b>					
SERS Short Term Investment Fund	1.21%	2.32%	3.76%	1.36%	1.62%
3-month Treasury Bill	1.17%	2.25%	3.59%	1.27%	1.55%
Callan Cash Database(1)	1.26%	2.44%	3.88%	1.41%	1.73%
SERS U.S. Short Term Bond Idx Fund	(0.40%)	1.12%	0.51%	(0.91%)	1.12%
Blmbg Gov/Cred 1-3 Yr	(0.37%)	1.13%	0.52%	(0.88%)	1.13%
Callan Short US Govt MFs	(0.65%)	0.96%	(0.33%)	(1.48%)	0.53%
SERS U.S. TIPS Index Fund	(1.44%)	1.86%	(1.36%)	(0.12%)	2.49%
Blmbg US TIPS	(1.42%)	1.87%	(1.40%)	(0.12%)	2.49%
Callan TIPS MFs	(1.46%)	1.91%	(1.33%)	(0.22%)	2.30%
SERS U.S. Bond Index Fund	(0.85%)	2.10%	(0.90%)	(3.99%)	0.77%
Blmbg Aggregate	(0.84%)	2.09%	(0.94%)	(3.96%)	0.77%
Callan Core Bond MFs	(0.77%)	2.45%	(0.69%)	(3.65%)	1.04%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
<b>Net Performance</b>				
<b>Domestic Equity</b>				
SERS U.S. Large Company Index Fund	13.39%	12.87%	10.91%	10.08%
S&P 500 Index	13.38%	12.86%	10.88%	10.04%
Callan Lg Cap Broad MF	12.69%	11.96%	10.14%	9.87%
SERS U.S. All Company Index Fund	12.07%	11.79%	-	-
Russell 3000 Index	12.86%	12.34%	10.61%	10.05%
Callan Multi Cap Brd MF	11.21%	10.53%	9.23%	9.29%
SERS U.S. SMID Company Idx Fund	9.86%	9.44%	9.36%	10.10%
Dow Jones US Completion	9.58%	9.19%	9.11%	9.88%
Callan SMID Broad MFs	9.93%	9.21%	9.21%	9.75%
<b>International Equity</b>				
SERS Global Non-U.S. Index Fund	6.55%	5.02%	-	-
MSCI ACWI ex US	6.32%	4.75%	2.87%	6.67%
Callan Non US Equity MFs	6.78%	5.35%	3.93%	6.89%
<b>Domestic Fixed Income</b>				
SERS Short Term Investment Fund	1.49%	1.11%	0.91%	-
3-month Treasury Bill	1.37%	0.98%	0.75%	1.35%
Callan Cash Database(1)	1.56%	1.27%	1.21%	1.73%
Blmbg Gov/Cred 1-3 Yr	0.89%	0.99%	1.48%	1.95%
Callan Short US Govt MFs	0.44%	0.59%	1.29%	1.72%
Blmbg US TIPS	1.99%	2.08%	2.85%	3.63%
Callan TIPS MFs	1.91%	1.89%	2.67%	3.32%
SERS U.S. Bond Index Fund	0.43%	1.50%	2.67%	2.98%
Blmbg Aggregate	0.44%	1.52%	2.73%	3.01%
Callan Core Bond MFs	0.70%	1.66%	3.07%	3.19%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

\*Funds not shown do not have longer term historical performance.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

	12/2022- 6/2023	2022	2021	2020	2019
<b>Net Performance</b>					
<b>Target Date Funds</b>					
SERS Post Retirement Fund	6.19%	(14.63%)	6.95%	11.97%	15.65%
BlackRock Post Retirement Index	6.03%	(14.54%)	7.02%	11.80%	15.63%
Callan Tgt Date Ret Inc	5.72%	(12.88%)	6.31%	10.02%	13.21%
SERS 2025 Retirement Fund	6.86%	(15.23%)	8.99%	12.19%	18.60%
BlackRock 2025 Index	6.67%	(15.17%)	9.07%	12.01%	18.56%
Callan Target Date 2025	7.27%	(15.14%)	10.04%	12.58%	18.53%
SERS 2030 Retirement Fund	8.36%	(15.97%)	11.43%	12.88%	20.80%
BlackRock 2030 Index	8.18%	(15.92%)	11.50%	12.72%	20.70%
Callan Target Date 2030	8.60%	(16.04%)	11.63%	13.23%	20.43%
SERS 2035 Retirement Fund	9.73%	(16.67%)	13.80%	13.58%	22.84%
BlackRock 2035 Index	9.55%	(16.67%)	13.85%	13.44%	22.72%
Callan Target Date 2035	9.82%	(16.79%)	13.92%	14.28%	22.16%
SERS 2040 Retirement Fund	11.06%	(17.35%)	15.96%	14.14%	24.71%
BlackRock 2040 Index	10.87%	(17.38%)	15.97%	13.98%	24.62%
Callan Target Date 2040	10.95%	(17.40%)	15.85%	14.91%	23.62%
SERS 2045 Retirement Fund	12.24%	(17.89%)	17.72%	14.83%	26.05%
BlackRock 2045 Index	12.05%	(17.96%)	17.70%	14.65%	25.90%
Callan Target Date 2045	11.80%	(17.95%)	16.83%	15.52%	24.60%
SERS 2050 Retirement Fund	12.95%	(18.20%)	18.67%	15.20%	26.60%
BlackRock 2050 Index	12.75%	(18.30%)	18.62%	15.07%	26.48%
Callan Target Date 2050	12.16%	(18.07%)	17.17%	15.73%	24.89%
SERS 2055 Retirement Fund	13.16%	(18.27%)	18.83%	15.32%	26.67%
BlackRock 2055 Index	12.97%	(18.38%)	18.81%	15.18%	26.58%
Callan Target Date 2055	12.40%	(18.21%)	17.27%	15.83%	24.97%
SERS 2060 Retirement Fund	13.18%	(18.28%)	18.82%	15.31%	26.66%
BlackRock 2060 Index	12.98%	(18.39%)	18.81%	15.19%	26.58%
Callan Target Date 2060	12.40%	(18.27%)	17.41%	15.90%	25.08%
SERS 2065 Retirement Fund	13.22%	(18.30%)	18.77%	15.15%	-
BlackRock 2065 Index	12.99%	(18.40%)	18.80%	15.19%	-
Callan Target Date 2065	12.60%	(18.61%)	17.54%	16.46%	25.62%



## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

	12/2022- 6/2023	2022	2021	2020	2019
<b>Net Performance</b>					
<b>Domestic Equity</b>					
SERS U.S. Large Company Index Fund	16.89%	(18.12%)	28.70%	18.43%	31.51%
S&P 500 Index	16.89%	(18.11%)	28.71%	18.40%	31.49%
Callan Lg Cap Broad MF	16.48%	(18.55%)	25.50%	18.47%	30.14%
SERS U.S. All Company Index Fund	10.92%	(19.23%)	25.61%	21.20%	30.52%
Russell 3000 Index	16.17%	(19.21%)	25.66%	20.89%	31.02%
Callan Multi Cap Brd MF	13.10%	(18.29%)	24.17%	17.19%	29.12%
SERS U.S. SMID Company Idx Fund	12.68%	(26.13%)	12.89%	32.03%	28.20%
Dow Jones US Completion	12.57%	(26.56%)	12.36%	32.17%	27.94%
Callan SMID Broad MFs	10.15%	(21.59%)	19.56%	24.00%	29.40%
<b>International Equity</b>					
SERS Global Non-U.S. Index Fund	10.10%	(15.92%)	7.97%	11.15%	21.77%
MSCI ACWI ex US	9.47%	(16.00%)	7.82%	10.65%	21.51%
Callan Non US Equity MFs	12.71%	(15.77%)	9.47%	11.12%	22.83%
<b>Domestic Fixed Income</b>					
SERS Short Term Investment Fund	2.32%	1.59%	0.07%	0.67%	2.31%
3-month Treasury Bill	2.25%	1.46%	0.05%	0.67%	2.28%
Callan Cash Database(1)	2.44%	1.15%	0.13%	1.05%	2.65%
SERS U.S. Short Term Bond Idx Fund	1.12%	(3.69%)	(0.52%)	3.36%	4.02%
Blmbg Gov/Cred 1-3 Yr	1.13%	(3.69%)	(0.47%)	3.33%	4.03%
Callan Short US Govt MFs	0.96%	(5.07%)	(1.07%)	3.57%	3.52%
SERS U.S. TIPS Index Fund	1.86%	(11.76%)	5.87%	11.00%	8.40%
Blmbg US TIPS	1.87%	(11.85%)	5.96%	10.99%	8.43%
Callan TIPS MFs	1.91%	(11.89%)	5.50%	10.84%	8.31%
SERS U.S. Bond Index Fund	2.10%	(12.94%)	(1.65%)	7.56%	8.69%
Blmbg Aggregate	2.09%	(13.01%)	(1.54%)	7.51%	8.72%
Callan Core Bond MFs	2.45%	(13.47%)	(1.17%)	8.65%	9.17%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
<b>Gross Performance</b>					
<b>Target Date Funds</b>					
SERS Post Retirement Fund	1.72%	6.23%	5.10%	2.48%	4.04%
BlackRock Post Retirement Index	1.68%	6.03%	5.06%	2.41%	3.95%
Callan Tgt Date Ret Inc	1.55%	5.72%	4.80%	2.30%	3.49%
SERS 2025 Retirement Fund	2.07%	6.89%	6.02%	3.90%	4.64%
BlackRock 2025 Index	2.02%	6.67%	5.94%	3.81%	4.52%
Callan Target Date 2025	2.45%	7.27%	7.63%	4.79%	4.92%
SERS 2030 Retirement Fund	2.97%	8.40%	8.22%	5.69%	5.51%
BlackRock 2030 Index	2.90%	8.18%	8.15%	5.60%	5.39%
Callan Target Date 2030	3.20%	8.60%	9.22%	6.08%	5.55%
SERS 2035 Retirement Fund	3.79%	9.77%	10.27%	7.39%	6.33%
BlackRock 2035 Index	3.71%	9.55%	10.18%	7.26%	6.18%
Callan Target Date 2035	3.98%	9.82%	11.22%	7.48%	6.21%
SERS 2040 Retirement Fund	4.59%	11.10%	12.29%	8.94%	7.05%
BlackRock 2040 Index	4.50%	10.87%	12.16%	8.77%	6.88%
Callan Target Date 2040	4.63%	10.95%	12.66%	8.72%	6.77%
SERS 2045 Retirement Fund	5.31%	12.28%	14.13%	10.20%	7.66%
BlackRock 2045 Index	5.21%	12.05%	13.99%	10.02%	7.45%
Callan Target Date 2045	5.12%	11.80%	13.91%	9.59%	7.16%
SERS 2050 Retirement Fund	5.77%	12.99%	15.27%	10.88%	7.99%
BlackRock 2050 Index	5.67%	12.75%	15.11%	10.67%	7.77%
Callan Target Date 2050	5.30%	12.16%	14.54%	9.78%	7.28%
SERS 2055 Retirement Fund	5.93%	13.20%	15.61%	11.01%	8.07%
BlackRock 2055 Index	5.83%	12.97%	15.46%	10.82%	7.86%
Callan Target Date 2055	5.36%	12.40%	14.70%	9.94%	7.35%
SERS 2060 Retirement Fund	5.93%	13.21%	15.62%	11.00%	8.06%
BlackRock 2060 Index	5.83%	12.98%	15.47%	10.82%	7.86%
Callan Target Date 2060	5.33%	12.40%	14.66%	9.92%	7.35%
SERS 2065 Retirement Fund	5.93%	13.25%	15.65%	10.98%	-
BlackRock 2065 Index	5.84%	12.99%	15.48%	10.82%	-
Callan Target Date 2065	5.45%	12.60%	14.83%	9.86%	7.60%

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
<b>Gross Performance</b>				
<b>Target Date Funds</b>				
SERS Post Retirement Fund	4.47%	4.61%	4.87%	-
BlackRock Post Retirement Index	4.37%	4.52%	4.77%	5.20%
Callan Tgt Date Ret Inc	3.78%	3.94%	4.27%	4.28%
SERS 2025 Retirement Fund	5.66%	5.70%	5.41%	-
BlackRock 2025 Index	5.53%	5.57%	5.29%	6.14%
Callan Target Date 2025	6.09%	6.09%	5.74%	-
SERS 2030 Retirement Fund	6.68%	6.49%	5.92%	-
BlackRock 2030 Index	6.53%	6.33%	5.78%	6.61%
Callan Target Date 2030	6.94%	6.86%	6.18%	6.91%
SERS 2035 Retirement Fund	7.64%	7.21%	6.39%	-
BlackRock 2035 Index	7.47%	7.04%	6.22%	7.01%
Callan Target Date 2035	7.75%	7.47%	6.76%	-
SERS 2040 Retirement Fund	8.49%	7.85%	6.78%	-
BlackRock 2040 Index	8.29%	7.66%	6.59%	7.37%
Callan Target Date 2040	8.41%	7.98%	7.09%	7.60%
SERS 2045 Retirement Fund	9.13%	8.36%	7.08%	-
BlackRock 2045 Index	8.90%	8.14%	6.88%	7.69%
Callan Target Date 2045	8.84%	8.27%	7.11%	-
SERS 2050 Retirement Fund	9.43%	8.64%	7.33%	-
BlackRock 2050 Index	9.21%	8.42%	7.13%	8.01%
Callan Target Date 2050	8.99%	8.35%	7.27%	-
SERS 2055 Retirement Fund	9.48%	8.73%	-	-
BlackRock 2055 Index	9.27%	8.52%	-	-
Callan Target Date 2055	9.04%	8.47%	8.03%	-
SERS 2060 Retirement Fund	9.47%	-	-	-
BlackRock 2060 Index	9.27%	-	-	-
Callan Target Date 2060	9.20%	8.79%	-	-

\*Funds not shown do not have longer term historical performance.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last Quarter	Year to Date	Last Year	Last 3 Years	Last 5 Years
<b>Gross Performance</b>					
<b>Domestic Equity</b>					
SERS U.S. Large Company Index Fund	8.74%	16.89%	19.59%	14.61%	12.32%
S&P 500 Index	8.74%	16.89%	19.59%	14.60%	12.31%
Callan Lg Cap Broad MF	8.50%	16.48%	19.19%	13.07%	10.98%
SERS U.S. All Company Index Fund	3.50%	10.92%	13.59%	12.09%	10.32%
Russell 3000 Index	8.39%	16.17%	18.95%	13.89%	11.39%
Callan Multi Cap Brd MF	6.59%	13.10%	16.98%	12.57%	9.38%
SERS U.S. SMID Company Idx Fund	6.46%	12.69%	15.37%	9.60%	6.33%
Dow Jones US Completion	6.38%	12.57%	14.96%	9.16%	6.01%
Callan SMID Broad MFs	4.58%	10.15%	15.92%	11.63%	6.69%
<b>International Equity</b>					
SERS Global Non-U.S. Index Fund	2.54%	10.11%	13.12%	7.50%	3.87%
MSCI ACWI ex US	2.44%	9.47%	12.72%	7.22%	3.52%
Callan Non US Equity MFs	3.05%	12.71%	18.05%	8.42%	4.16%
<b>Domestic Fixed Income</b>					
SERS Short Term Investment Fund	1.21%	2.32%	3.76%	1.36%	1.62%
3-month Treasury Bill	1.17%	2.25%	3.59%	1.27%	1.55%
Callan Cash Database(1)	1.26%	2.44%	3.88%	1.41%	1.73%
SERS U.S. Short Term Bond Idx Fund	(0.40%)	1.12%	0.51%	(0.91%)	1.13%
Blmbg Gov/Cred 1-3 Yr	(0.37%)	1.13%	0.52%	(0.88%)	1.13%
Callan Short US Govt MFs	(0.65%)	0.96%	(0.33%)	(1.48%)	0.53%
SERS U.S. TIPS Index Fund	(1.44%)	1.86%	(1.35%)	(0.12%)	2.50%
Blmbg US TIPS	(1.42%)	1.87%	(1.40%)	(0.12%)	2.49%
Callan TIPS MFs	(1.46%)	1.91%	(1.33%)	(0.22%)	2.30%
SERS U.S. Bond Index Fund	(0.85%)	2.10%	(0.90%)	(3.98%)	0.78%
Blmbg Aggregate	(0.84%)	2.09%	(0.94%)	(3.96%)	0.77%
Callan Core Bond MFs	(0.77%)	2.45%	(0.69%)	(3.65%)	1.04%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods ended June 30, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended June 30, 2023

	Last 7 Years	Last 10 Years	Last 15 Years	Last 20 Years
<b>Gross Performance</b>				
<b>Domestic Equity</b>				
SERS U.S. Large Company Index Fund	13.40%	12.88%	10.92%	10.09%
S&P 500 Index	13.38%	12.86%	10.88%	10.04%
Callan Lg Cap Broad MF	12.69%	11.96%	10.14%	9.87%
SERS U.S. All Company Index Fund	12.08%	11.80%	-	-
Russell 3000 Index	12.86%	12.34%	10.61%	10.05%
Callan Multi Cap Brd MF	11.21%	10.53%	9.23%	9.29%
SERS U.S. SMID Company Idx Fund	9.86%	9.45%	9.36%	10.11%
Dow Jones US Completion	9.58%	9.19%	9.11%	9.88%
Callan SMID Broad MFs	9.93%	9.21%	9.21%	9.75%
<b>International Equity</b>				
SERS Global Non-U.S. Index Fund	6.57%	5.04%	-	-
MSCI ACWI ex US	6.32%	4.75%	2.87%	6.67%
Callan Non US Equity MFs	6.78%	5.35%	3.93%	6.89%
<b>Domestic Fixed Income</b>				
SERS Short Term Investment Fund	1.49%	1.11%	0.91%	-
3-month Treasury Bill	1.37%	0.98%	0.75%	1.35%
Callan Cash Database(1)	1.56%	1.27%	1.21%	1.73%
Blmbg Gov/Cred 1-3 Yr	0.89%	0.99%	1.48%	1.95%
Callan Short US Govt MFs	0.44%	0.59%	1.29%	1.72%
Blmbg US TIPS	1.99%	2.08%	2.85%	3.63%
Callan TIPS MFs	1.91%	1.89%	2.67%	3.32%
SERS U.S. Bond Index Fund	0.44%	1.50%	2.67%	2.98%
Blmbg Aggregate	0.44%	1.52%	2.73%	3.01%
Callan Core Bond MFs	0.70%	1.66%	3.07%	3.19%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

	12/2022- 6/2023	2022	2021	2020	2019
<b>Gross Performance</b>					
<b>Target Date Funds</b>					
SERS Post Retirement Fund	6.23%	(14.57%)	7.03%	12.04%	15.72%
BlackRock Post Retirement Index	6.03%	(14.54%)	7.02%	11.80%	15.63%
Callan Tgt Date Ret Inc	5.72%	(12.88%)	6.31%	10.02%	13.21%
SERS 2025 Retirement Fund	6.89%	(15.17%)	9.06%	12.26%	18.67%
BlackRock 2025 Index	6.67%	(15.17%)	9.07%	12.01%	18.56%
Callan Target Date 2025	7.27%	(15.14%)	10.04%	12.58%	18.53%
SERS 2030 Retirement Fund	8.40%	(15.91%)	11.50%	12.96%	20.86%
BlackRock 2030 Index	8.18%	(15.92%)	11.50%	12.72%	20.70%
Callan Target Date 2030	8.60%	(16.04%)	11.63%	13.23%	20.43%
SERS 2035 Retirement Fund	9.77%	(16.61%)	13.88%	13.65%	22.93%
BlackRock 2035 Index	9.55%	(16.67%)	13.85%	13.44%	22.72%
Callan Target Date 2035	9.82%	(16.79%)	13.92%	14.28%	22.16%
SERS 2040 Retirement Fund	11.10%	(17.29%)	16.04%	14.22%	24.80%
BlackRock 2040 Index	10.87%	(17.38%)	15.97%	13.98%	24.62%
Callan Target Date 2040	10.95%	(17.40%)	15.85%	14.91%	23.62%
SERS 2045 Retirement Fund	12.28%	(17.84%)	17.79%	14.90%	26.12%
BlackRock 2045 Index	12.05%	(17.96%)	17.70%	14.65%	25.90%
Callan Target Date 2045	11.80%	(17.95%)	16.83%	15.52%	24.60%
SERS 2050 Retirement Fund	12.99%	(18.15%)	18.75%	15.27%	26.70%
BlackRock 2050 Index	12.75%	(18.30%)	18.62%	15.07%	26.48%
Callan Target Date 2050	12.16%	(18.07%)	17.17%	15.73%	24.89%
SERS 2055 Retirement Fund	13.20%	(18.22%)	18.91%	15.40%	26.75%
BlackRock 2055 Index	12.97%	(18.38%)	18.81%	15.18%	26.58%
Callan Target Date 2055	12.40%	(18.21%)	17.27%	15.83%	24.97%
SERS 2060 Retirement Fund	13.21%	(18.23%)	18.90%	15.38%	26.74%
BlackRock 2060 Index	12.98%	(18.39%)	18.81%	15.19%	26.58%
Callan Target Date 2060	12.40%	(18.27%)	17.41%	15.90%	25.08%
SERS 2065 Retirement Fund	13.25%	(18.25%)	18.85%	15.22%	-
BlackRock 2065 Index	12.99%	(18.40%)	18.80%	15.19%	-
Callan Target Date 2065	12.60%	(18.61%)	17.54%	16.46%	25.62%

## Investment Fund Returns

The table below details the rates of return for the Fund's investment funds over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

	12/2022- 6/2023	2022	2021	2020	2019
<b>Gross Performance</b>					
<b>Domestic Equity</b>					
SERS U.S. Large Company Index Fund	16.89%	(18.11%)	28.71%	18.44%	31.51%
S&P 500 Index	16.89%	(18.11%)	28.71%	18.40%	31.49%
Callan Lg Cap Broad MF	16.48%	(18.55%)	25.50%	18.47%	30.14%
SERS U.S. All Company Index Fund	10.92%	(19.23%)	25.62%	21.20%	30.53%
Russell 3000 Index	16.17%	(19.21%)	25.66%	20.89%	31.02%
Callan Multi Cap Brd MF	13.10%	(18.29%)	24.17%	17.19%	29.12%
SERS U.S. SMID Company Idx Fund	12.69%	(26.12%)	12.90%	32.04%	28.21%
Dow Jones US Completion	12.57%	(26.56%)	12.36%	32.17%	27.94%
Callan SMID Broad MFs	10.15%	(21.59%)	19.56%	24.00%	29.40%
<b>International Equity</b>					
SERS Global Non-U.S. Index Fund	10.11%	(15.91%)	7.98%	11.17%	21.79%
MSCI ACWI ex US	9.47%	(16.00%)	7.82%	10.65%	21.51%
Callan Non US Equity MFs	12.71%	(15.77%)	9.47%	11.12%	22.83%
<b>Domestic Fixed Income</b>					
SERS Short Term Investment Fund	2.32%	1.59%	0.07%	0.67%	2.31%
3-month Treasury Bill	2.25%	1.46%	0.05%	0.67%	2.28%
Callan Cash Database(1)	2.44%	1.15%	0.13%	1.05%	2.65%
SERS U.S. Short Term Bond Idx Fund	1.12%	(3.68%)	(0.51%)	3.37%	4.02%
Blmbg Gov/Cred 1-3 Yr	1.13%	(3.69%)	(0.47%)	3.33%	4.03%
Callan Short US Govt MFs	0.96%	(5.07%)	(1.07%)	3.57%	3.52%
SERS U.S. TIPS Index Fund	1.86%	(11.76%)	5.88%	11.00%	8.40%
Blmbg US TIPS	1.87%	(11.85%)	5.96%	10.99%	8.43%
Callan TIPS MFs	1.91%	(11.89%)	5.50%	10.84%	8.31%
SERS U.S. Bond Index Fund	2.10%	(12.93%)	(1.64%)	7.56%	8.69%
Blmbg Aggregate	2.09%	(13.01%)	(1.54%)	7.51%	8.72%
Callan Core Bond MFs	2.45%	(13.47%)	(1.17%)	8.65%	9.17%

(1) Callan Cash Database includes STIF, enhanced cash, and money market funds.

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**Investment Manager Performance Monitoring Summary Report**  
**June 30, 2023**

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
<b>Net of Fee Performance</b>									
<b>Target Date Funds</b>									
<b>SERS Post Retirement Fund</b> Callan Tgt Date Ret Inc	1.7 39	5.0 45	2.4 43	4.0 20	4.4 17	4.5 20			0.08 73
BlackRock Post Retirement Index	1.7 42	5.1 45	2.4 43	4.0 21	4.4 17	4.5 21			
<b>SERS 2025 Retirement Fund</b> Callan Target Date 2025	2.1 73	5.9 83	3.8 80	4.6 64	5.6 73	5.6 73			0.08 72
BlackRock 2025 Index	2.0 75	5.9 83	3.8 81	4.5 67	5.5 75	5.6 77			
<b>SERS 2030 Retirement Fund</b> Callan Target Date 2030	2.9 71	8.2 81	5.6 71	5.4 55	6.6 72	6.4 77			0.08 70
BlackRock 2030 Index	2.9 74	8.1 81	5.6 72	5.4 57	6.5 75	6.3 82			
<b>SERS 2035 Retirement Fund</b> Callan Target Date 2035	3.8 67	10.2 77	7.3 58	6.3 44	7.6 61	7.1 72			0.08 72
BlackRock 2035 Index	3.7 70	10.2 77	7.3 61	6.2 54	7.5 69	7.0 78			
<b>SERS 2040 Retirement Fund</b> Callan Target Date 2040	4.6 53	12.2 65	8.9 41	7.0 32	8.4 49	7.8 65			0.08 68
BlackRock 2040 Index	4.5 61	12.2 67	8.8 43	6.9 38	8.3 62	7.7 77			
<b>SERS 2045 Retirement Fund</b> Callan Target Date 2045	5.3 31	14.1 41	10.1 27	7.6 24	9.1 29	8.3 47			0.08 72
BlackRock 2045 Index	5.2 43	14.0 46	10.0 31	7.5 32	8.9 41	8.1 59			
<b>SERS 2050 Retirement Fund</b> Callan Target Date 2050	5.8 21	15.2 23	10.8 9	7.9 14	9.4 21	8.6 39			0.08 68
BlackRock 2050 Index	5.7 27	15.1 26	10.7 12	7.8 18	9.2 34	8.4 46			
<b>SERS 2055 Retirement Fund</b> Callan Target Date 2055	5.9 16	15.5 20	10.9 6	8.0 12	9.4 20	8.7 38			0.08 76
BlackRock 2055 Index	5.8 24	15.5 22	10.8 10	7.9 16	9.3 35	8.5 45			
<b>SERS 2060 Retirement Fund</b> Callan Target Date 2060	5.9 17	15.5 22	10.9 10	8.0 13	9.4 32				0.08 75
BlackRock 2060 Index	5.8 26	15.5 27	10.8 15	7.9 18	9.3 48				

Returns:  
■ above median  
■ third quartile  
■ fourth quartile

Return Consistency:  
■ above median  
■ third quartile  
■ fourth quartile

Risk Quadrant:  


Expense Ratio:  
■ below median  
■ second quartile  
■ first quartile



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Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
<b>SERS 2065 Retirement Fund</b> Callan Target Date 2065 BlackRock 2065 Index	5.9 <sup>23</sup> 5.8 <sup>35</sup>	15.6 <sup>24</sup> 15.5 <sup>33</sup>	10.9 <sup>20</sup> 10.8 <sup>22</sup>						0.08 <sup>53</sup>
<b>Domestic Equity</b>									
<b>SERS U.S. Large Company Stock Index Fund</b> Callan Lg Cap Broad MF S&P 500 Index	8.7 <sup>49</sup> 8.7 <sup>49</sup>	19.6 <sup>49</sup> 19.6 <sup>49</sup>	14.6 <sup>32</sup> 14.6 <sup>32</sup>	12.3 <sup>31</sup> 12.3 <sup>32</sup>	13.4 <sup>45</sup> 13.4 <sup>45</sup>	12.9 <sup>39</sup> 12.9 <sup>39</sup>			0.02 <sup>100</sup>
<b>SERS U.S. All Company Index Fund</b> Callan Multi Cap Brd MF Russell 3000 Index	3.5 <sup>84</sup> 8.4 <sup>35</sup>	13.6 <sup>67</sup> 19.0 <sup>41</sup>	12.1 <sup>55</sup> 13.9 <sup>38</sup>	10.3 <sup>38</sup> 11.4 <sup>25</sup>	12.1 <sup>40</sup> 12.9 <sup>31</sup>	11.8 <sup>32</sup> 12.3 <sup>23</sup>			0.03 <sup>99</sup>
<b>U.S. Small/Mid Company Stock Index Fund</b> Callan SMID Broad MFs Dow Jones US Completion	6.5 <sup>15</sup> 6.4 <sup>16</sup>	15.4 <sup>52</sup> 15.0 <sup>55</sup>	9.6 <sup>55</sup> 9.2 <sup>56</sup>	6.3 <sup>61</sup> 6.0 <sup>67</sup>	9.9 <sup>51</sup> 9.6 <sup>62</sup>	9.4 <sup>47</sup> 9.2 <sup>51</sup>			0.03 <sup>98</sup>
<b>International Equity</b>									
<b>SERS Global Non-U.S. Index Fund</b> Callan Non US Equity MFs MSCI ACWI ex US	2.5 <sup>69</sup> 2.4 <sup>75</sup>	13.1 <sup>92</sup> 12.7 <sup>92</sup>	7.5 <sup>59</sup> 7.2 <sup>62</sup>	3.9 <sup>60</sup> 3.5 <sup>69</sup>	6.6 <sup>52</sup> 6.3 <sup>55</sup>	5.0 <sup>62</sup> 4.7 <sup>72</sup>			0.05 <sup>99</sup>
<b>Domestic Fixed income</b>									
<b>SERS Short Term Investment Fund</b> Callan Cash Database 3-month Treasury Bill	1.2 <sup>63</sup> 1.2 <sup>66</sup>	3.8 <sup>62</sup> 3.6 <sup>64</sup>	1.4 <sup>60</sup> 1.3 <sup>64</sup>	1.6 <sup>74</sup> 1.6 <sup>90</sup>	1.5 <sup>70</sup> 1.4 <sup>93</sup>	1.1 <sup>84</sup> 1.0 <sup>96</sup>			0.00 <sup>100</sup>
<b>Comments:</b> Callan Cash Database includes STIF, enhanced cash, and money market funds.									
<b>SERS U.S. Short Term Bond Idx Fund</b> Callan Short US Govt MFs Blmbg Gov/Cred 1-3 Yr	-0.4 <sup>39</sup> -0.4 <sup>38</sup>	0.5 <sup>27</sup> 0.5 <sup>27</sup>	-0.9 <sup>15</sup> -0.9 <sup>14</sup>	1.1 <sup>4</sup> 1.1 <sup>4</sup>		0.9 <sup>7</sup> 1.0 <sup>6</sup>			0.02 <sup>100</sup>
<b>SERS U.S. TIPS Index Fund</b> Callan TIPS MFs Blmbg US TIPS	-1.4 <sup>47</sup> -1.4 <sup>43</sup>	-1.4 <sup>54</sup> -1.4 <sup>55</sup>	-0.1 <sup>44</sup> -0.1 <sup>44</sup>	2.5 <sup>28</sup> 2.5 <sup>28</sup>		2.0 <sup>34</sup> 2.1 <sup>26</sup>			0.02 <sup>99</sup>

Returns:  
 above median  
 third quartile  
 fourth quartile

Return Consistency:  
 above median  
 third quartile  
 fourth quartile

Risk Quadrant:

Expense Ratio:  
 below median  
 second quartile  
 first quartile

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Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	10 Year Return	5 Year Return Consistency	5 Year Risk Quadrant	Expense Ratio
<b>SERS U.S. Bond Index Fund</b>	-0.9 60	-0.9 68	-4.0 90	0.8 71	0.4 87	1.5 81			0.02 98
Callan Core Bond MFs									
Blmbg Aggregate	-0.8 60	-0.9 69	-4.0 85	0.8 72	0.4 86	1.5 74			

Returns:  
 above median  
 third quartile  
 fourth quartile

Return Consistency:  
 above median  
 third quartile  
 fourth quartile

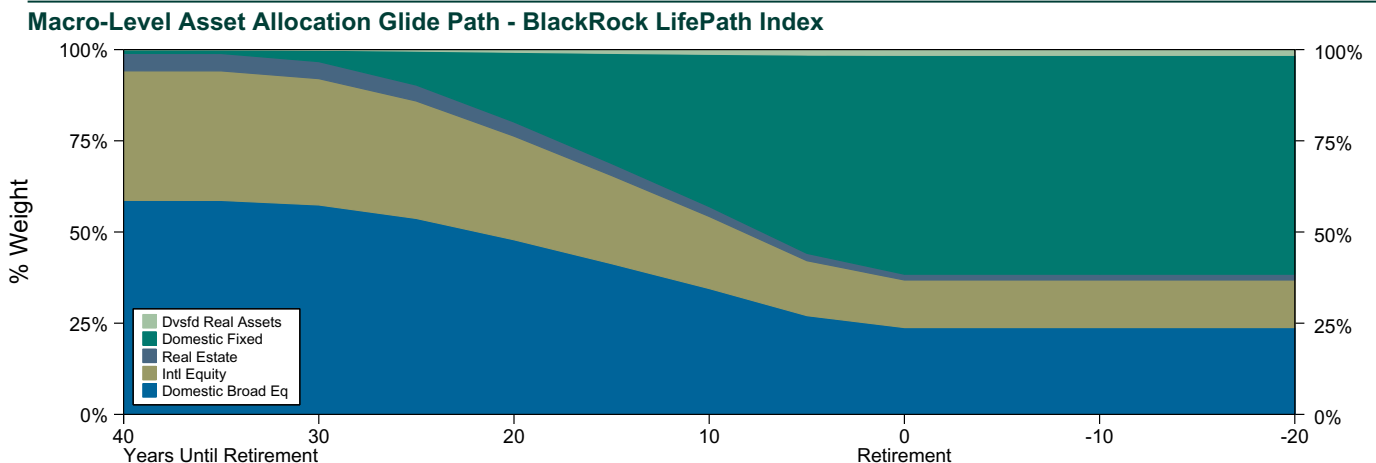
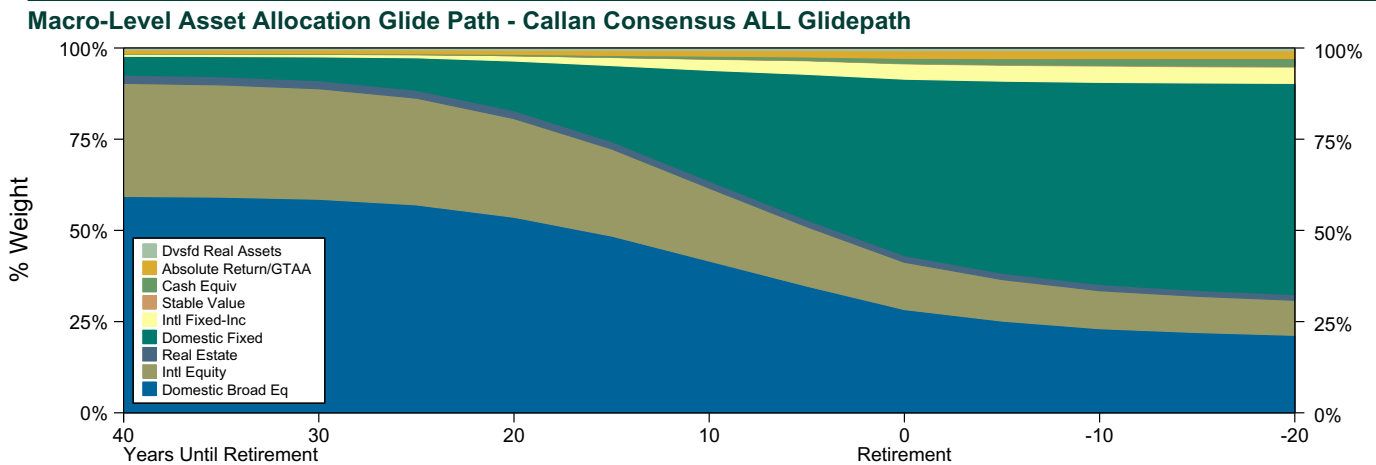
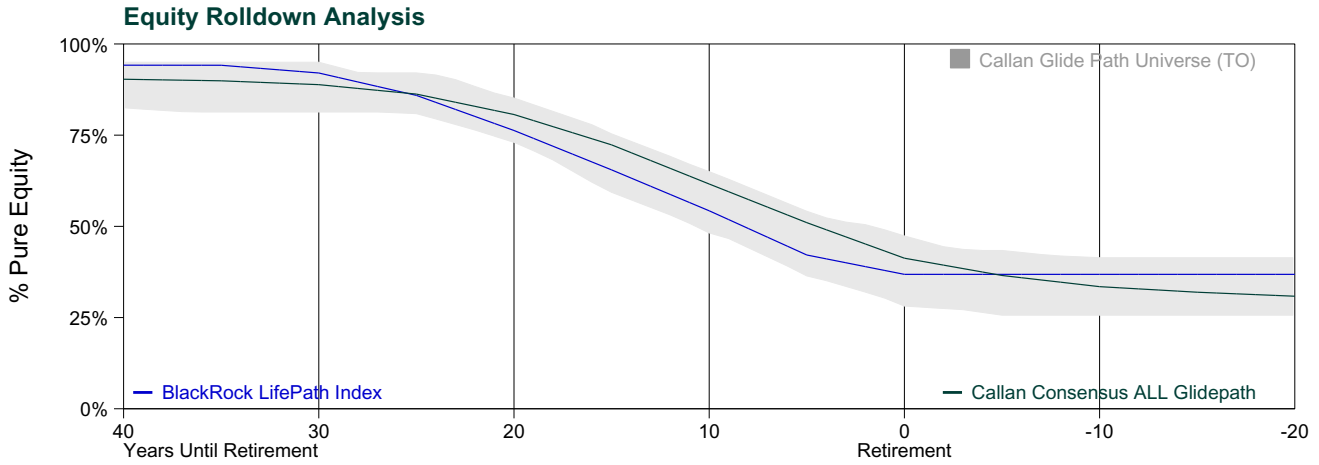
Risk Quadrant:

Expense Ratio:  
 below median  
 second quartile  
 first quartile



# Callan Consensus ALL Glidepath Target Date Glide Path Analysis as of June 30, 2023

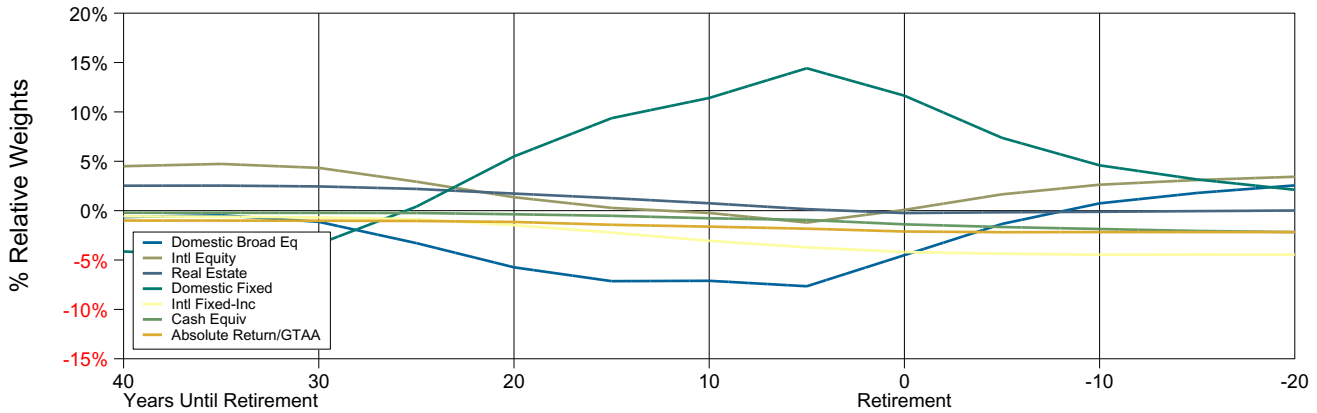
The following charts illustrate the asset allocation "glide path" underlying the relevant suite of target date funds. This analysis covers forty years of investor wealth accumulation up to retirement, as well as twenty years of wealth decumulation following retirement. The top chart shows the "pure" equity exposure (public equities excluding REITs) versus the peer group and index. The subsequent charts show more asset allocation detail at the high "macro" level.



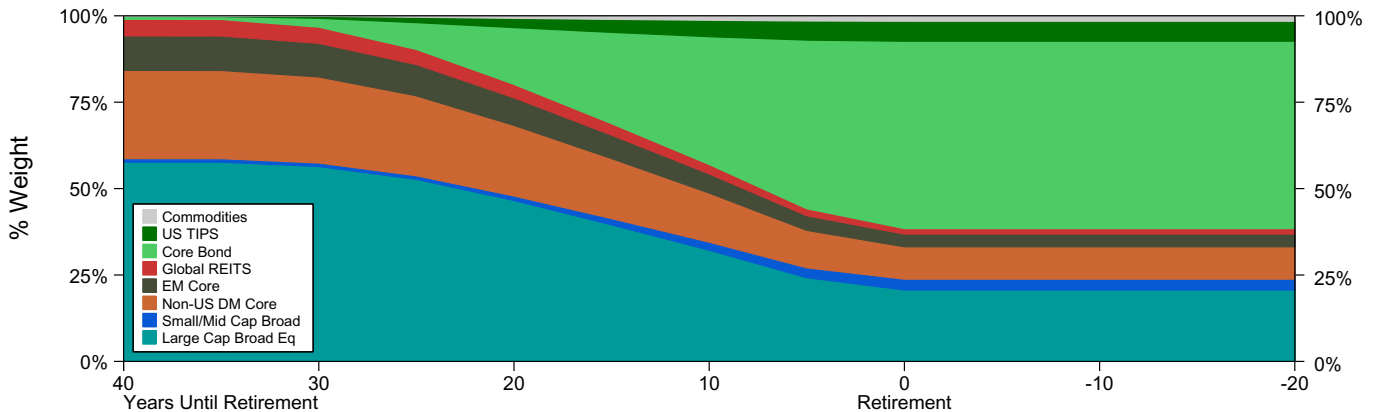
# BlackRock LifePath Index Target Date Glide Path Analysis as of June 30, 2023

The following charts illustrate the asset allocation "glide path" underlying the relevant suite of target date funds. This analysis covers forty years of investor wealth accumulation up to retirement, as well as twenty years of wealth decumulation following retirement. The top chart highlights any significant "macro-level" differences between the manager's asset allocation glide path and that of the glide path index. The bottom two charts illustrate the asset allocation glide paths of both the manager and index at the more detailed "micro" level.

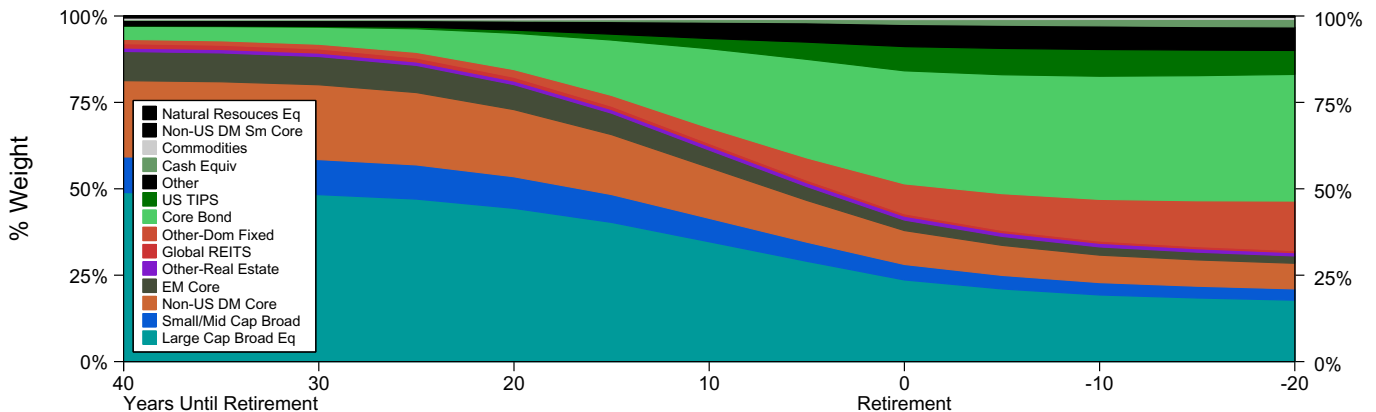
**Relative Macro Asset Allocation - BlackRock LifePath Index vs. Callan Consensus ALL Glidep**



**Micro-Level Asset Allocation Glide Path - BlackRock LifePath Index**



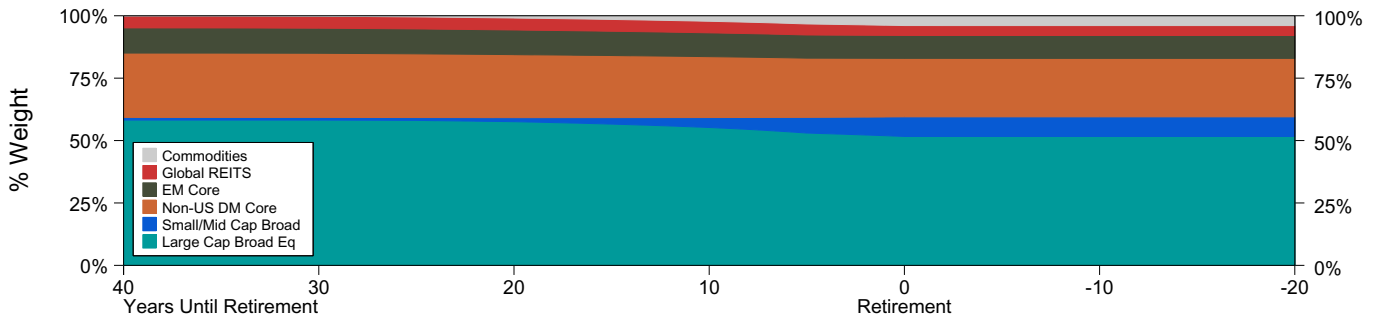
**Micro-Level Asset Allocation Glide Path - Callan Consensus ALL Glidepath**



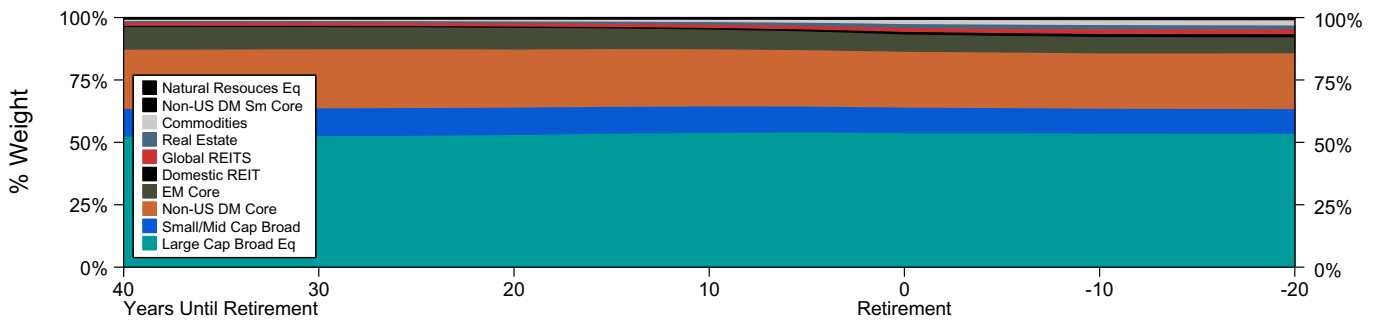
# BlackRock LifePath Index Target Date Glide Path Analysis as of June 30, 2023

The first two charts below illustrate the detailed composition over time of the "risky", or "growth" portion of the glide paths for both the manager and index, defined to be all public equity and real estate asset classes. These charts highlight both the levels of diversification and aggressiveness within the wealth creation portion of the glide paths. The last two charts serve a similar purpose but focus on the composition over time of the remaining wealth preservation portion (non-equity) of the manager and index glide paths.

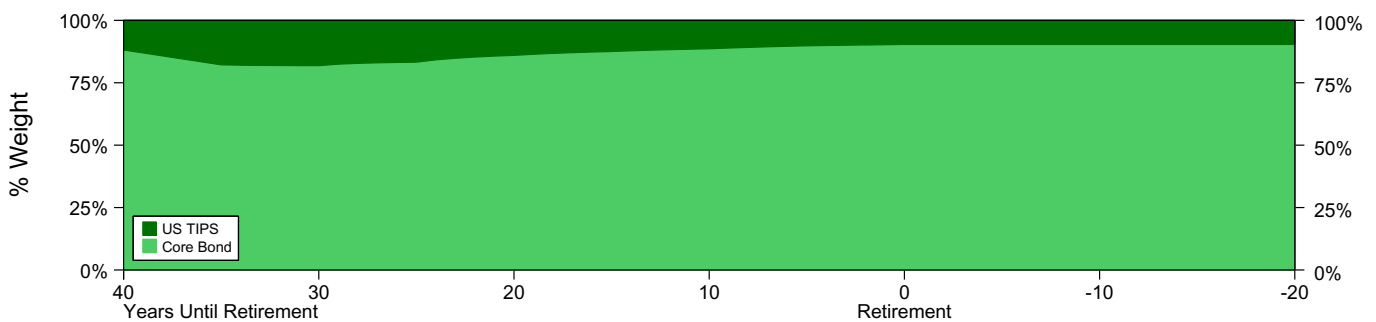
## Micro-Level Equity Allocation Glide Path - BlackRock LifePath Index



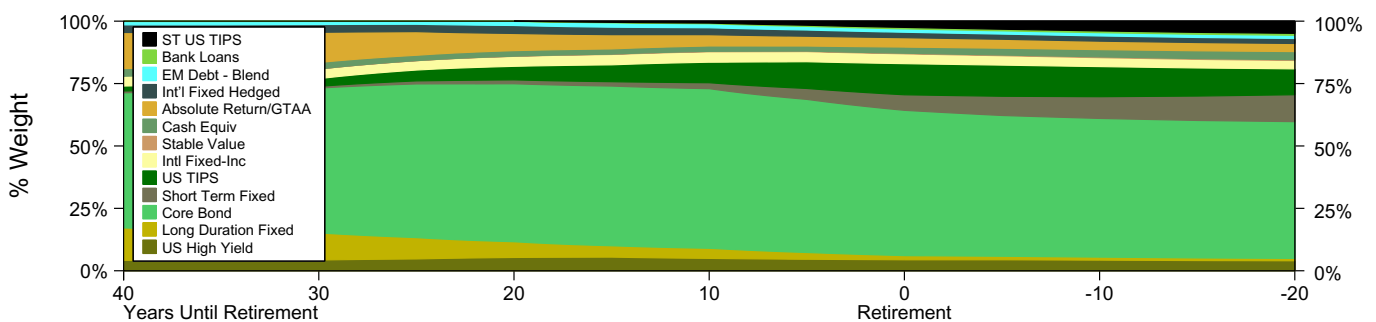
## Micro-Level Equity Asset Allocation Glide Path - Callan Consensus ALL Glidepath



## Micro-Level Non-Equity Allocation Glide Path - BlackRock LifePath Index



## Micro-Level Non-Equity Asset Allocation Glide Path - Callan Consensus ALL Glidep



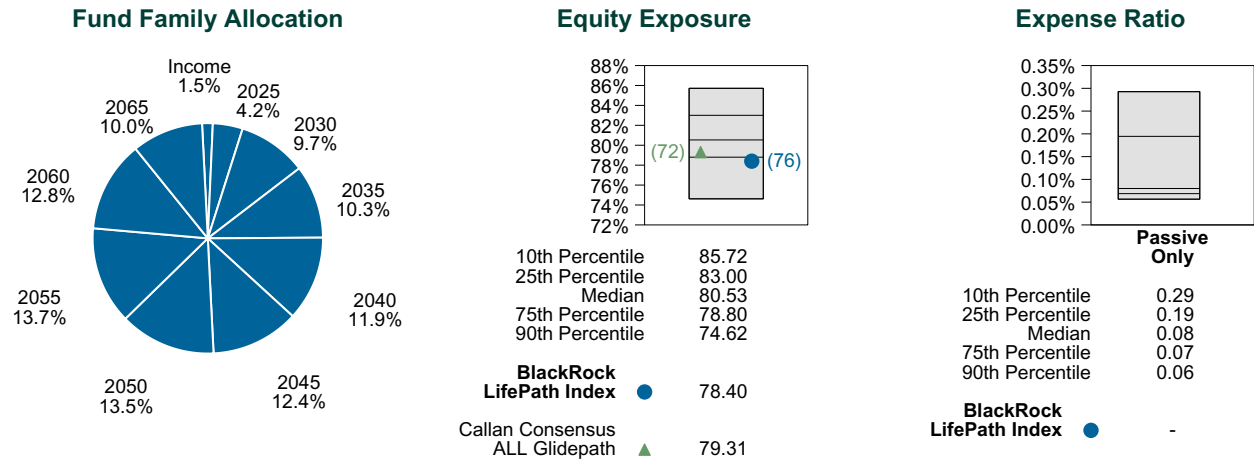
# Pennsylvania SERS 401(a) - BlackRock LifePath Index Target Date Fund Family Analysis as of June 30, 2023

The following is an analysis of the client's suite of target date funds as an aggregated portfolio using actual proportions held by the client's participants. The upper-left pie chart shows the current client weights across target dates. The rest of the charts compare different attributes of the aggregated client target date portfolio to a peer group of target date fund families, as well as target date indices, by mimicking the client target date weights using these alternatives. The first two charts evaluate the aggregate client equity exposure and expense ratio via target date funds. The last two charts analyze aggregate client target date performance on both an actual return basis as well as a "glide path return" basis (simulated returns using each funds' asset allocation "glide path" weights and index returns).

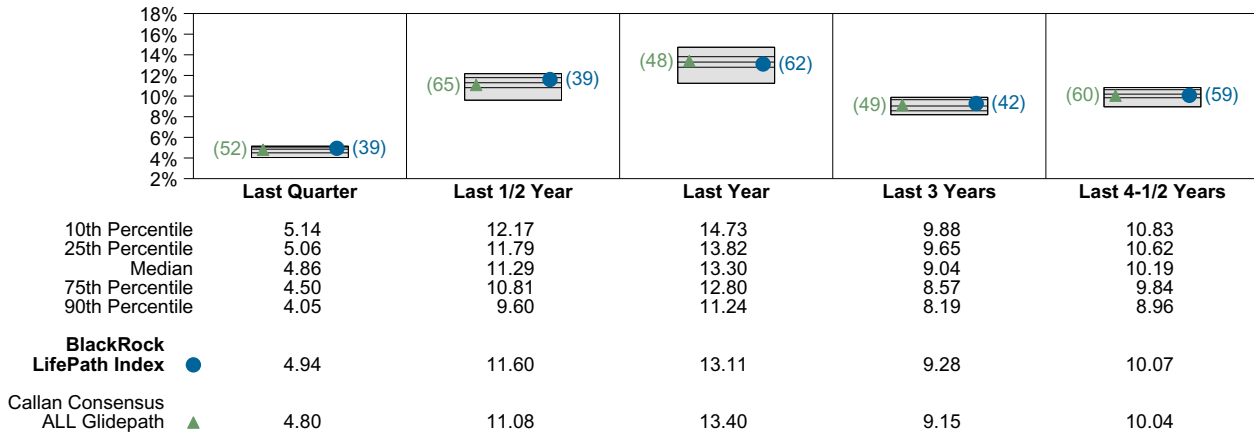
**Glidepath Peer Group: ALL**

**Passive and Non-Passive**

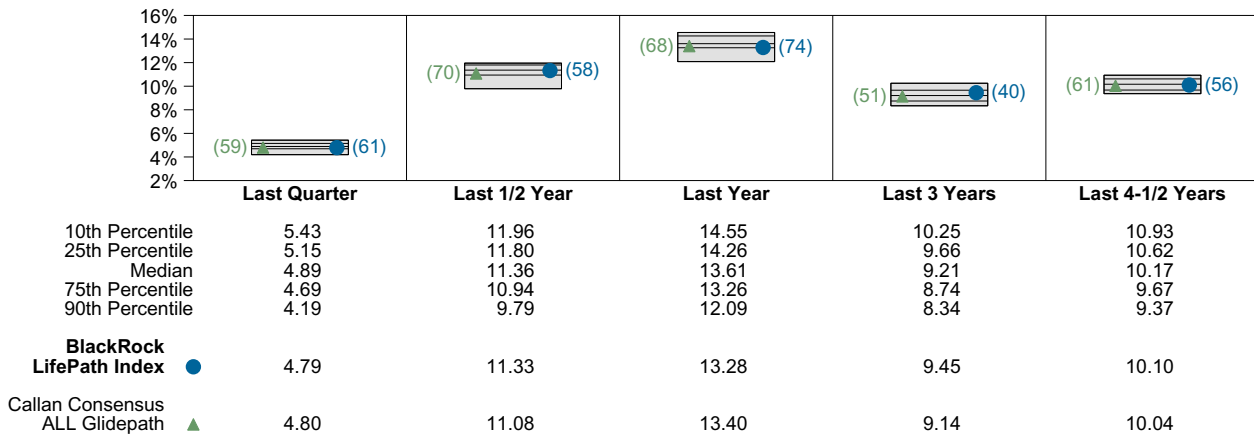
**Fee/Return Type: Gross**



## Target Date Family Performance vs Peer Families



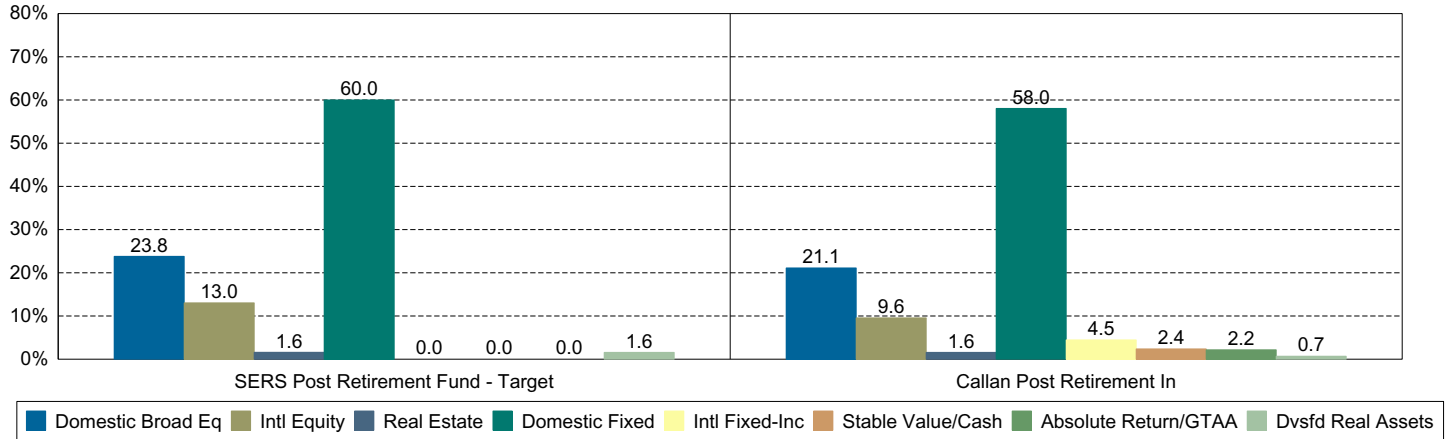
## Target Date Family Glide Path Returns vs Peer Families



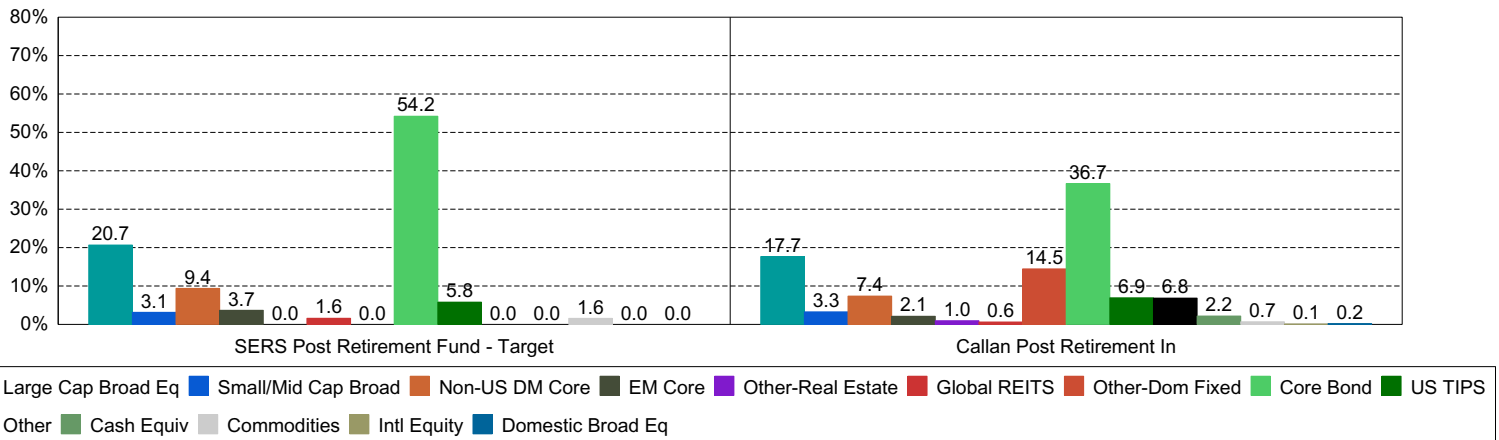
# SERS Post Retirement Fund Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

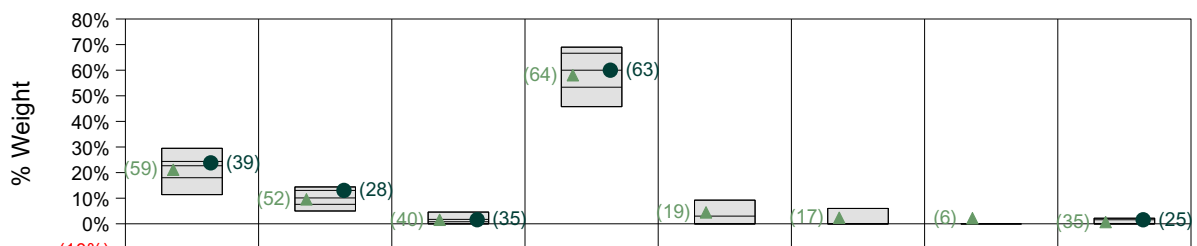
## Macro-Level Asset Allocation



## Micro-Level Asset Allocation



## Macro Asset Allocation Rankings vs. Callan Target Date Retirement Income



SERS Post Retirement Fund - Target

Callan Post Retirement In



# SERS Post Retirement Fund Period Ended June 30, 2023

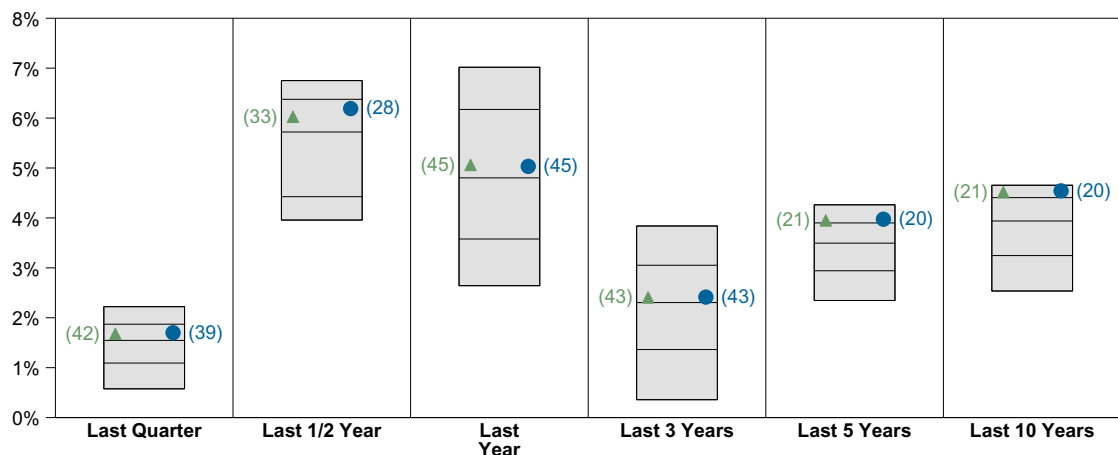
## Investment Philosophy

The BlackRock LifePath(R) Index Retirement Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

## Quarterly Summary and Highlights

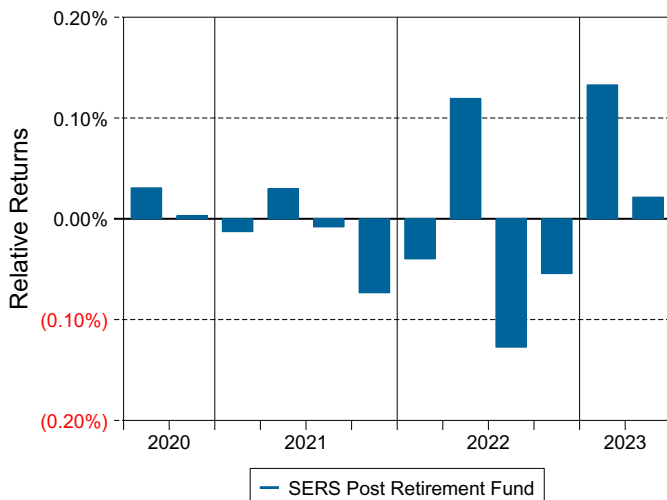
- SERS Post Retirement Fund's portfolio posted a 1.70% return for the quarter placing it in the 39 percentile of the Callan Target Date Retirement Income group for the quarter and in the 45 percentile for the last year.
- SERS Post Retirement Fund's portfolio outperformed the BlackRock Post Retirement Index by 0.02% for the quarter and underperformed the BlackRock Post Retirement Index for the year by 0.03%.

## Performance vs Callan Target Date Retirement Income (Net)

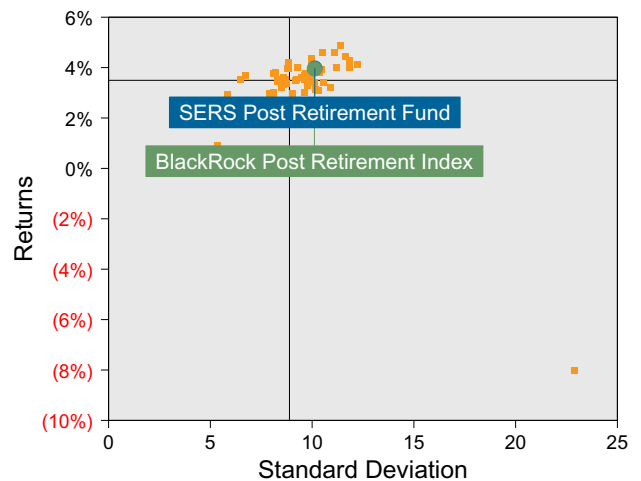


10th Percentile	2.22	6.75	7.02	3.84	4.26	4.65
25th Percentile	1.87	6.38	6.17	3.05	3.90	4.41
Median	1.55	5.72	4.80	2.30	3.49	3.94
75th Percentile	1.09	4.43	3.58	1.36	2.94	3.25
90th Percentile	0.58	3.96	2.64	0.36	2.35	2.54
<b>SERS Post Retirement Fund</b>	<b>● 1.70</b>	<b>6.19</b>	<b>5.03</b>	<b>2.41</b>	<b>3.97</b>	<b>4.54</b>
BlackRock Post Retirement Index	<b>▲ 1.68</b>	<b>6.03</b>	<b>5.06</b>	<b>2.41</b>	<b>3.95</b>	<b>4.52</b>

## Relative Returns vs BlackRock Post Retirement Index



## Callan Target Date Retirement Income (Net) Annualized Five Year Risk vs Return

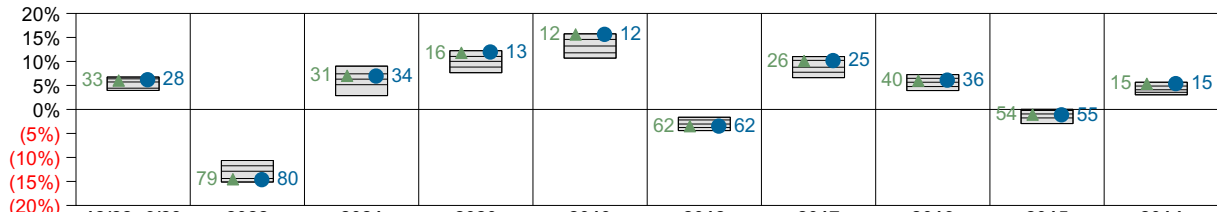


# SERS Post Retirement Fund Return Analysis Summary

## Return Analysis

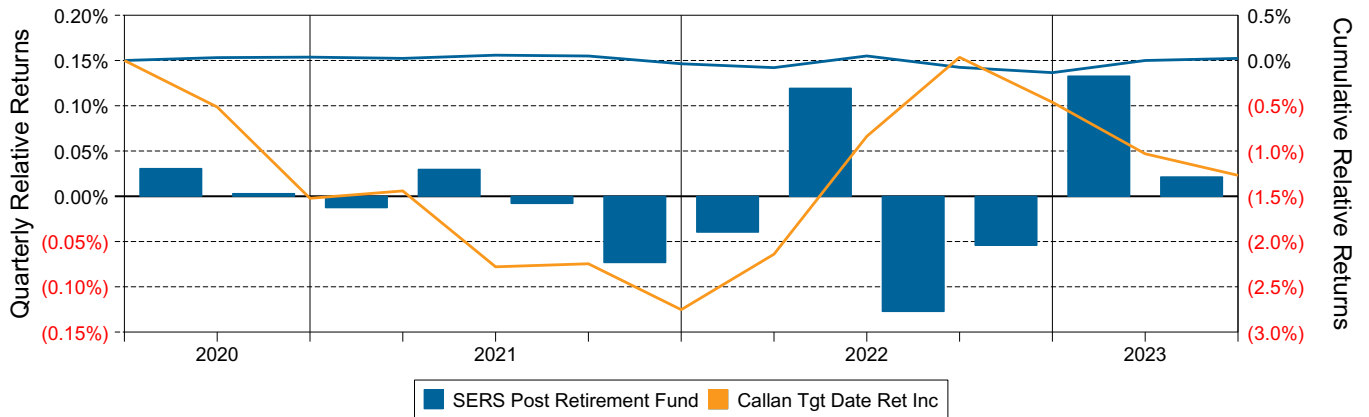
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Target Date Retirement Income (Net)

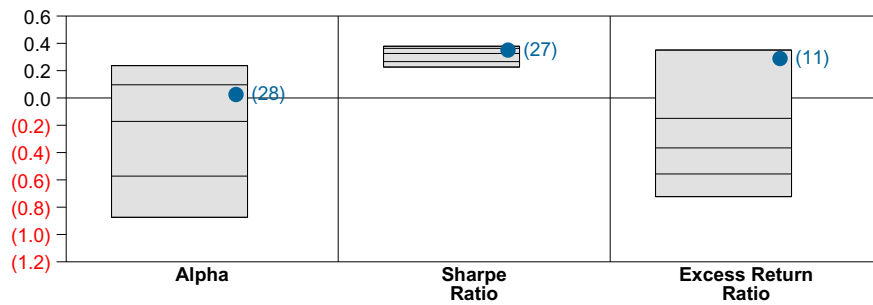


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	6.75	(10.64)	9.02	12.24	15.75	(1.63)	11.01	7.26	0.02	5.66
25th Percentile	6.38	(11.74)	7.42	11.04	14.59	(2.19)	10.22	6.48	(0.22)	4.87
Median	5.72	(12.88)	6.31	10.02	13.21	(3.04)	8.80	5.67	(0.94)	4.10
75th Percentile	4.43	(14.39)	5.16	8.83	11.79	(3.77)	7.75	4.77	(1.77)	3.57
90th Percentile	3.96	(15.12)	2.88	7.66	10.69	(4.41)	6.62	3.93	(2.94)	3.05
<b>SERS Post Retirement Fund</b>	<b>6.19</b>	<b>(14.63)</b>	<b>6.95</b>	<b>11.97</b>	<b>15.65</b>	<b>(3.47)</b>	<b>10.18</b>	<b>6.10</b>	<b>(1.12)</b>	<b>5.38</b>
<b>BlackRock Post Retirement Index</b>	<b>6.03</b>	<b>(14.54)</b>	<b>7.02</b>	<b>11.80</b>	<b>15.63</b>	<b>(3.48)</b>	<b>10.10</b>	<b>6.01</b>	<b>(1.07)</b>	<b>5.36</b>

### Cumulative and Quarterly Relative Returns vs BlackRock Post Retirement Index



### Risk Adjusted Return Measures vs BlackRock Post Retirement Index Rankings Against Callan Target Date Retirement Income (Net) Seven Years Ended June 30, 2023



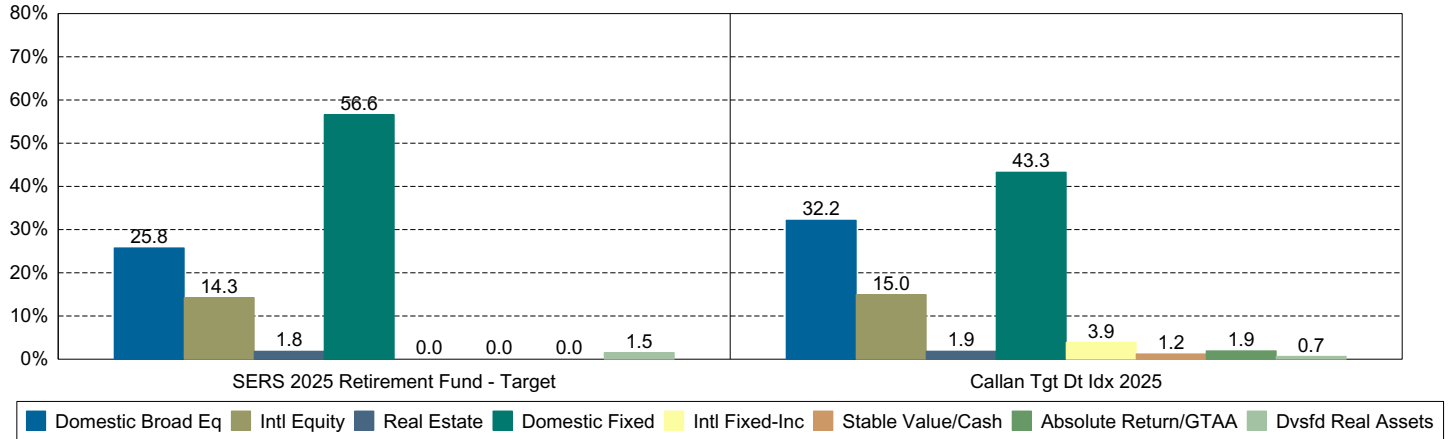
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.24	0.38	0.35
25th Percentile	0.10	0.36	(0.15)
Median	(0.17)	0.33	(0.37)
75th Percentile	(0.57)	0.27	(0.56)
90th Percentile	(0.87)	0.23	(0.72)
<b>SERS Post Retirement Fund</b>	<b>0.03</b>	<b>0.35</b>	<b>0.29</b>

# SERS 2025 Retirement Fund

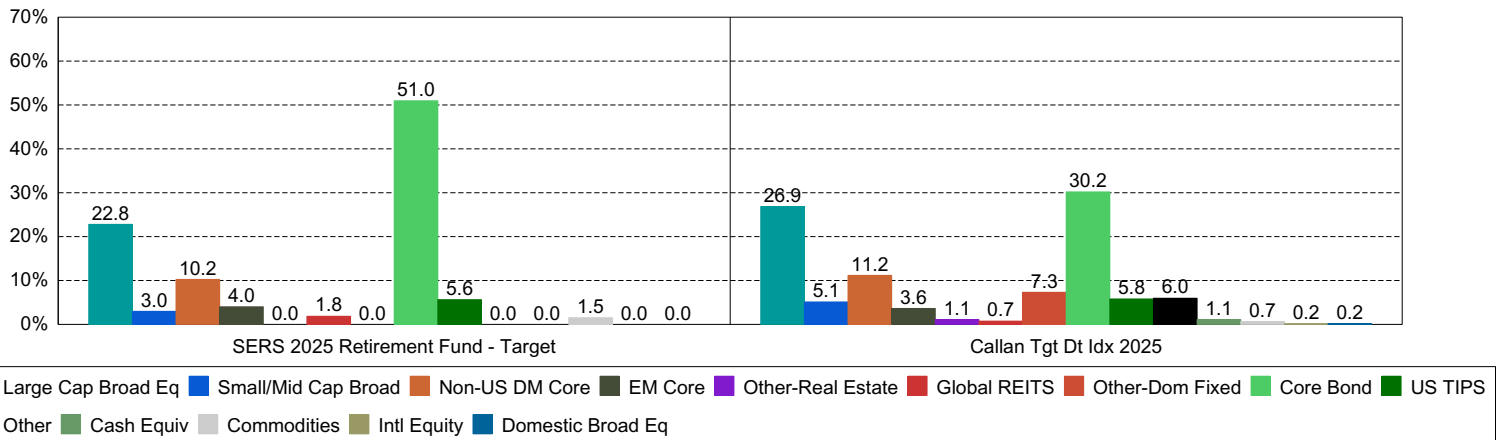
## Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

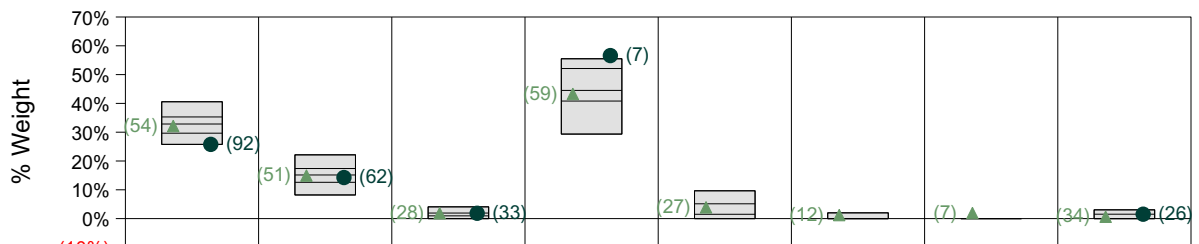
### Macro-Level Asset Allocation



### Micro-Level Asset Allocation



### Macro Asset Allocation Rankings vs. Callan Target Date 2025



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	40.57	22.14	4.08	55.50	9.66	2.00	0.00	3.04
25th Percentile	35.30	17.39	1.93	52.12	5.14	0.00	0.00	1.53
Median	32.85	15.15	0.95	44.51	1.50	0.00	0.00	0.00
75th Percentile	29.66	12.60	0.00	40.82	0.00	0.00	0.00	0.00
90th Percentile	25.77	8.20	0.00	29.34	0.00	0.00	0.00	0.00
<b>SERS 2025 Retirement Fund - Target</b>	● 25.77	14.26	1.85	56.60	-	-	-	1.53
<b>Callan Tgt Dt Idx 2025</b>	▲ 32.17	14.95	1.86	43.29	3.91	1.23	1.94	0.66

# SERS 2025 Retirement Fund Period Ended June 30, 2023

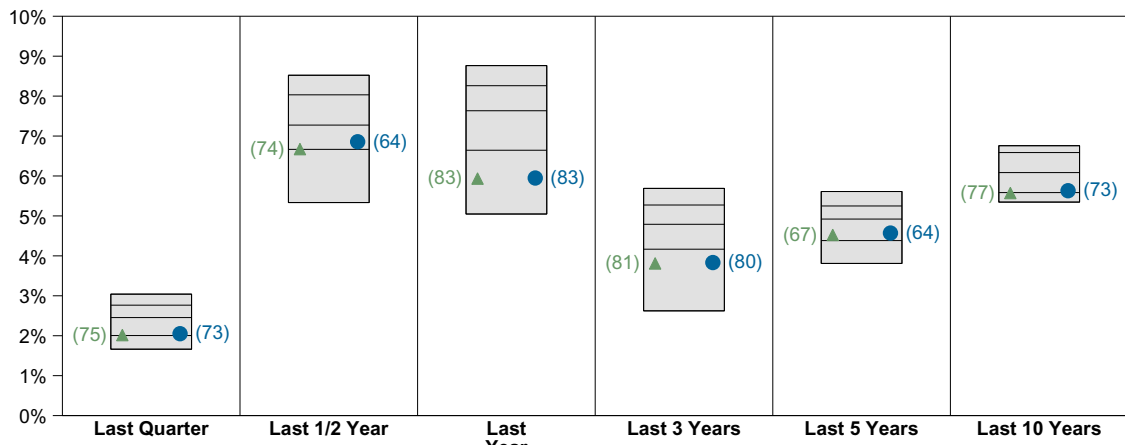
## Investment Philosophy

The BlackRock LifePath(R) Index 2025 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

## Quarterly Summary and Highlights

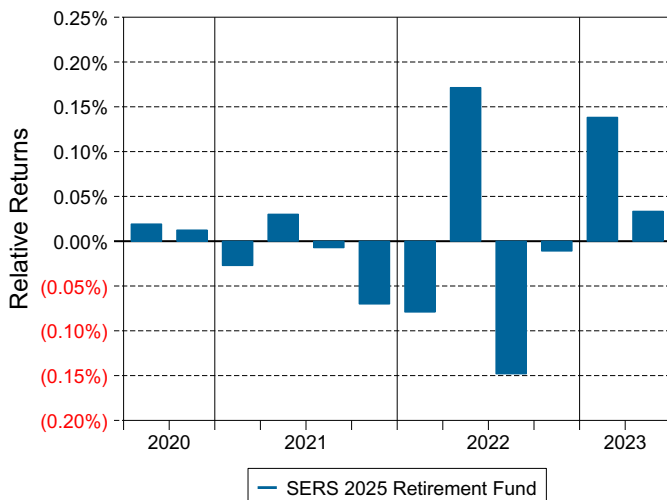
- SERS 2025 Retirement Fund's portfolio posted a 2.05% return for the quarter placing it in the 73 percentile of the Callan Target Date 2025 group for the quarter and in the 83 percentile for the last year.
- SERS 2025 Retirement Fund's portfolio outperformed the LifePath Index 2025 CB by 0.03% for the quarter and outperformed the LifePath Index 2025 CB for the year by 0.01%.

## Performance vs Callan Target Date 2025 (Net)

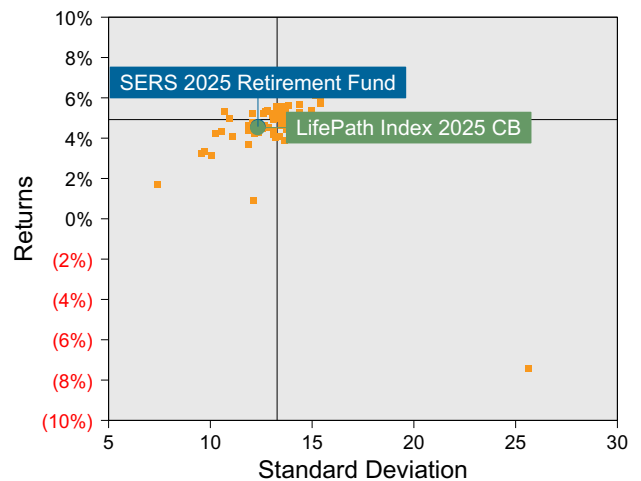


10th Percentile	3.04	8.52	8.76	5.69	5.61	6.76
25th Percentile	2.76	8.03	8.26	5.27	5.25	6.59
Median	2.45	7.27	7.63	4.79	4.92	6.09
75th Percentile	2.00	6.67	6.64	4.17	4.38	5.58
90th Percentile	1.66	5.33	5.05	2.62	3.81	5.35
<b>SERS 2025 Retirement Fund</b>	● 2.05	6.86	5.95	3.83	4.57	5.63
LifePath Index 2025 CB	▲ 2.02	6.67	5.94	3.81	4.52	5.57

## Relative Return vs LifePath Index 2025 CB



## Callan Target Date 2025 (Net) Annualized Five Year Risk vs Return

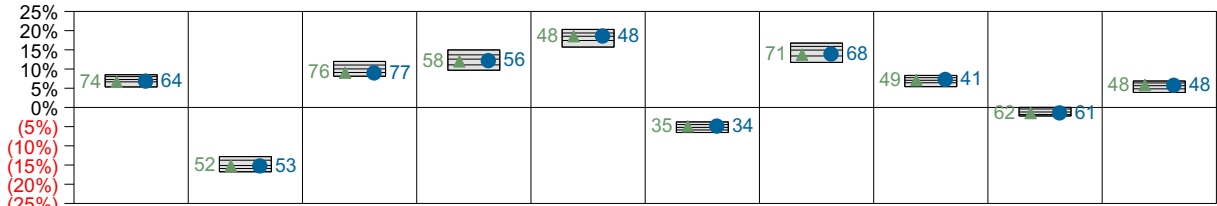


# SERS 2025 Retirement Fund Return Analysis Summary

## Return Analysis

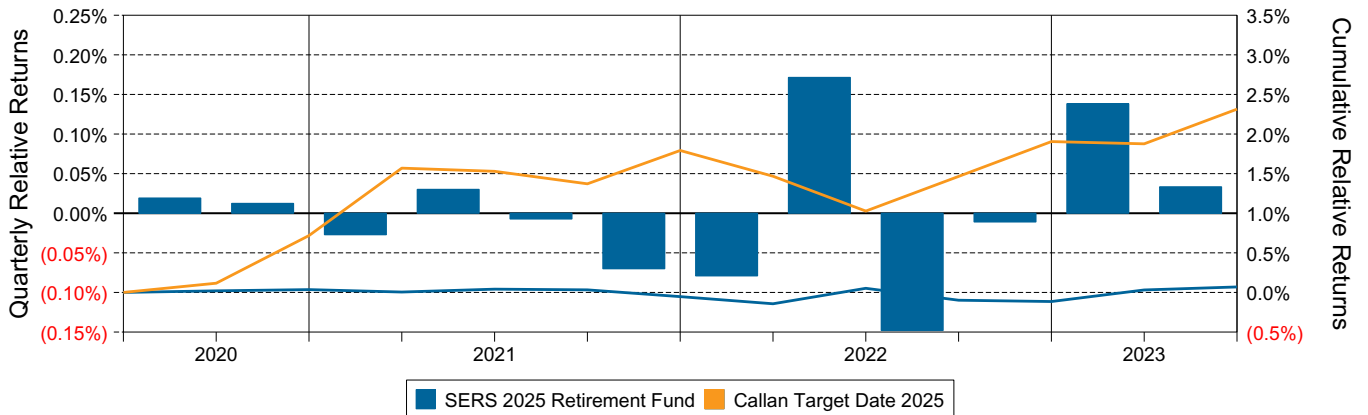
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Target Date 2025 (Net)

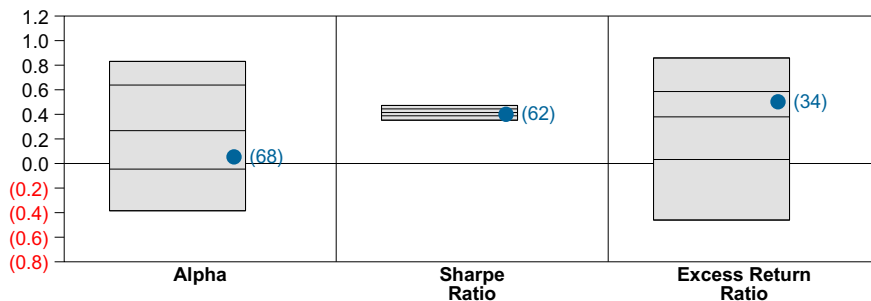


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	8.52	(12.80)	11.99	14.98	20.32	(3.77)	16.77	8.34	0.02	6.88
25th Percentile	8.03	(13.74)	11.04	13.70	19.39	(4.46)	15.90	7.76	(0.39)	6.37
Median	7.27	(15.14)	10.04	12.58	18.53	(5.20)	14.94	7.07	(1.19)	5.67
75th Percentile	6.67	(15.90)	9.10	11.08	17.43	(5.87)	13.41	6.43	(1.85)	4.84
90th Percentile	5.33	(16.76)	8.13	9.69	15.71	(6.53)	11.73	5.41	(2.22)	3.90
<b>SERS 2025 Retirement Fund</b>	6.86	(15.23)	8.99	12.19	18.60	(4.86)	13.91	7.30	(1.43)	5.77
LifePath Index 2025 CB	6.67	(15.17)	9.07	12.01	18.56	(4.90)	13.75	7.10	(1.45)	5.82

### Cumulative and Quarterly Relative Returns vs LifePath Index 2025 CB



### Risk Adjusted Return Measures vs LifePath Index 2025 CB Rankings Against Callan Target Date 2025 (Net) Seven Years Ended June 30, 2023



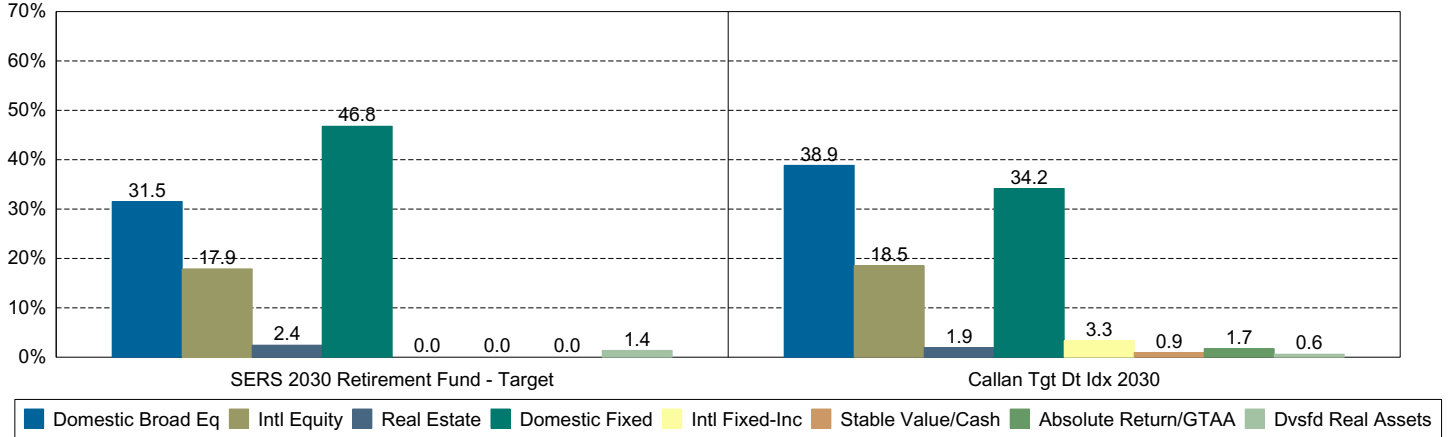
10th Percentile	0.83	0.47	0.86
25th Percentile	0.64	0.44	0.59
Median	0.27	0.41	0.38
75th Percentile	(0.05)	0.39	0.03
90th Percentile	(0.38)	0.35	(0.46)
<b>SERS 2025 Retirement Fund</b>	0.05	0.40	0.50

# SERS 2030 Retirement Fund

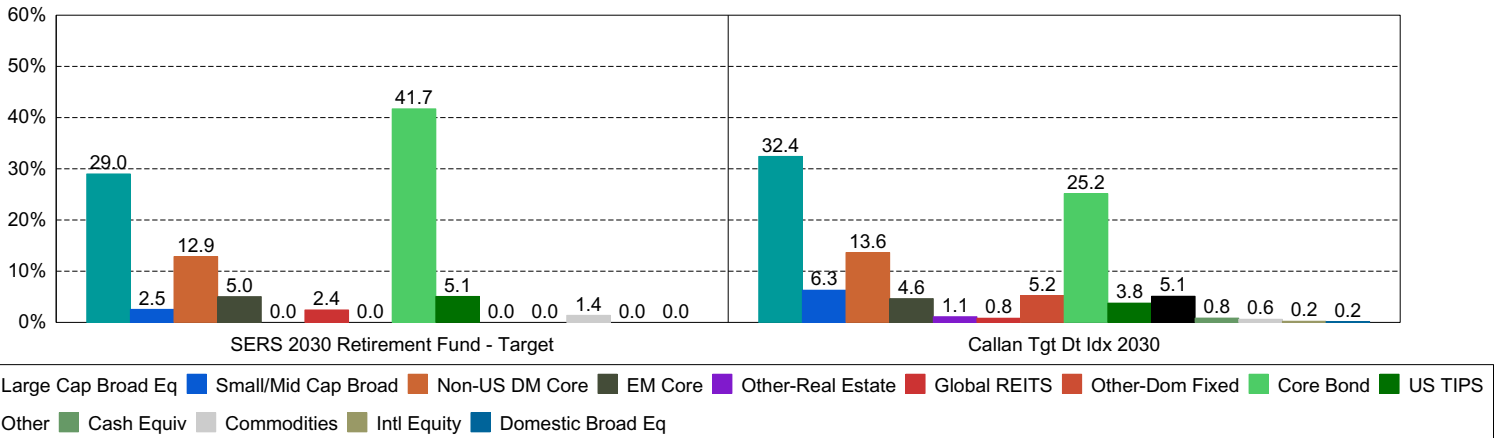
## Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

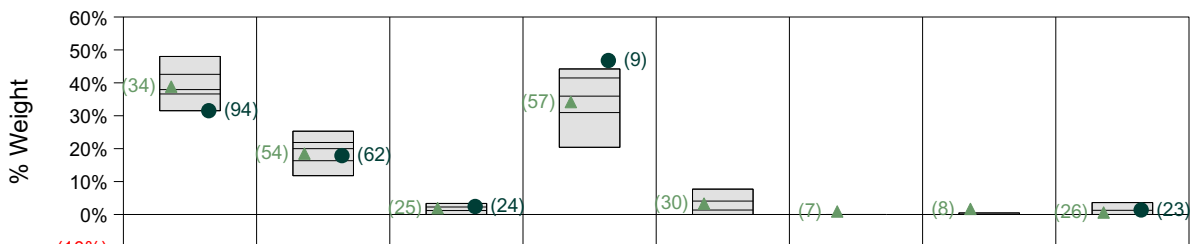
### Macro-Level Asset Allocation



### Micro-Level Asset Allocation



### Macro Asset Allocation Rankings vs. Callan Target Date 2030



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	48.01	25.30	3.35	44.22	7.70	0.00	0.46	3.62
25th Percentile	42.58	21.87	2.27	41.48	4.07	0.00	0.00	1.27
Median	37.95	20.00	1.20	35.95	1.35	0.00	0.00	0.00
75th Percentile	36.62	16.34	0.00	30.96	0.00	0.00	0.00	0.00
90th Percentile	31.53	11.79	0.00	20.41	0.00	0.00	0.00	0.00

<b>SERS 2030 Retirement Fund - Target</b>	●	31.53	17.89	2.43	46.78	-	-	1.37
Callan Tgt Dt Idx 2030	▲	38.86	18.51	1.92	34.16	3.32	0.92	1.70

# SERS 2030 Retirement Fund Period Ended June 30, 2023

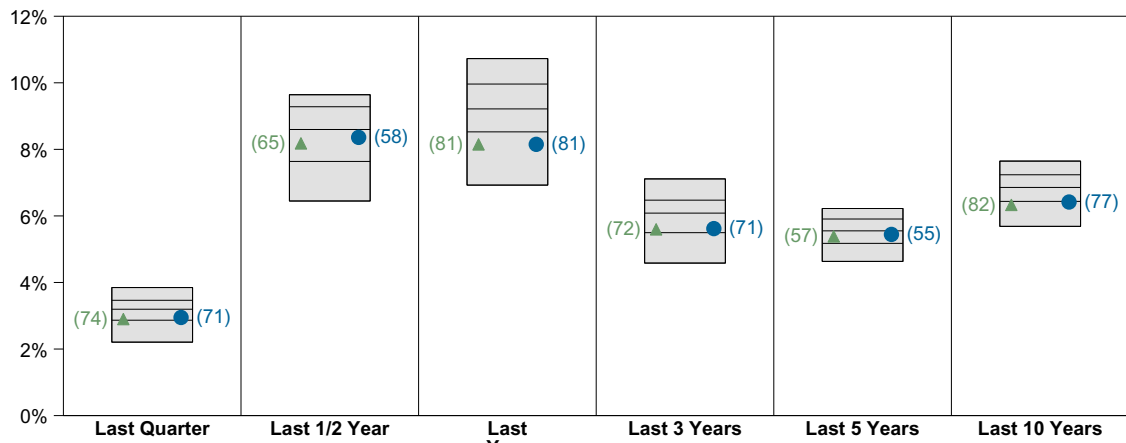
## Investment Philosophy

The BlackRock LifePath(R) Index 2030 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

## Quarterly Summary and Highlights

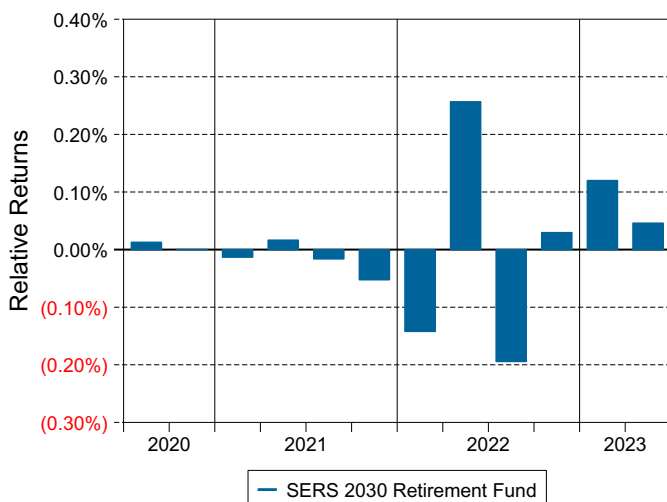
- SERS 2030 Retirement Fund's portfolio posted a 2.95% return for the quarter placing it in the 71 percentile of the Callan Target Date 2030 group for the quarter and in the 81 percentile for the last year.
- SERS 2030 Retirement Fund's portfolio outperformed the LifePath Index 2030 CB by 0.05% for the quarter and outperformed the LifePath Index 2030 CB for the year by 0.00%.

## Performance vs Callan Target Date 2030 (Net)

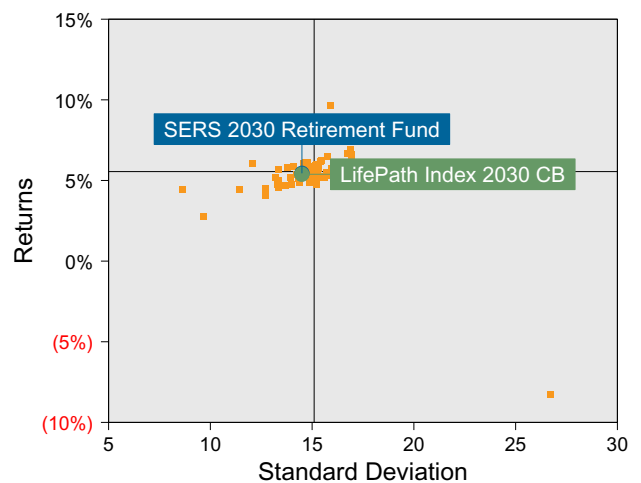


10th Percentile	3.85	9.64	10.73	7.11	6.22	7.65
25th Percentile	3.46	9.28	9.96	6.47	5.91	7.24
Median	3.20	8.60	9.22	6.08	5.55	6.86
75th Percentile	2.87	7.64	8.53	5.50	5.18	6.44
90th Percentile	2.21	6.45	6.93	4.58	4.63	5.69
<b>SERS 2030 Retirement Fund</b>	● 2.95	8.36	8.15	5.62	5.44	6.42
LifePath Index 2030 CB	▲ 2.90	8.18	8.15	5.60	5.39	6.33

## Relative Return vs LifePath Index 2030 CB



## Callan Target Date 2030 (Net) Annualized Five Year Risk vs Return

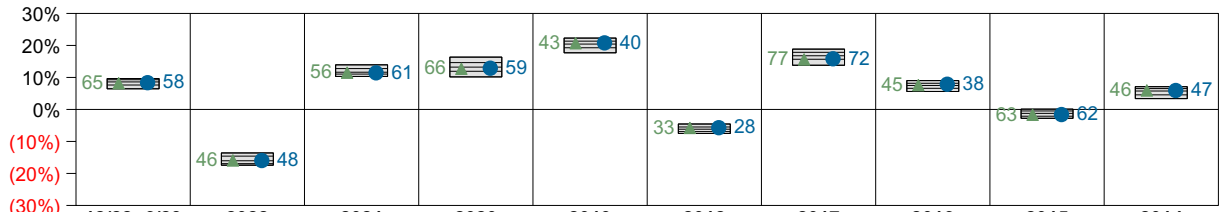


# SERS 2030 Retirement Fund Return Analysis Summary

## Return Analysis

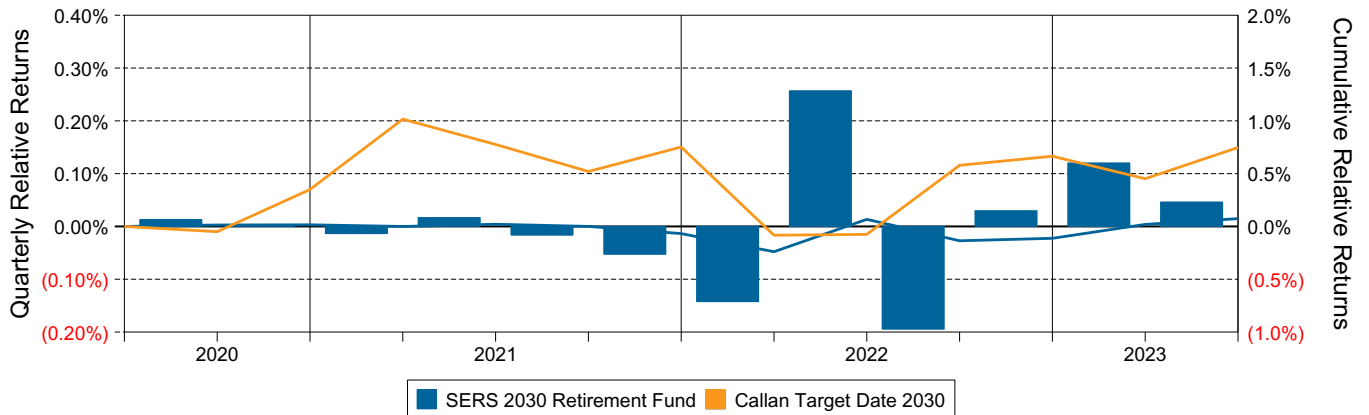
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Target Date 2030 (Net)

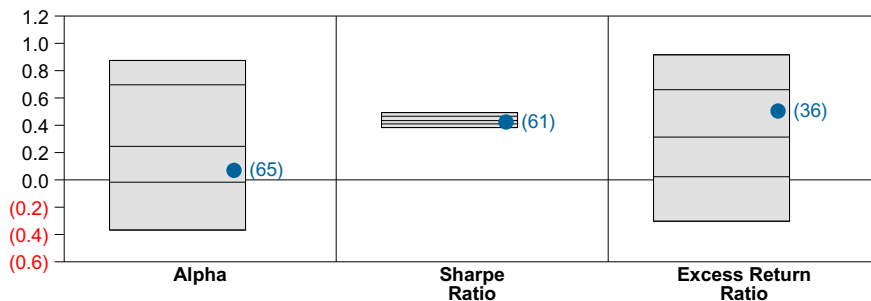


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	9.64	(13.59)	13.94	16.35	22.30	(4.55)	18.85	9.02	0.09	7.11
25th Percentile	9.28	(14.60)	12.77	14.64	21.34	(5.48)	17.85	8.17	(0.48)	6.52
Median	8.60	(16.04)	11.63	13.23	20.43	(6.17)	16.77	7.49	(1.22)	5.76
75th Percentile	7.64	(16.94)	11.05	11.92	19.28	(6.93)	15.68	6.60	(2.12)	4.56
90th Percentile	6.45	(17.42)	10.31	10.16	17.70	(7.50)	13.81	5.61	(2.77)	3.39
<b>SERS 2030 Retirement Fund</b>	8.36	(15.97)	11.43	12.88	20.80	(5.71)	15.83	7.88	(1.60)	5.92
LifePath Index 2030 CB	8.18	(15.92)	11.50	12.72	20.70	(5.76)	15.64	7.61	(1.66)	5.95

### Cumulative and Quarterly Relative Returns vs LifePath Index 2030 CB



### Risk Adjusted Return Measures vs LifePath Index 2030 CB Rankings Against Callan Target Date 2030 (Net) Seven Years Ended June 30, 2023



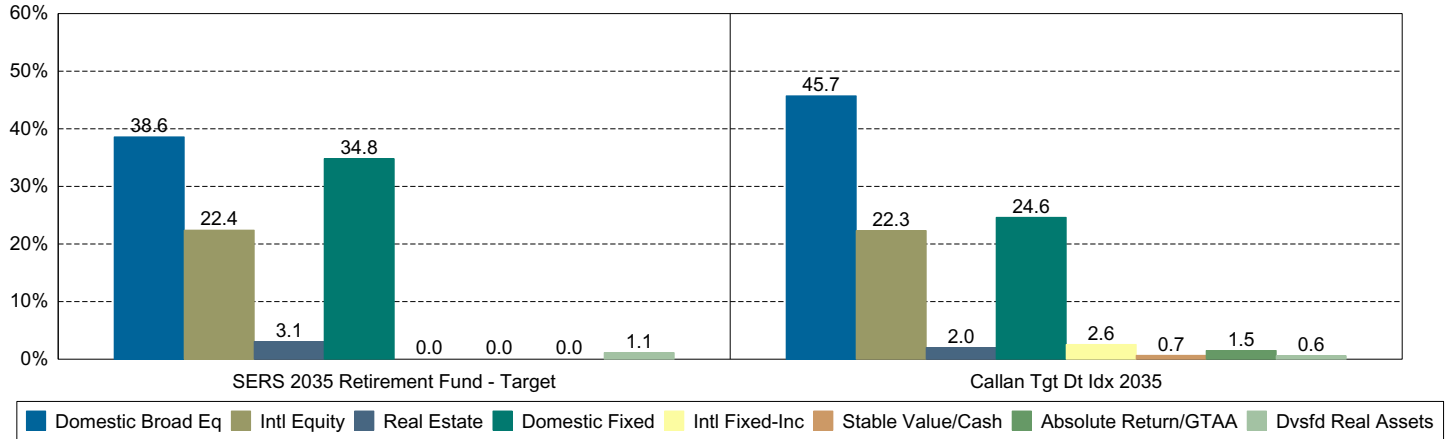
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.87	0.49	0.92
25th Percentile	0.70	0.47	0.66
Median	0.25	0.43	0.31
75th Percentile	(0.02)	0.41	0.02
90th Percentile	(0.37)	0.38	(0.30)
<b>SERS 2030 Retirement Fund</b>	0.07	0.42	0.50



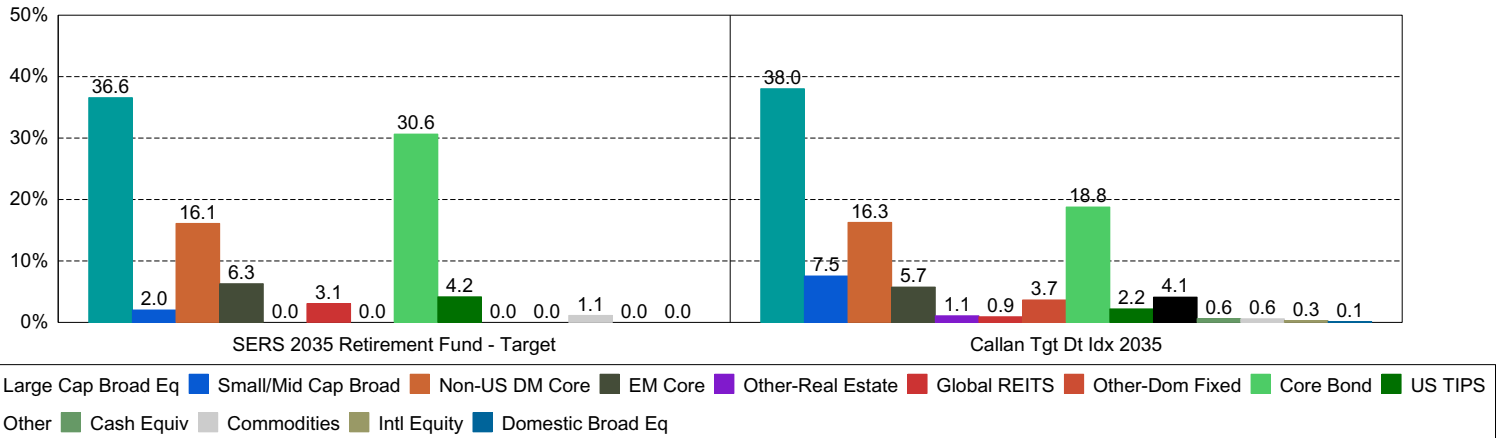
# SERS 2035 Retirement Fund Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

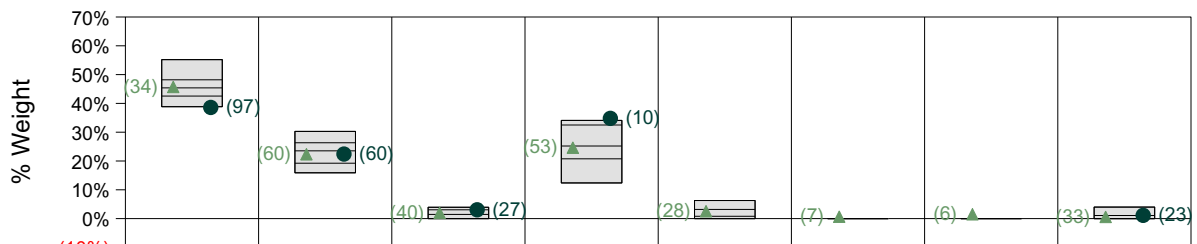
## Macro-Level Asset Allocation



## Micro-Level Asset Allocation



## Macro Asset Allocation Rankings vs. Callan Target Date 2035



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	55.19	30.28	3.93	34.09	6.28	0.00	0.00	4.00
25th Percentile	48.19	26.33	3.06	32.50	3.18	0.00	0.00	1.08
Median	45.39	23.53	1.45	25.20	0.81	0.00	0.00	0.00
75th Percentile	42.54	19.23	0.00	20.76	0.00	0.00	0.00	0.00
90th Percentile	38.86	15.90	0.00	12.38	0.00	0.00	0.00	0.00

<b>SERS 2035 Retirement Fund - Target</b>	●	38.59	22.40	3.06	34.81	-	-	-	1.13
Callan Tgt Dt Idx 2035	▲	45.72	22.33	2.00	24.63	2.56	0.67	1.51	0.59

# SERS 2035 Retirement Fund Period Ended June 30, 2023

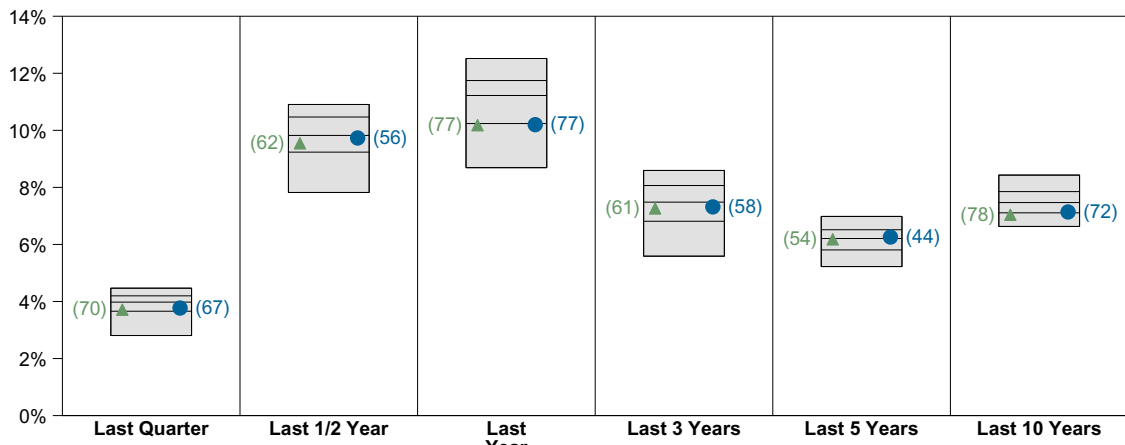
## Investment Philosophy

The BlackRock LifePath(R) Index 2035 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

## Quarterly Summary and Highlights

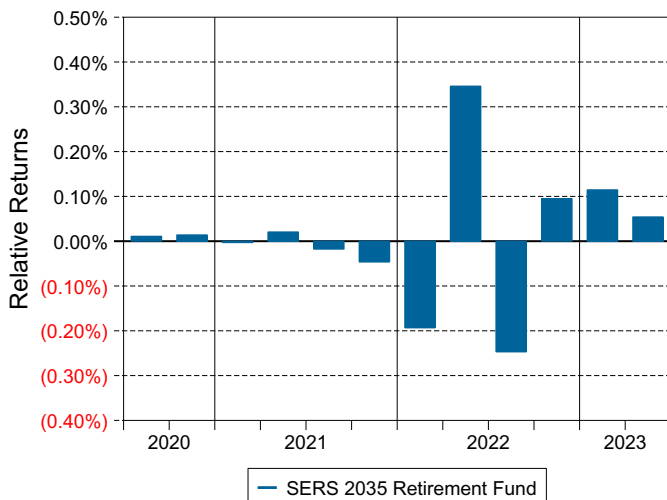
- SERS 2035 Retirement Fund's portfolio posted a 3.77% return for the quarter placing it in the 67 percentile of the Callan Target Date 2035 group for the quarter and in the 77 percentile for the last year.
- SERS 2035 Retirement Fund's portfolio outperformed the LifePath Index 2035 CB by 0.06% for the quarter and outperformed the LifePath Index 2035 CB for the year by 0.02%.

## Performance vs Callan Target Date 2035 (Net)

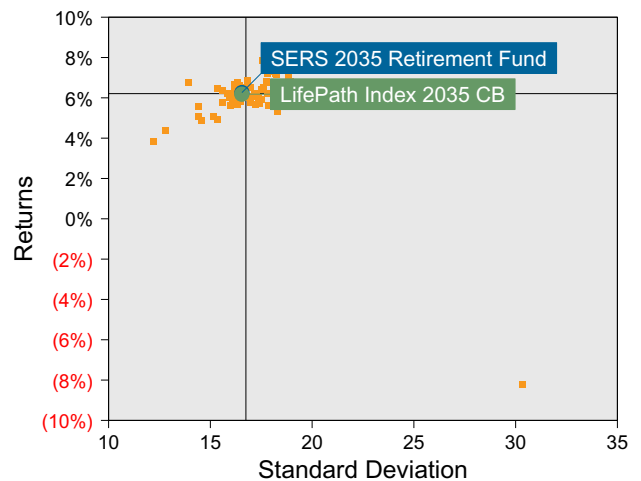


10th Percentile	4.47	10.91	12.52	8.59	6.98	8.43
25th Percentile	4.20	10.47	11.75	8.07	6.52	7.85
Median	3.98	9.82	11.22	7.48	6.21	7.47
75th Percentile	3.66	9.24	10.24	6.81	5.81	7.11
90th Percentile	2.81	7.82	8.69	5.59	5.22	6.63
<b>SERS 2035 Retirement Fund</b>	● 3.77	9.73	10.20	7.32	6.26	7.14
LifePath Index 2035 CB	▲ 3.71	9.55	10.18	7.26	6.18	7.04

## Relative Return vs LifePath Index 2035 CB



## Callan Target Date 2035 (Net) Annualized Five Year Risk vs Return

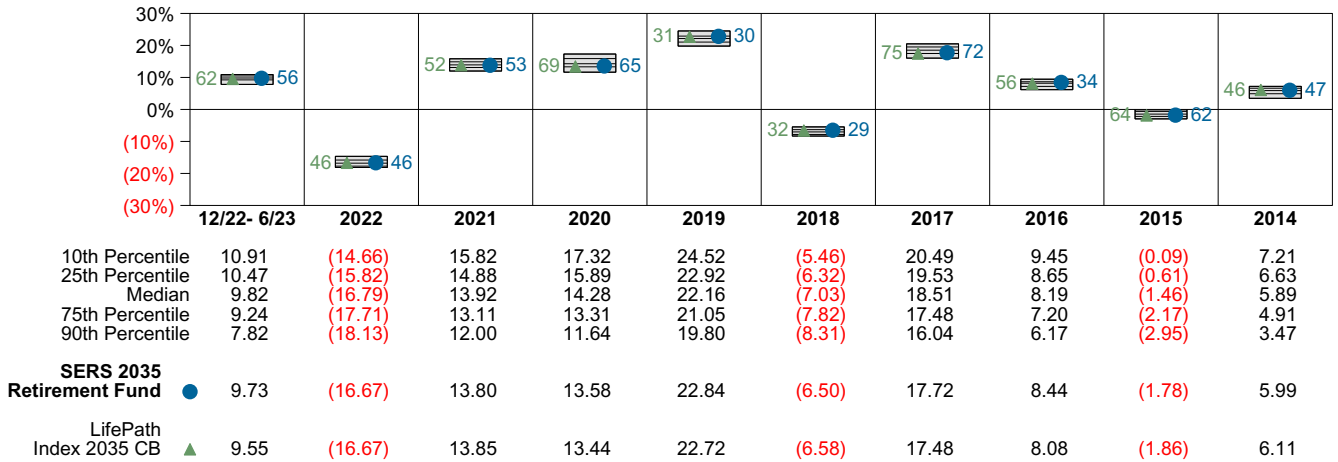


# SERS 2035 Retirement Fund Return Analysis Summary

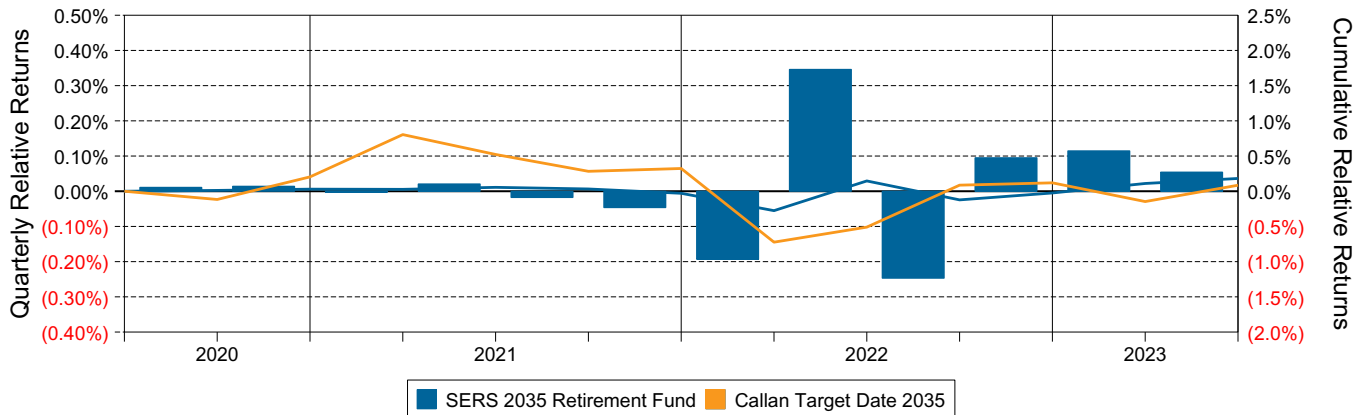
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

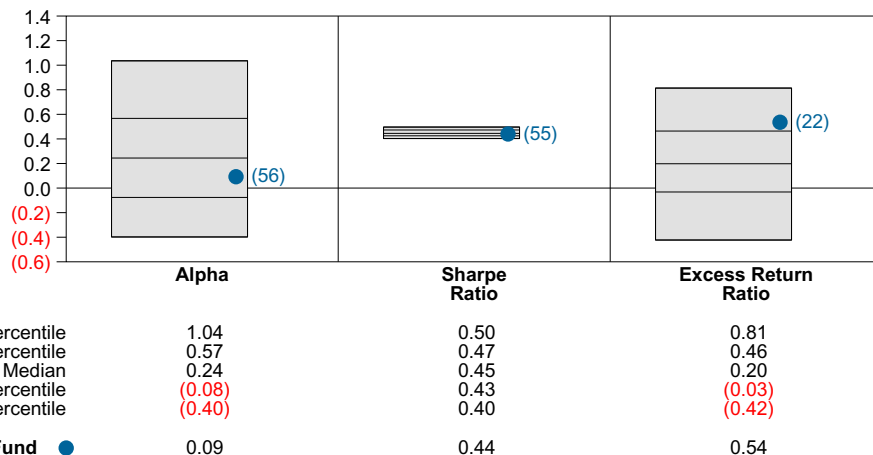
### Performance vs Callan Target Date 2035 (Net)



### Cumulative and Quarterly Relative Returns vs LifePath Index 2035 CB



### Risk Adjusted Return Measures vs LifePath Index 2035 CB Rankings Against Callan Target Date 2035 (Net) Seven Years Ended June 30, 2023

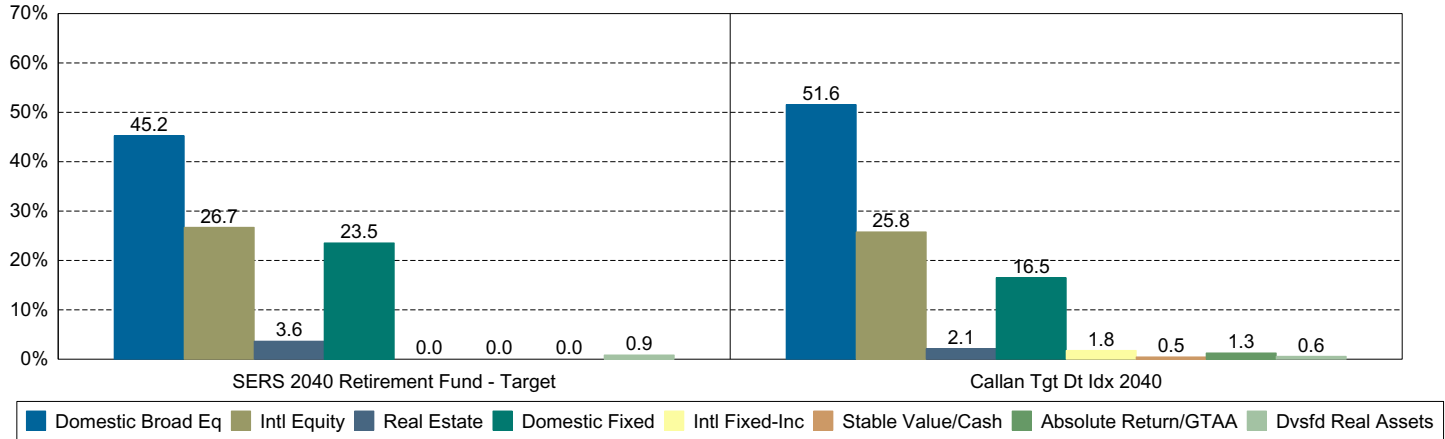


# SERS 2040 Retirement Fund

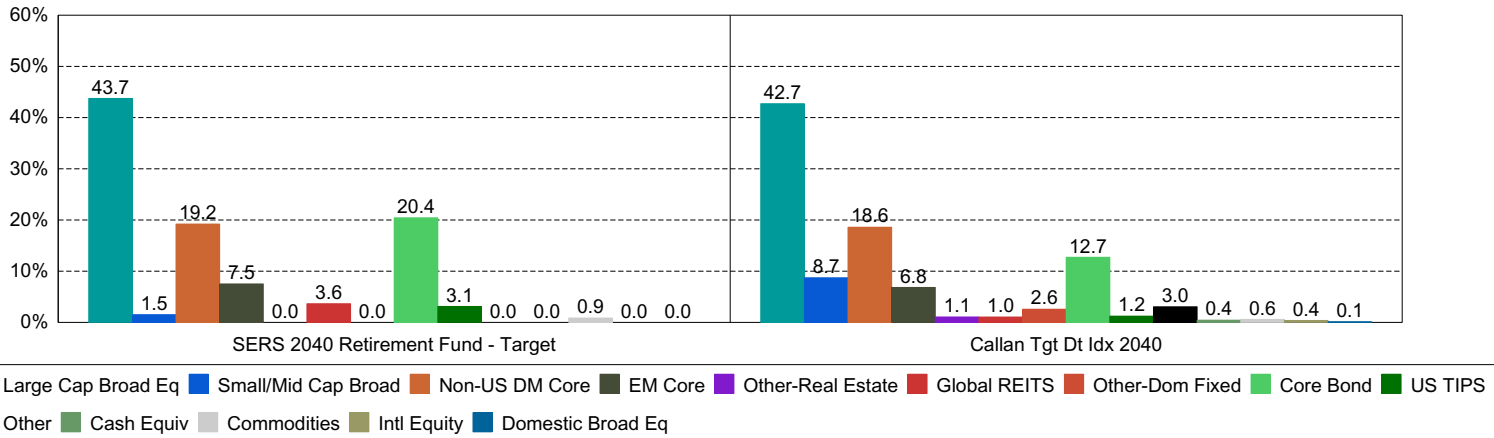
## Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

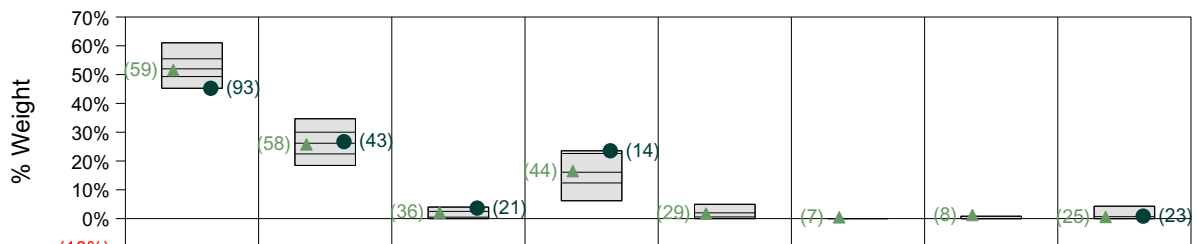
### Macro-Level Asset Allocation



### Micro-Level Asset Allocation



### Macro Asset Allocation Rankings vs. Callan Target Date 2040



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	61.05	34.66	4.00	23.54	4.96	0.00	0.82	4.30
25th Percentile	55.48	30.00	2.50	22.60	2.00	0.00	0.00	0.66
Median	52.00	26.16	0.50	16.10	0.58	0.00	0.00	0.00
75th Percentile	49.32	22.46	0.00	12.38	0.00	0.00	0.00	0.00
90th Percentile	45.25	18.45	0.00	6.20	0.00	0.00	0.00	0.00

<b>SERS 2040 Retirement Fund - Target</b>	●	45.25	26.71	3.65	23.54	-	-	-	0.85
Callan Tgt Dt Idx 2040	▲	51.55	25.78	2.10	16.50	1.77	0.45	1.26	0.58

# SERS 2040 Retirement Fund Period Ended June 30, 2023

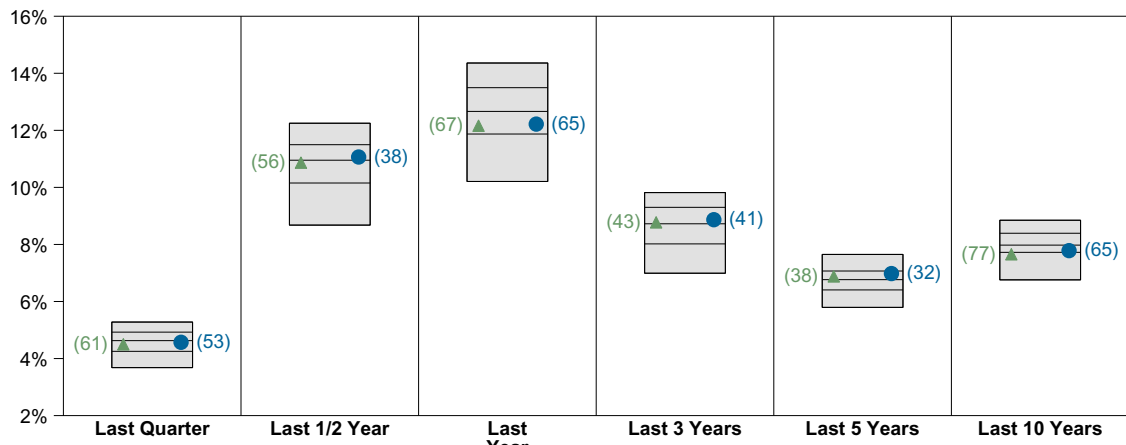
## Investment Philosophy

The BlackRock LifePath(R) Index 2040 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

## Quarterly Summary and Highlights

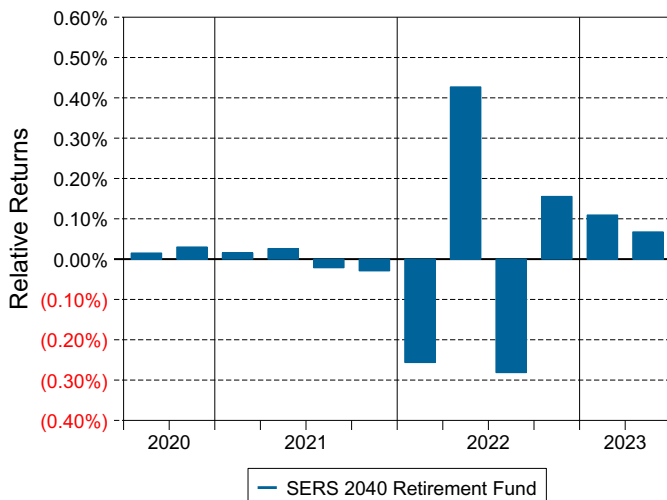
- SERS 2040 Retirement Fund's portfolio posted a 4.57% return for the quarter placing it in the 53 percentile of the Callan Target Date 2040 group for the quarter and in the 65 percentile for the last year.
- SERS 2040 Retirement Fund's portfolio outperformed the LifePath Index 2040 CB by 0.07% for the quarter and outperformed the LifePath Index 2040 CB for the year by 0.06%.

## Performance vs Callan Target Date 2040 (Net)

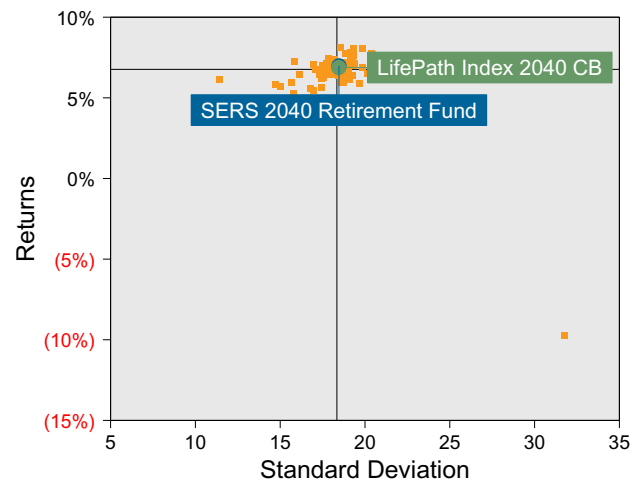


10th Percentile	5.28	12.25	14.36	9.82	7.65	8.85
25th Percentile	4.93	11.50	13.50	9.30	7.07	8.39
Median	4.63	10.95	12.66	8.72	6.77	7.98
75th Percentile	4.25	10.15	11.87	8.02	6.41	7.72
90th Percentile	3.68	8.68	10.21	6.99	5.79	6.76
<b>SERS 2040 Retirement Fund</b>	● 4.57	11.06	12.22	8.87	6.98	7.78
LifePath Index 2040 CB	▲ 4.50	10.87	12.16	8.77	6.88	7.66

## Relative Return vs LifePath Index 2040 CB



## Callan Target Date 2040 (Net) Annualized Five Year Risk vs Return

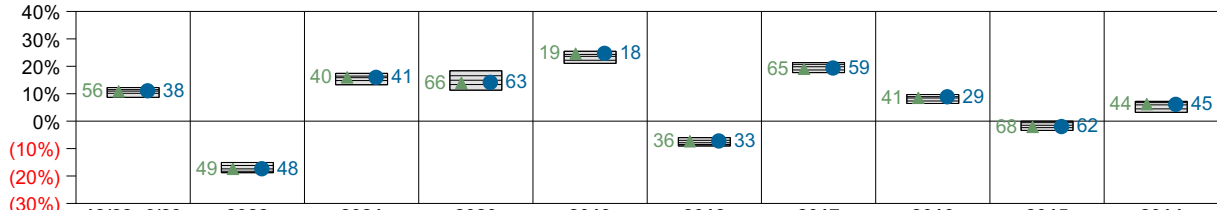


# SERS 2040 Retirement Fund Return Analysis Summary

## Return Analysis

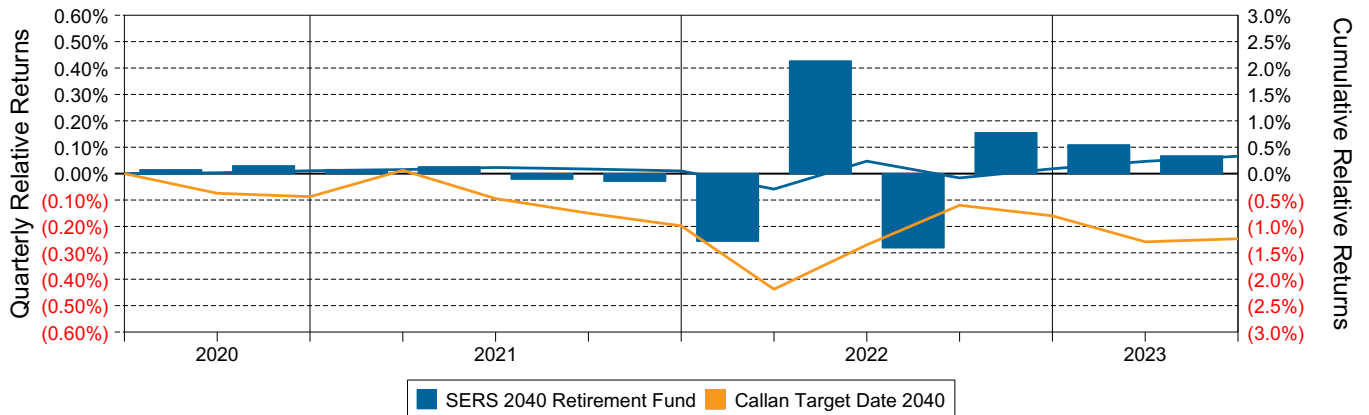
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Target Date 2040 (Net)

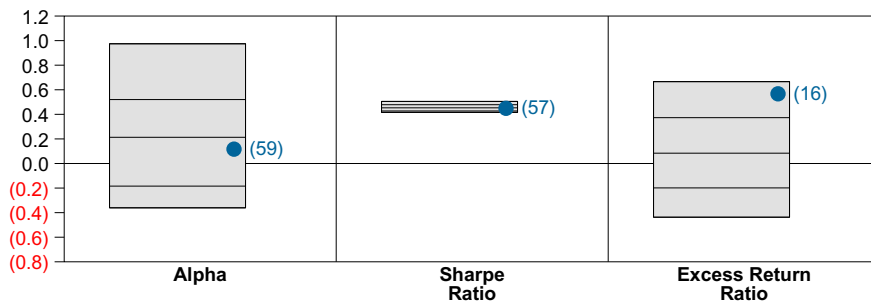


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	12.25	(15.07)	17.43	18.37	25.47	(6.01)	21.35	9.71	(0.03)	7.22
25th Percentile	11.50	(16.16)	16.42	16.56	24.33	(6.99)	20.71	8.93	(0.55)	6.76
Median	10.95	(17.40)	15.85	14.91	23.62	(7.87)	19.84	8.44	(1.51)	5.94
75th Percentile	10.15	(18.28)	14.80	13.35	22.20	(8.52)	18.66	7.35	(2.36)	4.47
90th Percentile	8.68	(18.79)	13.27	11.29	21.07	(9.05)	17.70	6.44	(3.38)	3.21
<b>SERS 2040 Retirement Fund</b>	● 11.06	(17.35)	15.96	14.14	24.71	(7.22)	19.38	8.88	(1.98)	6.12
LifePath Index 2040 CB	▲ 10.87	(17.38)	15.97	13.98	24.62	(7.33)	19.09	8.51	(2.08)	6.21

### Cumulative and Quarterly Relative Returns vs LifePath Index 2040 CB



### Risk Adjusted Return Measures vs LifePath Index 2040 CB Rankings Against Callan Target Date 2040 (Net) Seven Years Ended June 30, 2023



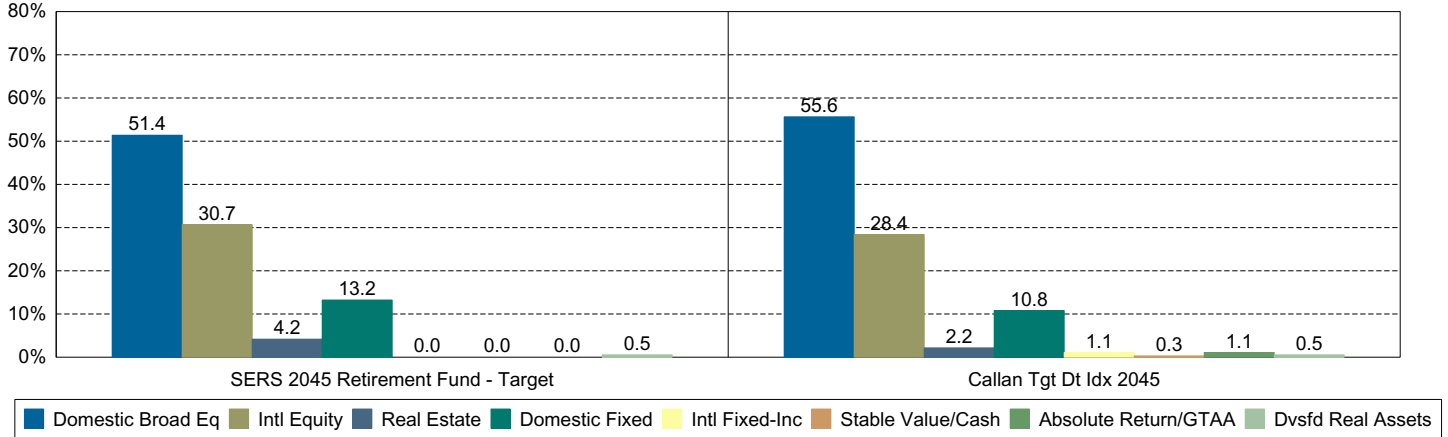
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.97	0.51	0.67
25th Percentile	0.52	0.48	0.37
Median	0.21	0.45	0.08
75th Percentile	(0.18)	0.43	(0.20)
90th Percentile	(0.36)	0.42	(0.44)
<b>SERS 2040 Retirement Fund</b>	● 0.12	0.45	0.57

# SERS 2045 Retirement Fund

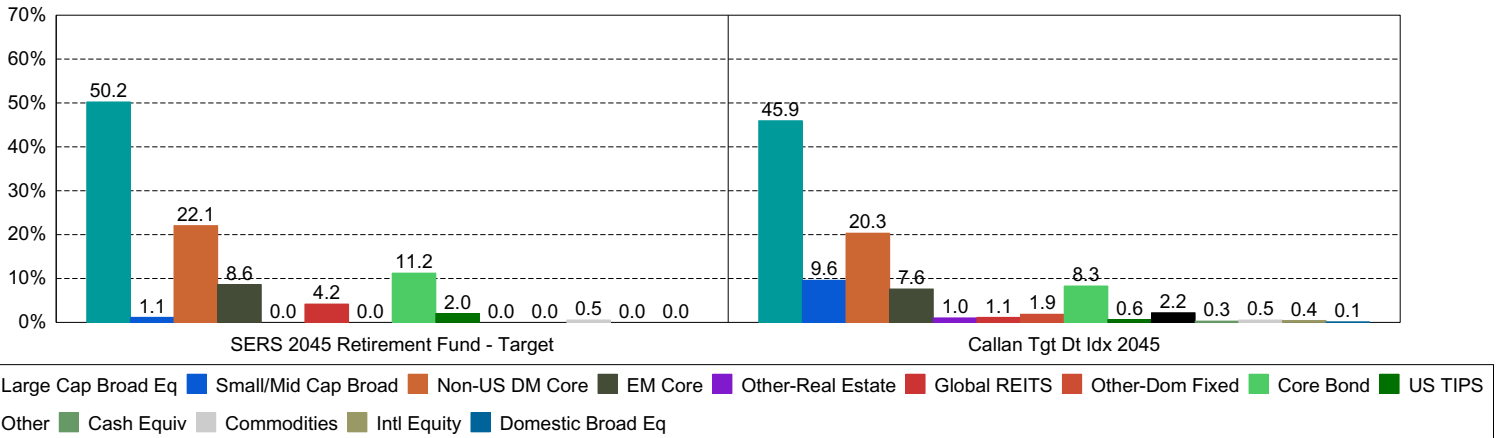
## Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

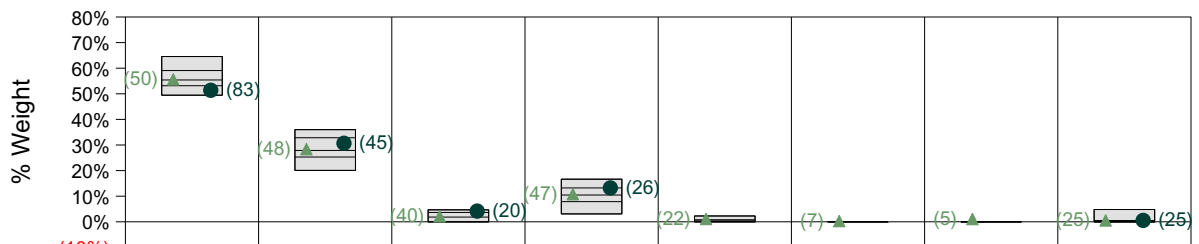
### Macro-Level Asset Allocation



### Micro-Level Asset Allocation



### Macro Asset Allocation Rankings vs. Callan Target Date 2045



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	64.56	36.00	4.68	16.65	2.28	0.00	0.00	4.80
25th Percentile	59.08	32.83	3.65	13.23	0.80	0.00	0.00	0.49
Median	55.41	27.88	1.84	10.46	0.37	0.00	0.00	0.00
75th Percentile	53.16	25.30	0.00	7.87	0.00	0.00	0.00	0.00
90th Percentile	49.45	20.07	0.00	3.08	0.00	0.00	0.00	0.00

<b>SERS 2045 Retirement Fund - Target</b>	●	51.37	30.68	4.17	13.23	-	-	-	0.54
Callan Tgt Dt Idx 2045	▲	55.64	28.37	2.16	10.79	1.11	0.30	1.09	0.54

# SERS 2045 Retirement Fund Period Ended June 30, 2023

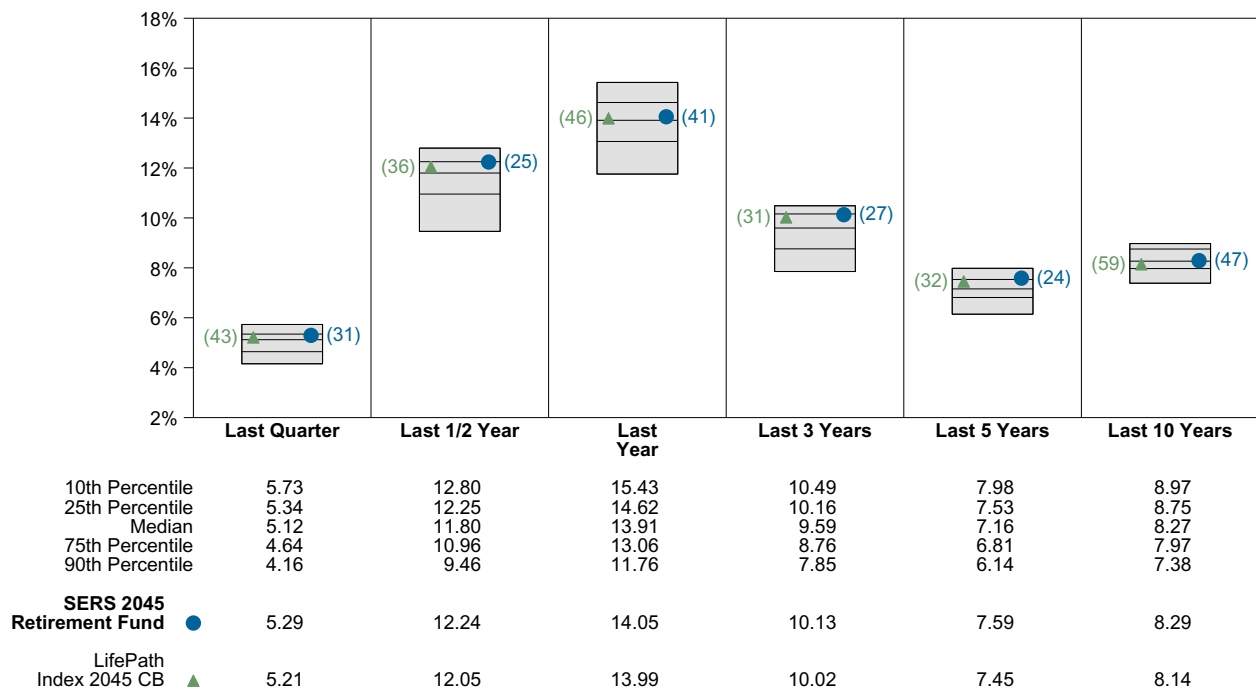
## Investment Philosophy

The BlackRock LifePath(R) Index 2045 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

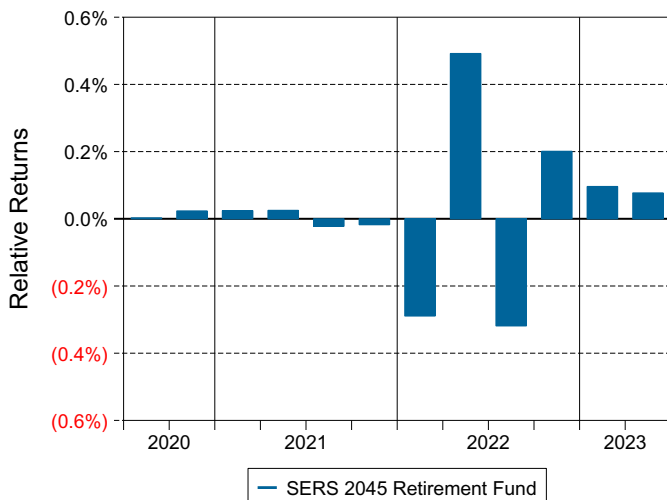
## Quarterly Summary and Highlights

- SERS 2045 Retirement Fund's portfolio posted a 5.29% return for the quarter placing it in the 31 percentile of the Callan Target Date 2045 group for the quarter and in the 41 percentile for the last year.
- SERS 2045 Retirement Fund's portfolio outperformed the LifePath Index 2045 CB by 0.08% for the quarter and outperformed the LifePath Index 2045 CB for the year by 0.06%.

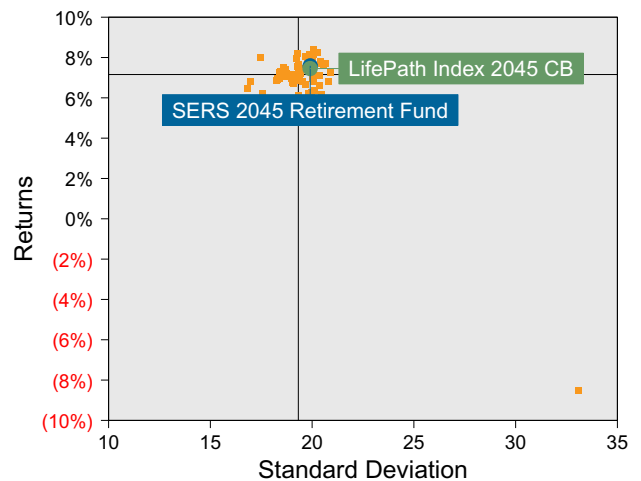
## Performance vs Callan Target Date 2045 (Net)



## Relative Return vs LifePath Index 2045 CB



## Callan Target Date 2045 (Net) Annualized Five Year Risk vs Return



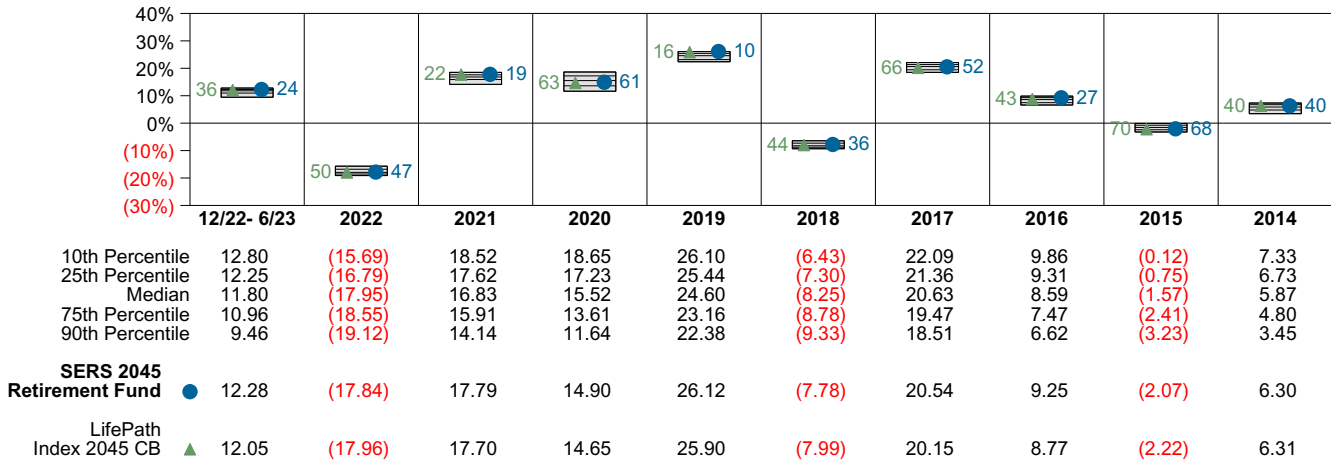


# SERS 2045 Retirement Fund Return Analysis Summary

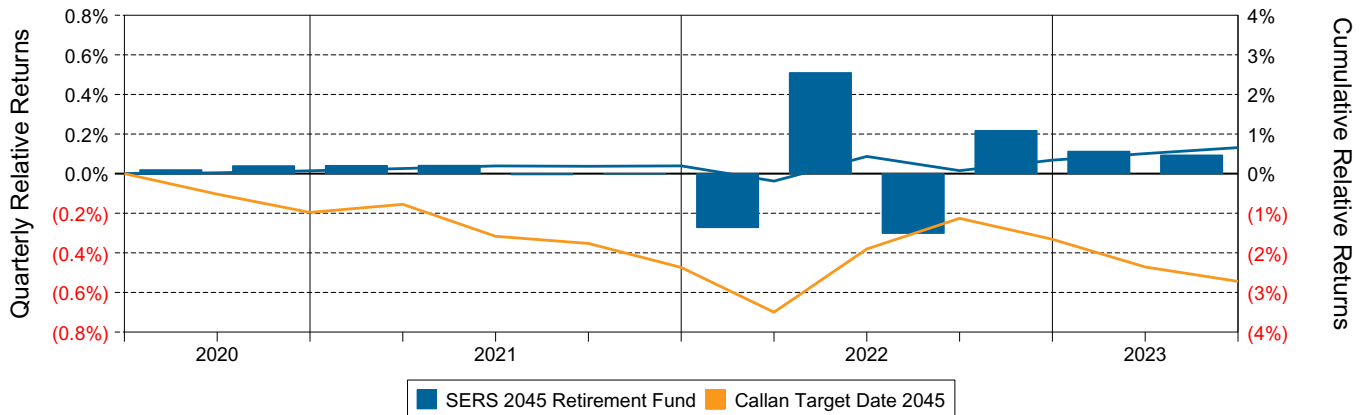
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

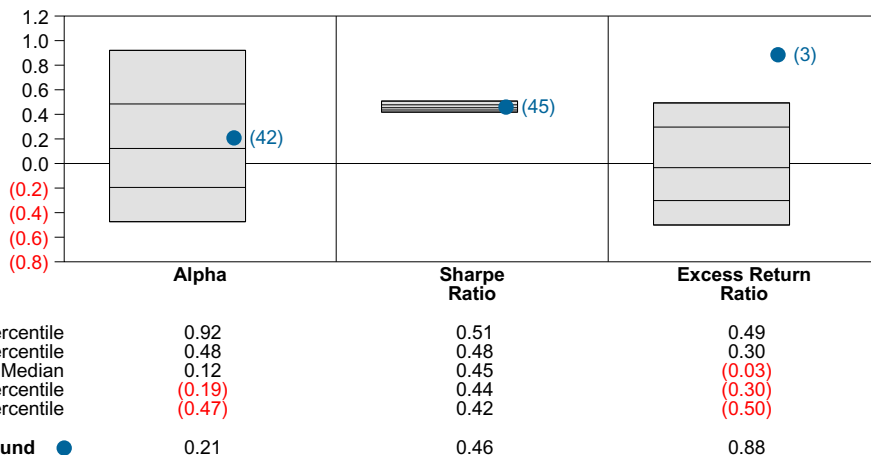
### Performance vs Callan Target Date 2045 (Net)



### Cumulative and Quarterly Relative Returns vs LifePath Index 2045 CB



### Risk Adjusted Return Measures vs LifePath Index 2045 CB Rankings Against Callan Target Date 2045 (Net) Seven Years Ended June 30, 2023

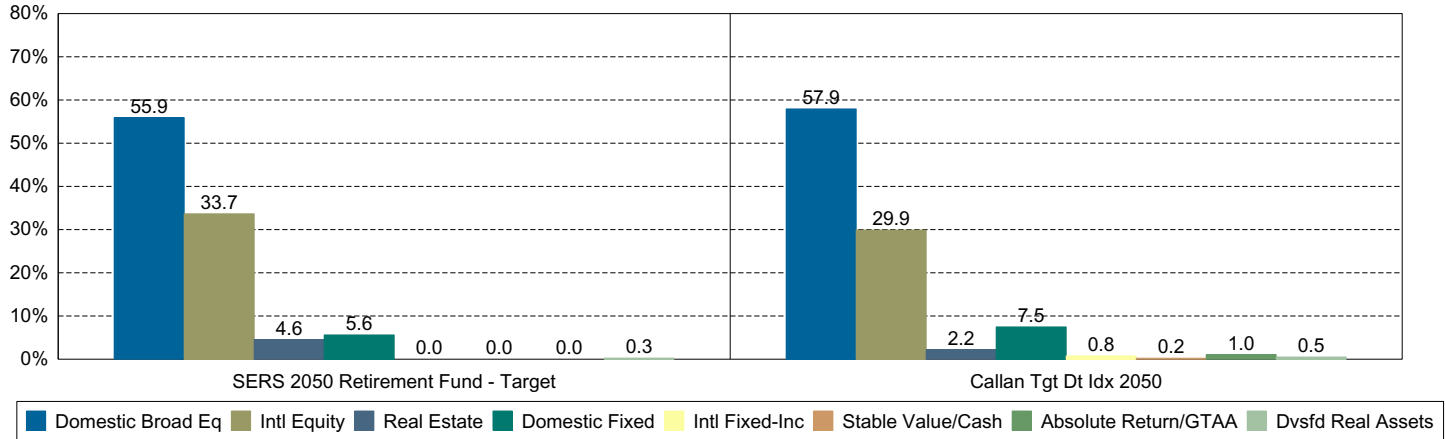


# SERS 2050 Retirement Fund

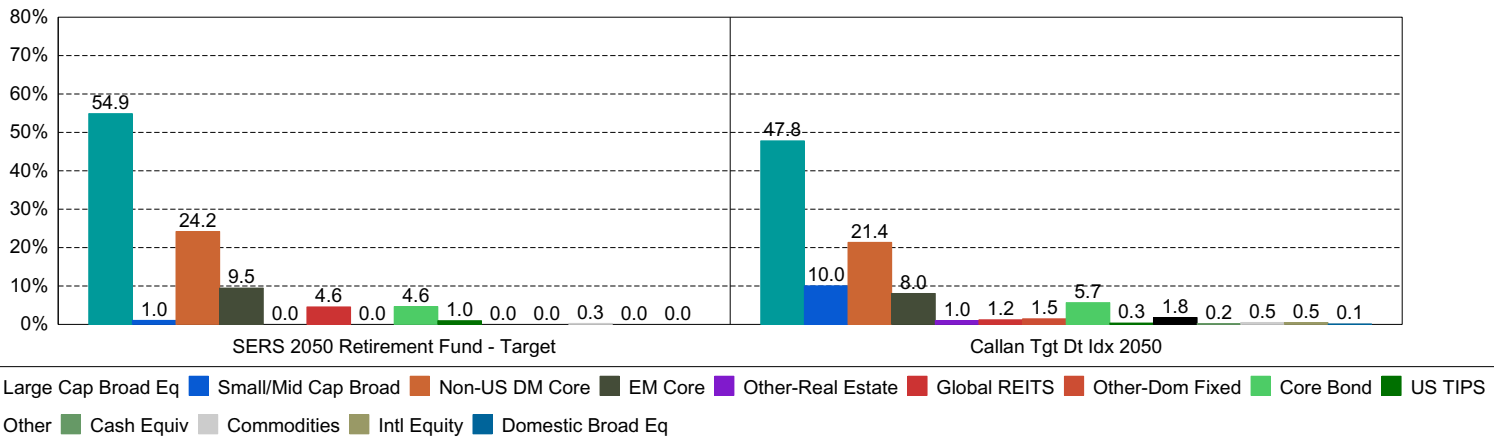
## Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

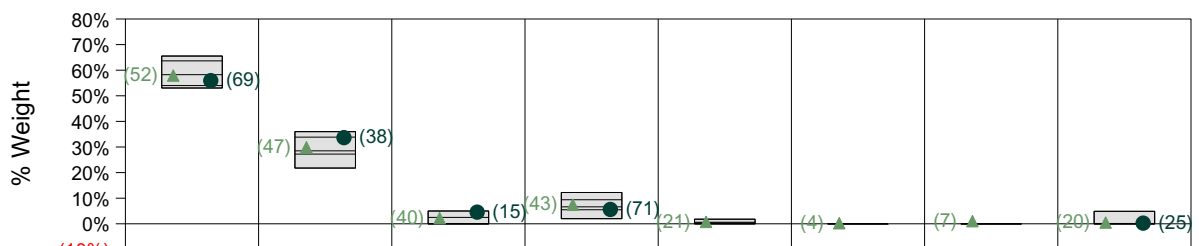
### Macro-Level Asset Allocation



### Micro-Level Asset Allocation



### Macro Asset Allocation Rankings vs. Callan Target Date 2050



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	65.53	36.00	5.00	12.23	1.80	0.00	0.00	4.88
25th Percentile	63.65	33.85	2.50	9.40	0.60	0.00	0.00	0.13
Median	58.25	28.50	0.00	6.62	0.35	0.00	0.00	0.00
75th Percentile	54.00	27.23	0.00	5.49	0.00	0.00	0.00	0.00
90th Percentile	53.04	21.78	0.00	2.00	0.00	0.00	0.00	0.00
<b>SERS 2050 Retirement Fund - Target</b>	● 55.93	33.65	4.55	5.61	-	-	-	0.26
Callan Tgt Dt Idx 2050	▲ 57.93	29.88	2.20	7.47	0.76	0.23	1.03	0.50

# SERS 2050 Retirement Fund

## Period Ended June 30, 2023

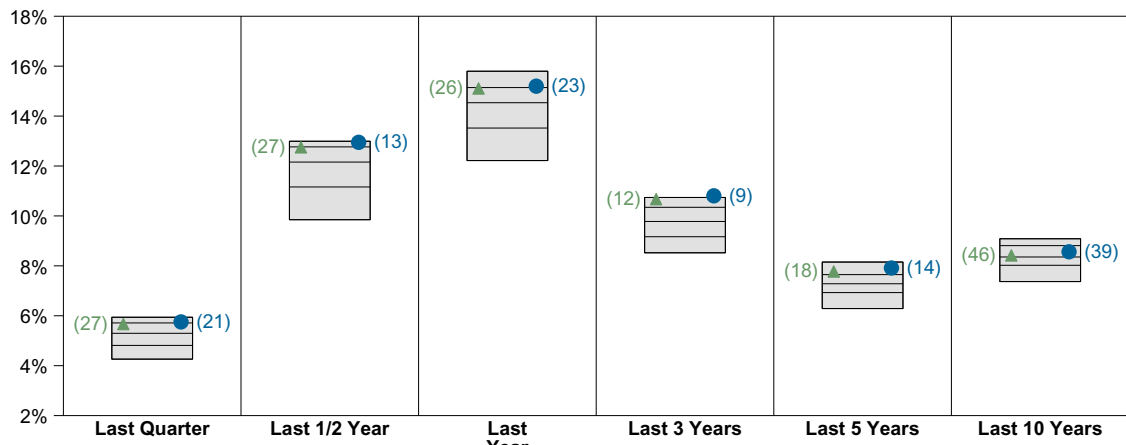
### Investment Philosophy

The BlackRock LifePath(R) Index 2050 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

### Quarterly Summary and Highlights

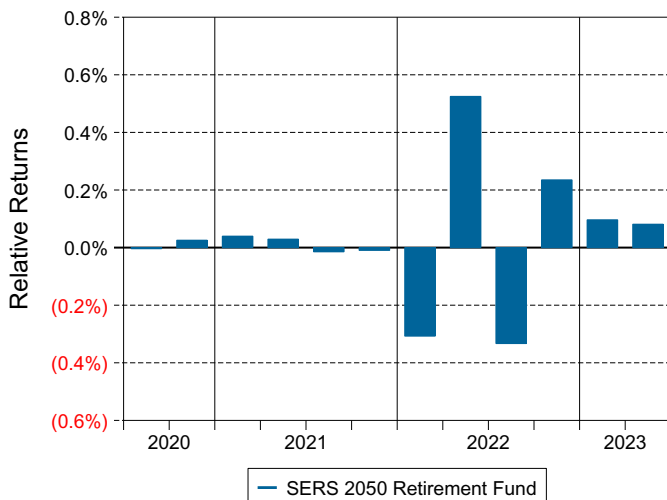
- SERS 2050 Retirement Fund's portfolio posted a 5.75% return for the quarter placing it in the 21 percentile of the Callan Target Date 2050 group for the quarter and in the 23 percentile for the last year.
- SERS 2050 Retirement Fund's portfolio outperformed the LifePath Index 2050 CB by 0.09% for the quarter and outperformed the LifePath Index 2050 CB for the year by 0.09%.

### Performance vs Callan Target Date 2050 (Net)

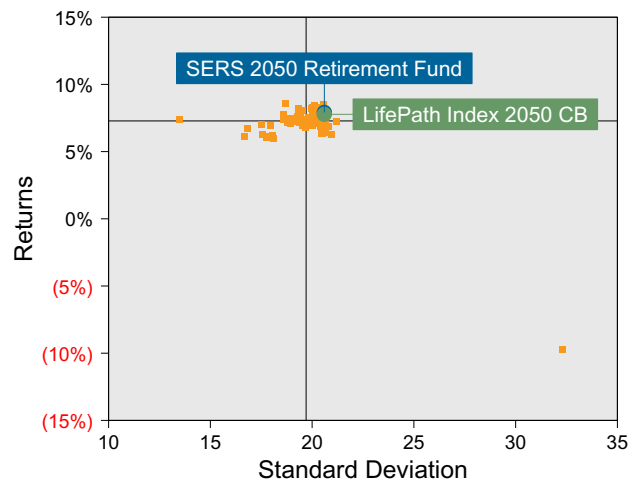


10th Percentile	5.94	12.99	15.80	10.74	8.15	9.09
25th Percentile	5.71	12.77	15.14	10.34	7.65	8.81
Median	5.30	12.16	14.54	9.78	7.28	8.35
75th Percentile	4.81	11.16	13.52	9.17	6.93	8.02
90th Percentile	4.26	9.85	12.22	8.52	6.29	7.37
<b>SERS 2050 Retirement Fund</b>	● 5.75	12.95	15.20	10.80	7.91	8.56
LifePath Index 2050 CB	▲ 5.67	12.75	15.11	10.67	7.77	8.42

### Relative Return vs LifePath Index 2050 CB



### Callan Target Date 2050 (Net) Annualized Five Year Risk vs Return

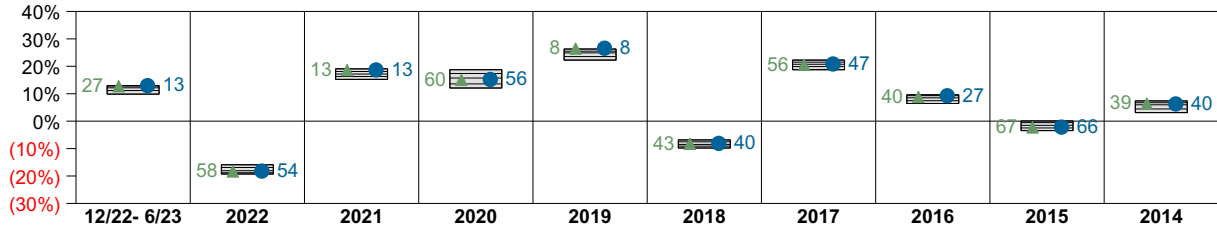


# SERS 2050 Retirement Fund Return Analysis Summary

## Return Analysis

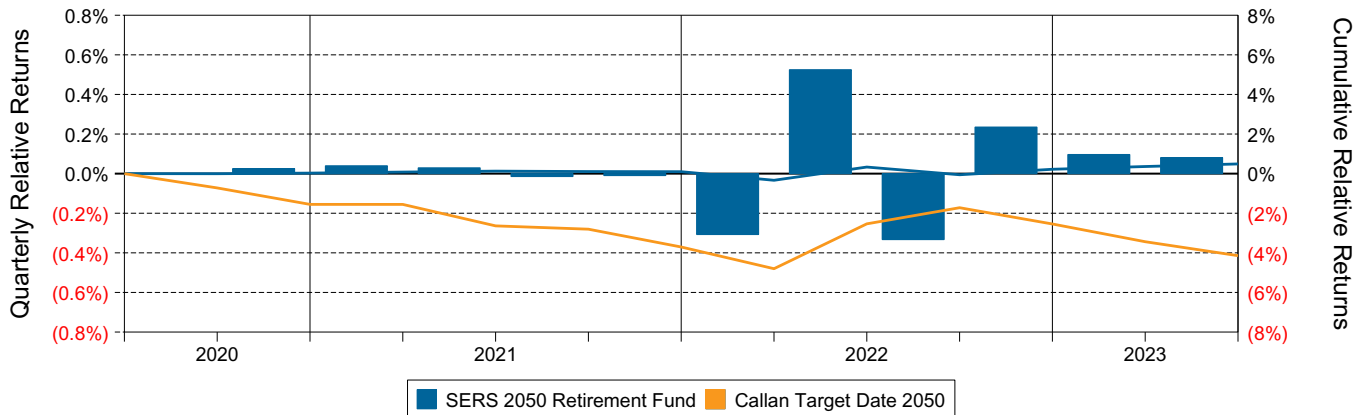
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Target Date 2050 (Net)

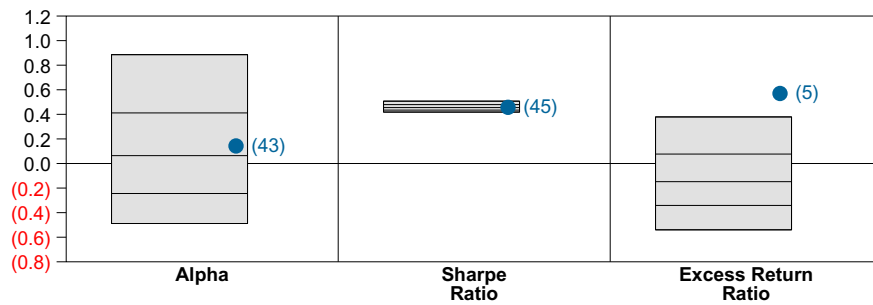


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	12.99	(15.90)	19.07	18.76	26.30	(6.84)	22.27	9.60	0.05	7.37
25th Percentile	12.77	(16.89)	18.10	17.38	25.51	(7.53)	21.51	9.29	(0.54)	6.72
Median	12.16	(18.07)	17.17	15.73	24.89	(8.48)	20.74	8.51	(1.53)	5.96
75th Percentile	11.16	(18.80)	16.27	13.59	23.55	(9.11)	19.91	7.45	(2.48)	4.45
90th Percentile	9.85	(19.28)	15.23	12.08	22.26	(9.80)	18.75	6.44	(3.45)	3.12
<b>SERS 2050 Retirement Fund</b>	● 12.95	(18.20)	18.67	15.20	26.60	(8.11)	20.85	9.26	(2.17)	6.28
LifePath Index 2050 CB	▲ 12.75	(18.30)	18.62	15.07	26.48	(8.26)	20.55	8.82	(2.26)	6.41

### Cumulative and Quarterly Relative Returns vs LifePath Index 2050 CB



### Risk Adjusted Return Measures vs LifePath Index 2050 CB Rankings Against Callan Target Date 2050 (Net) Seven Years Ended June 30, 2023

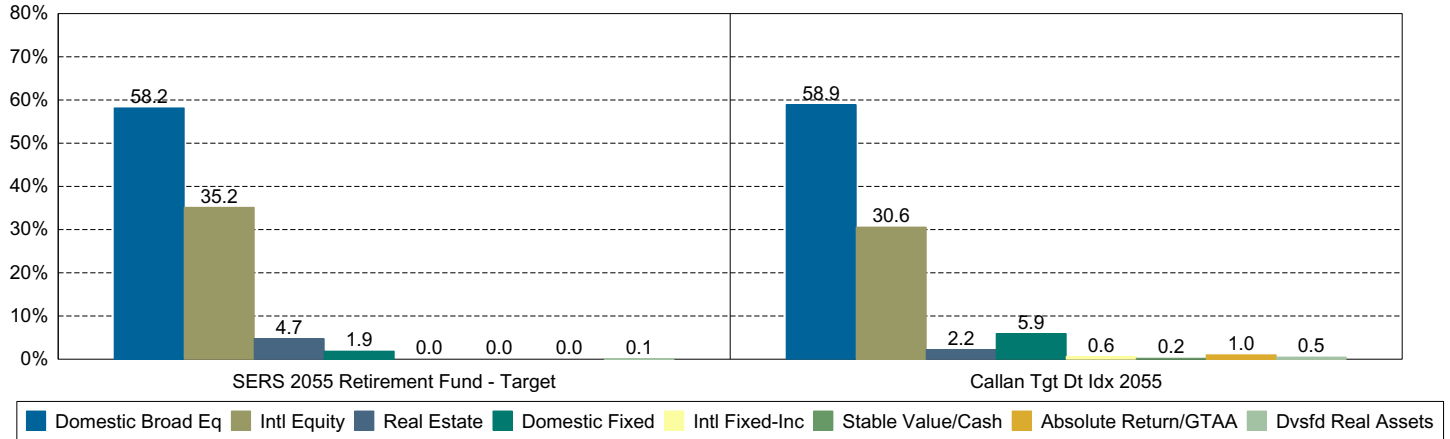


	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.89	0.51	0.38
25th Percentile	0.41	0.48	0.08
Median	0.06	0.46	(0.15)
75th Percentile	(0.24)	0.43	(0.34)
90th Percentile	(0.49)	0.42	(0.54)
<b>SERS 2050 Retirement Fund</b>	● 0.14	0.46	0.57

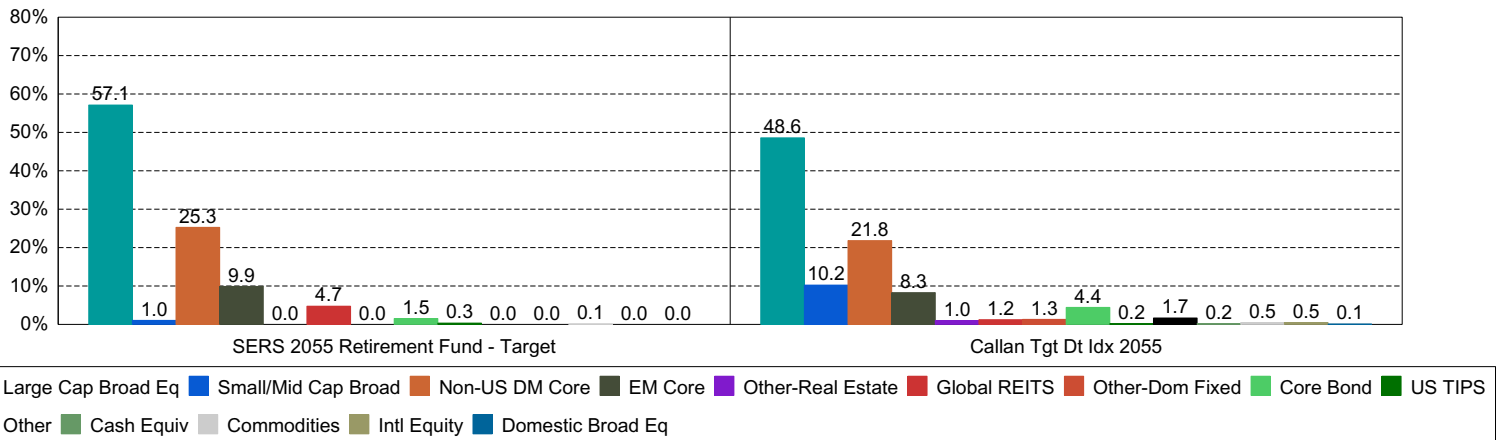
# SERS 2055 Retirement Fund Target Date Fund Asset Allocation as of June 30, 2023

The charts below illustrate the current target asset allocation of the relevant target date fund based on its underlying glide path and compares it to an index. The top charts compare target asset allocation at a high "macro" asset class level, while the middle charts show a more detailed "micro" level view. The bottom chart compares the current "macro" level target asset allocation, and index, to a relevant peer group of target date funds by ranking the various target asset class weights versus those peer target date funds.

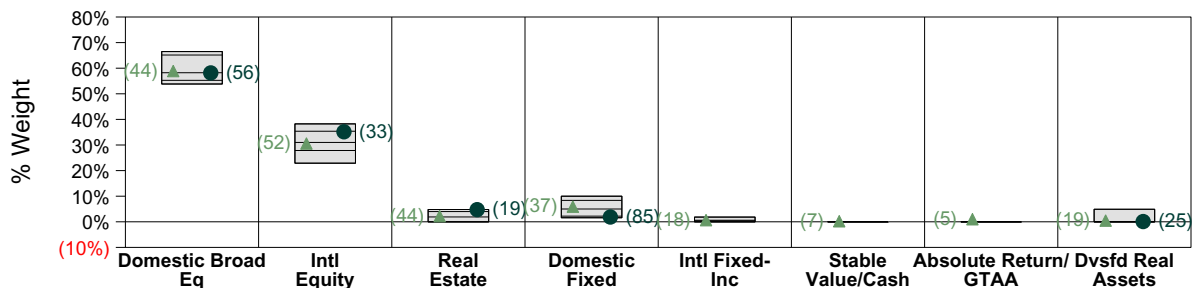
## Macro-Level Asset Allocation



## Micro-Level Asset Allocation



## Macro Asset Allocation Rankings vs. Callan Target Date 2055



	Domestic Broad Eq	Intl Equity	Real Estate	Domestic Fixed	Intl Fixed-Inc	Stable Value/Cash	Absolute Return/GTAA	Dvsfd Real Assets
10th Percentile	66.50	38.25	4.80	10.00	1.84	0.00	0.00	4.90
25th Percentile	65.15	35.38	4.00	8.36	0.60	0.00	0.00	0.07
Median	58.23	31.00	1.90	5.00	0.35	0.00	0.00	0.00
75th Percentile	55.26	27.85	0.00	2.21	0.00	0.00	0.00	0.00
90th Percentile	53.82	22.90	0.00	1.58	0.00	0.00	0.00	0.00
<b>SERS 2055 Retirement Fund - Target</b>	● 58.16	35.15	4.74	1.86	-	-	-	0.09
Callan Tgt Dt Idx 2055	▲ 58.89	30.58	2.23	5.93	0.65	0.22	1.01	0.48

# SERS 2055 Retirement Fund Period Ended June 30, 2023

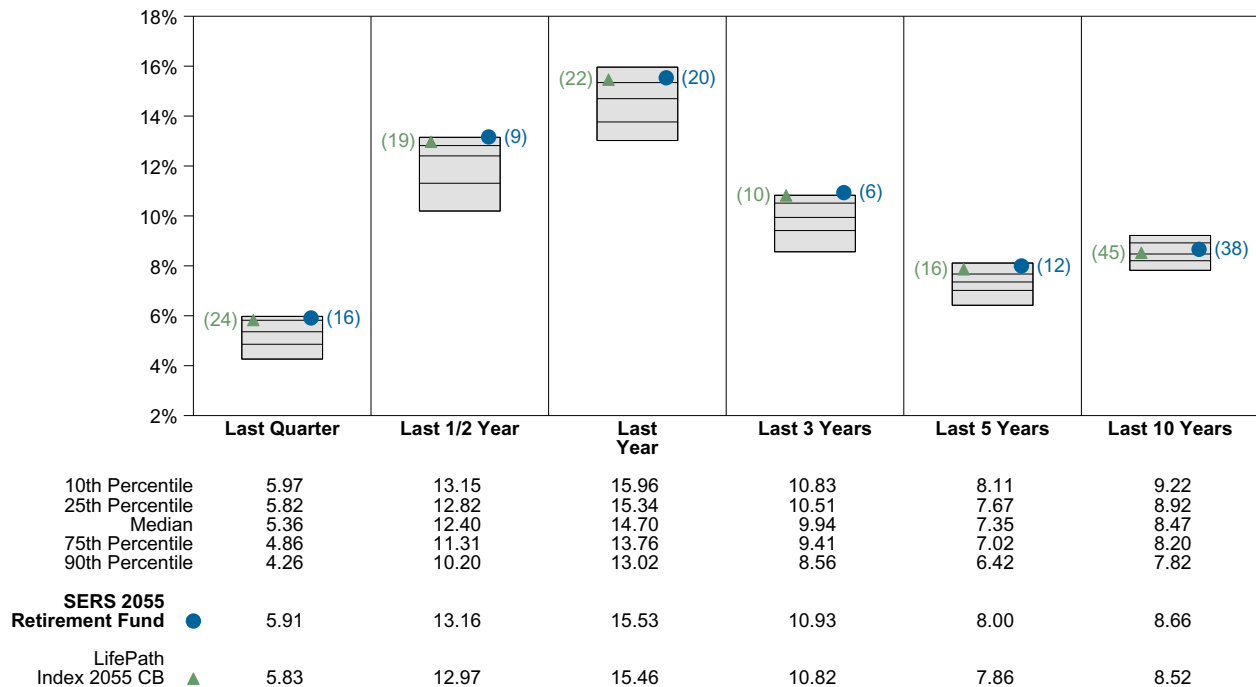
## Investment Philosophy

The BlackRock LifePath(R) Index 2055 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

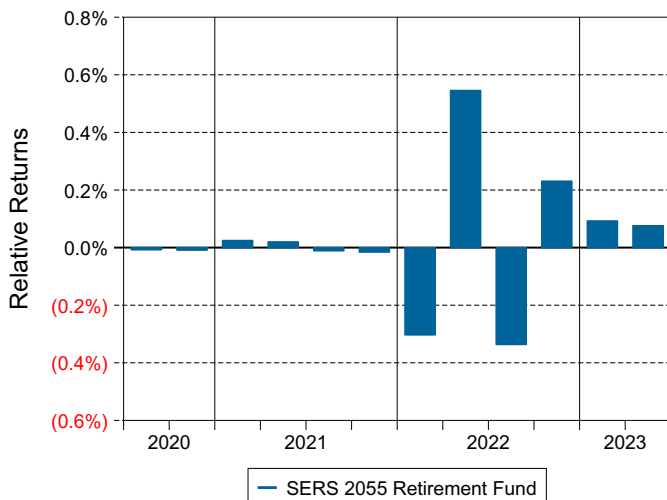
## Quarterly Summary and Highlights

- SERS 2055 Retirement Fund's portfolio posted a 5.91% return for the quarter placing it in the 16 percentile of the Callan Target Date 2055 group for the quarter and in the 20 percentile for the last year.
- SERS 2055 Retirement Fund's portfolio outperformed the LifePath Index 2055 CB by 0.08% for the quarter and outperformed the LifePath Index 2055 CB for the year by 0.07%.

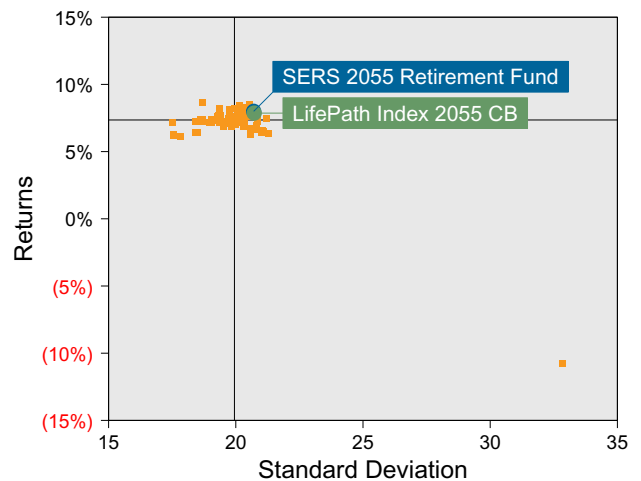
## Performance vs Callan Target Date 2055 (Net)



## Relative Return vs LifePath Index 2055 CB



## Callan Target Date 2055 (Net) Annualized Five Year Risk vs Return

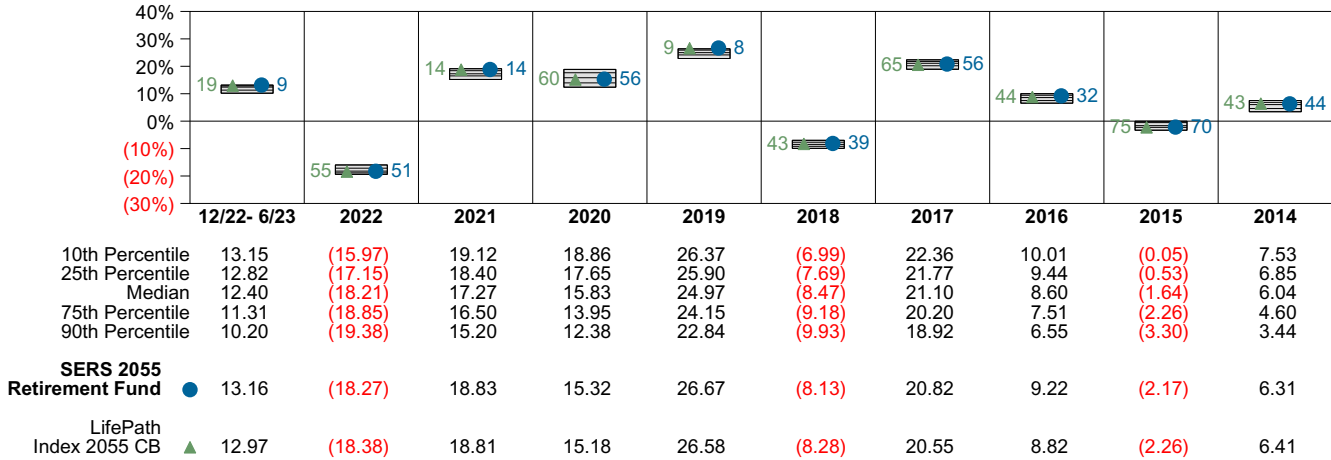


# SERS 2055 Retirement Fund Return Analysis Summary

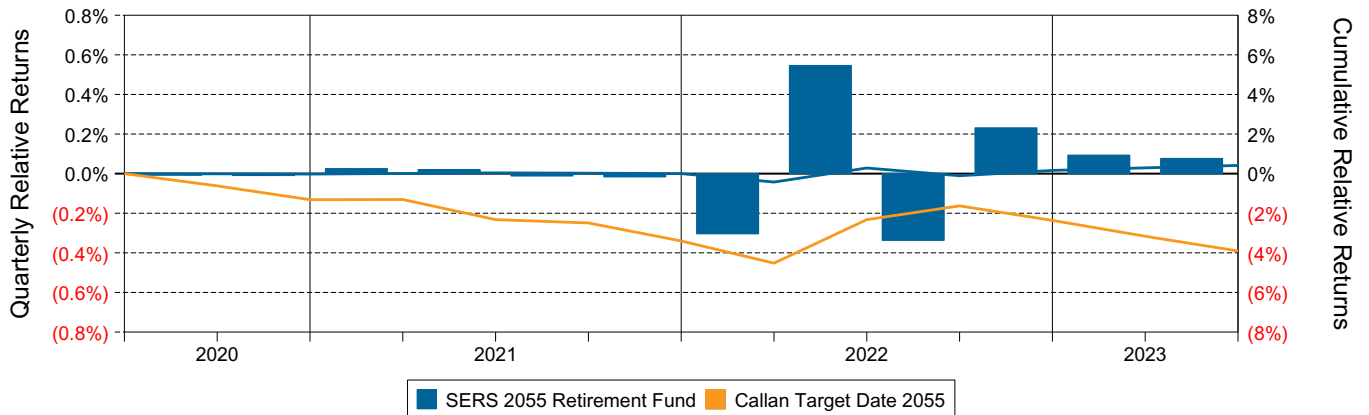
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

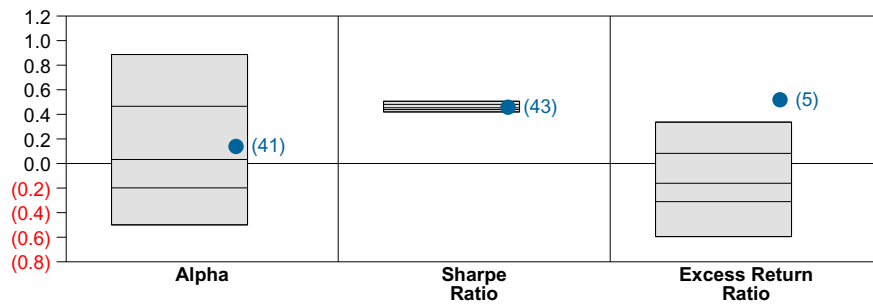
### Performance vs Callan Target Date 2055 (Net)



### Cumulative and Quarterly Relative Returns vs LifePath Index 2055 CB



### Risk Adjusted Return Measures vs LifePath Index 2055 CB Rankings Against Callan Target Date 2055 (Net) Seven Years Ended June 30, 2023



<b>SERS 2055 Retirement Fund</b>	● 0.14	0.46	0.52
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# SERS 2060 Retirement Fund

## Period Ended June 30, 2023

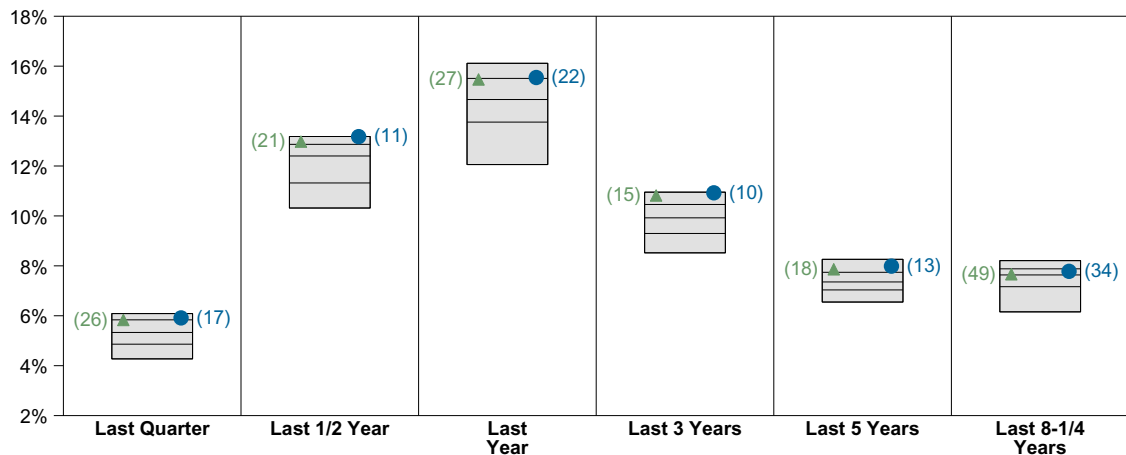
### Investment Philosophy

The BlackRock LifePath(R) Index 2060 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

### Quarterly Summary and Highlights

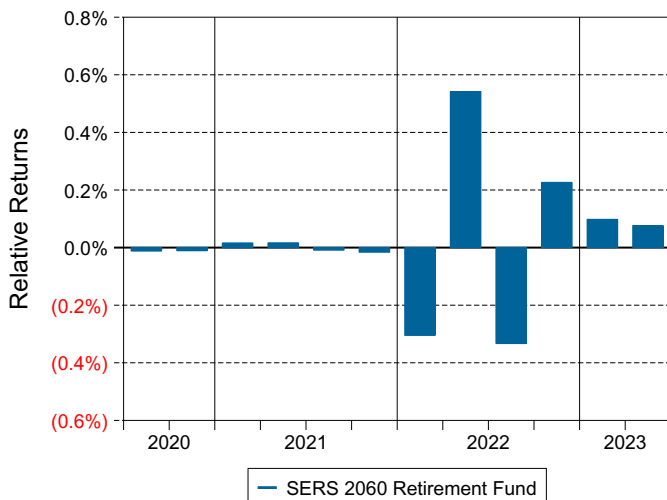
- SERS 2060 Retirement Fund's portfolio posted a 5.91% return for the quarter placing it in the 17 percentile of the Callan Target Date 2060 group for the quarter and in the 22 percentile for the last year.
- SERS 2060 Retirement Fund's portfolio outperformed the LifePath Index 2060 CB by 0.08% for the quarter and outperformed the LifePath Index 2060 CB for the year by 0.08%.

### Performance vs Callan Target Date 2060 (Net)

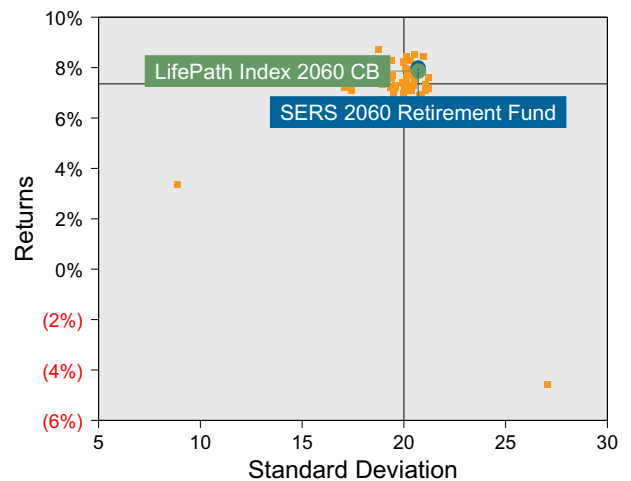


	Last Quarter	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 8-1/4 Years
10th Percentile	6.09	13.18	16.11	10.95	8.26	8.21
25th Percentile	5.84	12.87	15.51	10.46	7.74	7.88
Median	5.33	12.40	14.66	9.92	7.35	7.64
75th Percentile	4.86	11.32	13.76	9.30	7.04	7.16
90th Percentile	4.27	10.32	12.06	8.52	6.55	6.16
<b>SERS 2060 Retirement Fund</b>	<b>● 5.91</b>	<b>13.18</b>	<b>15.54</b>	<b>10.93</b>	<b>7.99</b>	<b>7.78</b>
LifePath Index 2060 CB	▲ 5.83	12.98	15.47	10.82	7.86	7.66

### Relative Return vs LifePath Index 2060 CB



### Callan Target Date 2060 (Net) Annualized Five Year Risk vs Return



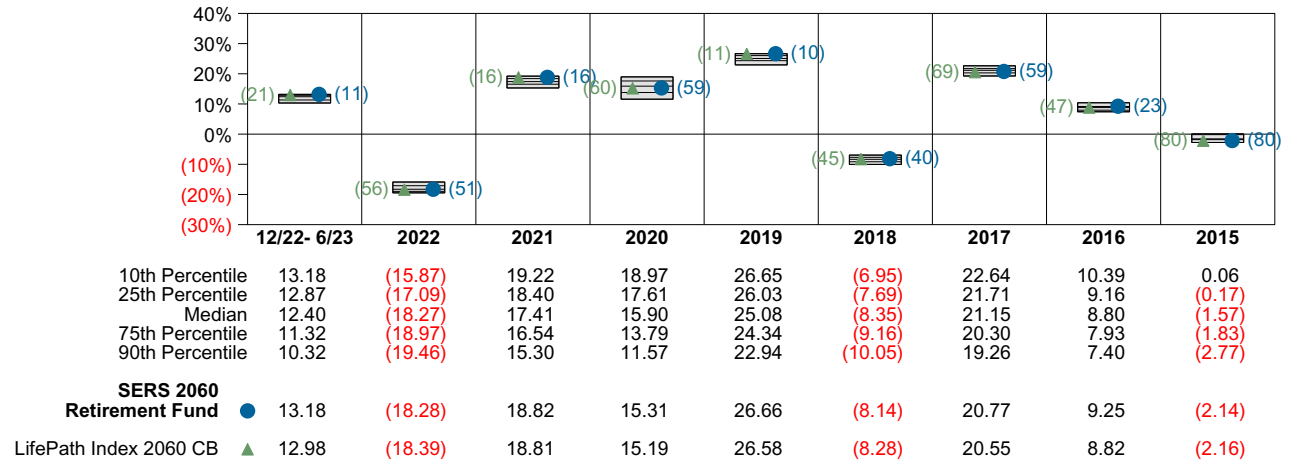


# SERS 2060 Retirement Fund Return Analysis Summary

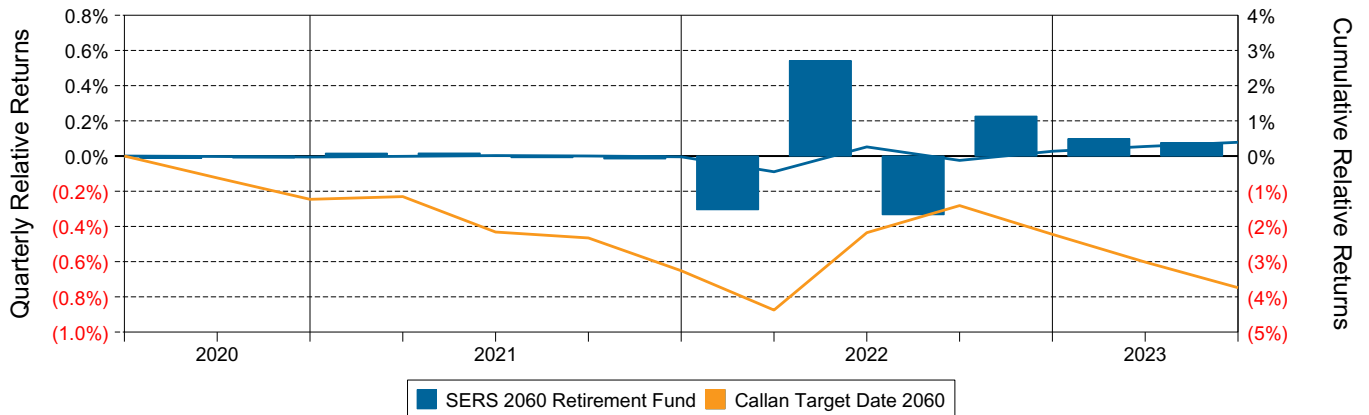
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

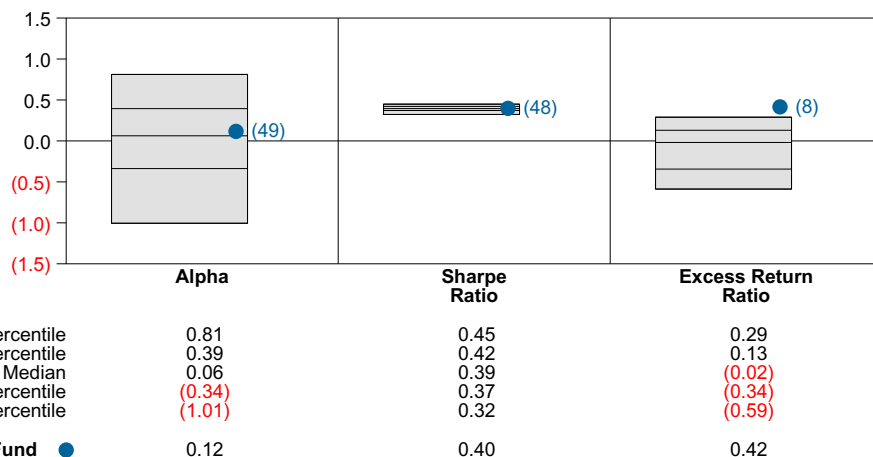
### Performance vs Callan Target Date 2060 (Net)



### Cumulative and Quarterly Relative Returns vs LifePath Index 2060 CB



### Risk Adjusted Return Measures vs LifePath Index 2060 CB Rankings Against Callan Target Date 2060 (Net) Eight and One-Quarter Years Ended June 30, 2023



# SERS 2065 Retirement Fund Period Ended June 30, 2023

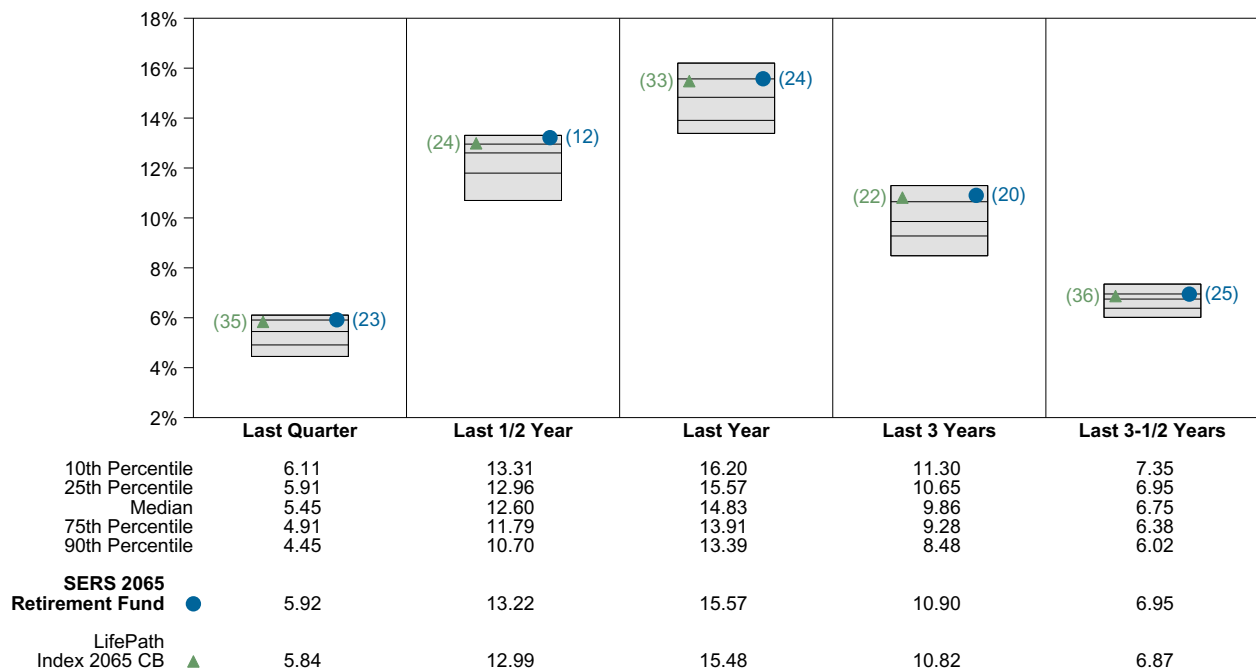
## Investment Philosophy

The BlackRock LifePath(R) Index 2065 Fund (the "Fund") seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. The Fund will be diversified across global asset classes, with allocations changing over the investment horizon to become more heavily oriented toward debt and debt-like securities, on the premise that individuals investing for retirement desire to reduce investment risk in their retirement accounts as their retirement date approaches.

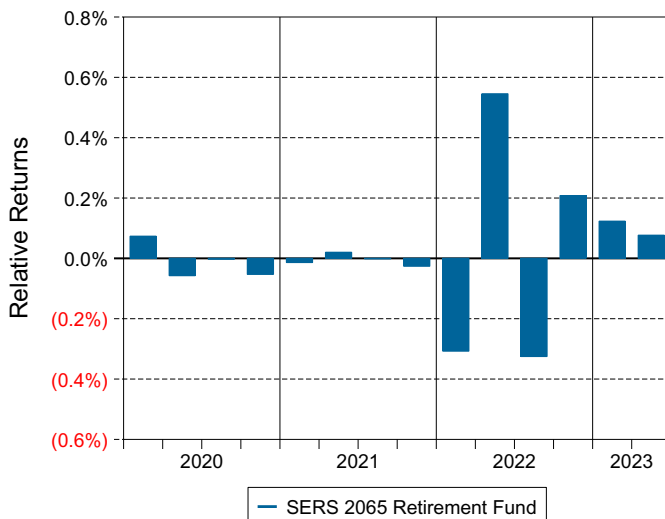
## Quarterly Summary and Highlights

- SERS 2065 Retirement Fund's portfolio posted a 5.92% return for the quarter placing it in the 23 percentile of the Callan Target Date 2065 group for the quarter and in the 24 percentile for the last year.
- SERS 2065 Retirement Fund's portfolio outperformed the LifePath Index 2065 CB by 0.08% for the quarter and outperformed the LifePath Index 2065 CB for the year by 0.09%.

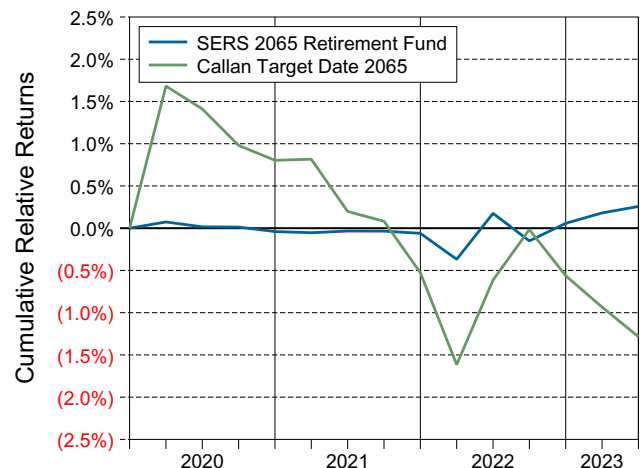
## Performance vs Callan Target Date 2065 (Net)



## Relative Return vs LifePath Index 2065 CB



## Cumulative Returns vs LifePath Index 2065 CB





# SERS U.S. Large Company Index Period Ended June 30, 2023

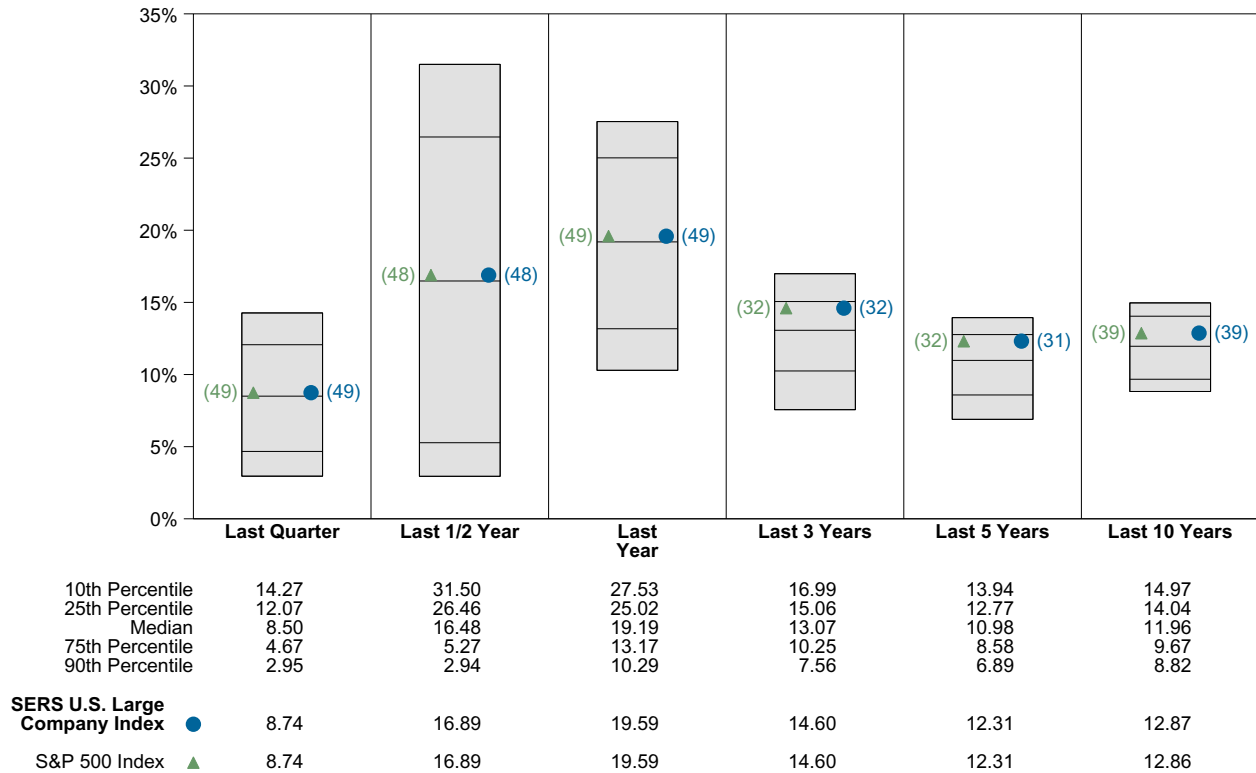
## Investment Philosophy

The strategy seeks to replicate the performance and characteristics of the S&P 500 Index with minimal tracking error. Mellon Capital uses full replication to construct the portfolio, holding each security in the index in its proportionate weight. This fund is managed by Mellon Capital Management.

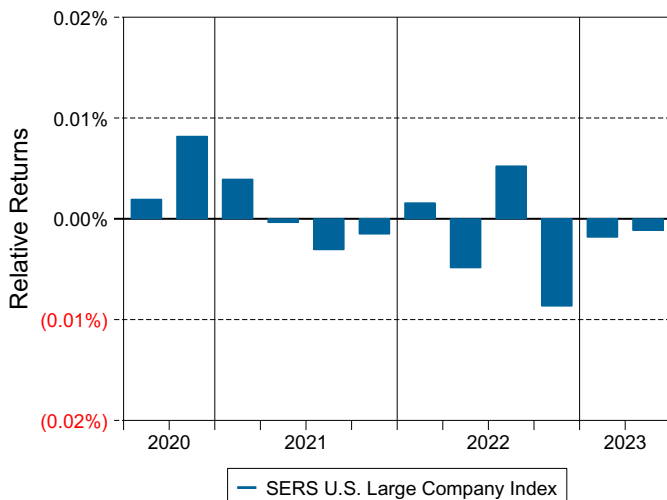
## Quarterly Summary and Highlights

- SERS U.S. Large Company Index's portfolio posted a 8.74% return for the quarter placing it in the 49 percentile of the Callan Large Cap Broad Equity Mut Funds group for the quarter and in the 49 percentile for the last year.
- SERS U.S. Large Company Index's portfolio underperformed the S&P 500 Index by 0.00% for the quarter and underperformed the S&P 500 Index for the year by 0.01%.

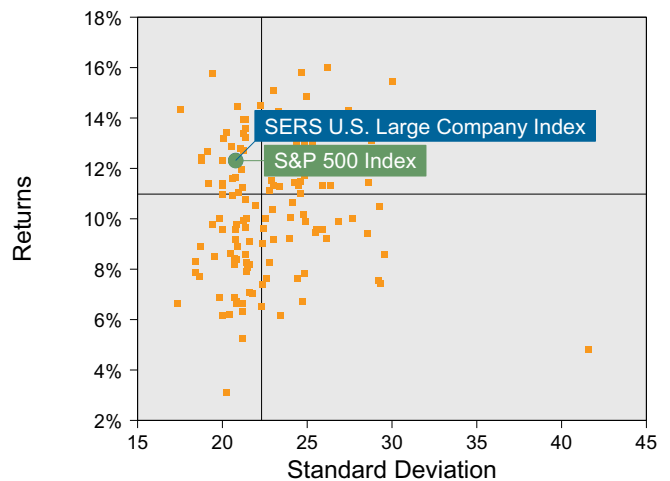
## Performance vs Callan Large Cap Broad Equity Mut Funds (Institutional Net)



## Relative Return vs S&P 500 Index



## Callan Large Cap Broad Equity Mut Funds (Institutional Net) Annualized Five Year Risk vs Return

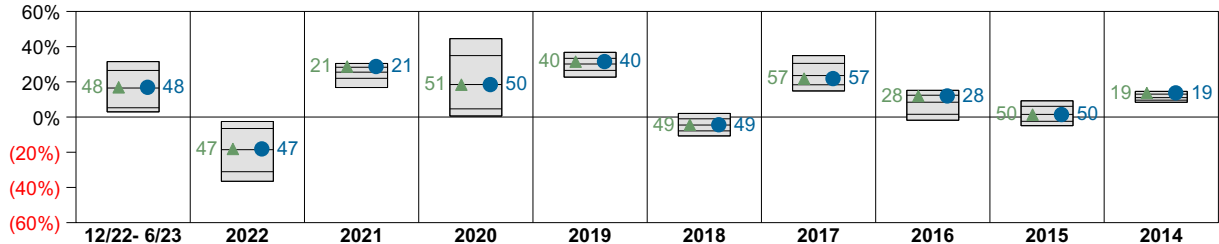


# SERS U.S. Large Company Index Return Analysis Summary

## Return Analysis

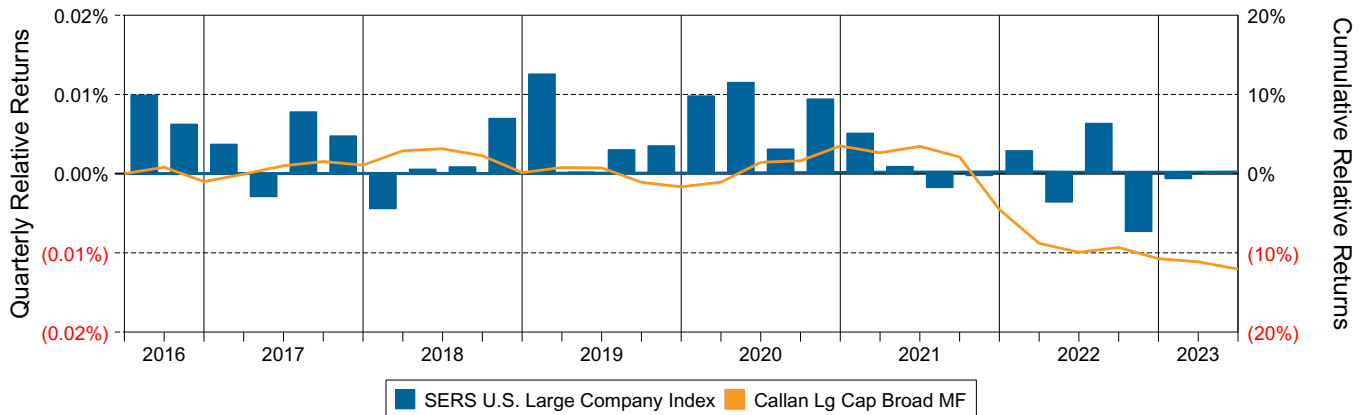
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Large Cap Broad Equity Mut Funds (Institutional Net)

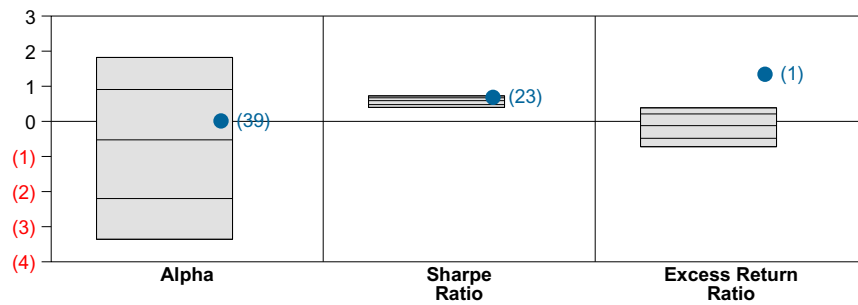


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	31.50	(2.53)	30.44	44.54	36.76	2.05	34.91	15.17	9.23	14.58
25th Percentile	26.46	(6.52)	28.29	34.90	33.34	(1.00)	30.48	12.39	6.09	13.01
Median	16.48	(18.55)	25.50	18.47	30.14	(4.54)	23.56	8.43	1.50	11.02
75th Percentile	5.27	(31.06)	22.00	4.64	26.51	(7.86)	18.33	1.56	(2.42)	9.59
90th Percentile	2.94	(36.52)	16.77	0.58	22.66	(10.72)	14.82	(1.82)	(4.91)	8.38
<b>SERS U.S. Large Company Index</b>	● 16.89	(18.11)	28.71	18.44	31.51	(4.38)	21.85	11.99	1.41	13.72
S&P 500 Index	▲ 16.89	(18.11)	28.71	18.40	31.49	(4.38)	21.83	11.96	1.38	13.69

### Cumulative and Quarterly Relative Returns vs S&P 500 Index



### Risk Adjusted Return Measures vs S&P 500 Index Rankings Against Callan Large Cap Broad Equity Mut Funds (Institutional Net) Seven Years Ended June 30, 2023



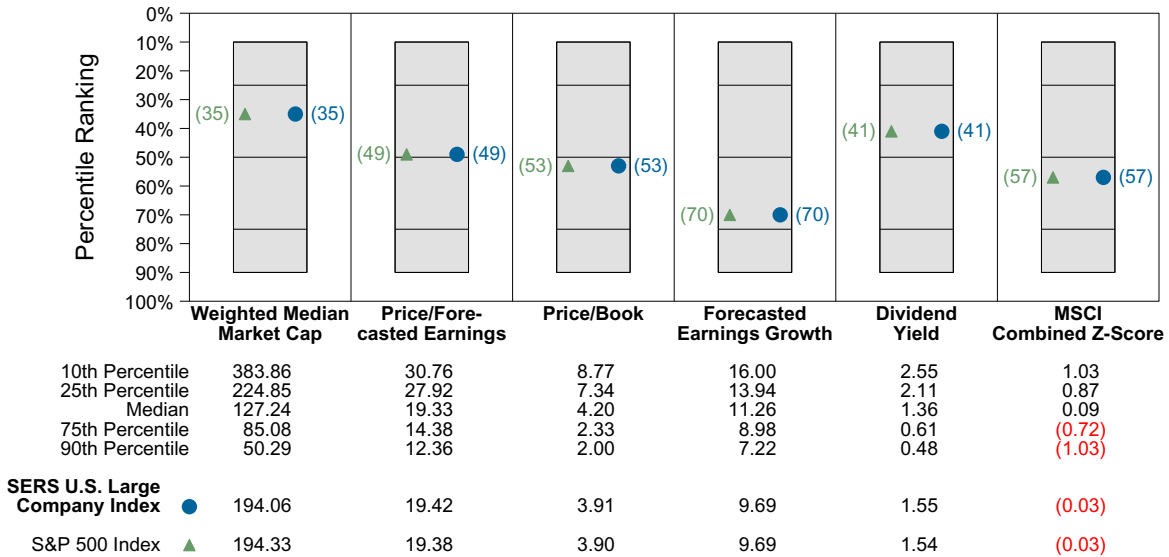
	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	1.82	0.73	0.39
25th Percentile	0.91	0.67	0.21
Median	(0.53)	0.59	(0.12)
75th Percentile	(2.20)	0.48	(0.48)
90th Percentile	(3.36)	0.40	(0.72)
<b>SERS U.S. Large Company Index</b>	● 0.01	0.68	1.34

# SERS U.S. Large Company Index Equity Characteristics Analysis Summary

## Portfolio Characteristics

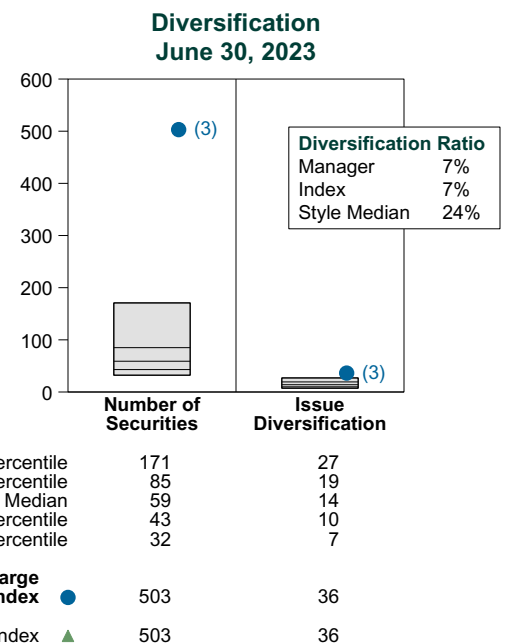
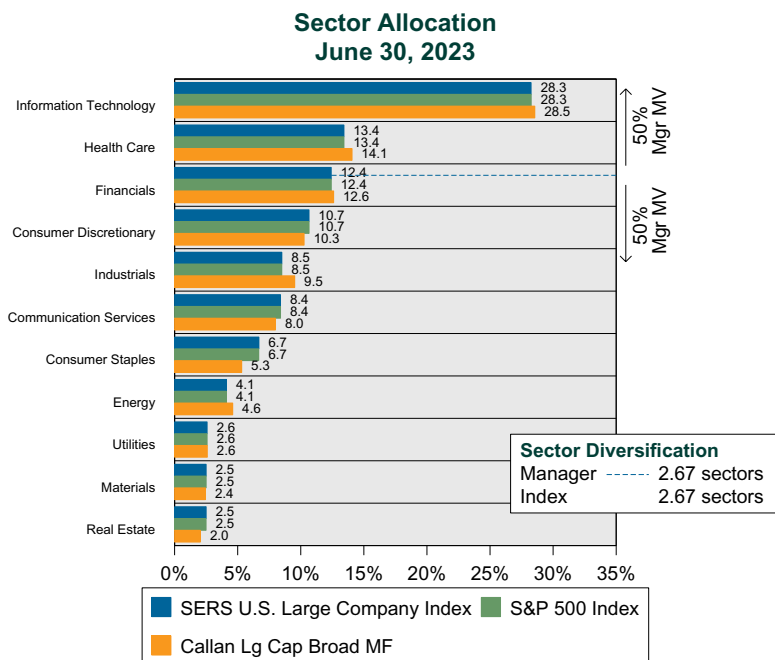
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against Callan Large Cap Broad Equity Mut Funds as of June 30, 2023



## Sector Weights

The graph below contrasts the manager's sector weights with those of the benchmark and median sector weights across the members of the peer group. The magnitude of sector weight differences from the index and the manager's sector diversification are also shown. Diversification by number and concentration of holdings are also compared to the benchmark and peer group. Issue Diversification represents by count, and Diversification Ratio by percent, the number of holdings that account for half of the portfolio's market value.



## SERS U.S. Large Company Index Top 10 Portfolio Holdings Characteristics as of June 30, 2023

### 10 Largest Holdings

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Apple Inc	Information Technology	\$462,380	7.7%	17.79%	3050.90	30.17	0.49%	7.30%
Microsoft Corp	Information Technology	\$408,246	6.8%	18.38%	2532.08	31.09	0.80%	11.65%
Amazon.Com	Consumer Discretionary	\$187,616	3.1%	26.21%	1337.54	62.67	0.00%	8.16%
Nvidia Corp	Information Technology	\$168,675	2.8%	52.31%	1044.86	47.67	0.04%	21.20%
Alphabet Inc Cl A	Communication Services	\$114,656	1.9%	15.40%	711.14	20.65	0.00%	18.40%
Tesla Mtrs Inc	Consumer Discretionary	\$113,704	1.9%	26.18%	829.68	62.87	0.00%	9.88%
Meta Platforms Inc	Communication Services	\$102,355	1.7%	35.40%	634.84	21.88	0.00%	18.50%
Alphabet Inc Cl C	Communication Services	\$99,672	1.7%	16.32%	710.58	20.98	0.00%	18.40%
Berkshire Hathaway Inc Del Cl B New	Financials	\$98,044	1.6%	10.44%	441.93	20.23	0.00%	9.41%
Unitedhealth Group	Health Care	\$72,149	1.2%	2.11%	447.49	18.18	1.56%	13.00%

### 10 Best Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Carnival Corp	Consumer Discretionary	\$3,087	0.1%	85.52%	21.08	38.67	0.00%	(15.72)%
Norwegian Cruise Line Hldgs Shs	Consumer Discretionary	\$1,494	0.0%	61.85%	9.23	18.75	0.00%	4.81%
Royal Caribbean Cruises Ltd	Consumer Discretionary	\$3,660	0.1%	58.87%	26.53	17.75	0.00%	(31.43)%
Nvidia Corp	Information Technology	\$168,675	2.8%	52.31%	1044.86	47.67	0.04%	21.20%
Generac Hldgs Inc	Industrials	\$1,510	0.0%	38.07%	9.27	21.19	0.00%	(1.44)%
Lilly (Eli) & Co	Health Care	\$59,575	1.0%	36.92%	445.19	44.71	0.96%	24.50%
Delta Air Lines Inc Del	Industrials	\$4,960	0.1%	36.14%	30.55	7.18	0.84%	37.30%
Broadcom Ltd Shs	Information Technology	\$58,309	1.0%	35.94%	357.98	19.71	2.12%	10.60%
Meta Platforms Inc	Communication Services	\$102,355	1.7%	35.40%	634.84	21.88	0.00%	18.50%
Intuitive Surgical Inc	Health Care	\$19,318	0.3%	33.85%	119.82	57.36	0.00%	15.97%

### 10 Worst Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Advance Auto Parts Inc	Consumer Discretionary	\$674	0.0%	(41.49)%	4.18	10.95	1.42%	(1.90)%
Catalent Inc	Health Care	\$1,258	0.0%	(34.01)%	7.82	35.54	0.00%	7.70%
Marketaxess Hldgs Inc	Financials	\$1,580	0.0%	(33.03)%	9.85	32.42	1.10%	13.49%
Newell Brands Inc	Consumer Discretionary	\$534	0.0%	(29.51)%	3.60	8.07	3.22%	(5.99)%
Viacomcbs Inc Cl B	Communication Services	\$1,286	0.0%	(28.47)%	9.72	15.37	6.03%	5.70%
Epam Sys Inc	Information Technology	\$2,129	0.0%	(24.83)%	13.01	21.45	0.00%	6.30%
Keycorp	Financials	\$1,385	0.0%	(24.67)%	8.64	6.23	8.87%	(2.10)%
Etsy Inc	Consumer Discretionary	\$1,672	0.0%	(24.00)%	10.44	30.79	0.00%	16.00%
Mosaic Co New	Materials	\$1,855	0.0%	(23.24)%	11.62	7.34	2.29%	(25.27)%
Moderna Inc	Health Care	\$6,406	0.1%	(20.89)%	46.32	(37.00)	0.00%	-

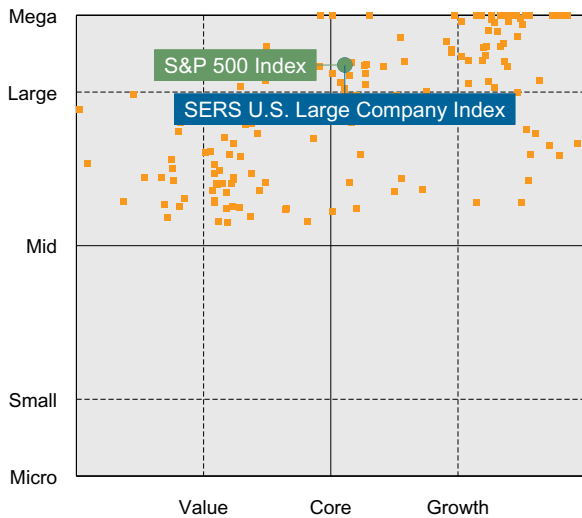
# Historical Holdings Based Style Analysis

## SERS U.S. Large Company Index

### For Three Years Ended June 30, 2023

This page analyzes the historical investment style of a portfolio utilizing a detailed holdings-based style analysis to determine average actual exposures to various market capitalization and style segments of the domestic equity market. The market is segmented quarterly by capitalization and style. The capitalization segments are dictated by capitalization decile breakpoints. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the average historical market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the average historical portfolio and index weights and stock counts (in parentheses) in each capitalization/style segment of the market. The next two style exposure charts illustrate the actual quarterly cap/style and style only segment exposures of the portfolio through history.

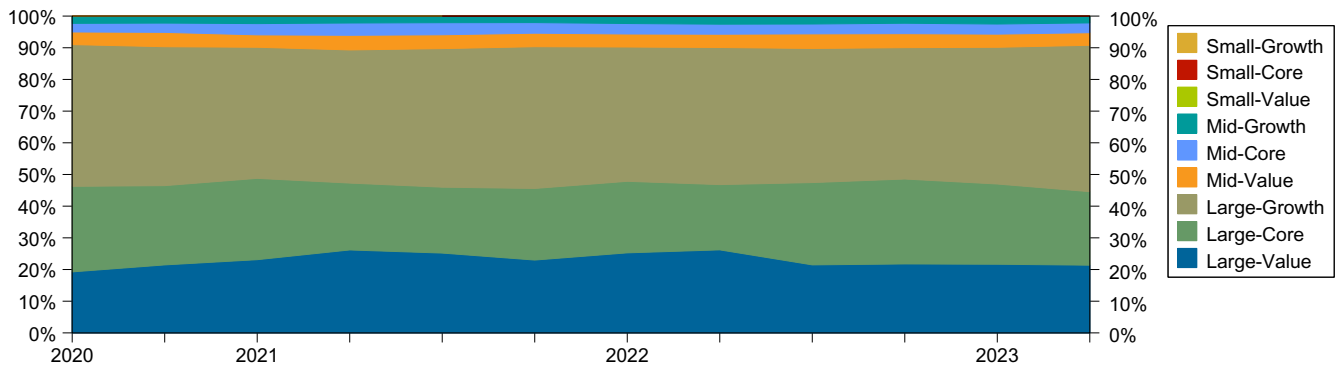
**Average Style Map vs Callan Lg Cap Broad MF Holdings for Three Years Ended June 30, 2023**



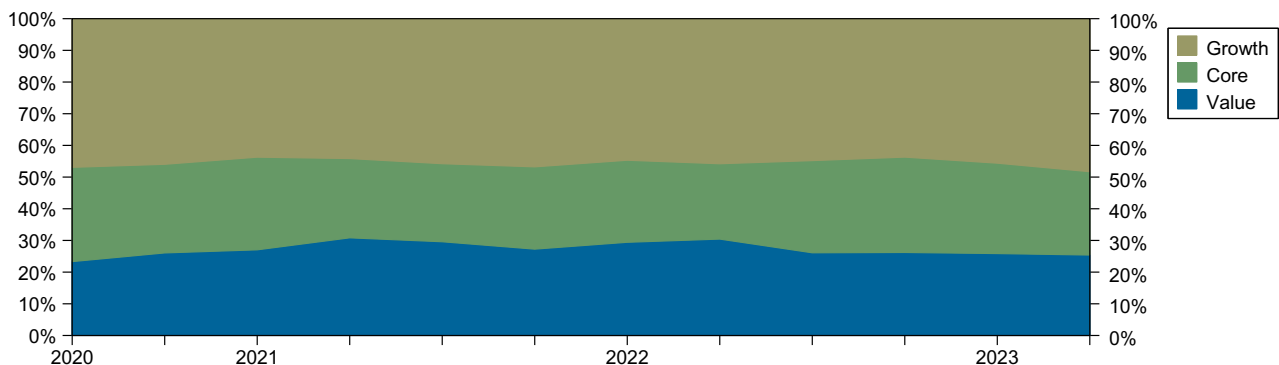
**Average Style Exposure Matrix Holdings for Three Years Ended June 30, 2023**

	Value	Core	Growth	Total
Large	23.0% (96)	23.9% (94)	43.3% (84)	<b>90.2% (274)</b>
Mid	4.3% (102)	3.3% (76)	2.2% (46)	<b>9.8% (224)</b>
Small	0.0% (4)	0.0% (2)	0.0% (1)	<b>0.1% (7)</b>
Micro	0.0% (0)	0.0% (0)	0.0% (0)	<b>0.0% (0)</b>
<b>Total</b>	<b>27.3% (202)</b>	<b>27.2% (172)</b>	<b>45.5% (131)</b>	<b>100.0% (505)</b>

### SERS U.S. Large Company Index Historical Cap/Style Exposures



### SERS U.S. Large Company Index Historical Style Only Exposures





# SERS U.S. All Company Index Fund

## Period Ended June 30, 2023

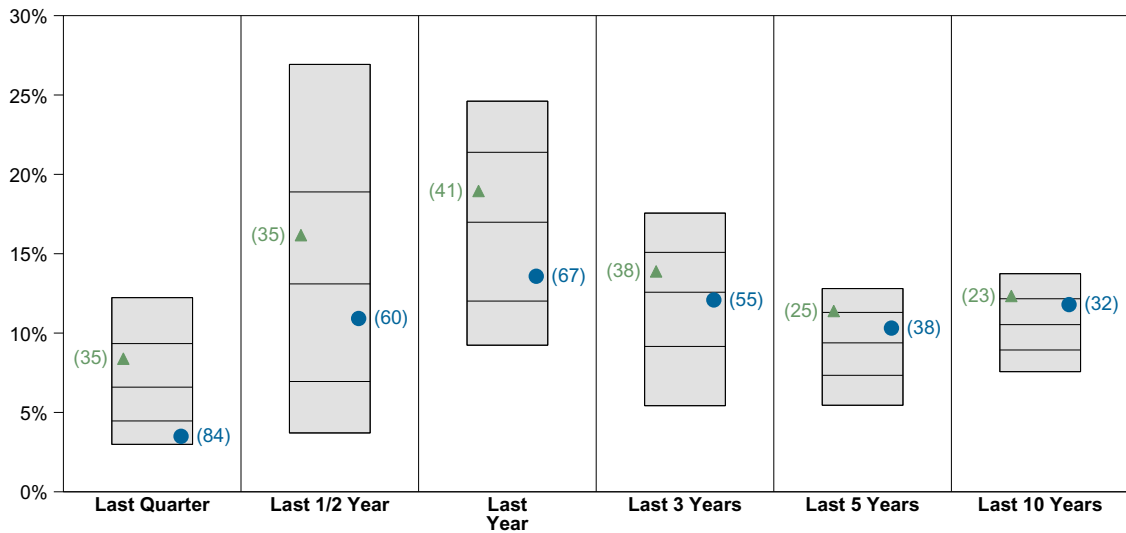
### Investment Philosophy

The U.S. All Company Stock Index Fund's Investment objective is to track the performance of the Russell 3000 index. In meeting this objective, the Fund may invest in securities and a combination of other collective funds that together are designed to track the performance of the Index. The Fund will principally invest in other affiliated bank collective funds and equity securities, including common stock of U.S. companies. This fund is managed by Mellon Capital Management.

### Quarterly Summary and Highlights

- SERS U.S. All Company Index Fund's portfolio posted a 3.50% return for the quarter placing it in the 84 percentile of the Callan Multi Cap Broad Mutual Funds group for the quarter and in the 67 percentile for the last year.
- SERS U.S. All Company Index Fund's portfolio underperformed the Russell 3000 Index by 4.89% for the quarter and underperformed the Russell 3000 Index for the year by 5.37%.

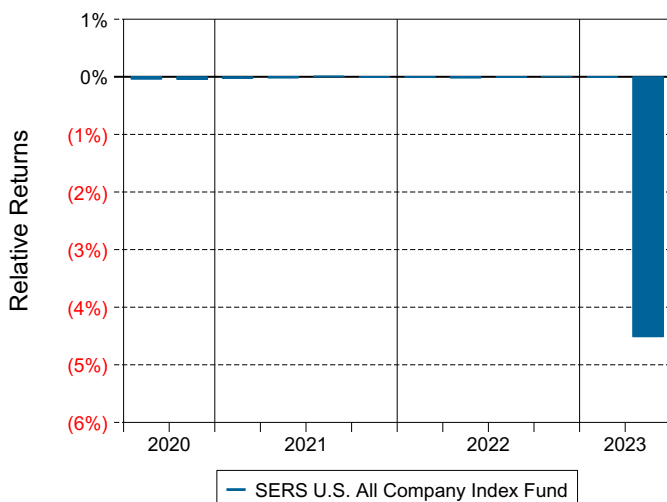
### Performance vs Callan Multi Cap Broad Mutual Funds (Institutional Net)



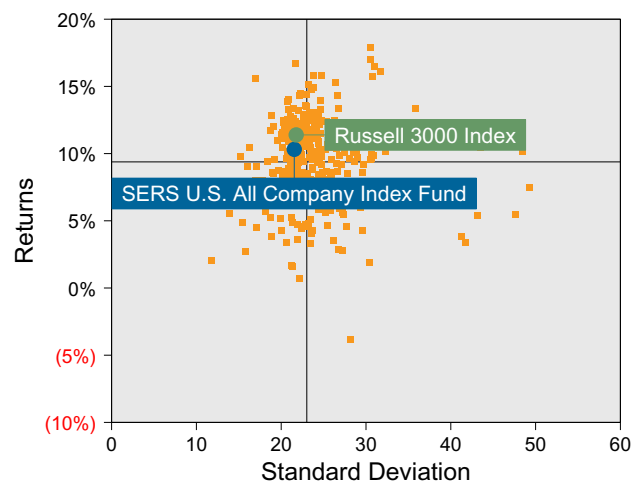
10th Percentile	12.23	26.93	24.61	17.56	12.80	13.74
25th Percentile	9.34	18.89	21.39	15.09	11.30	12.16
Median	6.59	13.10	16.98	12.57	9.38	10.53
75th Percentile	4.46	6.95	12.02	9.16	7.34	8.93
90th Percentile	2.99	3.71	9.24	5.42	5.45	7.57

		Last Quarter	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>SERS U.S. All Company Index Fund</b>	●	3.50	10.92	13.58	12.09	10.31	11.79
Russell 3000 Index	▲	8.39	16.17	18.95	13.89	11.39	12.34

### Relative Return vs Russell 3000 Index



### Callan Multi Cap Broad Mutual Funds (Institutional Net) Annualized Five Year Risk vs Return

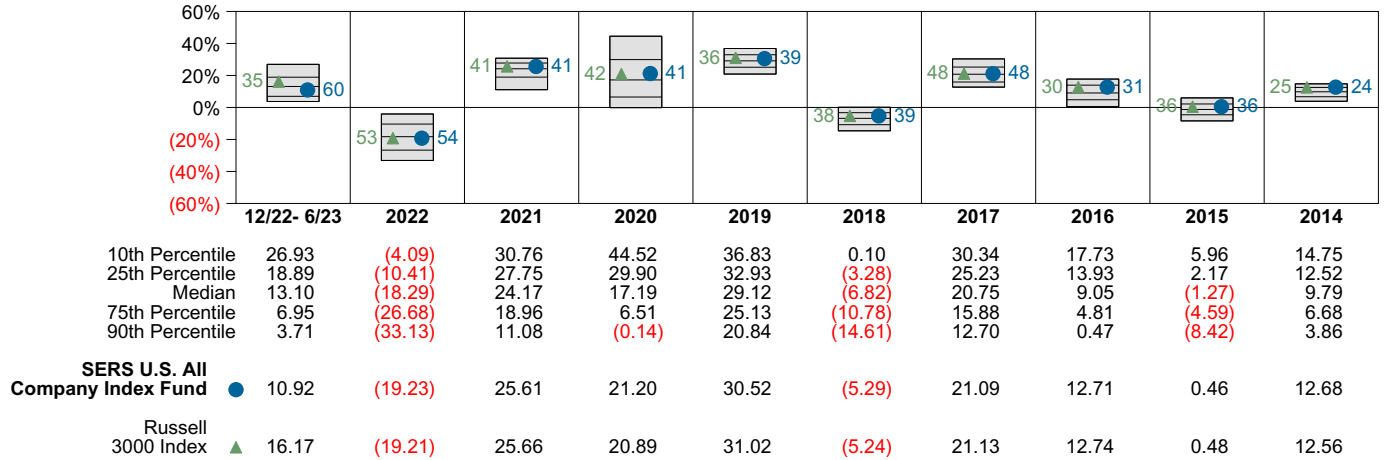


# SERS U.S. All Company Index Fund Return Analysis Summary

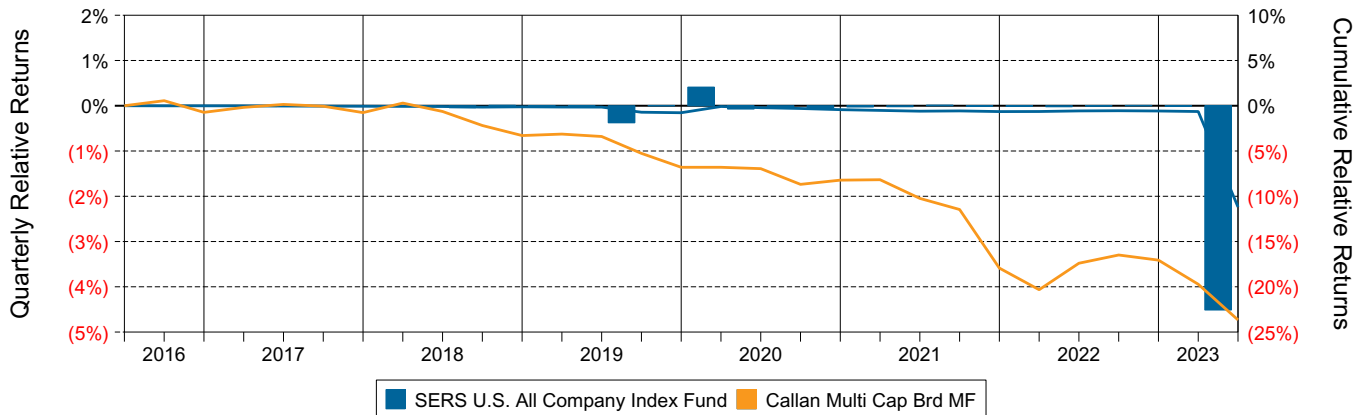
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

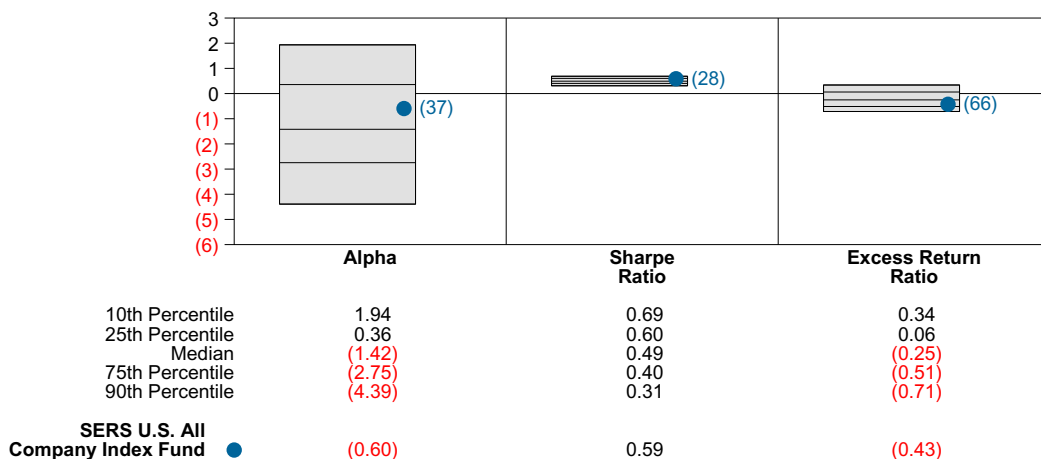
### Performance vs Callan Multi Cap Broad Mutual Funds (Institutional Net)



### Cumulative and Quarterly Relative Returns vs Russell 3000 Index



### Risk Adjusted Return Measures vs Russell 3000 Index Rankings Against Callan Multi Cap Broad Mutual Funds (Institutional Net) Seven Years Ended June 30, 2023

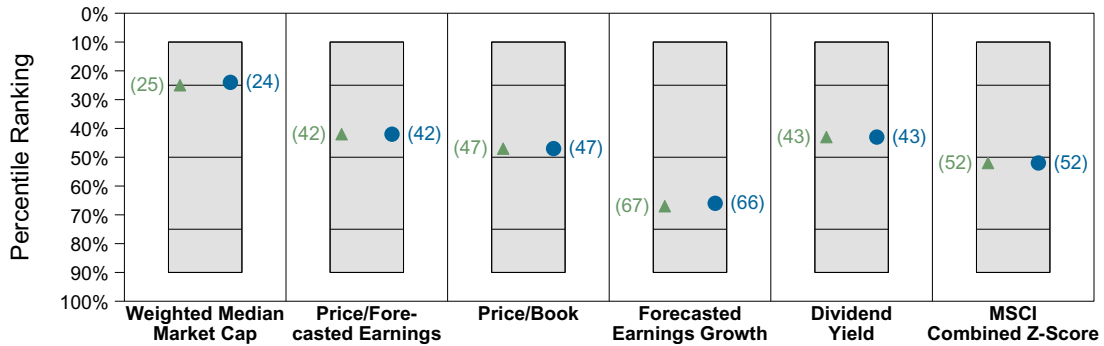


# SERS U.S. All Company Index Fund Equity Characteristics Analysis Summary

## Portfolio Characteristics

This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against Callan Multi Cap Broad Mutual Funds as of June 30, 2023

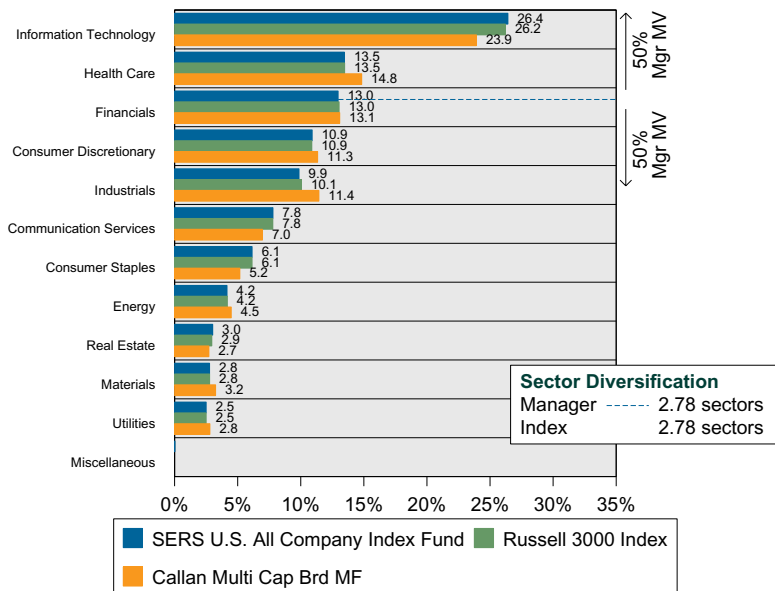


	Weighted Median Market Cap	Price/Forecasted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	218.42	29.07	7.51	16.86	2.42	0.89
25th Percentile	127.98	24.54	5.43	14.72	1.95	0.63
Median	71.60	18.03	3.37	11.87	1.38	0.03
75th Percentile	37.40	14.04	2.27	9.64	0.81	(0.56)
90th Percentile	17.14	12.32	1.90	7.34	0.51	(0.89)
<b>SERS U.S. All Company Index Fund</b>	● 129.74	19.58	3.54	10.55	1.52	(0.01)
Russell 3000 Index	▲ 128.58	19.60	3.55	10.53	1.51	(0.01)

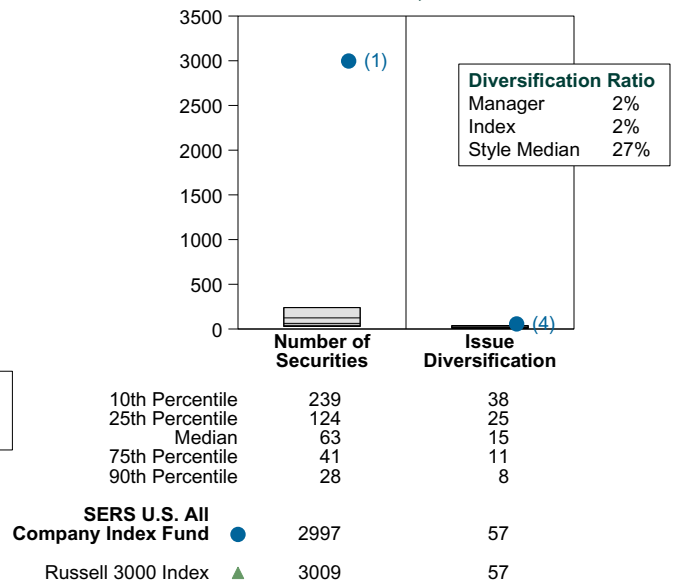
## Sector Weights

The graph below contrasts the manager's sector weights with those of the benchmark and median sector weights across the members of the peer group. The magnitude of sector weight differences from the index and the manager's sector diversification are also shown. Diversification by number and concentration of holdings are also compared to the benchmark and peer group. Issue Diversification represents by count, and Diversification Ratio by percent, the number of holdings that account for half of the portfolio's market value.

### Sector Allocation June 30, 2023



### Diversification June 30, 2023



## SERS U.S. All Company Index Fund Top 10 Portfolio Holdings Characteristics as of June 30, 2023

### 10 Largest Holdings

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Apple Inc	Information Technology	\$149,569	6.7%	17.79%	3050.90	30.17	0.49%	7.30%
Microsoft Corp	Information Technology	\$130,951	5.8%	18.38%	2532.08	31.09	0.80%	11.65%
Amazon.Com	Consumer Discretionary	\$60,684	2.7%	26.21%	1337.54	62.67	0.00%	8.16%
Nvidia Corp	Information Technology	\$51,935	2.3%	52.31%	1044.86	47.67	0.04%	21.20%
Tesla Mtrs Inc	Consumer Discretionary	\$37,318	1.7%	26.18%	829.68	62.87	0.00%	9.88%
Alphabet Inc Cl A	Communication Services	\$36,753	1.6%	15.40%	711.14	20.65	0.00%	18.40%
Meta Platforms Inc	Communication Services	\$32,798	1.5%	35.40%	634.84	21.88	0.00%	18.50%
Berkshire Hathaway Inc Del Cl B New	Financials	\$32,253	1.4%	10.44%	441.93	20.23	0.00%	9.41%
Alphabet Inc Cl C	Communication Services	\$32,189	1.4%	16.32%	710.58	20.98	0.00%	18.40%
Unitedhealth Group	Health Care	\$23,076	1.0%	2.11%	447.49	18.18	1.56%	13.00%

### 10 Best Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Cxapp Inc Cl A	Information Technology	\$2	0.0%	503.32%	0.09	(83.36)	0.00%	-
Immunogen Inc	Health Care	\$235	0.0%	391.42%	4.83	(53.15)	0.00%	-
Applied Blockchain Inc	Industrials	\$32	0.0%	317.34%	0.90	21.44	0.00%	-
Eyepoint Pharmaceuticals Inc	Health Care	\$14	0.0%	197.26%	0.30	(4.17)	0.00%	-
Carisma Therapeutics Inc	Health Care	\$12	0.0%	183.04%	0.35	(3.69)	0.00%	-
P3 Health Partners Inc	Health Care	\$6	0.0%	182.10%	0.34	(5.84)	0.00%	-
Nano X Imaging	Health Care	\$37	0.0%	168.45%	0.85	(18.55)	0.00%	-
Carvana Co Cl A	Consumer Discretionary	\$126	0.0%	164.75%	2.75	(5.11)	0.00%	-
Olema Pharmaceuticals Inc Com	Health Care	\$12	0.0%	160.31%	0.37	(3.09)	0.00%	-
Golden Bull	Information Technology	\$15	0.0%	148.90%	0.34	(16.44)	0.00%	-

### 10 Worst Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Viewray Inc	Health Care	\$2	0.0%	(89.83)%	0.06	(0.69)	0.00%	-
Rain Therapeutics	Health Care	\$1	0.0%	(86.28)%	0.03	(0.78)	0.00%	-
Fibrogen Inc	Health Care	\$12	0.0%	(85.53)%	0.26	(1.25)	0.00%	-
Homestreet Inc	Financials	\$6	0.0%	(66.56)%	0.11	6.39	6.76%	28.50%
Bioxcel Therapeutics Inc	Health Care	\$6	0.0%	(64.31)%	0.19	(1.12)	0.00%	-
Orchestra Biomed Hldgs Inc	Health Care	\$1	0.0%	(64.23)%	0.25	(4.14)	0.00%	-
Enviva Inc	Energy	\$17	0.0%	(62.43)%	0.73	(11.63)	33.36%	3.91%
Nanostring Technologies Inc	Health Care	\$10	0.0%	(59.09)%	0.19	(1.81)	0.00%	-
Loop Media Inc	Communication Services	\$4	0.0%	(58.43)%	0.13	(5.80)	0.00%	-
Adicet Bio Inc	Health Care	\$4	0.0%	(57.70)%	0.10	(0.88)	0.00%	-

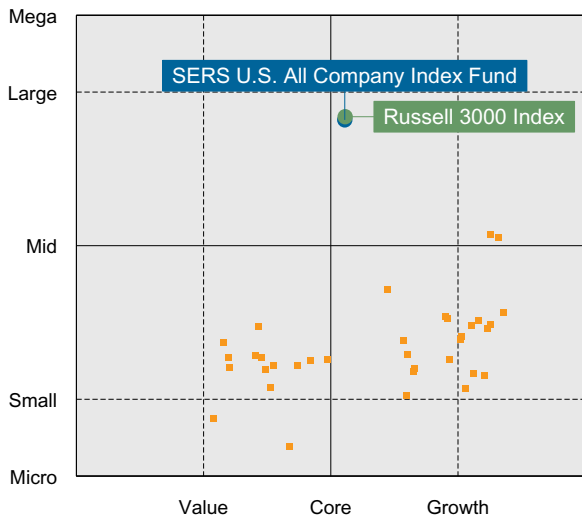
# Historical Holdings Based Style Analysis

## SERS U.S. All Company Index Fund

### For Four and 3/4 Years Ended June 30, 2023

This page analyzes the historical investment style of a portfolio utilizing a detailed holdings-based style analysis to determine average actual exposures to various market capitalization and style segments of the domestic equity market. The market is segmented quarterly by capitalization and style. The capitalization segments are dictated by capitalization decile breakpoints. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the average historical market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the average historical portfolio and index weights and stock counts (in parentheses) in each capitalization/style segment of the market. The next two style exposure charts illustrate the actual quarterly cap/style and style only segment exposures of the portfolio through history.

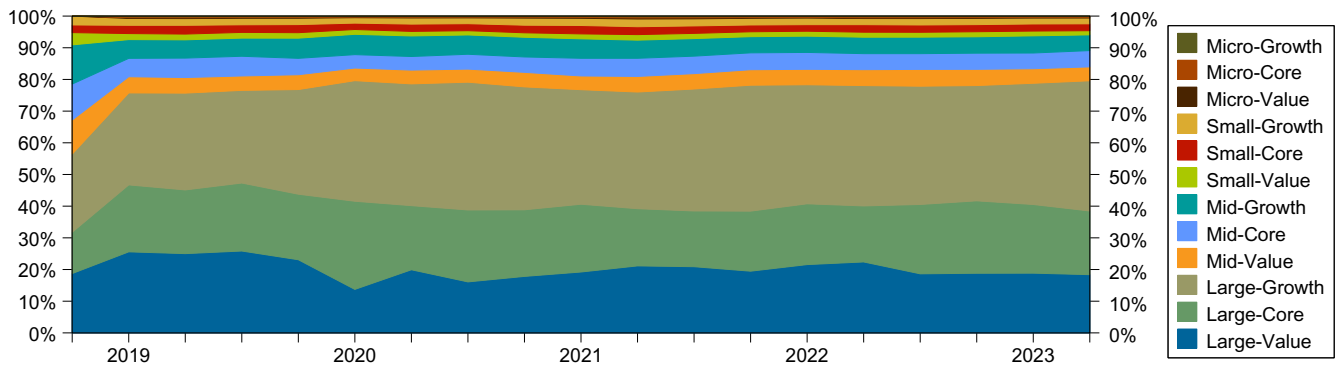
**Average Style Map vs Callan SMID Broad MFs Holdings for Four and 3/4 Years Ended June 30, 2023**



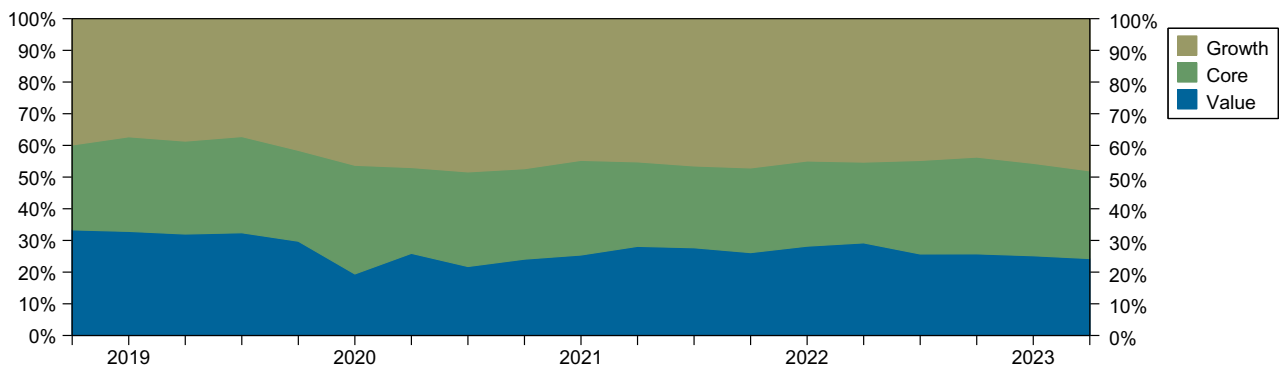
**Average Style Exposure Matrix Holdings for Four and 3/4 Years Ended June 30, 2023**

	Value	Core	Growth	Total
Large	20.3% (95)	20.4% (94)	35.9% (100)	<b>76.6% (289)</b>
	20.5% (98)	20.9% (97)	36.2% (103)	<b>77.6% (298)</b>
Mid	5.0% (165)	5.5% (205)	6.1% (220)	<b>16.6% (590)</b>
	4.7% (166)	5.2% (207)	5.7% (222)	<b>15.6% (595)</b>
Small	1.7% (297)	2.4% (481)	2.1% (370)	<b>6.1% (1148)</b>
	1.6% (308)	2.4% (499)	2.0% (385)	<b>6.0% (1192)</b>
Micro	0.2% (295)	0.3% (389)	0.1% (160)	<b>0.7% (844)</b>
	0.3% (310)	0.3% (414)	0.2% (170)	<b>0.7% (894)</b>
<b>Total</b>	<b>27.2% (852)</b>	<b>28.6% (1169)</b>	<b>44.2% (850)</b>	<b>100.0% (2871)</b>
	27.1% (882)	28.8% (1217)	44.1% (880)	100.0% (2979)

### SERS U.S. All Company Index Fund Historical Cap/Style Exposures



### SERS U.S. All Company Index Fund Historical Style Only Exposures



# SERS U.S. SMID Company Index Period Ended June 30, 2023

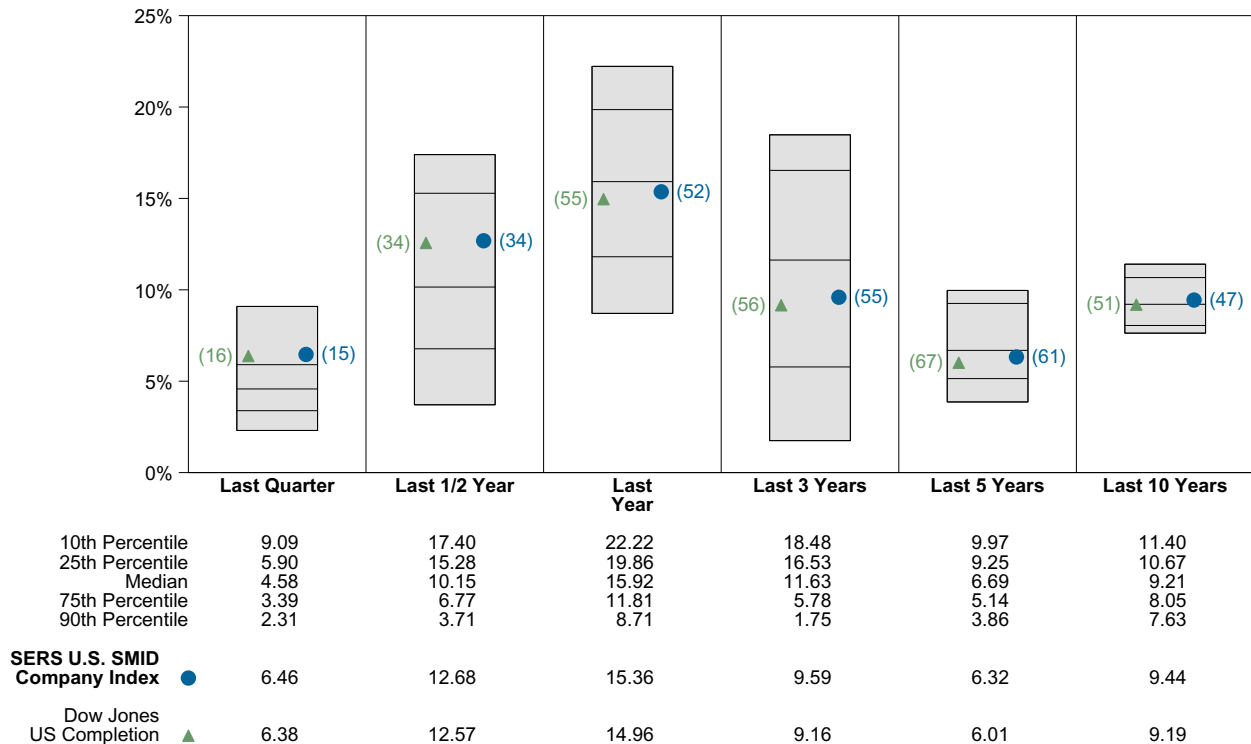
## Investment Philosophy

The objective of the U.S. Small/Mid Company Stock Index Fund is to track the performance of the Dow Jones U.S. Completion Total Stock Market Index. In meeting this objective, the Fund may invest in securities, exchange-traded/mutual funds and a combination of other collective funds that together are designed to track the performance of the Dow Jones U.S. Completion Total Stock Market Index. This fund is managed by Mellon Capital Management.

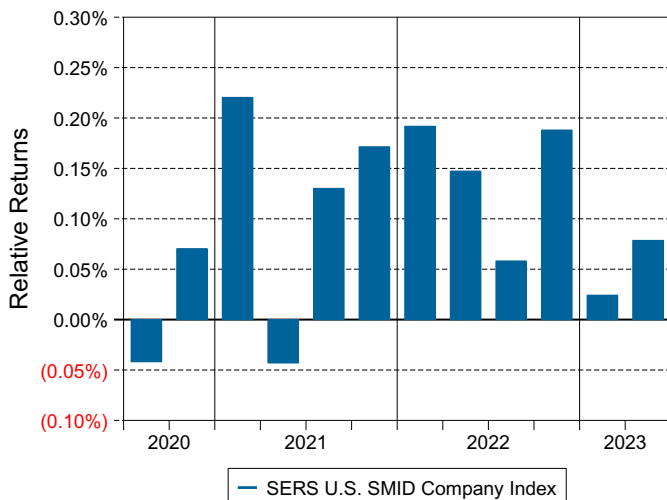
## Quarterly Summary and Highlights

- SERS U.S. SMID Company Index's portfolio posted a 6.46% return for the quarter placing it in the 15 percentile of the Callan Small/MidCap Broad Mutual Funds group for the quarter and in the 52 percentile for the last year.
- SERS U.S. SMID Company Index's portfolio outperformed the Dow Jones US Completion by 0.08% for the quarter and outperformed the Dow Jones US Completion for the year by 0.40%.

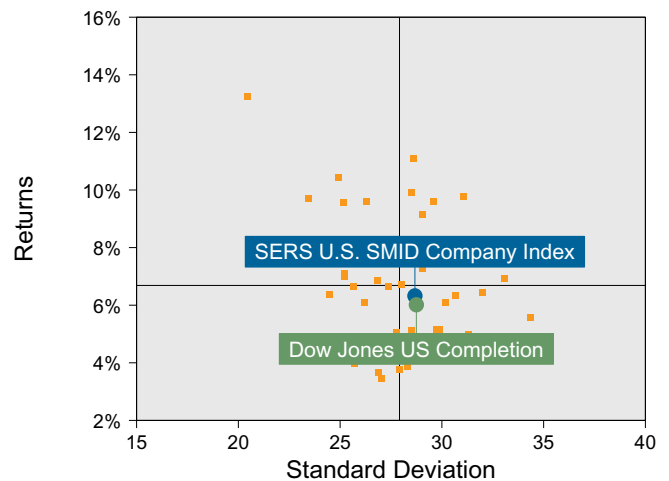
## Performance vs Callan Small/MidCap Broad Mutual Funds (Institutional Net)



## Relative Return vs Dow Jones US Completion



## Callan Small/MidCap Broad Mutual Funds (Institutional Net) Annualized Five Year Risk vs Return

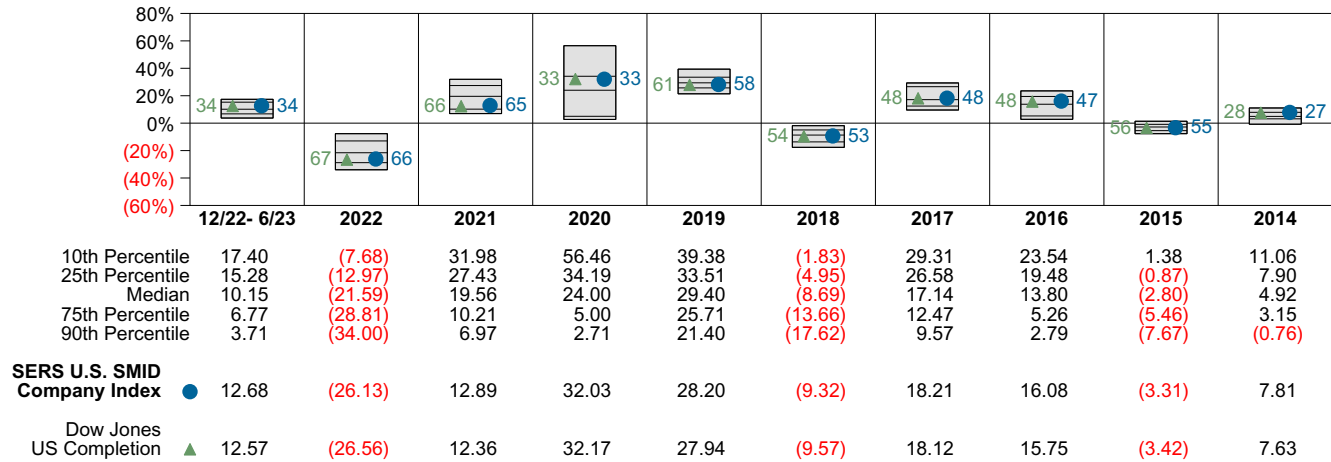


# SERS U.S. SMID Company Index Return Analysis Summary

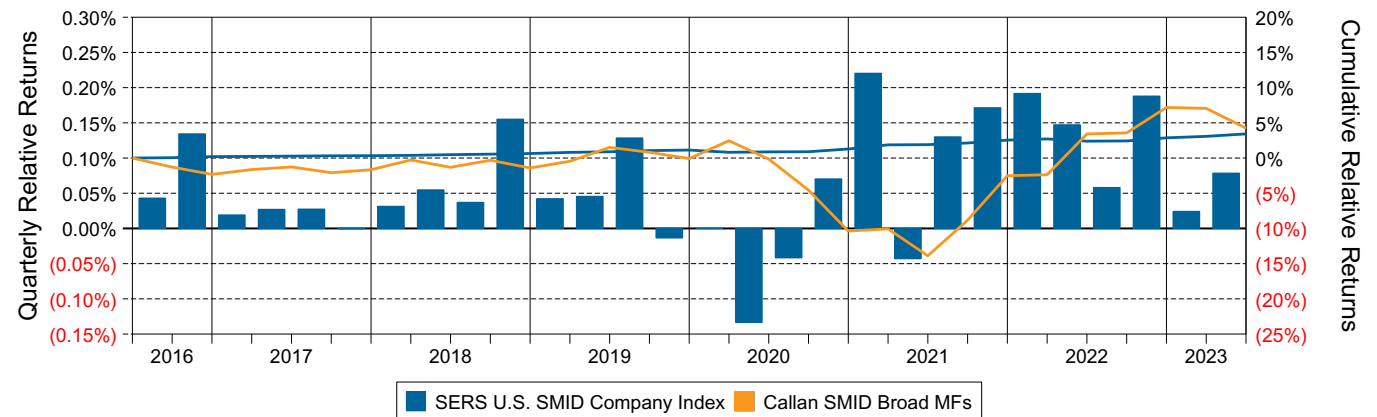
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

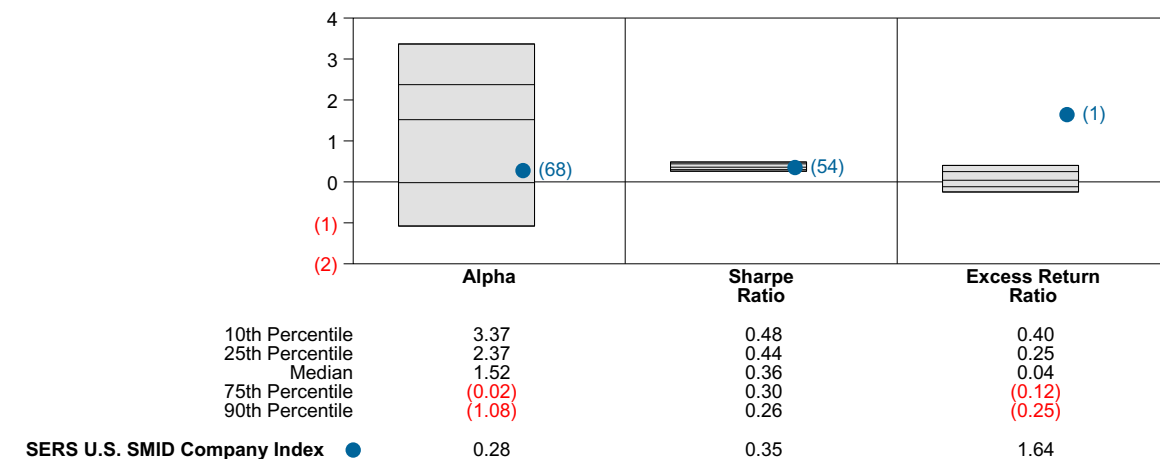
### Performance vs Callan Small/MidCap Broad Mutual Funds (Institutional Net)



### Cumulative and Quarterly Relative Returns vs Dow Jones US Completion



### Risk Adjusted Return Measures vs Dow Jones US Completion Rankings Against Callan Small/MidCap Broad Mutual Funds (Institutional Net) Seven Years Ended June 30, 2023

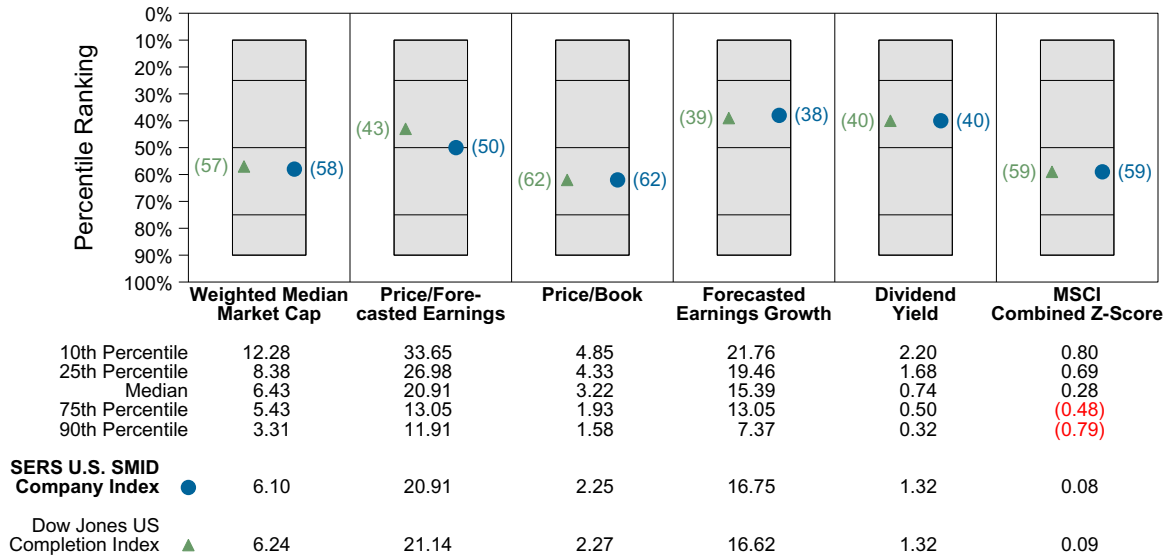


# SERS U.S. SMID Company Index Equity Characteristics Analysis Summary

## Portfolio Characteristics

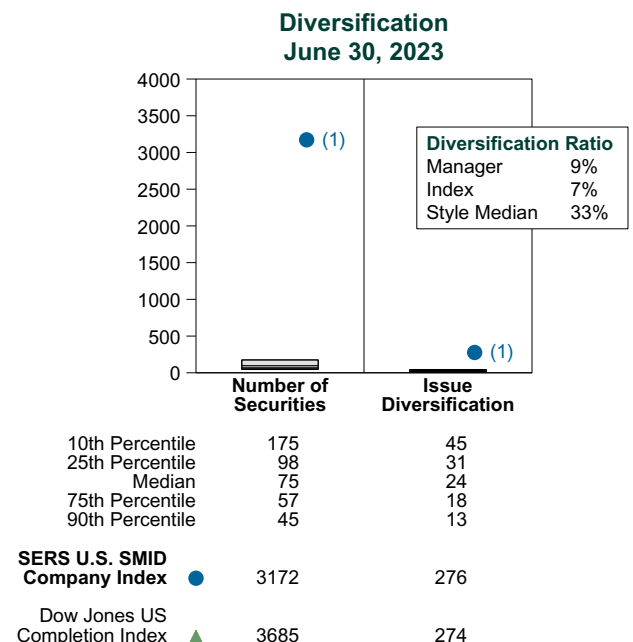
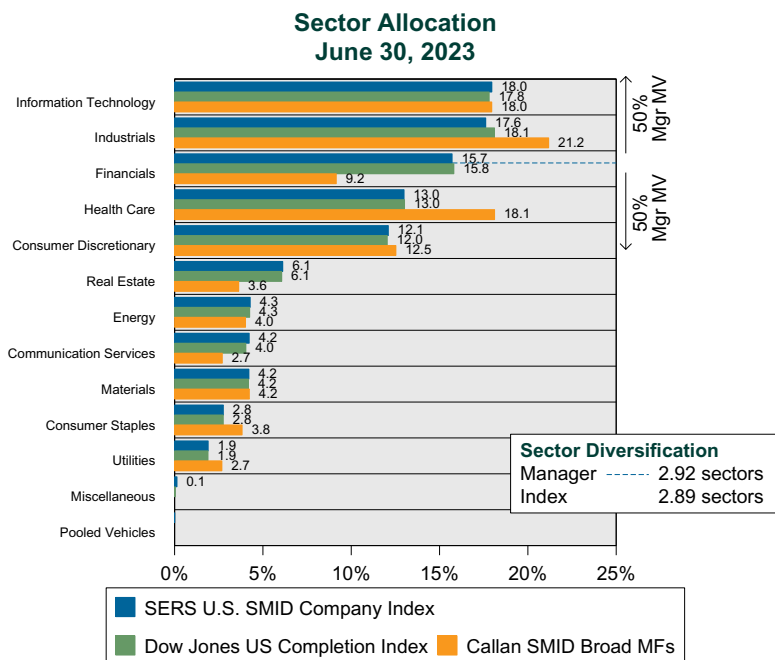
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against Callan Small/MidCap Broad Mutual Funds as of June 30, 2023



## Sector Weights

The graph below contrasts the manager's sector weights with those of the benchmark and median sector weights across the members of the peer group. The magnitude of sector weight differences from the index and the manager's sector diversification are also shown. Diversification by number and concentration of holdings are also compared to the benchmark and peer group. Issue Diversification represents by count, and Diversification Ratio by percent, the number of holdings that account for half of the portfolio's market value.





## SERS U.S. SMID Company Index Top 10 Portfolio Holdings Characteristics as of June 30, 2023

### 10 Largest Holdings

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Uber Technologies Inc	Industrials	\$13,786	1.4%	36.18%	87.37	95.09	0.00%	-
Blackstone Group Inc Com Cl A	Financials	\$10,360	1.0%	6.81%	65.64	17.91	4.19%	11.37%
Airbnb Inc Cl A Com Usd0.0001 Cl A	Consumer Discretionary	\$8,325	0.8%	3.01%	52.85	34.41	0.00%	22.00%
Marvell Technology Group Ltd	Information Technology	\$8,090	0.8%	38.27%	51.41	31.92	0.40%	14.06%
Snowflake Inc Cl A	Information Technology	\$8,036	0.8%	14.06%	57.35	234.02	0.00%	-
Workday Inc Cl A	Information Technology	\$7,341	0.7%	9.37%	46.48	39.16	0.00%	30.84%
Lululemon Athletica Inc	Consumer Discretionary	\$6,910	0.7%	3.93%	46.16	29.86	0.00%	17.30%
Cheniere Energy Inc	Energy	\$5,830	0.6%	(3.07)%	37.02	7.34	1.04%	24.80%
Square Inc Cl A	Financials	\$5,707	0.6%	(3.03)%	36.23	32.55	0.00%	39.62%
The Trade Desk Inc Com Cl A	Communication Services	\$5,394	0.5%	26.78%	34.35	57.33	0.00%	46.57%

### 10 Best Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Minerva Neurosciences Inc	Health Care	\$8	0.0%	470.39%	0.05	(5.27)	0.00%	-
Immunogen Inc	Health Care	\$692	0.1%	391.42%	4.83	(53.15)	0.00%	-
Marker Therapeutics Inc	Health Care	\$2	0.0%	336.62%	0.03	(1.67)	0.00%	-
Gsi Technology	Information Technology	\$17	0.0%	221.55%	0.14	(9.16)	0.00%	(22.31)%
Aemetis Inc	Energy	\$37	0.0%	216.33%	0.27	(5.98)	0.00%	-
Dpcm Cap Inc Com	Miscellaneous	\$20	0.0%	214.83%	0.17	(4.14)	0.00%	-
Rockwell Med Inc	Health Care	\$6	0.0%	201.56%	0.08	(13.75)	0.00%	-
Eyepoint Pharmaceuticals Inc	Health Care	\$30	0.0%	197.26%	0.30	(4.17)	0.00%	-
Diamedica Therapeutics Inc	Health Care	\$19	0.0%	188.74%	0.16	(6.82)	0.00%	-
Carisma Therapeutics Inc	Health Care	\$39	0.0%	183.04%	0.35	(3.69)	0.00%	-

### 10 Worst Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Neonode Inc Com Par	Information Technology	\$6	0.0%	-	0.12	120.60	0.00%	18.70%
Yellow Corp	Industrials	\$5	0.0%	-	0.04	(0.30)	0.00%	28.13%
Soligenix Inc	Health Care	\$0	0.0%	-	0.01	(0.37)	0.00%	-
Adamis Pharmaceuticals Corp	Health Care	\$1	0.0%	-	0.01	(0.31)	0.00%	-
Mullen Automotive Inc	Consumer Discretionary	\$1	0.0%	-	0.07	(0.00)	0.00%	-
Bellerophon Therapeutics Inc	Health Care	\$1	0.0%	(91.30)%	0.01	(0.51)	0.00%	-
Viewray Inc	Health Care	\$8	0.0%	(89.83)%	0.06	(0.69)	0.00%	-
Biocept Inc	Health Care	\$0	0.0%	(88.14)%	0.00	(0.05)	0.00%	-
Rain Therapeutics	Health Care	\$2	0.0%	(86.28)%	0.03	(0.78)	0.00%	-
Fibrogen Inc	Health Care	\$38	0.0%	(85.53)%	0.26	(1.25)	0.00%	-

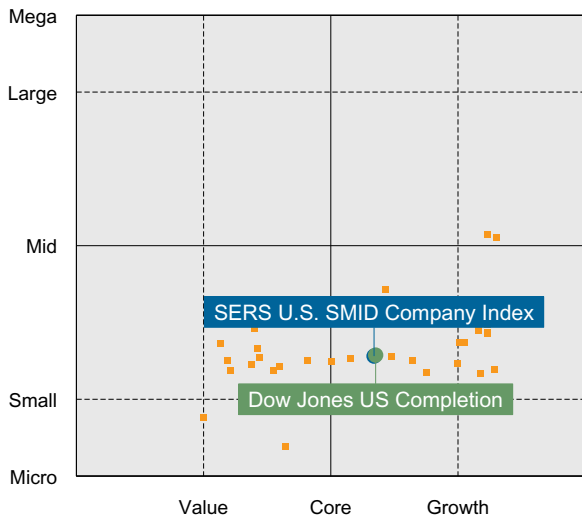
# Historical Holdings Based Style Analysis

## SERS U.S. SMID Company Index

### For Three Years Ended June 30, 2023

This page analyzes the historical investment style of a portfolio utilizing a detailed holdings-based style analysis to determine average actual exposures to various market capitalization and style segments of the domestic equity market. The market is segmented quarterly by capitalization and style. The capitalization segments are dictated by capitalization decile breakpoints. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the average historical market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the average historical portfolio and index weights and stock counts (in parentheses) in each capitalization/style segment of the market. The next two style exposure charts illustrate the actual quarterly cap/style and style only segment exposures of the portfolio through history.

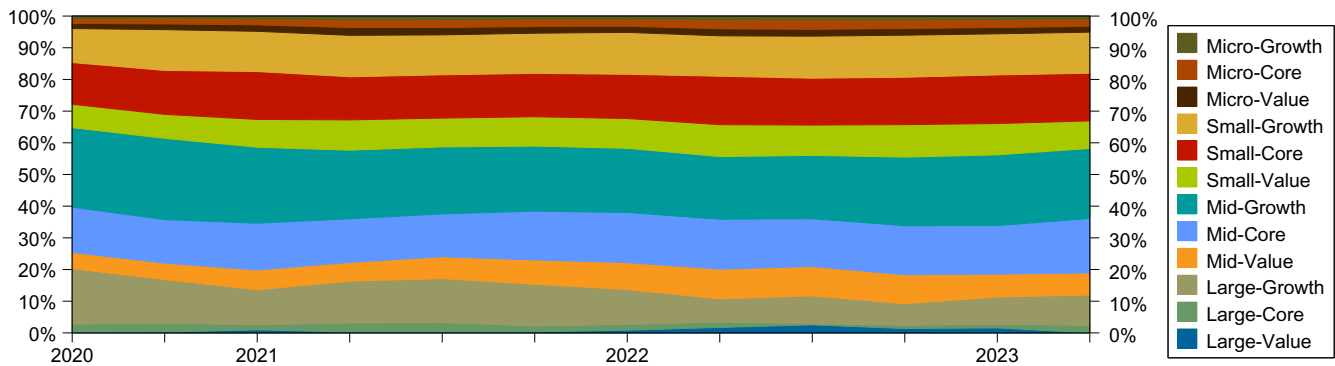
**Average Style Map vs Callan SMID Broad MFs Holdings for Three Years Ended June 30, 2023**



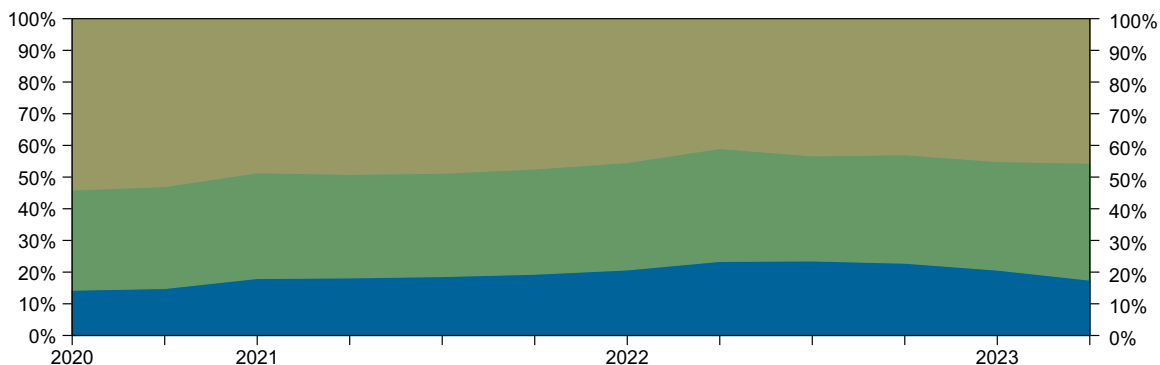
**Average Style Exposure Matrix Holdings for Three Years Ended June 30, 2023**

	0.9% (2)	1.9% (4)	11.2% (19)	<b>14.0% (25)</b>
Large	0.9% (2)	2.0% (4)	11.3% (20)	<b>14.2% (26)</b>
	7.3% (65)	15.0% (140)	22.0% (173)	<b>44.3% (378)</b>
Mid	7.2% (65)	15.0% (140)	22.1% (174)	<b>44.3% (379)</b>
	9.1% (288)	14.4% (529)	12.8% (392)	<b>36.3% (1209)</b>
Small	9.0% (288)	14.3% (530)	12.7% (395)	<b>36.0% (1213)</b>
	2.0% (563)	2.3% (681)	1.0% (224)	<b>5.4% (1468)</b>
Micro	2.0% (722)	2.4% (964)	1.0% (275)	<b>5.4% (1961)</b>
<b>Total</b>	<b>19.3% (918)</b>	<b>33.7% (1354)</b>	<b>47.0% (808)</b>	<b>100.0% (3080)</b>
	19.1% (1077)	33.7% (1638)	47.1% (864)	100.0% (3579)
	Value	Core	Growth	Total

**SERS U.S. SMID Company Index Historical Cap/Style Exposures**



**SERS U.S. SMID Company Index Historical Style Only Exposures**





# SERS Global Non-U.S. Index Fund

## Period Ended June 30, 2023

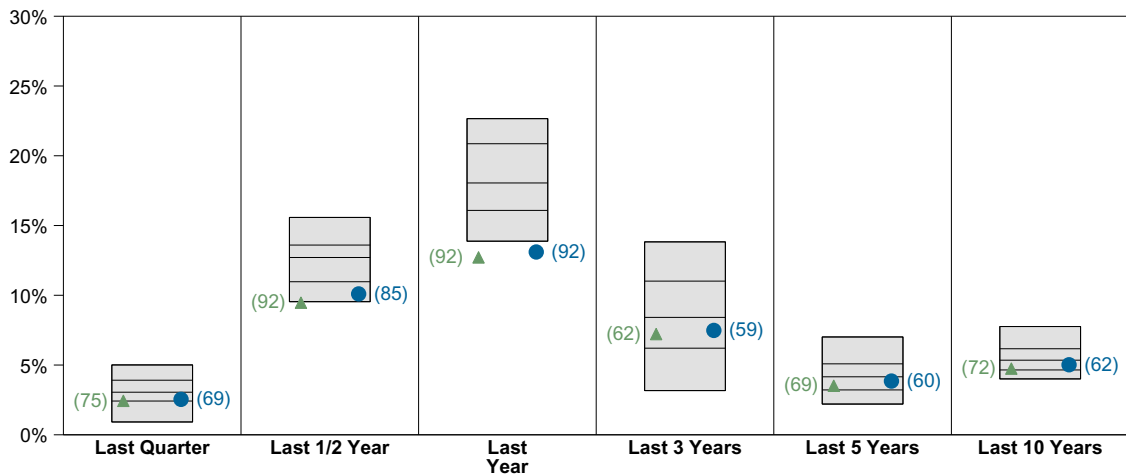
### Investment Philosophy

The Global Non-U.S. Stock Index Fund Fund seeks to track the performance of the MSCI All Country World Index (ACWI) ex-U.S. Index. In meeting this objective, the assets of the Fund may be invested in securities, and a combination of other collective funds that are designed to track the performance of such Index. The Fund will principally invest in a combination of other affiliated bank collective funds, equity securities and derivatives, including common stock of foreign companies, depository receipts, financial futures and over-the-counter derivatives that represent developed and emerging market equity securities. This fund is managed by Mellon Capital Management.

### Quarterly Summary and Highlights

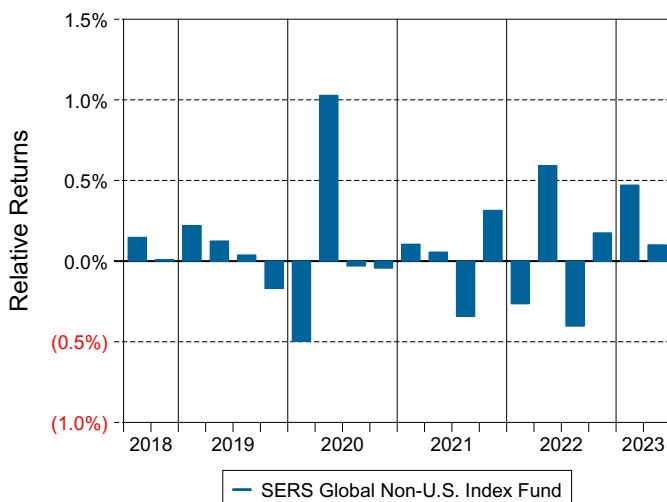
- SERS Global Non-U.S. Index Fund's portfolio posted a 2.54% return for the quarter placing it in the 69 percentile of the Callan Non US Equity Mutual Funds group for the quarter and in the 92 percentile for the last year.
- SERS Global Non-U.S. Index Fund's portfolio outperformed the MSCI ACWI xUS by 0.10% for the quarter and outperformed the MSCI ACWI xUS for the year by 0.39%.

### Performance vs Callan Non US Equity Mutual Funds (Institutional Net)

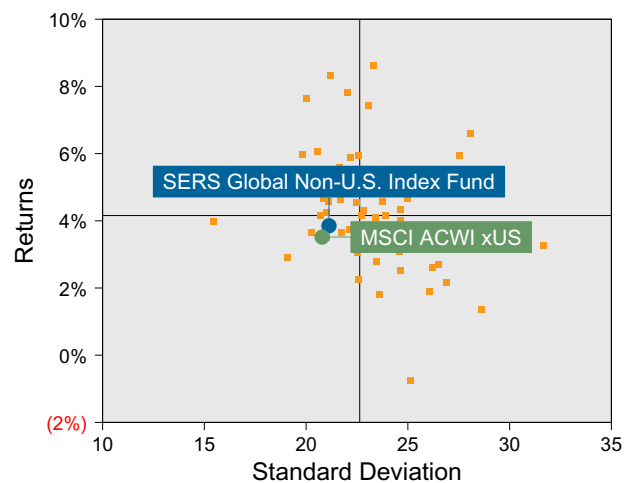


10th Percentile	5.01	15.58	22.66	13.83	7.01	7.76
25th Percentile	3.91	13.60	20.86	11.01	5.09	6.17
Median	3.05	12.71	18.05	8.42	4.16	5.35
75th Percentile	2.42	10.97	16.08	6.21	3.22	4.65
90th Percentile	0.92	9.54	13.88	3.17	2.20	4.01
<b>SERS Global Non-U.S. Index Fund</b>	<b>2.54</b>	<b>10.10</b>	<b>13.10</b>	<b>7.48</b>	<b>3.85</b>	<b>5.02</b>
<b>MSCI ACWI xUS</b>	<b>2.44</b>	<b>9.47</b>	<b>12.72</b>	<b>7.22</b>	<b>3.52</b>	<b>4.75</b>

### Relative Return vs MSCI ACWI xUS



### Callan Non US Equity Mutual Funds (Institutional Net) Annualized Five Year Risk vs Return

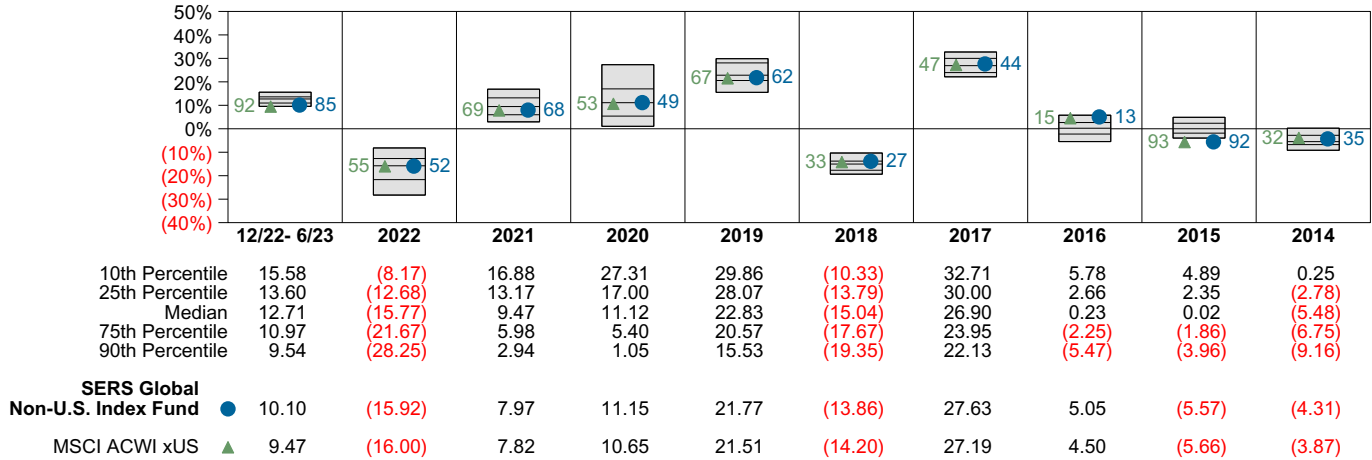


# SERS Global Non-U.S. Index Fund Return Analysis Summary

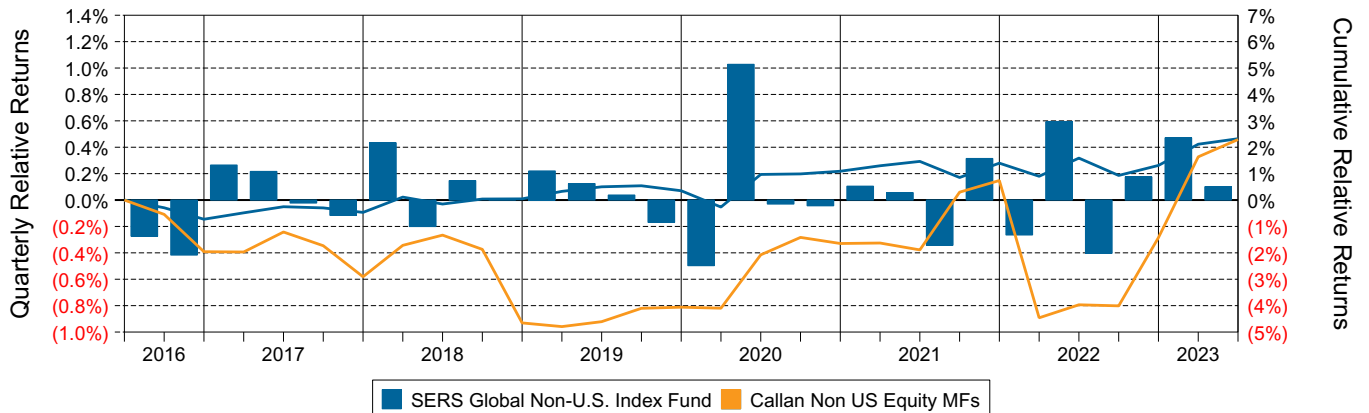
## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

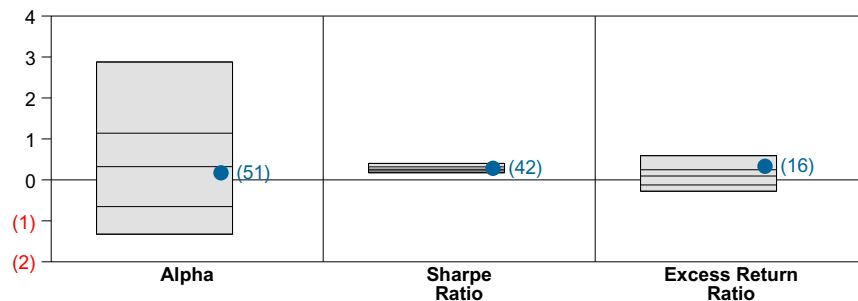
### Performance vs Callan Non US Equity Mutual Funds (Institutional Net)



### Cumulative and Quarterly Relative Returns vs MSCI ACWI xUS



### Risk Adjusted Return Measures vs MSCI ACWI xUS Rankings Against Callan Non US Equity Mutual Funds (Institutional Net) Seven Years Ended June 30, 2023

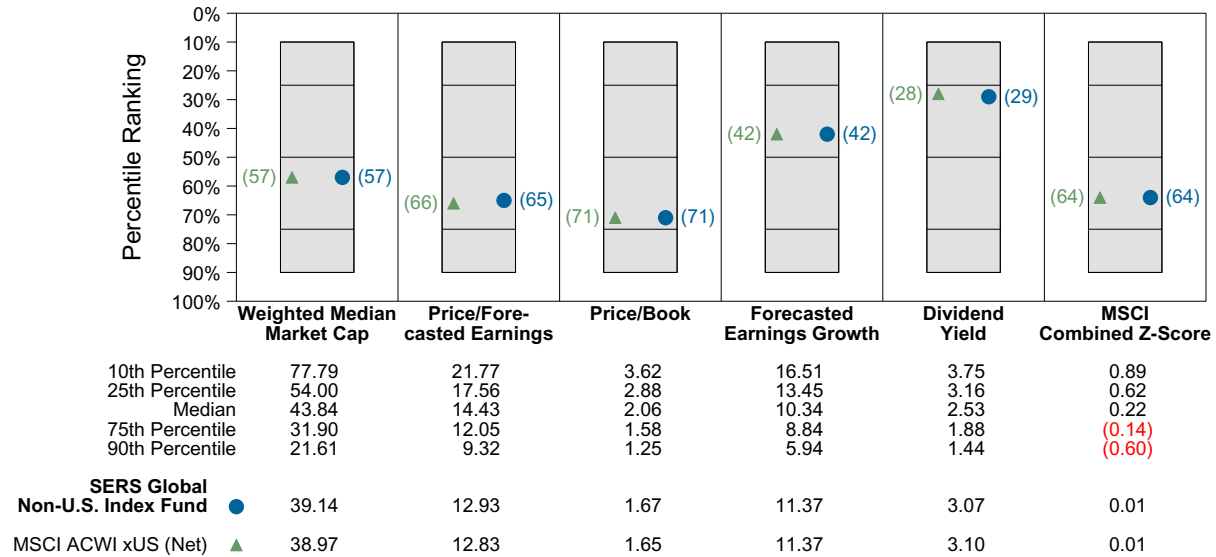


# SERS Global Non-U.S. Index Fund Equity Characteristics Analysis Summary

## Portfolio Characteristics

This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

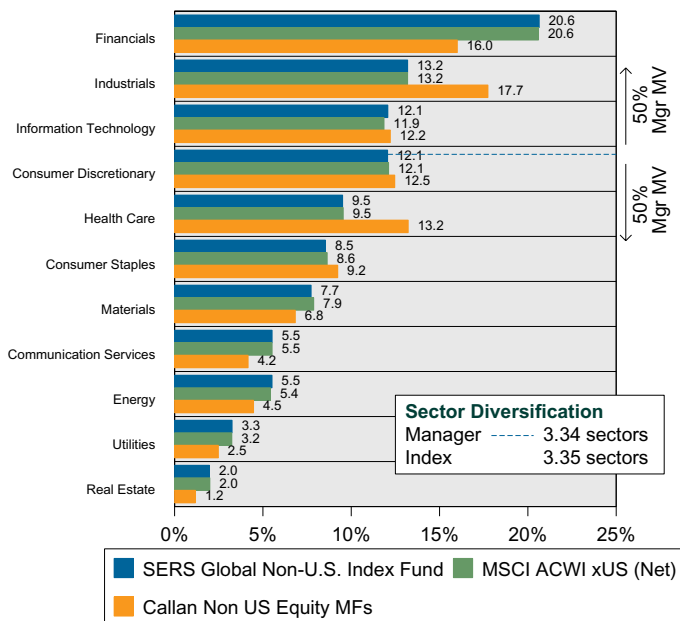
## Portfolio Characteristics Percentile Rankings Rankings Against Callan Non US Equity Mutual Funds as of June 30, 2023



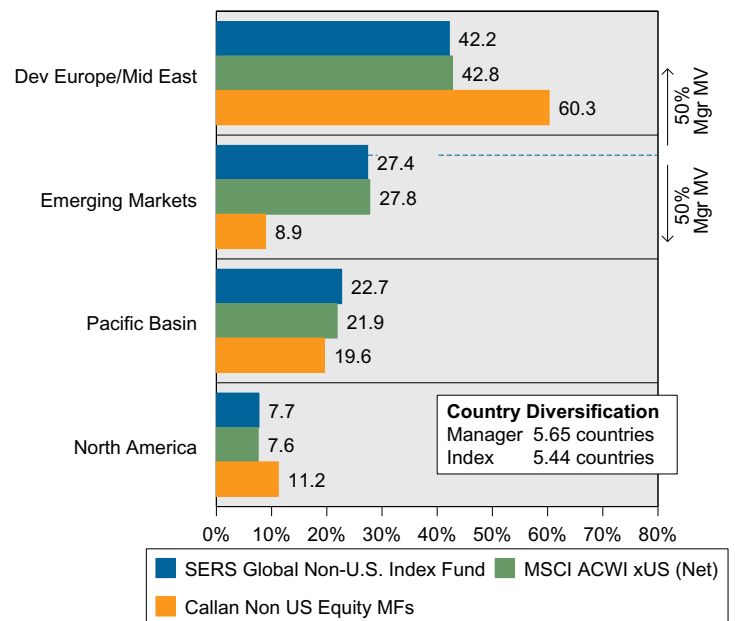
## Sector Weights

The graph below contrasts the manager's sector weights with those of the benchmark and median sector weights across the members of the peer group. The magnitude of sector weight differences from the index and the manager's sector diversification are also shown. The regional allocation chart compares the manager's geographical region weights with those of the benchmark as well as the median region weights of the peer group.

### Sector Allocation June 30, 2023



### Regional Allocation June 30, 2023



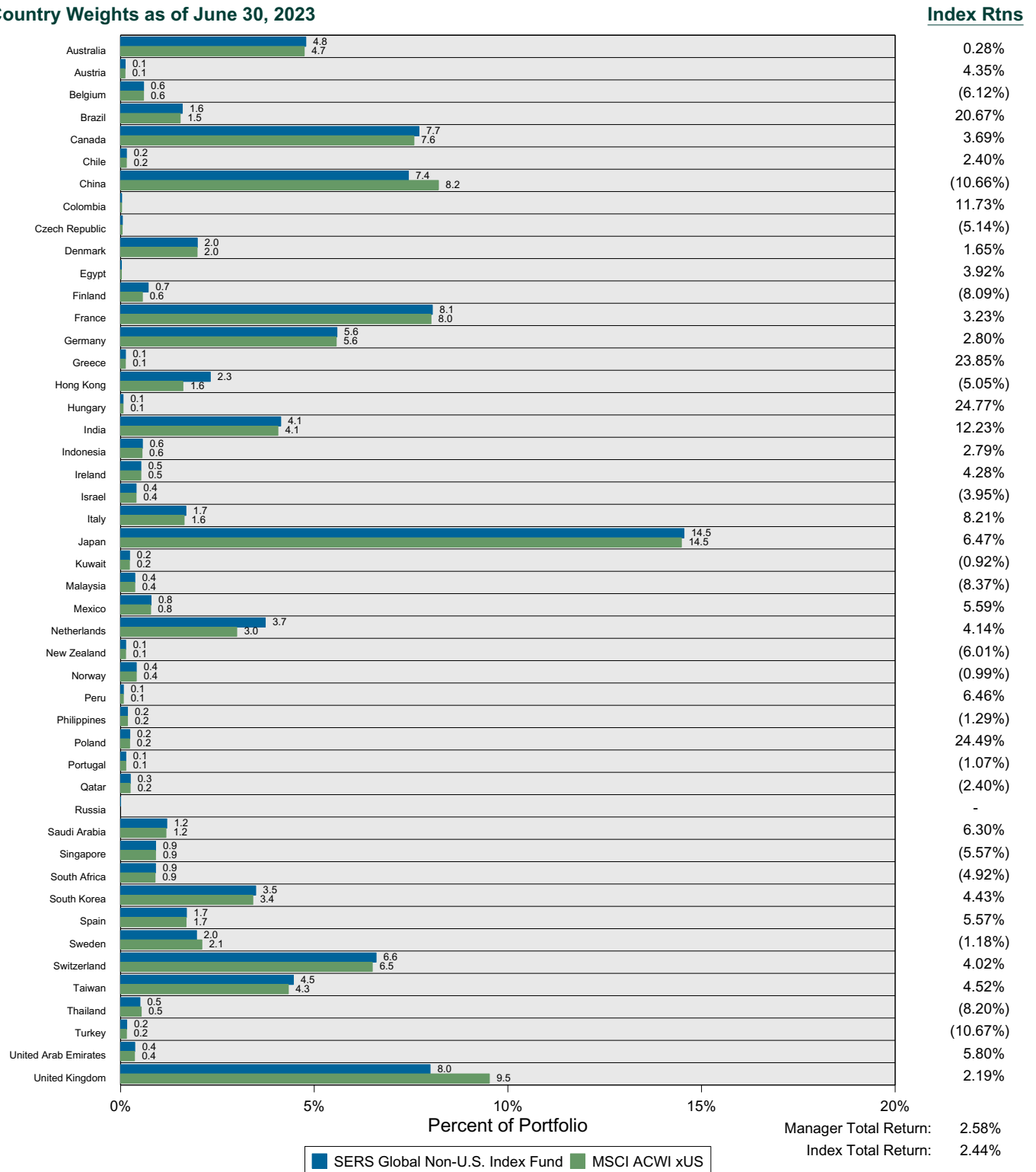
# Country Allocation

## SERS Global Non-U.S. Index Fund VS MSCI ACWI xUS (Net)

### Country Allocation

The chart below contrasts the portfolio's country allocation with that of the index as of June 30, 2023. This chart is useful because large deviations in country allocation relative to the index are often good predictors of tracking error in the subsequent quarter. To the extent that the portfolio allocation is similar to the index, the portfolio should experience more "index-like" performance. In order to illustrate the performance effect on the portfolio and index of these country allocations, the individual index country returns are also shown.

Country Weights as of June 30, 2023



## SERS Global Non-U.S. Index Fund Top 10 Portfolio Holdings Characteristics as of June 30, 2023

### 10 Largest Holdings

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Taiwan Semicond Manufac Co L Shs	Information Technology	\$53,267	1.9%	6.14%	479.60	16.35	1.95%	3.91%
Nestle S A Shs Nom New	Consumer Staples	\$37,999	1.4%	1.11%	321.13	20.81	2.74%	7.38%
Asml Holding N V Asml Rev Stk Spl	Information Technology	\$33,438	1.2%	6.80%	291.61	31.86	0.90%	26.35%
Tencent Holdings Limited Shs Par Hkd	Communication Services	\$30,627	1.1%	(18.28)%	405.12	18.32	0.72%	14.34%
Samsung Electronics Co Ltd Ord	Information Technology	\$30,584	1.1%	12.10%	327.11	24.18	2.00%	(3.12)%
Novo Nordisk B	Health Care	\$30,579	1.1%	1.72%	276.68	28.97	1.13%	25.20%
Lvmh Moet Hennessy Lou Vuittd Ord	Consumer Discretionary	\$29,828	1.1%	3.44%	472.70	24.88	1.39%	12.20%
Astrazeneca Plc Ord	Health Care	\$25,478	0.9%	3.23%	222.19	17.91	1.86%	13.56%
Roche Hldgs Ag Basel Div Rts Ctf	Health Care	\$24,652	0.9%	7.02%	214.78	13.49	3.47%	4.95%
Novartis	Health Care	\$23,645	0.9%	9.72%	229.11	14.19	3.56%	9.12%

### 10 Best Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
Wistron	Information Technology	\$888	0.0%	112.11%	8.45	22.81	2.86%	9.84%
Quanta Computer Inc Shs	Information Technology	\$1,541	0.1%	79.01%	18.85	18.63	3.95%	6.69%
Daewoo Intl	Industrials	\$182	0.0%	76.56%	5.32	9.57	2.51%	46.90%
Hapvida Partp.E Invms.On	Health Care	\$569	0.0%	75.70%	6.79	455.00	1.00%	(28.61)%
Bco Btg Pactual Unt	Financials	\$876	0.0%	68.22%	21.97	11.94	0.47%	13.10%
Rede D Or Sao Luiz Sa Common Stock	Health Care	\$437	0.0%	62.89%	15.62	30.18	1.23%	(2.26)%
Petroleo Brasileiro Sa Petro Pfd Shs	Energy	\$3,705	0.1%	58.40%	34.29	3.67	39.99%	47.66%
Lpp Sa Gdansk Shs	Consumer Discretionary	\$461	0.0%	55.06%	6.39	16.99	3.07%	15.30%
Petroleo Brasileiro Sa Petro Ord New	Energy	\$3,189	0.1%	53.97%	51.07	4.24	50.23%	47.67%
Godrej Properties	Real Estate	\$263	0.0%	52.39%	5.32	50.85	0.13%	6.11%

### 10 Worst Performers

Stock	Sector	Ending Market Value	Percent of Portfolio	Qtrly Return	Market Capital	Price/Forecasted Earnings Ratio	Dividend Yield	Forecasted Growth in Earnings
China Meidong Auto Hdg.	Consumer Discretionary	\$99	0.0%	(48.87)%	1.55	9.09	2.47%	12.30%
China Tourism Group Duty F H	Consumer Discretionary	\$137	0.0%	(48.36)%	1.57	16.80	0.86%	15.64%
Gds Holdings Ltd Cl A Common Stock U	Information Technology	\$145	0.0%	(46.84)%	1.99	(8.43)	0.00%	-
China Intl.Trvl.Ser.'a'	Consumer Discretionary	\$61	0.0%	(43.06)%	29.71	19.00	1.36%	13.61%
Hangzhou Tigermed Cny1 H	Health Care	\$90	0.0%	(42.24)%	0.70	13.44	1.40%	47.44%
Bilibili Inc Ads Repstg Shs Cl Z	Communication Services	\$354	0.0%	(39.34)%	4.94	(21.70)	0.00%	-
Shai.Fudan Mircoelec H	Information Technology	\$84	0.0%	(36.47)%	0.70	11.82	0.78%	19.33%
Hangzhou Tigermed Cnsl. 'a'	Health Care	\$19	0.0%	(36.34)%	6.66	20.60	0.77%	23.90%
Hangzhou Lion Electronics A	Information Technology	\$16	0.0%	(35.70)%	3.42	38.05	1.14%	108.25%
Cj Corp (Cheil Jedang)	Industrials	\$90	0.0%	(35.30)%	1.51	5.52	3.66%	(35.91)%



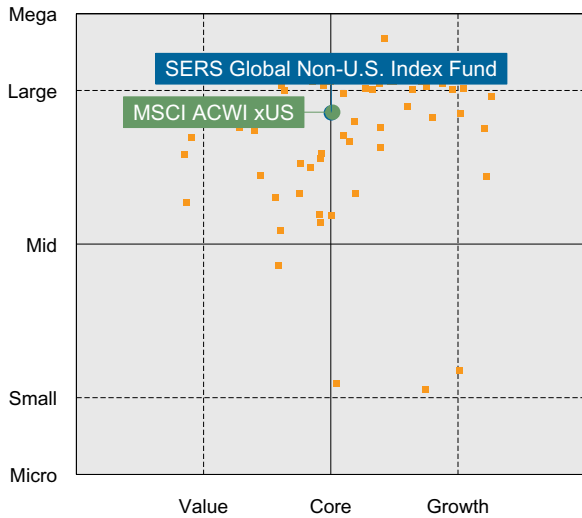
# Historical Holdings Based Style Analysis

## SERS Global Non-U.S. Index Fund

### For Three Years Ended June 30, 2023

This page analyzes the historical investment style of a portfolio utilizing a detailed holdings-based style analysis to determine average actual exposures to various region and style segments of the international/global equity market. The market is segmented quarterly by region and style. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the average historical market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the average historical portfolio and index weights and stock counts (in parentheses) in each region/style segment of the market. The next two style exposure charts illustrate the actual quarterly region/style and style only segment exposures of the portfolio through history.

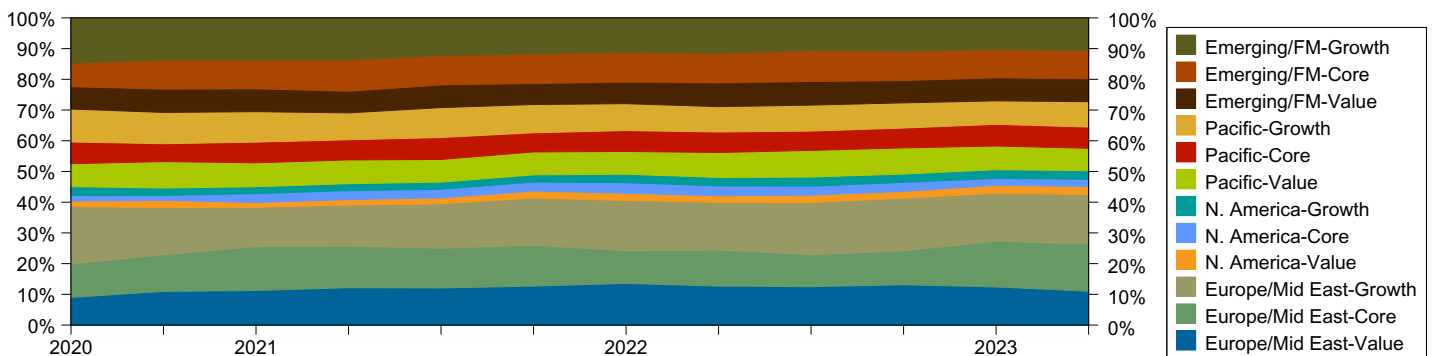
**Average Style Map vs Callan Non US Equity MFs Holdings for Three Years Ended June 30, 2023**



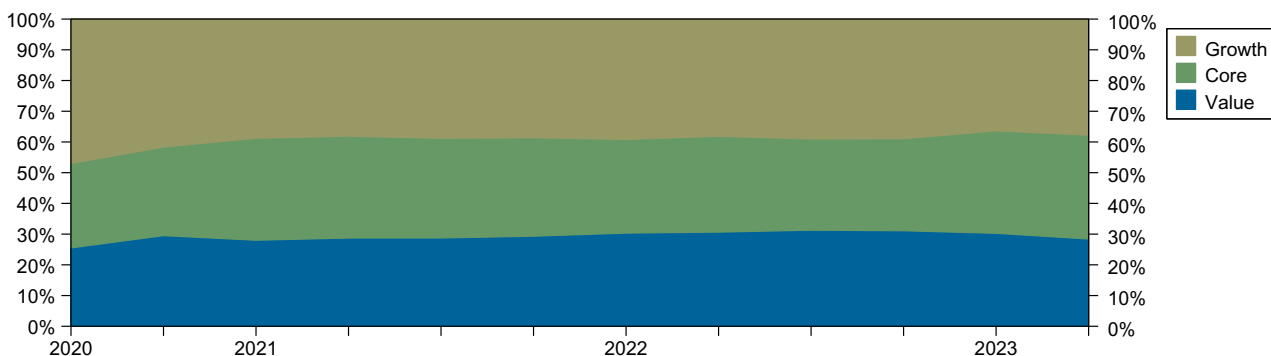
**Average Style Exposure Matrix Holdings for Three Years Ended June 30, 2023**

Europe/ Mid East	12.0% (138)	12.6% (126)	15.7% (150)	40.2% (414)
	11.9% (148)	12.2% (128)	16.0% (164)	40.2% (440)
N. America	2.2% (25)	2.7% (27)	2.6% (31)	7.4% (83)
	2.3% (27)	2.6% (29)	2.6% (34)	7.5% (90)
Pacific	7.8% (139)	6.6% (119)	9.0% (130)	23.5% (388)
	7.7% (140)	6.6% (120)	8.7% (130)	23.0% (390)
Emerging/ FM	7.4% (421)	9.4% (386)	12.1% (397)	28.9% (1204)
	7.5% (460)	9.5% (432)	12.4% (444)	29.4% (1336)
<b>Total</b>	<b>29.3% (723)</b>	<b>31.3% (658)</b>	<b>39.4% (708)</b>	<b>100.0% (2089)</b>
	<b>29.4% (775)</b>	<b>30.9% (709)</b>	<b>39.7% (772)</b>	<b>100.0% (2256)</b>
	Value	Core	Growth	Total

**SERS Global Non-U.S. Index Fund Historical Region/Style Exposures**



**SERS Global Non-U.S. Index Fund Historical Style Only Exposures**





# SERS Short Term Investment Fund

## Period Ended June 30, 2023

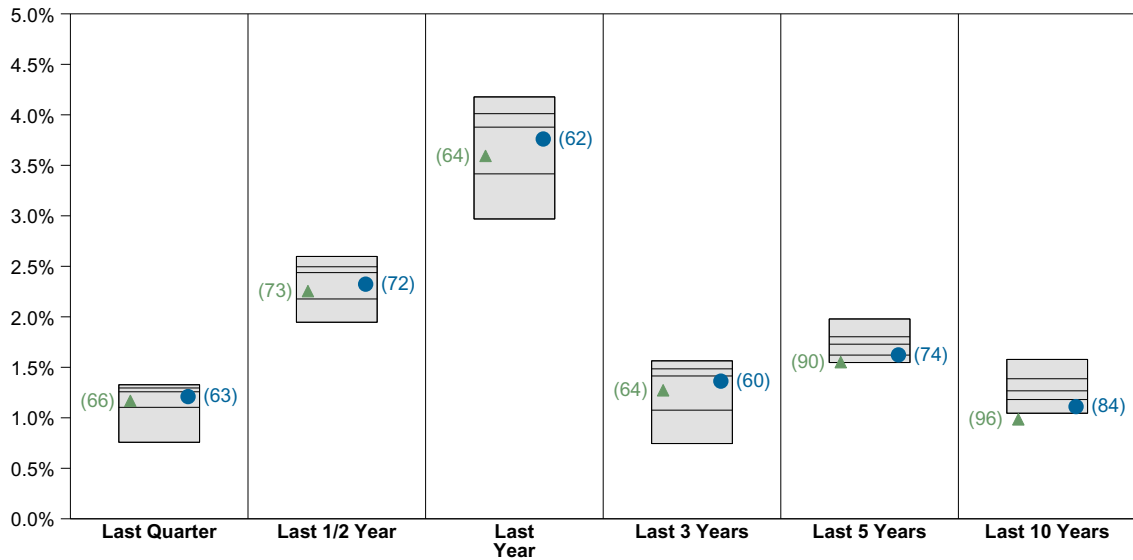
### Investment Philosophy

The Short Term Investment Fund seeks to achieve the highest current income consistent with maintaining liquidity and safety of principal. This fund is managed by the Pennsylvania State Treasurer. It is compared against the Callan Cash Database, which includes STIF, enhanced cash, and money market funds.

### Quarterly Summary and Highlights

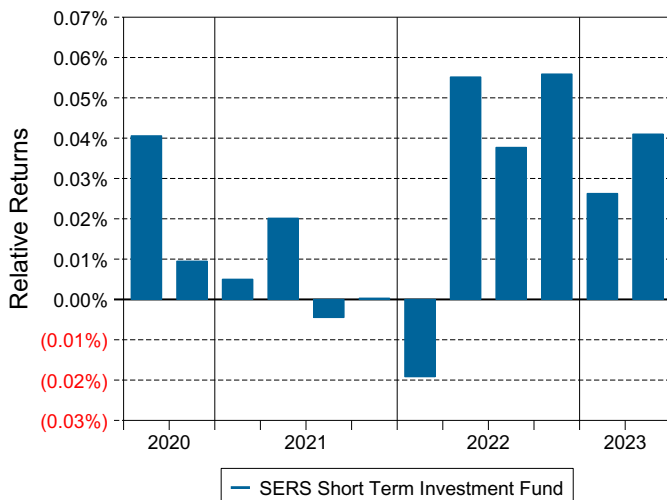
- SERS Short Term Investment Fund's portfolio posted a 1.21% return for the quarter placing it in the 63 percentile of the Callan Cash Database group for the quarter and in the 62 percentile for the last year.
- SERS Short Term Investment Fund's portfolio outperformed the 3-month Treasury Bill by 0.04% for the quarter and outperformed the 3-month Treasury Bill for the year by 0.17%.

### Performance vs Callan Cash Database (Gross)

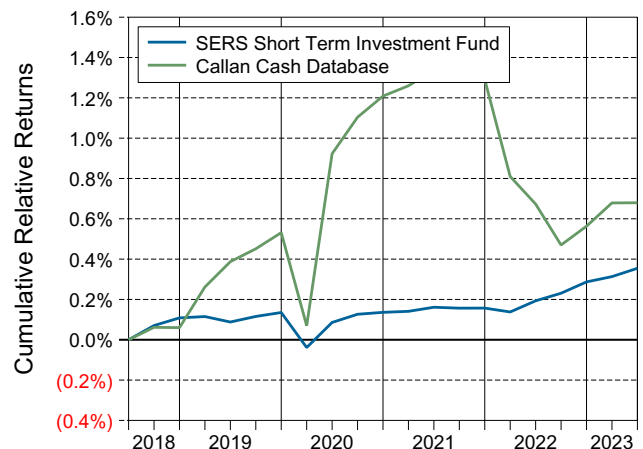


10th Percentile		1.33	2.60	4.18	1.56	1.98	1.58
25th Percentile		1.30	2.50	4.01	1.48	1.80	1.39
Median		1.26	2.44	3.88	1.41	1.73	1.27
75th Percentile		1.10	2.18	3.42	1.08	1.62	1.18
90th Percentile		0.76	1.95	2.97	0.75	1.55	1.05
<b>SERS Short Term Investment Fund</b>	●	1.21	2.32	3.76	1.36	1.62	1.11
3-month Treasury Bill	▲	1.17	2.25	3.59	1.27	1.55	0.98

### Relative Return vs 3-month Treasury Bill



### Cumulative Returns vs 3-month Treasury Bill

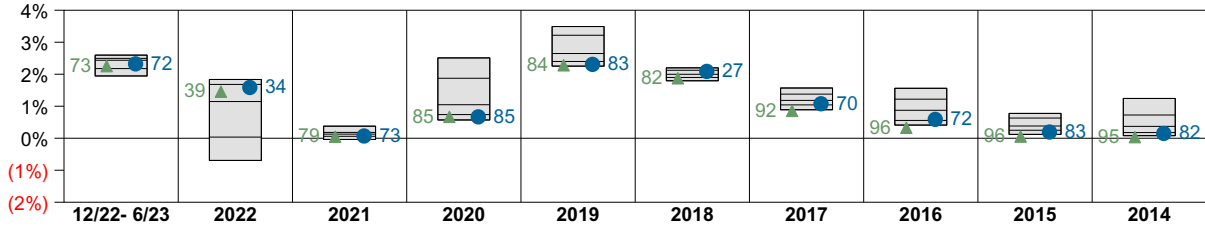


# SERS Short Term Investment Fund Return Analysis Summary

## Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and 12 quarter rolling manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures. Callan Cash Database includes STIF, enhanced cash, and money market funds.

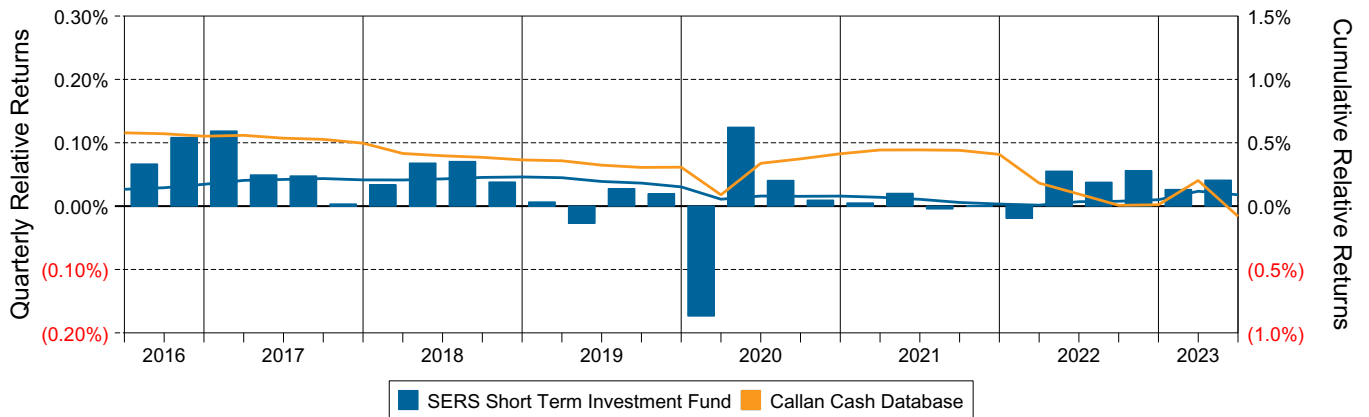
## Performance vs Callan Cash Database (Gross)



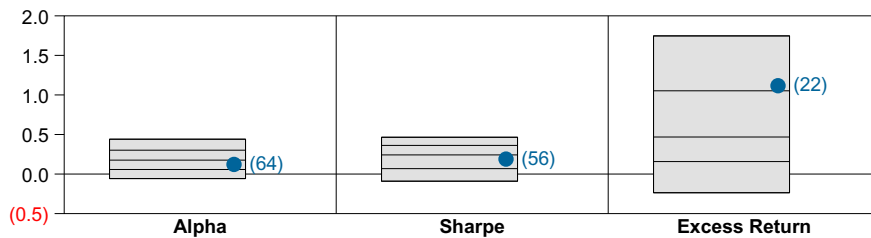
### SERS Short Term Investment Fund

3-month Treasury Bill

## Rolling 12 Quarter and Quarterly Relative Returns vs 3-month Treasury Bill



## Risk Adjusted Return Measures vs 3-month Treasury Bill Rankings Against Callan Cash Database (Gross) Seven Years Ended June 30, 2023



# SERS U.S. Short Term Bond Idx Fund

## Period Ended June 30, 2023

### Investment Philosophy

The Fund's investment objective is to seek to track the performance of the Bloomberg Barclays U.S. 1-3 Year Government/Credit Index ("Index"). In meeting this objective, the Fund may invest in securities (including those issued through private placements) and a combination of other collective funds that together are designed to track the performance of the Index. The Fund will principally invest in other affiliated bank collective funds, debt securities of U.S. corporations and the U.S. government, its agencies and instrumentalities, including mortgage-related and asset-backed securities. This fund is managed by Mellon Capital Management.

### Quarterly Summary and Highlights

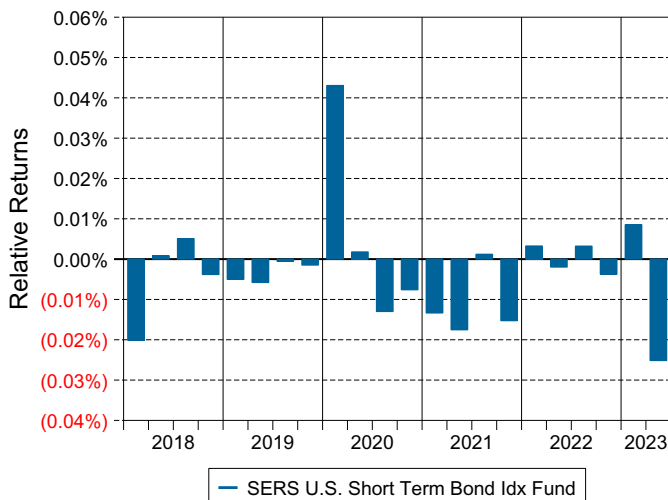
- SERS U.S. Short Term Bond Idx Fund's portfolio posted a (0.40)% return for the quarter placing it in the 39 percentile of the Callan Short US Gov Bond Mut Funds group for the quarter and in the 27 percentile for the last year.
- SERS U.S. Short Term Bond Idx Fund's portfolio underperformed the Blmbg Gov/Cred 1-3 Yr by 0.03% for the quarter and underperformed the Blmbg Gov/Cred 1-3 Yr for the year by 0.02%.

### Performance vs Callan Short US Gov Bond Mut Funds (Institutional Net)

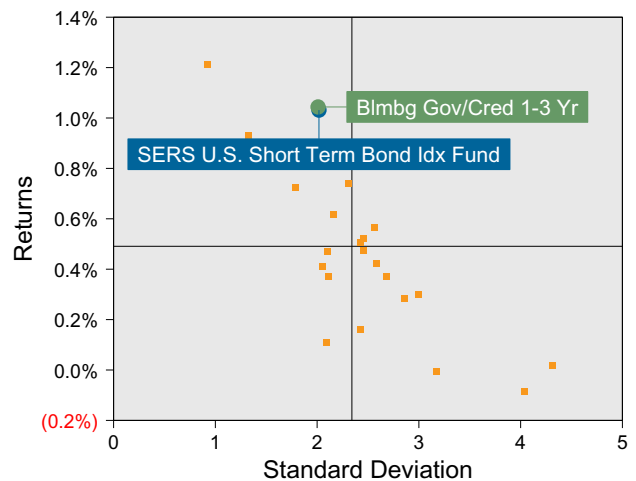


	Last Quarter	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 5-1/2 Years
10th Percentile	0.41	1.97	1.46	(0.36)	0.96	0.89
25th Percentile	(0.21)	1.46	0.57	(1.12)	0.86	0.82
Median	(0.65)	0.96	(0.33)	(1.48)	0.53	0.49
75th Percentile	(0.86)	0.78	(0.97)	(1.97)	0.36	0.30
90th Percentile	(0.99)	0.49	(2.03)	(2.96)	0.11	0.01
<b>SERS U.S. Short Term Bond Idx Fund</b>	<b>● (0.40)</b>	1.12	0.51	<b>(0.91)</b>	1.12	1.03
Blmbg Gov/Cred 1-3 Yr	<b>▲ (0.37)</b>	1.13	0.52	<b>(0.88)</b>	1.13	1.04

### Relative Return vs Blmbg Gov/Cred 1-3 Yr



### Callan Short US Gov Bond Mut Funds (Institutional Net) Annualized Five and One-Half Year Risk vs Return



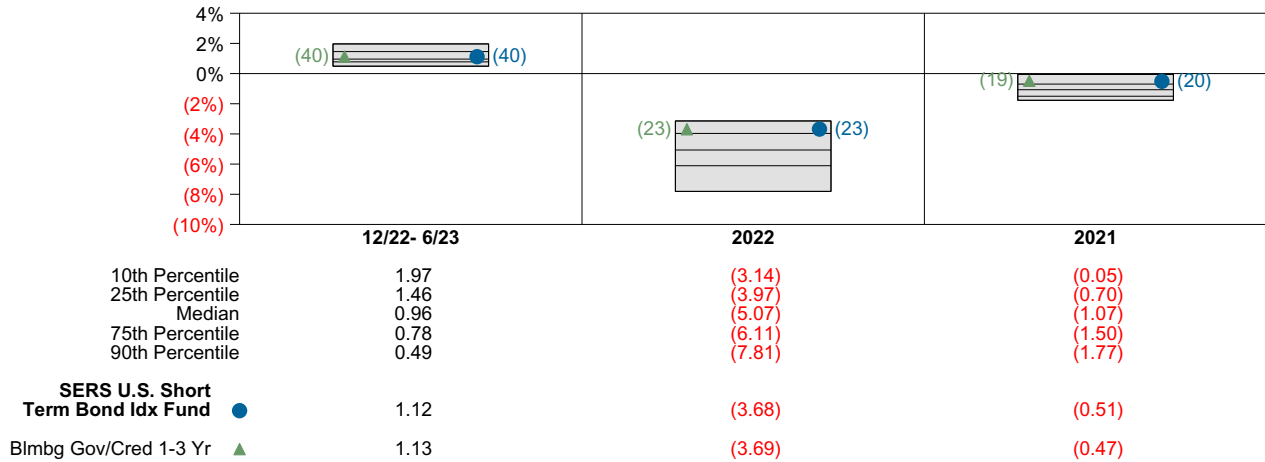
# SERS U.S. Short Term Bond Idx Fund

## Return Analysis Summary

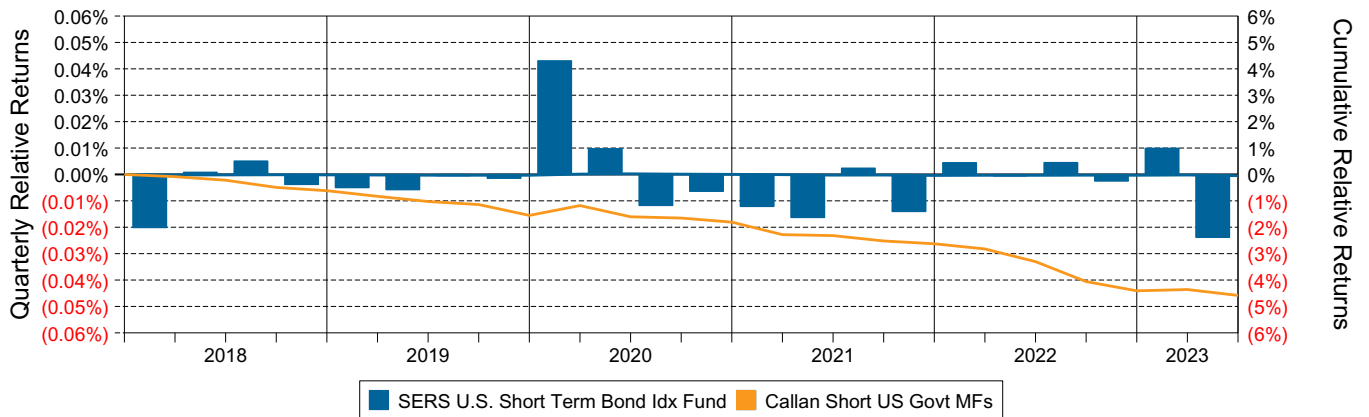
### Return Analysis

The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures. Callan Cash Database includes STIF, enhanced cash, and money market funds.

### Performance vs Callan Short US Gov Bond Mut Funds (Institutional Net)



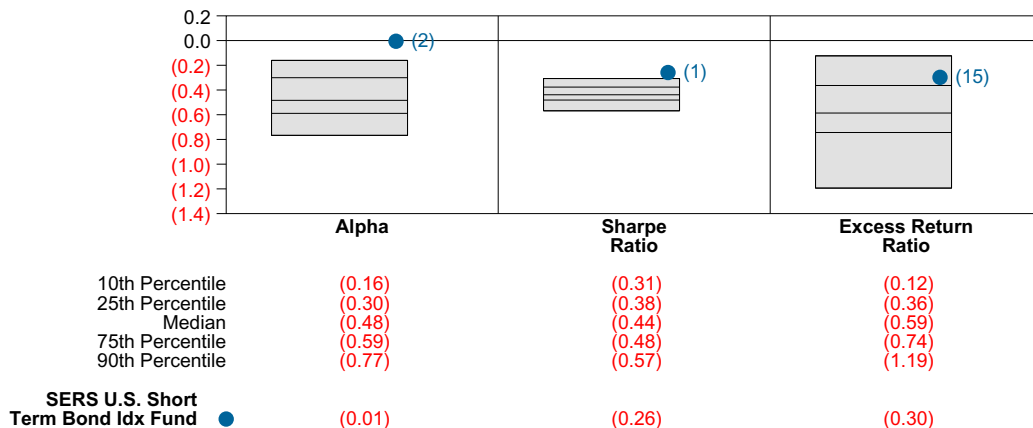
### Cumulative and Quarterly Relative Returns vs Blmbg Gov/Cred 1-3 Yr



### Risk Adjusted Return Measures vs Blmbg Gov/Cred 1-3 Yr

#### Rankings Against Callan Short US Gov Bond Mut Funds (Institutional Net)

#### Five and One-Half Years Ended June 30, 2023



# SERS U.S. Short Term Bond Idx Fund

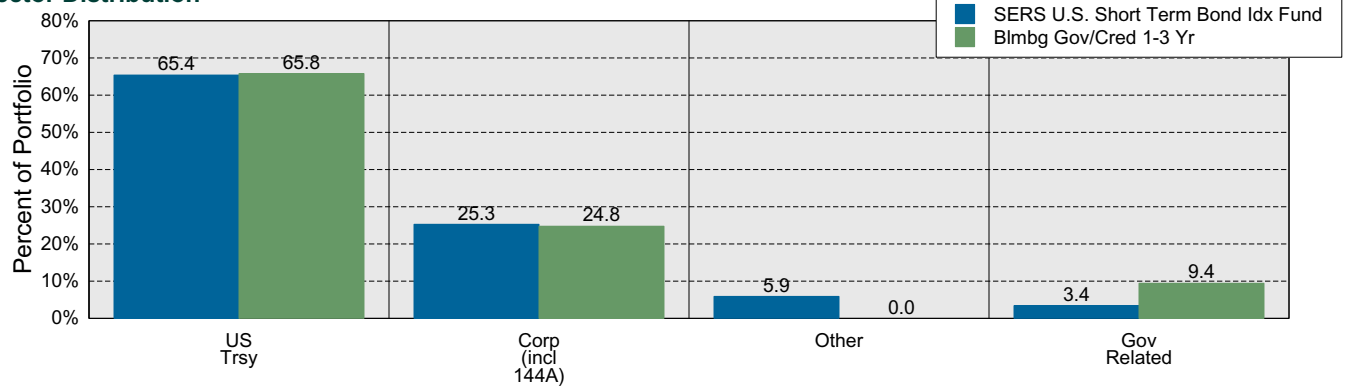
## Portfolio Characteristics Summary

### As of June 30, 2023

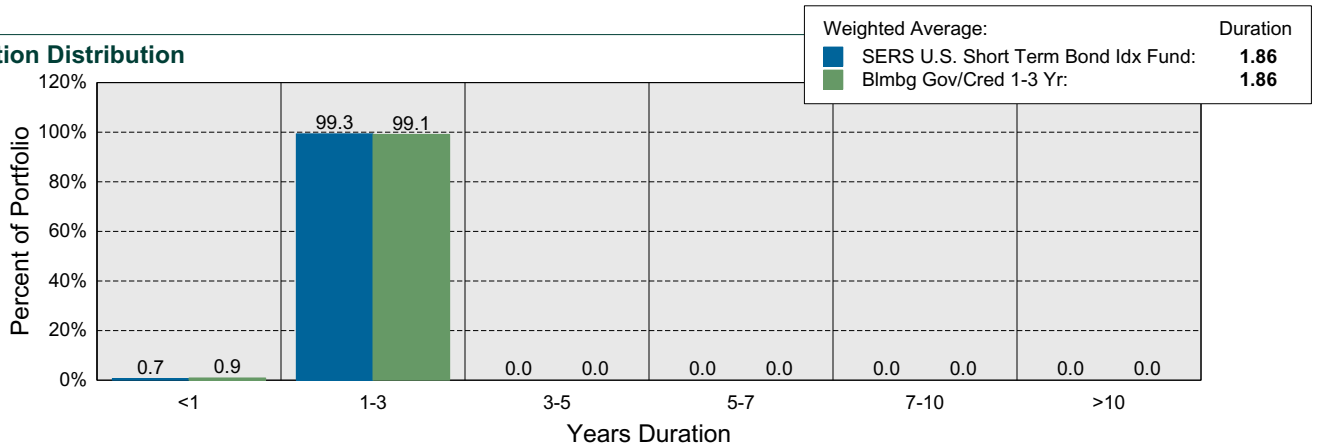
#### Portfolio Structure Comparison

The charts below compare the structure of the portfolio to that of the index from the three perspectives that have the greatest influence on return. The first chart compares the two portfolios across sectors. The second chart compares the duration distribution. The last chart compares the distribution across quality ratings.

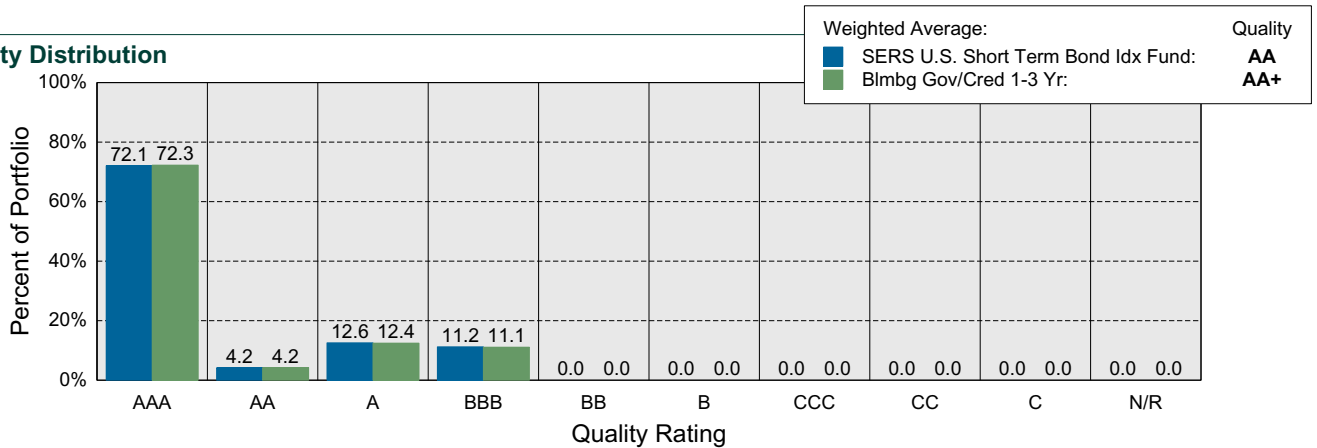
#### Sector Distribution



#### Duration Distribution



#### Quality Distribution



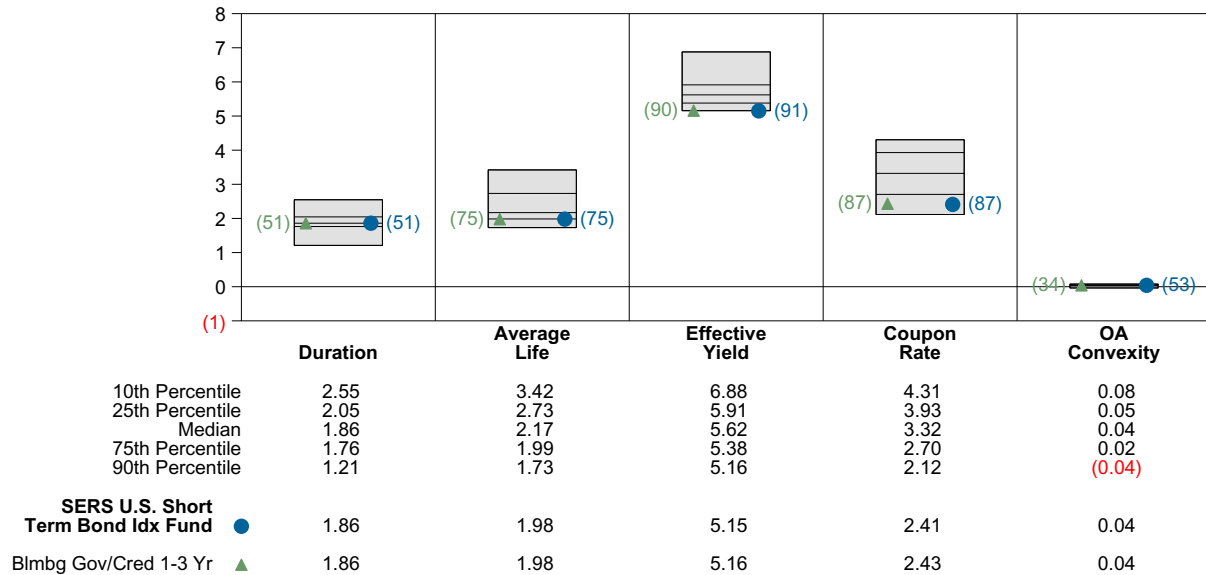
# SERS U.S. Short Term Bond Idx Fund

## Bond Characteristics Analysis Summary

### Portfolio Characteristics

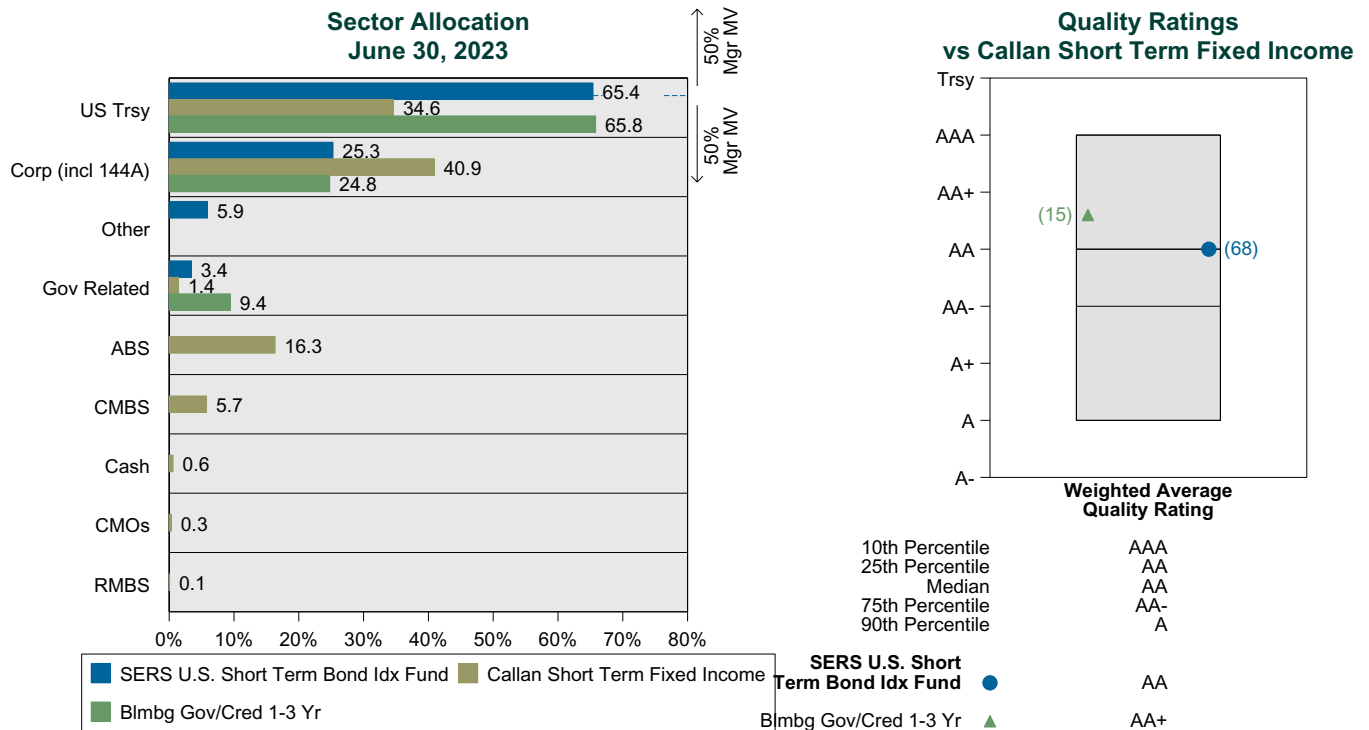
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

### Fixed Income Portfolio Characteristics Rankings Against Callan Short Term Fixed Income as of June 30, 2023



### Sector Allocation and Quality Ratings

The first graph compares the manager's sector allocation with the average allocation across all the members of the manager's style. The second graph compares the manager's weighted average quality rating with the range of quality ratings for the style.





# SERS U.S. TIPS Index Fund

## Period Ended June 30, 2023

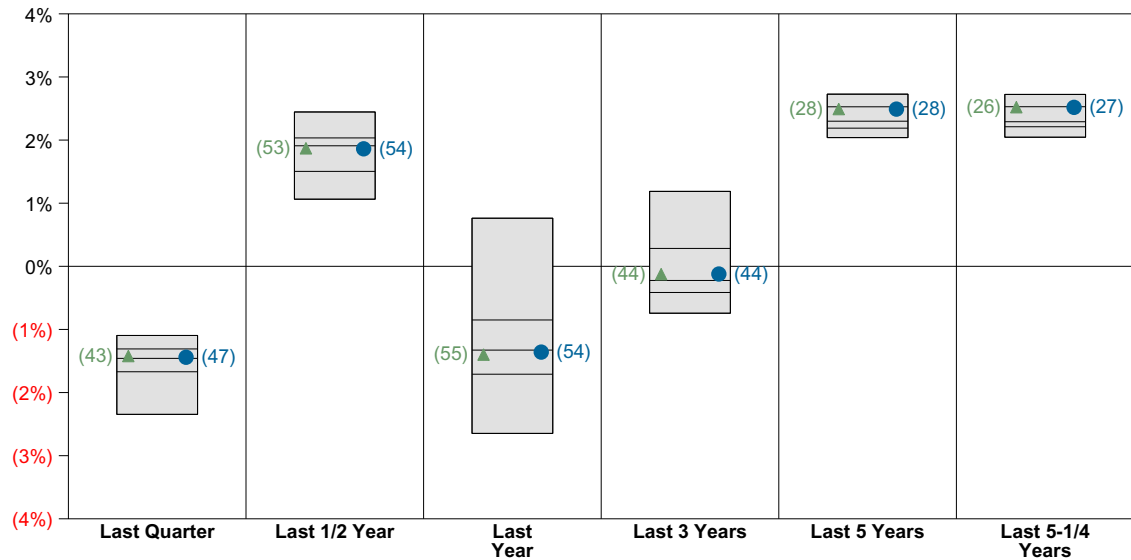
### Investment Philosophy

The objective of the U.S. Treasury Inflation Protected Security Index Fund is to track the performance of the U.S. inflation-linked government bond market (otherwise known as Treasury Inflation Protected Securities, or "TIPS"). This fund is managed by Mellon Capital Management.

### Quarterly Summary and Highlights

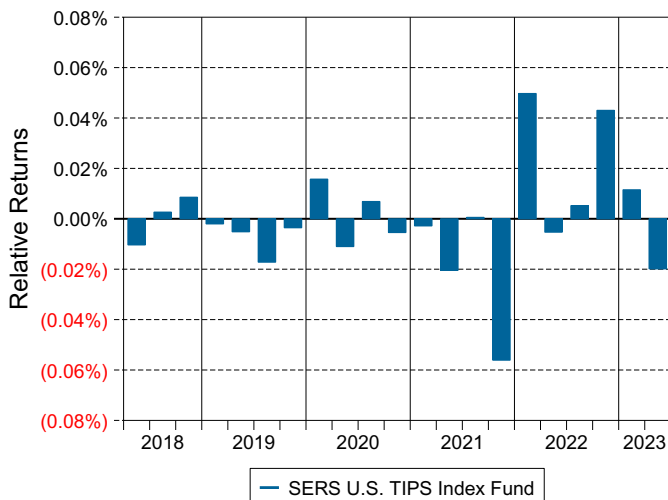
- SERS U.S. TIPS Index Fund's portfolio posted a (1.44)% return for the quarter placing it in the 47 percentile of the Callan Treas Infl Prot Securities MFs group for the quarter and in the 54 percentile for the last year.
- SERS U.S. TIPS Index Fund's portfolio underperformed the Blmbg TIPS by 0.02% for the quarter and outperformed the Blmbg TIPS for the year by 0.04%.

### Performance vs Callan Treas Infl Prot Securities MFs (Institutional Net)

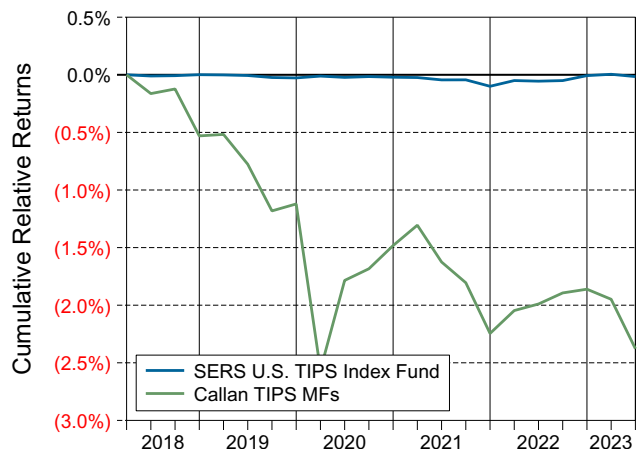


	Last Quarter	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 5-1/4 Years
<b>SERS U.S. TIPS Index Fund</b> ●	(1.44)	1.86	(1.36)	(0.12)	2.49	2.52
<b>Blmbg TIPS</b> ▲	(1.42)	1.87	(1.40)	(0.12)	2.49	2.52

### Relative Return vs Blmbg TIPS



### Cumulative Returns vs Blmbg TIPS



# SERS U.S. TIPS Index Fund

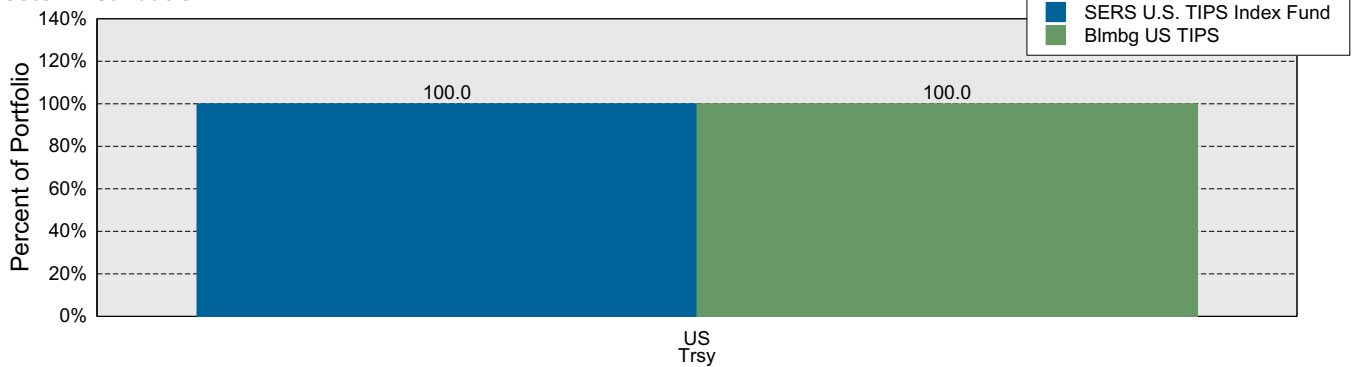
## Portfolio Characteristics Summary

### As of June 30, 2023

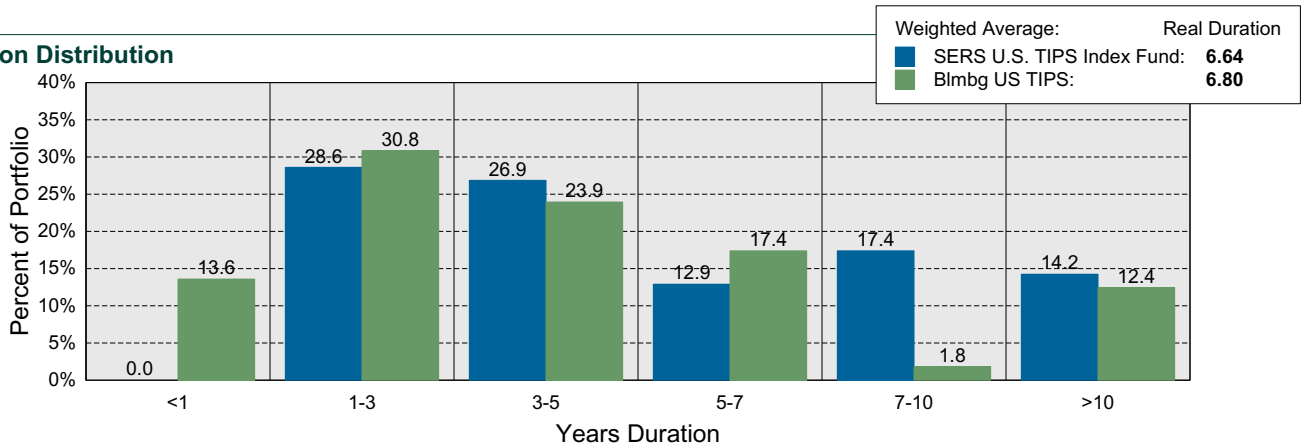
#### Portfolio Structure Comparison

The charts below compare the structure of the portfolio to that of the index from the three perspectives that have the greatest influence on return. The first chart compares the two portfolios across sectors. The second chart compares the duration distribution. The last chart compares the distribution across quality ratings.

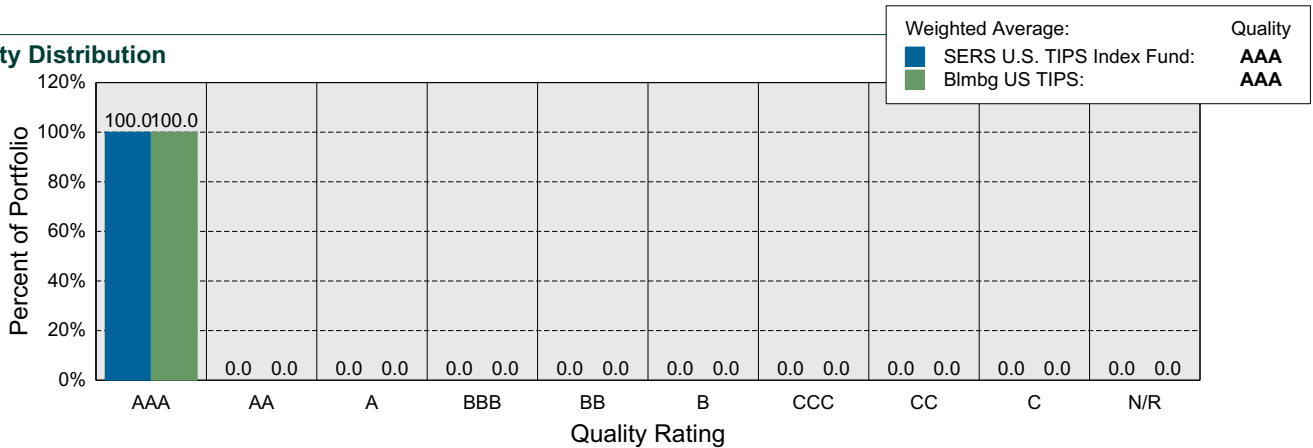
#### Sector Distribution



#### Duration Distribution



#### Quality Distribution

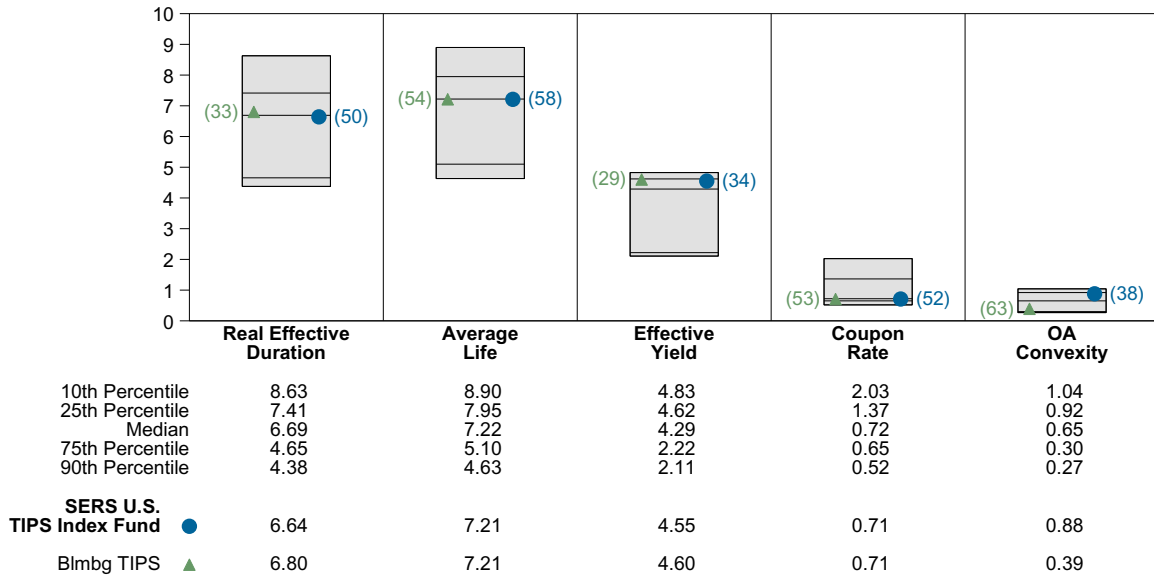


# SERS U.S. TIPS Index Fund Bond Characteristics Analysis Summary

## Portfolio Characteristics

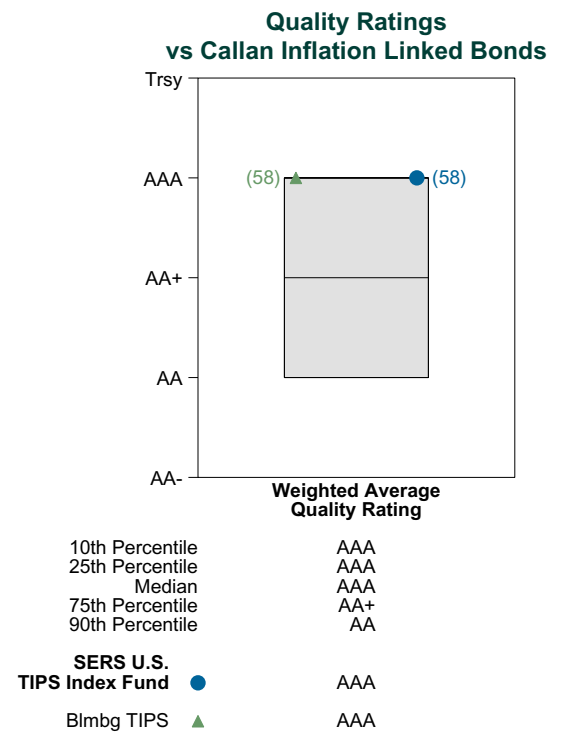
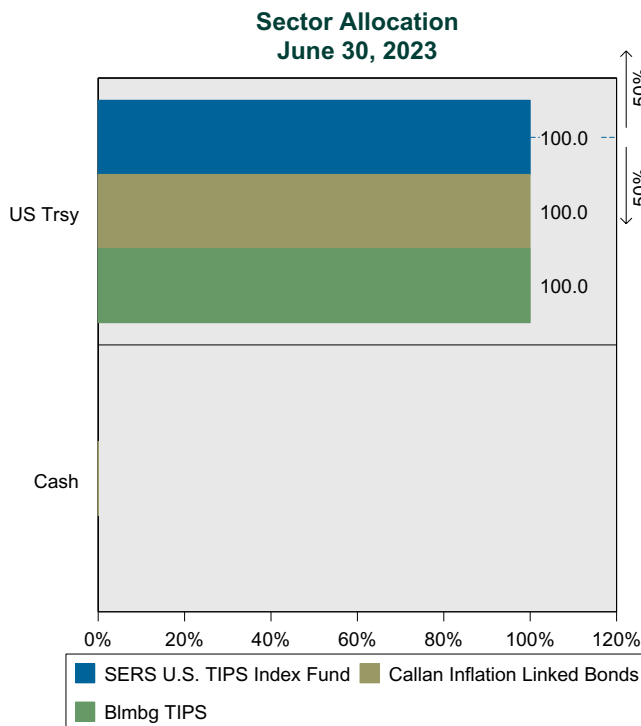
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Fixed Income Portfolio Characteristics Rankings Against Callan Inflation Linked Bonds as of June 30, 2023



## Sector Allocation and Quality Ratings

The first graph compares the manager's sector allocation with the average allocation across all the members of the manager's style. The second graph compares the manager's weighted average quality rating with the range of quality ratings for the style.



# SERS U.S. Bond Index Fund

## Period Ended June 30, 2023

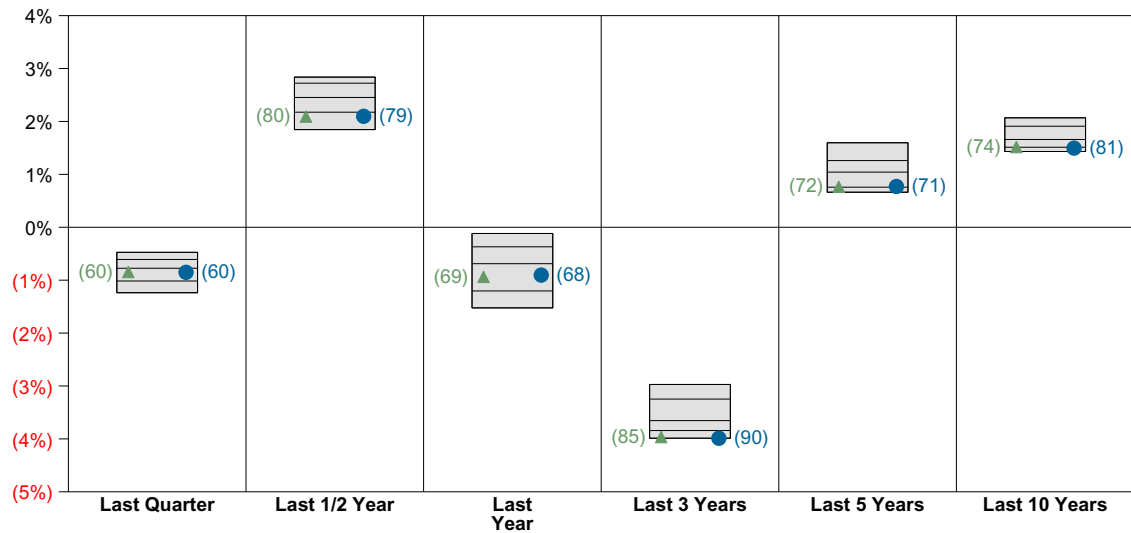
### Investment Philosophy

The objective of the Fund is to track the performance of the Bloomberg US Aggregate Bond Index. In meeting this objective, the Fund may invest in securities (including those issued through private placements) and a combination of other collective funds that together are designed to track the performance of the Bloomberg US Aggregate Bond Index. This fund is managed by Mellon Capital Management.

### Quarterly Summary and Highlights

- SERS U.S. Bond Index Fund's portfolio posted a (0.85)% return for the quarter placing it in the 60 percentile of the Callan Core Bond Mutual Funds group for the quarter and in the 68 percentile for the last year.
- SERS U.S. Bond Index Fund's portfolio underperformed the Blmbg:Aggregate by 0.01% for the quarter and outperformed the Blmbg:Aggregate for the year by 0.03%.

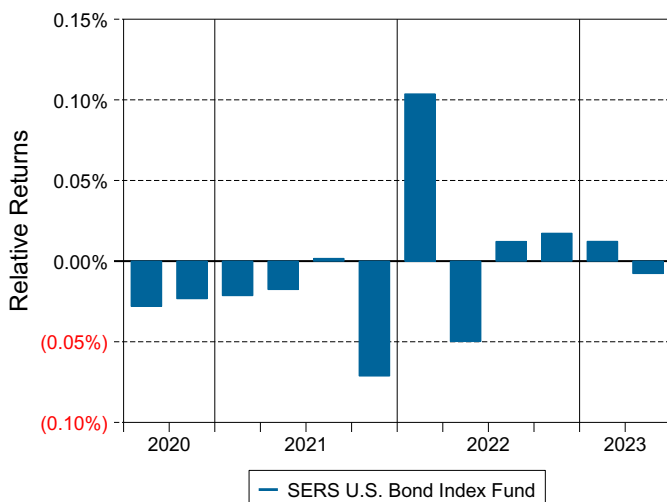
### Performance vs Callan Core Bond Mutual Funds (Institutional Net)



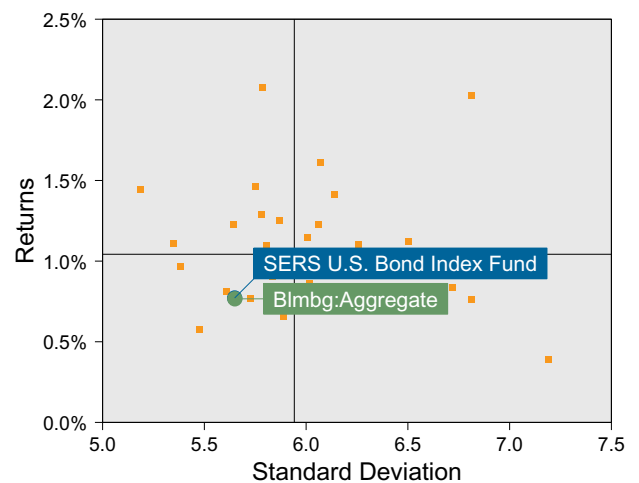
	Last Quarter	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(0.47)	2.84	(0.12)	(2.97)	1.60	2.07
25th Percentile	(0.61)	2.72	(0.37)	(3.25)	1.26	1.91
Median	(0.77)	2.45	(0.69)	(3.65)	1.04	1.66
75th Percentile	(1.02)	2.17	(1.20)	(3.84)	0.76	1.51
90th Percentile	(1.24)	1.85	(1.52)	(3.99)	0.66	1.43

<b>SERS U.S. Bond Index Fund</b>	<b>(0.85)</b>	<b>2.10</b>	<b>(0.90)</b>	<b>(3.99)</b>	<b>0.77</b>	<b>1.50</b>
<b>Blmbg:Aggregate</b>	<b>(0.84)</b>	<b>2.09</b>	<b>(0.94)</b>	<b>(3.96)</b>	<b>0.77</b>	<b>1.52</b>

### Relative Return vs Blmbg:Aggregate



### Callan Core Bond Mutual Funds (Institutional Net) Annualized Five Year Risk vs Return

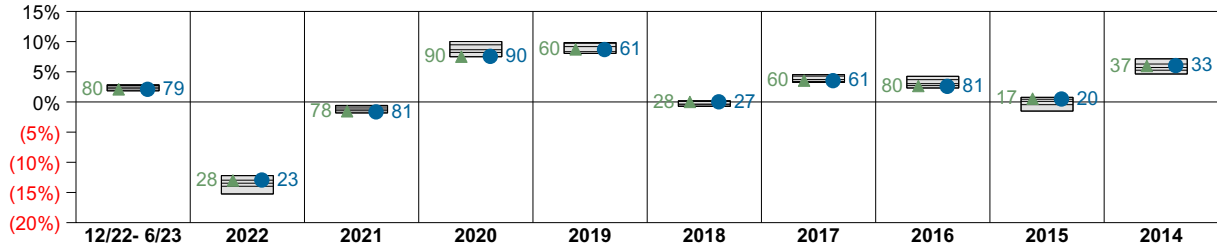


# SERS U.S. Bond Index Fund Return Analysis Summary

## Return Analysis

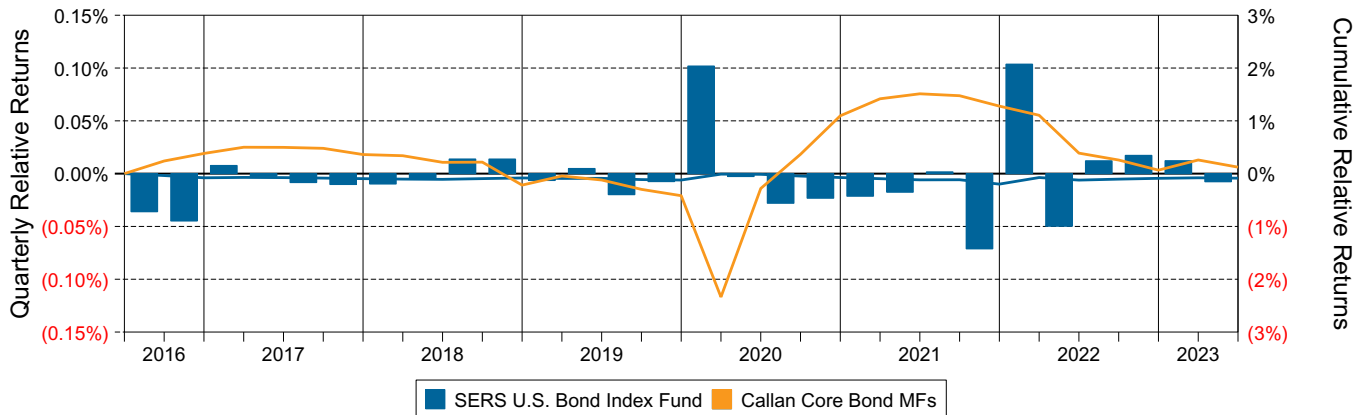
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

### Performance vs Callan Core Bond Mutual Funds (Institutional Net)

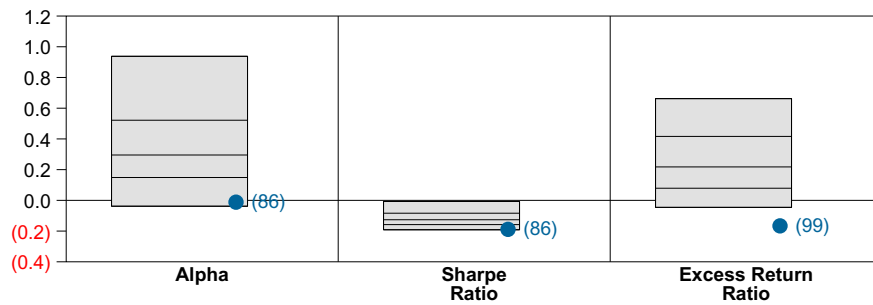


	12/22- 6/23	2022	2021	2020	2019	2018	2017	2016	2015	2014
<b>SERS U.S. Bond Index Fund</b>	2.10	(12.94)	(1.65)	7.56	8.69	0.02	3.53	2.59	0.49	6.03
<b>Blmbg:Aggregate</b>	2.09	(13.01)	(1.54)	7.51	8.72	0.01	3.54	2.65	0.55	5.97

### Cumulative and Quarterly Relative Returns vs Blmbg:Aggregate



### Risk Adjusted Return Measures vs Blmbg:Aggregate Rankings Against Callan Core Bond Mutual Funds (Institutional Net) Seven Years Ended June 30, 2023



	Alpha	Sharpe Ratio	Excess Return Ratio
<b>SERS U.S. Bond Index Fund</b>	(0.01)	(0.19)	(0.17)

# SERS U.S. Bond Index Fund

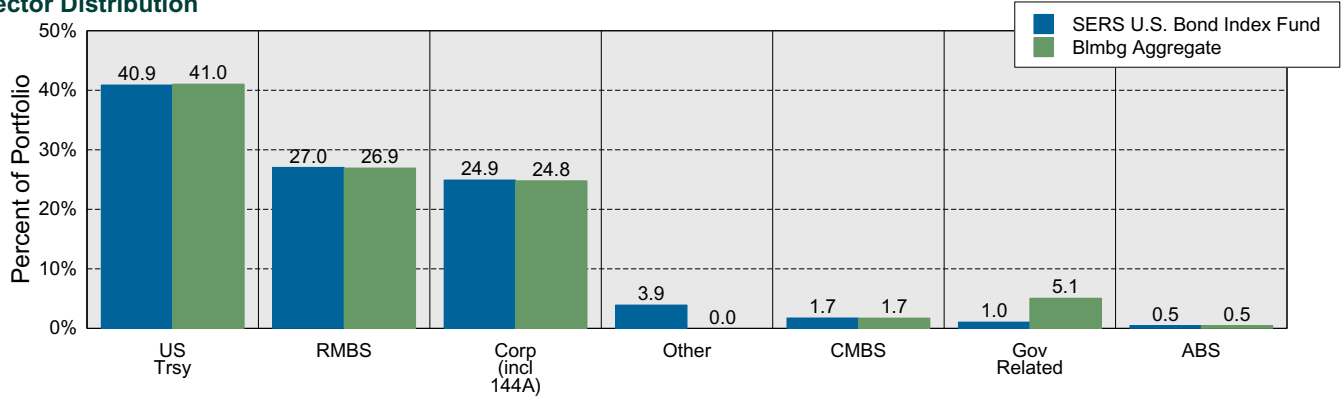
## Portfolio Characteristics Summary

### As of June 30, 2023

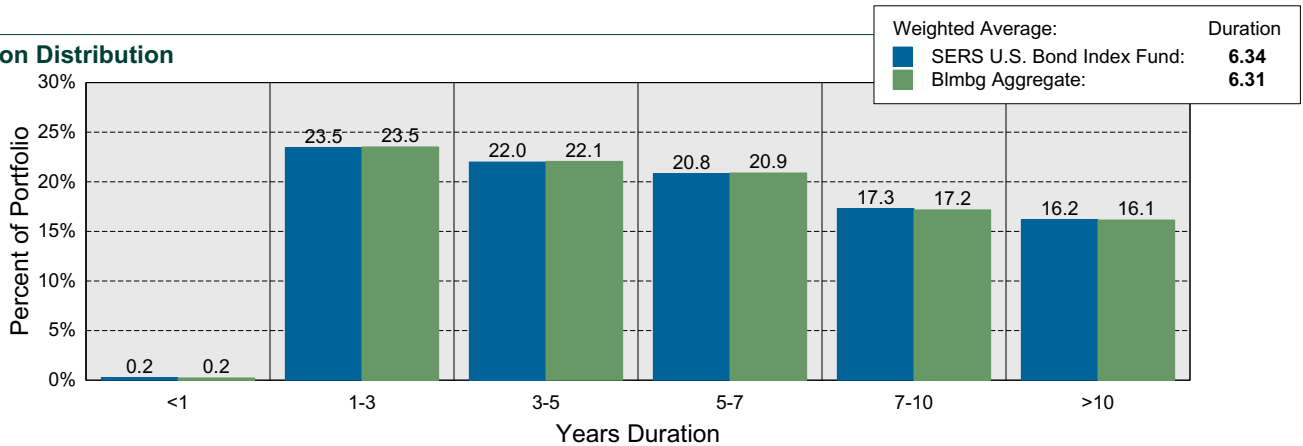
#### Portfolio Structure Comparison

The charts below compare the structure of the portfolio to that of the index from the three perspectives that have the greatest influence on return. The first chart compares the two portfolios across sectors. The second chart compares the duration distribution. The last chart compares the distribution across quality ratings.

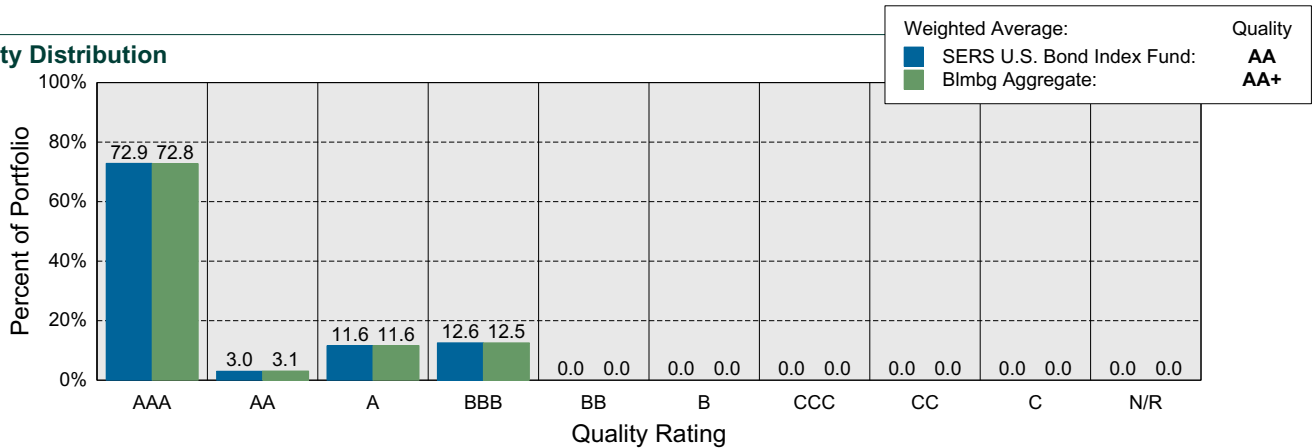
#### Sector Distribution



#### Duration Distribution



#### Quality Distribution



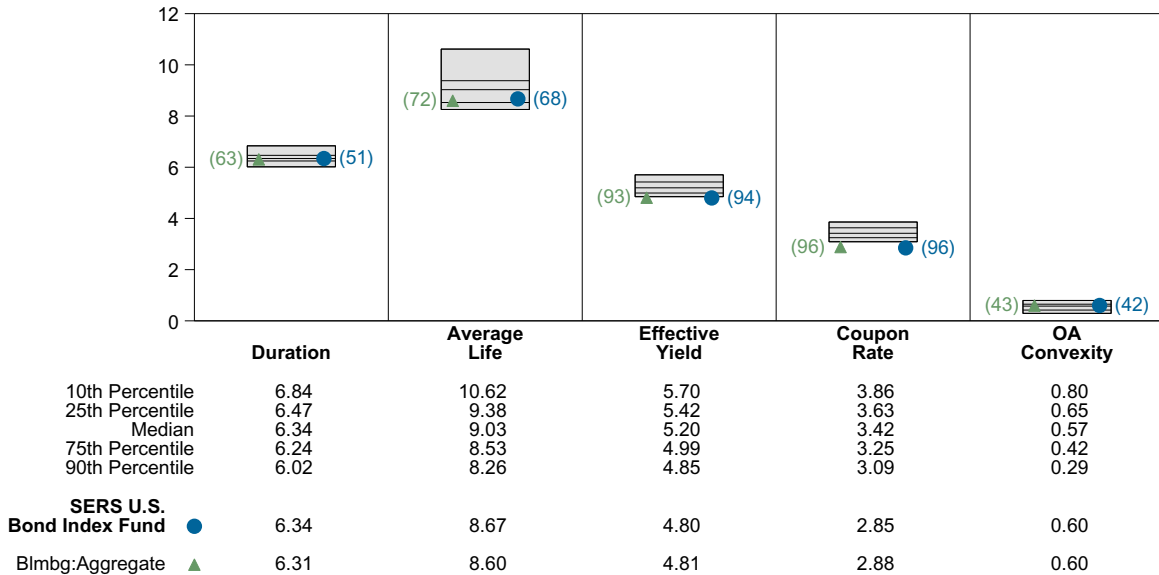
# SERS U.S. Bond Index Fund

## Bond Characteristics Analysis Summary

### Portfolio Characteristics

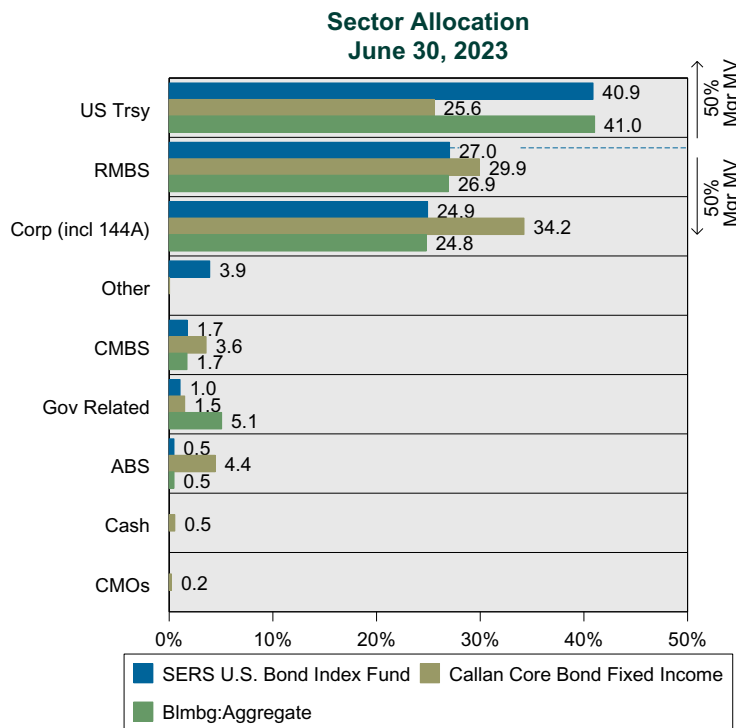
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

### Fixed Income Portfolio Characteristics Rankings Against Callan Core Bond Fixed Income as of June 30, 2023

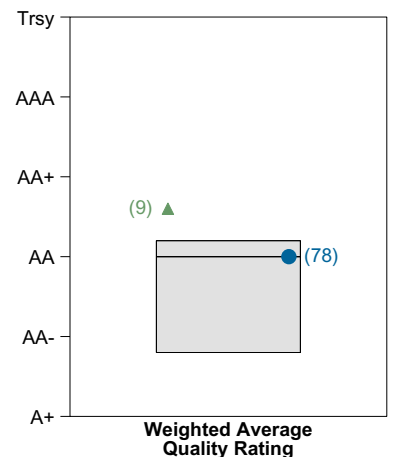


### Sector Allocation and Quality Ratings

The first graph compares the manager's sector allocation with the average allocation across all the members of the manager's style. The second graph compares the manager's weighted average quality rating with the range of quality ratings for the style.



#### Quality Ratings vs Callan Core Bond Fixed Income



10th Percentile	AA
25th Percentile	AA
Median	AA
75th Percentile	AA
90th Percentile	AA-

<b>SERS U.S. Bond Index Fund</b>	AA
Blmbg:Aggregate	AA+





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## Equity Market Indicators

The market indicators included in this report are regarded as measures of equity or fixed income performance results. The returns shown reflect both income and capital appreciation.

**S&P 500 Index** Measures performance of top 500 companies in leading industries of U.S. economy. The index covers approximately 80% of available market capitalization.

## Fixed Income Market Indicators

**3-month Treasury Bill** Provides a measure of riskless return. The rate of return is the average interest rate available on the beginning of each month for a Treasury Bill maturing in ninety days.

**Bloomberg Aggregate** Represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities.

## International Equity Market Indicators

**MSCI EAFE (Net)** Is composed of approximately 1000 equity securities representing the stock exchanges of Europe, Australia, New Zealand and the Far East. The index is capitalization-weighted and is expressed in terms of U.S. dollars.

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## Callan Databases

In order to provide comparative investment results for use in evaluating a fund's performance, Callan gathers rate of return data from investment managers. These data are then grouped by type of assets managed and by the type of investment manager. Except for mutual funds, the results are for tax-exempt fund assets. The databases, excluding mutual funds, represent investment managers who handle over 80% of all tax-exempt fund assets.

### Equity Funds

Equity funds concentrate their investments in common stocks and convertible securities. The funds included maintain well-diversified portfolios.

**Middle Capitalization** - Mutual Funds who invest primarily in mid-range companies with market capitalizations between core equity companies and small capitalization companies. The average market capitalization is approximately \$7 billion. Invests in securities with greater volatility than the broader market as measured by the risk statistics Beta and Standard Deviation. The Middle Capitalization Style Group consists of the Middle Capitalization Growth Equity and the Middle Capitalization Value Equity Style Groups.

### Fixed Income Funds

Fixed Income funds concentrate their investments in bonds, preferred stocks, and money market securities. The funds included maintain well-diversified portfolios.

**Core Bond** - Mutual Funds that construct portfolios to approximate the investment results of the Bloomberg Barclays Capital Government/Credit Bond Index or the Bloomberg Barclays Capital Aggregate Bond Index with a modest amount of variability in duration around the index. The objective is to achieve value added from sector and/or issue selection.

### Balanced Funds

Balanced funds diversify their investments among common stocks, bonds, preferred stocks and money market securities. The funds included maintain well-diversified equity and fixed income portfolios.

**Mutual Fund Balanced Funds** - The Mutual Fund Balanced Fund Database consists of open-end mutual fund balanced products.

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## Risk/Reward Statistics

The risk statistics used in this report examine performance characteristics of a manager or a portfolio relative to a benchmark (market indicator) which assumes to represent overall movements in the asset class being considered. The main unit of analysis is the excess return, which is the portfolio return minus the return on a risk free asset (3 month T-Bill).

**Alpha** measures a portfolio's return in excess of the market return adjusted for risk. It is a measure of the manager's contribution to performance with reference to security selection. A positive alpha indicates that a portfolio was positively rewarded for the residual risk which was taken for that level of market exposure.

**Beta** measures the sensitivity of rates of portfolio returns to movements in the market index. A portfolio's beta measures the expected change in return per 1% change in the return on the market. If a beta of a portfolio is 1.5, a 1 percent increase in the return on the market will result, on average, in a 1.5 percent increase in the return on the portfolio. The converse would also be true.

**Downside Risk** stems from the desire to differentiate between "good risk" (upside volatility) and "bad risk" (downside volatility). Whereas standard deviation punishes both upside and downside volatility, downside risk measures only the standard deviation of returns below the target. Returns above the target are assigned a deviation of zero. Both the frequency and magnitude of underperformance affect the amount of downside risk.

**Excess Return Ratio** is a measure of risk adjusted relative return. This ratio captures the amount of active management performance (value added relative to an index) per unit of active management risk (tracking error against the index.) It is calculated by dividing the manager's annualized cumulative excess return relative to the index by the standard deviation of the individual quarterly excess returns. The Excess Return Ratio can be interpreted as the manager's active risk/reward tradeoff for diverging from the index when the index is mandated to be the "riskless" market position.

**Information Ratio** measures the manager's market risk-adjusted excess return per unit of residual risk relative to a benchmark. It is computed by dividing alpha by the residual risk over a given time period. Assuming all other factors being equal, managers with lower residual risk achieve higher values in the information ratio. Managers with higher information ratios will add value relative to the benchmark more reliably and consistently.

**R-Squared** indicates the extent to which the variability of the portfolio returns are explained by market action. It can also be thought of as measuring the diversification relative to the appropriate benchmark. An r-squared value of .75 indicates that 75% of the fluctuation in a portfolio return is explained by market action. An r-squared of 1.0 indicates that a portfolio's returns are entirely related to the market and it is not influenced by other factors. An r-squared of zero indicates that no relationship exists between the portfolio's return and the market.

**Relative Standard Deviation** is a simple measure of a manager's risk (volatility) relative to a benchmark. It is calculated by dividing the manager's standard deviation of returns by the benchmark's standard deviation of returns. A relative standard deviation of 1.20, for example, means the manager has exhibited 20% more risk than the benchmark over that time period. A ratio of .80 would imply 20% less risk. This ratio is especially useful when analyzing the risk of investment grade fixed-income products where actual historical durations are not available. By using this relative risk measure over rolling time periods one can illustrate the "implied" historical duration patterns of the portfolio versus the benchmark.

**Residual Portfolio Risk** is the unsystematic risk of a fund, the portion of the total risk unique to the fund (manager) itself and not related to the overall market. This reflects the "bets" which the manager places in that particular asset market. These bets may reflect emphasis in particular sectors, maturities (for bonds), or other issue specific factors which the manager considers a good investment opportunity. Diversification of the portfolio will reduce or eliminate the residual risk of that portfolio.

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## Risk/Reward Statistics

**Rising Declining Periods** refer to the sub-asset class cycles vis-a-vis the broader asset class. This is determined by evaluating the cumulative relative sub-asset class index performance to that of the broader asset class index. For example, to determine the Growth Style cycle, the S&P 500 Growth Index (sub-asset class) performance is compared to that of the S&P 500 Index (broader asset class).

**Sharpe Ratio** is a commonly used measure of risk-adjusted return. It is calculated by subtracting the "risk-free" return (usually 3 Month Treasury Bill) from the portfolio return and dividing the resulting "excess return" by the portfolio's risk level (standard deviation). The result is a measure of return gained per unit of risk taken.

**Sortino Ratio** is a downside risk-adjusted measure of value-added. It measures excess return over a benchmark divided by downside risk. The natural appeal is that it identifies value-added per unit of truly bad risk. The danger of interpretation, however, lies in these two areas: (1) the statistical significance of the denominator, and (2) its reliance on the persistence of skewness in return distributions.

**Standard Deviation** is a statistical measure of portfolio risk. It reflects the average deviation of the observations from their sample mean. Standard deviation is used as an estimate of risk since it measures how wide the range of returns typically is. The wider the typical range of returns, the higher the standard deviation of returns, and the higher the portfolio risk. If returns are normally distributed (ie. has a bell shaped curve distribution) then approximately 2/3 of the returns would occur within plus or minus one standard deviation from the sample mean.

**Total Portfolio Risk** is a measure of the volatility of the quarterly excess returns of an asset. Total risk is composed of two measures of risk: market (non-diversifiable or systematic) risk and residual (diversifiable or unsystematic) risk. The purpose of portfolio diversification is to reduce the residual risk of the portfolio.

**Tracking Error** is a statistical measure of a portfolio's risk relative to an index. It reflects the standard deviation of a portfolio's individual quarterly or monthly returns from the index's returns. Typically, the lower the Tracking Error, the more "index-like" the portfolio.

**Treynor Ratio** represents the portfolio's average excess return over a specified period divided by the beta relative to its benchmark over that same period. This measure reflects the reward over the risk-free rate relative to the systematic risk assumed.

Note: Alpha, Total Risk, and Residual Risk are annualized.



## Quarterly Highlights

The Callan Institute provides research to update clients on the latest industry trends and carefully structured educational programs to enhance the knowledge of industry professionals. Visit [www.callan.com/research-library](http://www.callan.com/research-library) to see all of our publications, and [www.callan.com/blog](http://www.callan.com/blog) to view our blog. For more information contact Barb Gerraty at 415-274-3093 / [institute@callan.com](mailto:institute@callan.com).

## New Research from Callan's Experts

**[2023 Private Credit Fees and Terms Study](#)** | Catherine Beard and Jared Ungar assess private credit partnerships in our first fees and terms study for this asset class.

**[2Q23 Real Assets Reporter: Life Sciences Investments](#)** | Christine Mays describes life sciences investments and the role they can play in institutional portfolios.

**[The Critical Underlying Technology Behind Digital Assets: A Primer for Institutional Investors](#)** | This paper provides background on key concepts around digital assets: blockchains and distributed ledgers; cryptography; validation protocols; smart contracts; and tokenization.

## Blog Highlights

**[Biodiversity: A Relatively New Theme for ESG-Focused Investors](#)** | Biodiversity investments include companies that support the sustainable use of natural resources and ecosystem services or technologies, or products or services that reduce biodiversity threats or restore natural habitats.

**[Higher Interest Rates Meet Lower Valuations: Implications for the CRE Industry](#)** | The commercial real estate (CRE) industry, already facing challenges with economic uncertainty, the shift to remote work, and recent layoffs by many major office tenants, now confronts higher interest rates and plummeting pricing.

**[How to Improve DC Plans with DEI](#)** | For defined contribution (DC) plan sponsors, understanding the diversity within the employee population supports inclusiveness and equality in access and opportunities.

## Webinar Replays

**[Research Cafe: ESG Interview Series](#)** | During this interview, Aaron Quach, Callan ESG team member, interviews Jan Mende, Callan real assets specialist and author of our white paper on energy transition. They will discuss the growing opportunities for investment within the energy transition space and how they can be incorporated into the portfolios of institutional investors.

## Quarterly Periodicals

**[Private Equity Update, 1Q23](#)** | A high-level summary of private equity activity in the quarter through all the investment stages

**[Active vs. Passive Charts, 1Q23](#)** | A comparison of active managers alongside relevant benchmarks over the long term

**[Market Pulse, 1Q23](#)** | A quarterly market reference guide covering trends in the U.S. economy, developments for institutional investors, and the latest data on the capital markets

**[Capital Markets Review, 1Q23](#)** | Analysis and a broad overview of the economy and public and private markets activity each quarter across a wide range of asset classes

**[Hedge Fund Update, 1Q23](#)** | Commentary on developments for hedge funds and multi-asset class (MAC) strategies

**[Real Assets Update, 1Q23](#)** | A summary of market activity for real assets and private real estate during the quarter

**[Private Credit Update, 1Q23](#)** | A review of performance and fundraising activity for private credit during the quarter

## Events

A complete list of all upcoming events can be found on our website: [callan.com/events-education](https://callan.com/events-education).

Please mark your calendar and look forward to upcoming invitations:

**Webinar: The End of the Low-Yield Environment**  
Aug 9, 2023 – Virtual

**2023 October Workshops**  
Oct. 24, 2023 – New York  
Oct. 26, 2023 – Chicago

**2024 National Conference**  
April 8-10, 2024 – San Francisco

For more information about events, please contact Barb Gerraty: 415-274-3093 / [gerraty@callan.com](mailto:gerraty@callan.com)

## Education: By the Numbers

50+

Unique pieces of research the Institute generates each year

525

Attendees (on average) of the Institute's annual National Conference

3,700

Total attendees of the "Callan College" since 1994

## Education

Founded in 1994, the "Callan College" offers educational sessions for industry professionals involved in the investment decision-making process.

### Introduction to Investments

Sept. 26-28 – Virtual

This program familiarizes institutional investor trustees and staff and asset management advisers with basic investment theory, terminology, and practices. This course is designed for individuals with less than two years of experience with asset-management oversight and/or support responsibilities.

### Alternative Investments

Aug. 23-24 – Virtual

Alternative investments like private equity, hedge funds, and real estate can play a key role in any portfolio. In our "Callan College" on Alternatives, you will learn about the importance of allocations to alternatives, and how to consider integrating, evaluating, and monitoring them.

Our virtual sessions are held over two to three days with virtual modules of 2.5-3 hours, while in-person sessions run either a full day or one-and-a-half days. Virtual tuition is \$950 per person and includes instruction and digital materials. In-person tuition is \$2,350 per person and includes instruction, all materials, breakfast and lunch on each day, and dinner on the first evening with the instructors.

Additional information including registration can be found at: [callan.com/events-education](https://callan.com/events-education)



"Research is the foundation of all we do at Callan, and sharing our best thinking with the investment community is our way of helping to foster dialogue to raise the bar across the industry."

Greg Allen, CEO and Chief Research Officer







## List of Callan’s Investment Manager Clients

Confidential – For Callan Client Use Only

Callan takes its fiduciary and disclosure responsibilities to clients very seriously. We recognize that there are numerous potential conflicts of interest encountered in the investment consulting industry, and that it is our responsibility to manage those conflicts effectively and in the best interest of our clients. At Callan, we employ a robust process to identify, manage, monitor, and disclose potential conflicts on an ongoing basis.

The list below is an important component of our conflicts management and disclosure process. It identifies those investment managers that pay Callan fees for educational, consulting, software, database, or reporting products and services. We update the list quarterly because we believe that our fund sponsor clients should know the investment managers that do business with Callan, particularly those investment manager clients that the fund sponsor clients may be using or considering using. Please note that if an investment manager receives a product or service on a complimentary basis (e.g., attending an educational event), they are not included in the list below. Callan is committed to ensuring that we do not consider an investment manager’s business relationship with Callan, or lack thereof, in performing evaluations for or making suggestions or recommendations to its other clients. Please refer to Callan’s ADV Part 2A for a more detailed description of the services and products that Callan makes available to investment manager clients through our Institutional Consulting Group, Independent Adviser Group, and Fund Sponsor Consulting Group. Due to the complex corporate and organizational ownership structures of many investment management firms, parent and affiliate firm relationships are not indicated on our list.

Fund sponsor clients may request a copy of the most currently available list at any time. Fund sponsor clients may also request specific information regarding the fees paid to Callan by particular fund manager clients. Per company policy, information requests regarding fees are handled exclusively by Callan’s Compliance department.

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