

Investment Performance Review
Period Ending June 30, 2023

Retirement Board of Allegheny County



2nd Quarter 2023 Market Environment



The Economy

- Though the Atlanta Fed GDPNow model forecasted weak GDP growth in 2023 as the impact from higher interest rates continued to spread through the broader economy, the first quarter GDP final revision of 2% was markedly higher than the 1.3% first reported.
- The US Federal Reserve Bank (the Fed) continued to increase interest rates during the quarter with an additional 0.25% increase in the Fed Funds rate in May, followed by a pause in June. The Fed continues to prioritize fighting high inflation with the press release from the June meeting detailing the extent that additional policy firming (i.e., rate increases) will consider the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.
- June brought some weakness in the US labor market as nonfarm payrolls increased by 209,000, below the expected 240,000 new jobs. This represented the slowest month for job creation since December 2020. Initial jobless also rose for the week ending July 1st.
- The global banking sector came under duress in the first quarter of 2023, triggered by the second and third-largest regional bank failures in US history. Fears of deterioration in the banking sector have waned, likely helped by aggressive intervention from the FDIC and Federal Reserve.

Equity (Domestic and International)

- US equities moved broadly higher during the second quarter led by growth-oriented sectors. The S&P 500 Benchmark rose 8.7% for the quarter, its best-performing quarter since Q4-2021. Large-cap growth was the best-performing domestic segment of the equity market during the period while small-cap value, while positive, was the weakest relative performer for the quarter.
- International stocks experienced modest returns during the quarter. Local currency (LCL) performance outpaced US Dollar (USD) performance in most regions though both benchmarks were positive as the USD traded higher during the quarter.
- Global GDP growth continues to face challenges despite falling energy prices. European growth remained under pressure amid hawkish central bank policies. While China has fully reopened after almost three years of COVID-19 restrictions, there have been challenges associated with the region re-integrating with the global economy.

Fixed Income

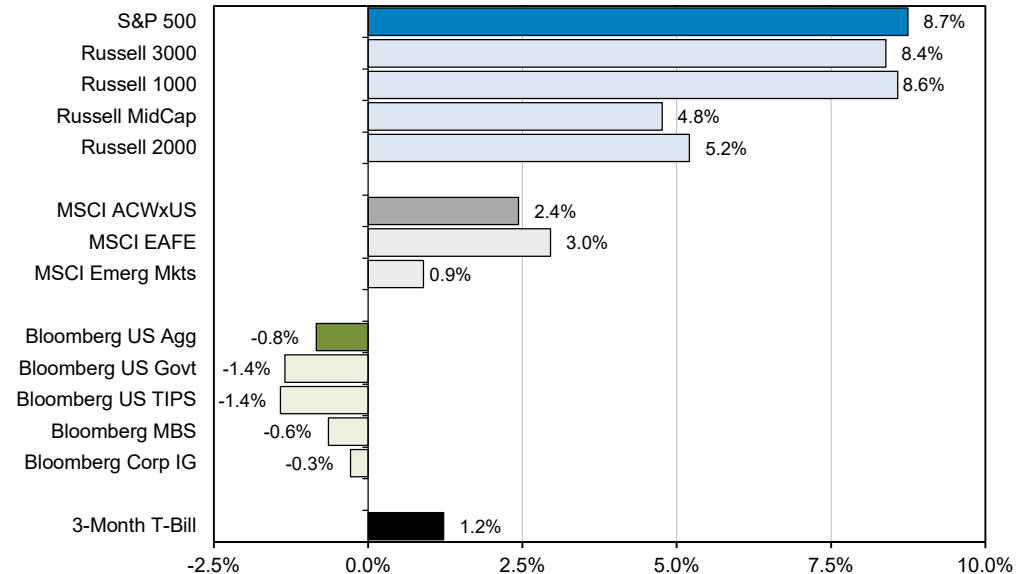
- While inflation continues to decline, the Fed maintained their inflation-fighting policy stance, increasing interest rates by 0.25% in May but opting to pause in June. The additional rate hike in May along with the possibility that additional rate hikes could occur in this tightening cycle, drove intermediate and long-term rates slightly higher during the quarter.
- US Government securities were the worst-performing sector during the quarter. US Treasuries lagged the corporate and securitized sectors as yields at longer maturities rose slightly and credit conditions were considered more favorable than the previous quarter.
- Corporate bonds with lower credit ratings held up better than higher quality issues, aided by narrowing credit spreads as well as their higher coupons. High-yield bonds were the best-performing segment of the domestic bond market, echoing the equity market's positive sentiment during the quarter.
- Global bonds underperformed US issues during the quarter and the trailing one-year period.

Market Themes

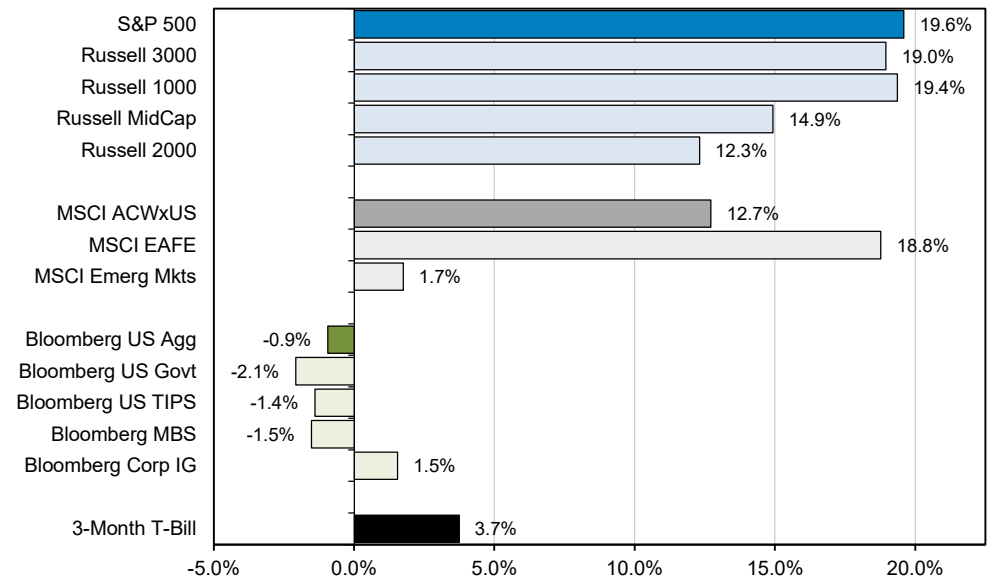
- Central banks remained vigilant in their fight against inflation with the Fed, the Bank of England, and the European Central foreshadowing the potential for further tightening with additional rate hikes in the coming months. GDP contraction in the Eurozone for the previous two quarters has been met with recovering asset prices in the most recent quarter as investors remain hopeful of future growth.
- The conflict in Ukraine continues without expectations of any resolution in the near future. Energy costs have subsided in recent months attributed to a mild winter in the Eurozone region and an increase in fossil fuel production in the US.
- Short-term interest rates rose across most developed markets as central banks continued to tighten policy stances. Despite previous concerns about the potential for slowing economic growth, lower-quality corporate bonds outpaced higher-quality government bonds as credit spreads narrowed.
- Both US and international equity markets continued to recover from the disappointing year that was 2022 on expectations that inflation would continue to moderate and central banks would slow the pace of their monetary tightening cycles. Growth has significantly outpaced value in the previous two quarters.

- Domestic equity markets started 2023 with solid results, led mostly by the large-cap names. The poor performance posted by domestic equities in the first half of 2022 has rolled off and now each index has turned positive on a trailing one-year basis. Factors contributing to the quarter's results include strong economic data in the face of higher benchmark rates and the expectation that the Fed would slow the pace of future interest rate increases. For the period, the S&P 500 large-cap benchmark returned 8.7% versus 4.8% for mid-cap and 5.2% for small-cap benchmarks.
- International developed and emerging market equities also delivered positive results, albeit lagging behind their domestic counterparts. Europe continues to face geopolitical risks related to the conflict in Ukraine and rising interest rates, though inflation has eased somewhat due to higher rates and more manageable energy prices. Performance in the emerging market index was led by the Latin America region whose regional index posted a strong 14.0% return in USD terms. The developed market MSCI EAFE Index returned 3.0% for the quarter and the MSCI Emerging Markets Index rose by 0.9%.
- The domestic bond market ebbed during the quarter due to higher rates from the Federal Reserve's decision to hike policy rates an additional 0.25%. The Bloomberg (BB) US Aggregate Index returned -0.8% for the period while investment-grade corporate bonds were down less with a return of -0.3%.
- During the one-year trailing period, US equity markets were positive as the weak performance from the first half of 2022 rolled off. The S&P 500 Index returned 19.6% for the year. The weakest relative performance for the year was the Russell 2000 Index, which still climbed 12.3% over the last 12-months.
- International markets also rolled off their poor performance in 2022. Over the trailing one-year period, the MSCI EAFE Index returned 18.8% while the MSCI Emerging Markets Index added a much more modest 1.7%. Concerns relating to the conflict in Ukraine continued to emanate throughout the region and globally. Elevated inflation and slowing global economic growth continue to be an additional headwind for global markets.
- Bond markets softened further, posting negative returns over the previous 1-year period for most indices. The primary driver of results during the first half of 2023 continues to be higher interest rates, which directly impact bond prices and index performance. Investment-grade corporate bonds were the only sector to post positive performance over the previous 12-months, adding 1.5%. The US Government sector suffered the most for the period, posting a return of -2.1%.

Quarter Performance



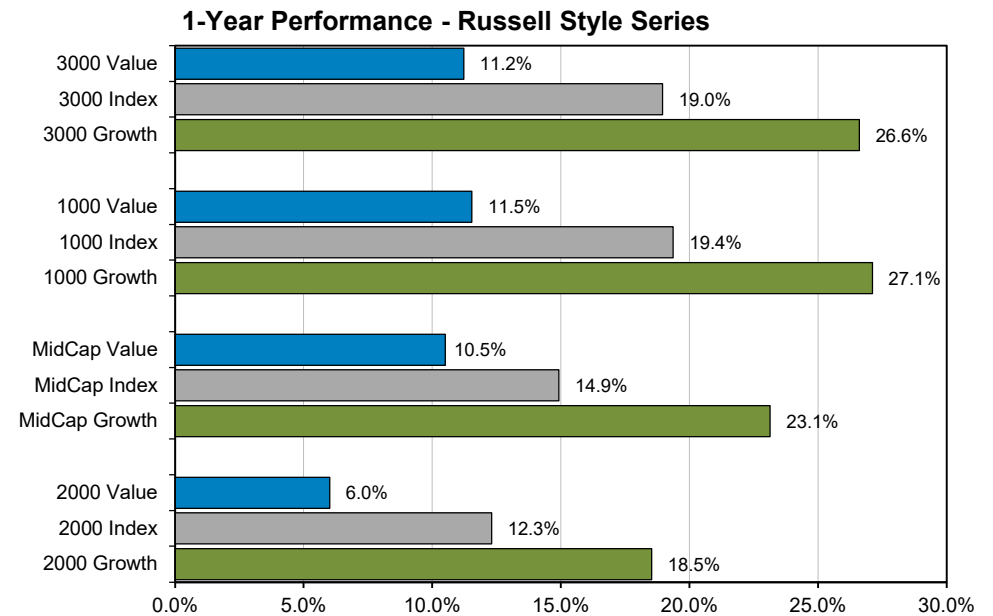
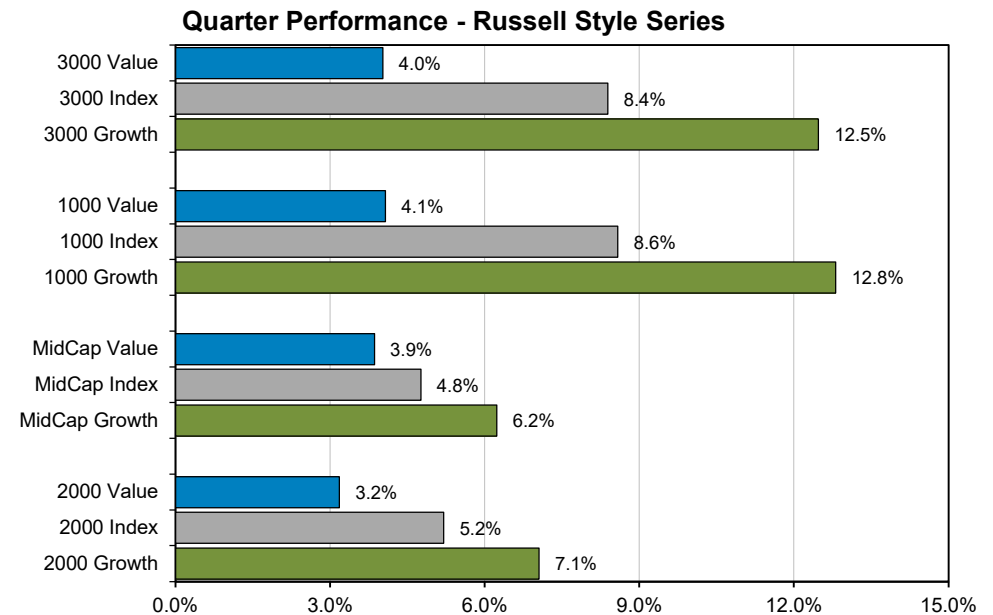
1-Year Performance



Source: Investment Metrics



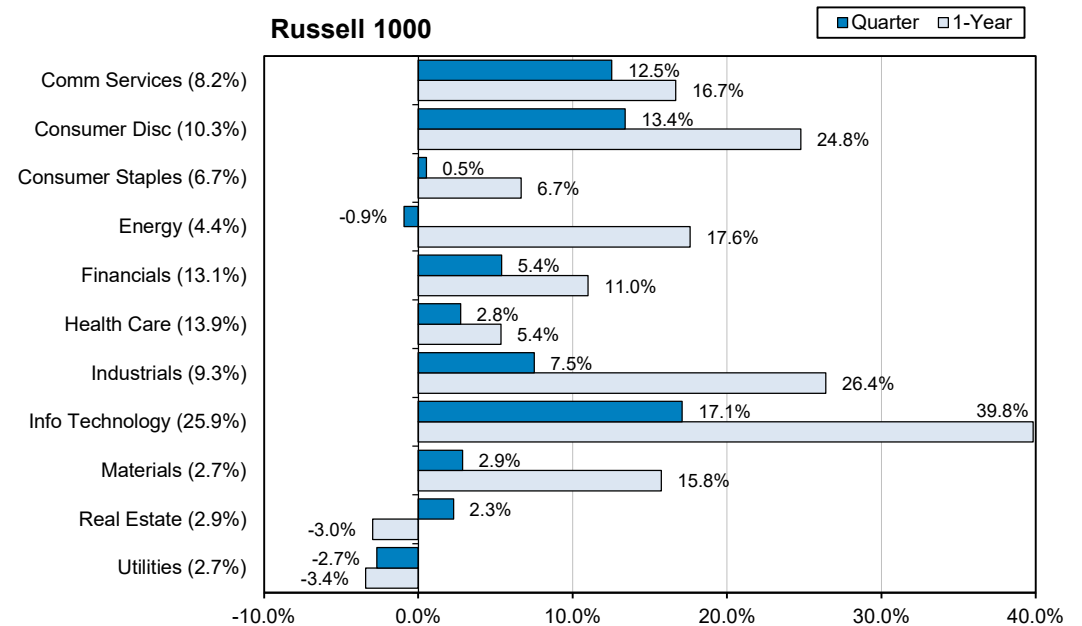
- Core domestic equity benchmarks posted positive results for the second quarter in a row. However, concerns regarding the regional banking sector and the financial sector's large weight in the value benchmarks weighed heavily on the broad value indices' performance in the first half of 2023. Large-cap stocks once again led results for the capitalization-based benchmarks, besting both the mid-cap and small-cap indices for the quarter. Growth benchmarks posted the strongest results as economic data continues to show favorable conditions for growth stocks. The Russell 1000 Growth Index topped the quarter, returning 12.8% followed by the Russell 2000 Growth Index and the Russell Midcap Growth Index, which rose by 7.1% and 6.2%, respectively.
- As previously stated, Growth stocks at all capitalization ranges outperformed their value counterparts by a wide margin for the quarter. This continued the 2023 theme of growth-based benchmark outperformance. Among the value benchmarks Large cap, mid-cap and small-cap value each posted positive performance for the quarter with the Russell 1000 Value Index leading the way at 4.1%.
- The second quarter's continued positive performance in tandem with the poor performance from the first half of 2022 rolling off the various benchmark returns turned the Russell indices positive on a trailing 12-month basis. Within large-cap stocks, the Russell 1000 Growth Index returned a strong 27.1%, leading the way among style and market capitalization classifications. The worst-performing index was the Russell 2000 Value, which posted a modest 6.0% return for the trailing 12-months.
- Growth rebounded from disappointing results in early 2022 and led value-based benchmarks in all market capitalization ranges during the trailing year. The Russell 2000 Growth Index returned 18.5%, outpacing the Russell 2000 Value index return of 6.0% by a span of 12.5%. The Russell 1000 Growth and Russell Midcap Growth benchmarks gained 27.1% and 23.1%, respectively, while their corresponding value index counterparts returned solid, but lagging, performance of 11.5% and 10.5%, respectively.



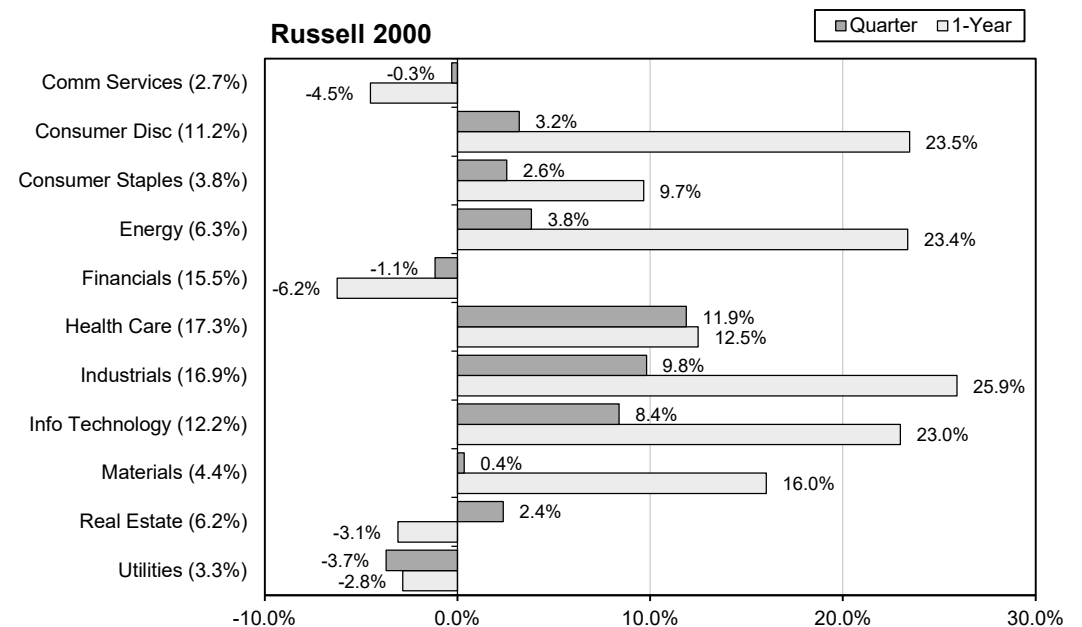
Source: Investment Metrics



- Large Cap sector performance was mostly positive for the second quarter. Nine of 11 economic sectors posted positive absolute performance for the quarter, but just three managed to outpace the return of the Russell 1000 index.
- After a challenging 2022, the information technology sector continued its dominating rebound, amassing an impressive 17.1% return for the quarter. The other two sectors that outpaced the headline index's return for the quarter were communication services (12.5%) and consumer discretionary (13.4%). Energy (-0.9%), and utilities (-2.7%) were the two sectors that lost ground for the quarter.
- For the full year, four economic sectors exceeded the return of the broad large-cap benchmark and seven of the eleven sectors posted positive performance. The weakest economic sector in the Russell 1000 for the year was utilities, which declined by -3.4% and was heavily impacted by rising energy costs and a market rotation away from defensive names.



- Eight small-cap economic sectors posted positive results during the quarter while just three exceeded the 5.2% return of the Russell 2000 Index. The health care (11.9%), industrials (9.8%), and information technology (8.4%) sectors led the way, outpacing the broad benchmark for the quarter while the utilities (-3.7%), financials (-1.1%), and communication services (-0.3%) sectors posted negative returns.
- Like large cap sector performance over the trailing year, seven small cap sectors were positive. Industrials posted the strongest sector results (25.9%) but the consumer discretionary, energy, and information technology sectors each also returned in excess of 20% for the last 12-months. Five of the 11 economic sectors fell short of core small-cap benchmark's return of 12.3% over the trailing year. The worst-performing sector for the year was financials with a return of -6.2%. The communication services (-4.5%), real estate (-3.1%), and utilities (-2.8%) sectors also posted negative results for the year.



Source: Morningstar Direct
 As a result of the GICS classification changes on 9/28/2018 and certain associated reporting limitations, sector performance represents backward looking performance for the prior year of each sector's current constituency, post creation of the Communication Services sector.



The Market Environment
Top 10 Index Weights & Quarterly Performance for the Russell 1000 & 2000
As of June 30, 2023

Top 10 Weighted Stocks				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
Apple Inc	7.0%	17.8%	42.7%	Information Technology
Microsoft Corp	6.2%	18.4%	33.9%	Information Technology
Amazon.com Inc	2.9%	26.2%	22.7%	Consumer Discretionary
NVIDIA Corp	2.4%	52.3%	179.3%	Information Technology
Tesla Inc	1.8%	26.2%	16.6%	Consumer Discretionary
Alphabet Inc Class A	1.7%	15.4%	9.9%	Communication Services
Meta Platforms Inc Class A	1.5%	35.4%	78.0%	Communication Services
Berkshire Hathaway Inc Class B	1.5%	10.4%	24.9%	Financials
Alphabet Inc Class C	1.5%	16.3%	10.6%	Communication Services
UnitedHealth Group Inc	1.1%	2.1%	-5.1%	Health Care

Top 10 Performing Stocks (by Quarter)				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
XP Inc Class A	0.0%	97.6%	30.6%	Financials
Wayfair Inc Class A	0.0%	89.3%	49.2%	Consumer Discretionary
Carnival Corp	0.0%	85.5%	117.7%	Consumer Discretionary
XPO Inc	0.0%	85.0%	95.0%	Industrials
Palantir Technologies Inc	0.1%	81.4%	69.0%	Information Technology
MongoDB Inc Class A	0.1%	76.3%	58.4%	Information Technology
Vertiv Holdings Co Class A	0.0%	73.1%	201.6%	Industrials
Nu Holdings Ltd Ordinary Shares	0.0%	65.8%	111.0%	Financials
AppLovin Corp Ordinary Shares -	0.0%	63.4%	-25.3%	Information Technology
Norwegian Cruise Line Holdings Ltd	0.0%	61.9%	95.8%	Consumer Discretionary

Bottom 10 Performing Stocks (by Quarter)				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
Victoria's Secret & Co	0.0%	-49.0%	-37.7%	Consumer Discretionary
Advance Auto Parts Inc	0.0%	-41.5%	-58.1%	Consumer Discretionary
Tandem Diabetes Care Inc	0.0%	-39.6%	-58.5%	Health Care
First Horizon Corp	0.0%	-35.8%	-46.6%	Financials
Ubiquiti Inc	0.0%	-35.1%	-28.5%	Information Technology
Catalent Inc	0.0%	-34.0%	-59.6%	Health Care
Concentrix Corp Ordinary Shares	0.0%	-33.4%	-39.9%	Industrials
MarketAxess Holdings Inc	0.0%	-33.0%	3.1%	Financials
Mercury Systems Inc	0.0%	-32.3%	-46.2%	Industrials
Peloton Interactive Inc	0.0%	-32.2%	-16.2%	Consumer Discretionary

Top 10 Weighted Stocks				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
Super Micro Computer Inc	0.5%	133.9%	517.7%	Information Technology
SPS Commerce Inc	0.3%	26.1%	69.9%	Information Technology
Rambus Inc	0.3%	25.2%	198.6%	Information Technology
Chart Industries Inc	0.3%	27.4%	-4.5%	Industrials
Novanta Inc	0.3%	15.7%	51.8%	Information Technology
Chord Energy Corp Ordinary Shares	0.3%	16.9%	38.0%	Energy
Light & Wonder Inc Ordinary Shares	0.3%	14.5%	46.3%	Consumer Discretionary
ChampionX Corp	0.3%	14.8%	57.8%	Energy
Atkore Inc	0.3%	11.0%	87.9%	Industrials
Commercial Metals Co	0.3%	8.0%	61.2%	Materials

Top 10 Performing Stocks (by Quarter)				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
CXApp Inc Ordinary Shares - Class A	0.0%	503.3%	9.2%	Information Technology
Immunogen Inc	0.2%	391.4%	319.3%	Health Care
Applied Digital Corp	0.0%	317.4%	790.5%	Information Technology
Presto Automation Inc	0.0%	230.4%	N/A	Information Technology
EyePoint Pharmaceuticals Inc	0.0%	195.9%	10.5%	Health Care
CARISMA Therapeutics Inc	0.0%	182.9%	N/A	Health Care
P3 Health Partners Inc Class A	0.0%	182.1%	-19.6%	Health Care
Nano X Imaging Ltd Ordinary Shares	0.0%	168.5%	37.1%	Health Care
Carvana Co Class A	0.1%	164.8%	14.8%	Consumer Discretionary
Bit Digital Inc Ordinary Shares	0.0%	163.6%	209.9%	Information Technology

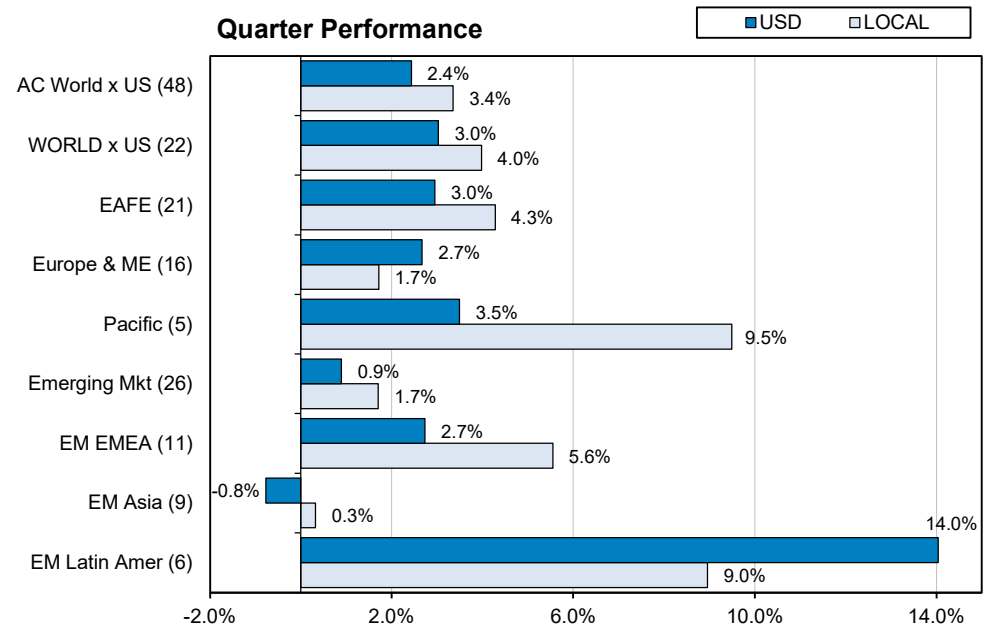
Bottom 10 Performing Stocks (by Quarter)				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
Babylon Holdings Ltd Ordinary Shares	0.0%	-98.6%	-99.7%	Health Care
ViewRay Inc	0.0%	-89.8%	-86.7%	Health Care
Rain Oncology Inc	0.0%	-86.3%	-78.4%	Health Care
FibroGen Inc	0.0%	-85.5%	-74.4%	Health Care
HomeStreet Inc	0.0%	-66.6%	-82.0%	Financials
BioXcel Therapeutics Inc	0.0%	-64.3%	-49.5%	Health Care
Orchestra BioMed Holdings Inc	0.0%	-64.2%	N/A	Health Care
PolyMet Mining Corp	0.0%	-63.2%	-68.6%	Materials
Enviva Inc	0.0%	-62.4%	-80.1%	Energy
NanoString Technologies Inc	0.0%	-59.1%	-68.1%	Health Care

Source: Morningstar Direct

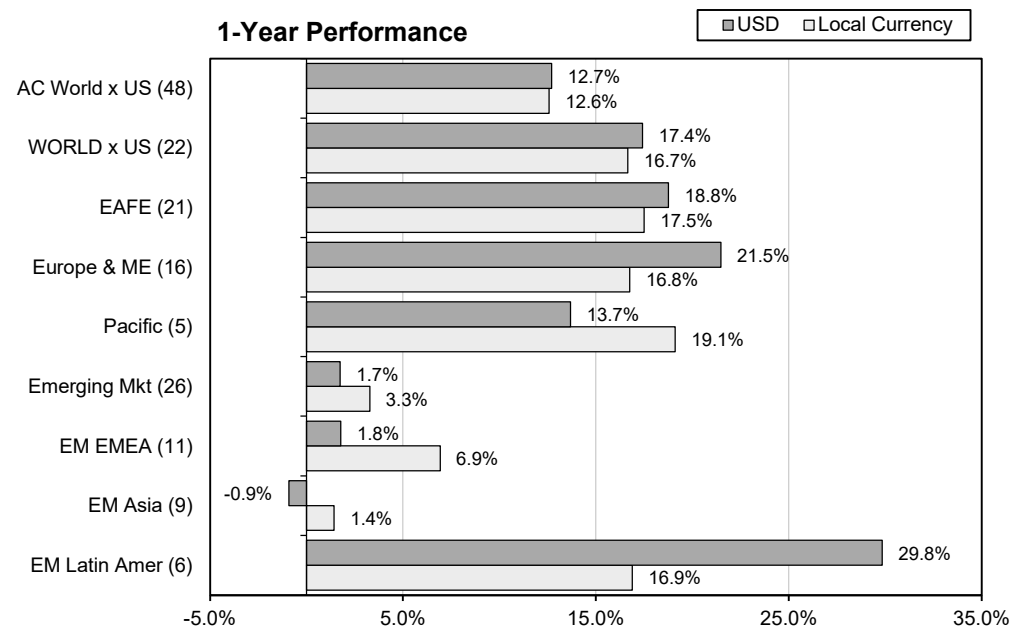


- Many of the international developed and emerging market benchmarks posted positive performance in both USD and LCL terms for the second quarter. While the strengthening of the USD chilled non-US index performance in USD during the quarter, the developed market MSCI EAFE Index still returned a solid 3.0% in USD and 4.3% in LCL terms for the period. The MSCI Emerging Markets Index rose by 0.9% in USD and 1.7% in LCL terms.
- Latin America (LATAM) dramatically outpaced other emerging markets for the quarter with the regional index earning a solid 14.0% in USD and 9.0% in LCL terms. Performance in the region was driven by strong demand for commodity exports from growing worldwide production along with a USD performance boost due to local currency strength in the region.
- The largest weighted country in the emerging market index (China, 8.2%) lagged during the quarters. Investors have struggled to accurately forecast the pace of China's recovery after its grand economic reopening from COVID-19 lockdowns, which led to a flurry of spending that has since cooled.
- Much like domestic markets, trailing one-year results for international developed and emerging markets rolled off their poor performance from early 2022 which resulted in strong results for the trailing year. Much of the strong USD performance in late 2022 has been reversed in 2023 with the MSCI EAFE Index returning 18.8% in USD for the year and 17.5% in LCL terms.
- Annual returns across emerging markets were more bifurcated. Latin American results led the way with returns of 29.8% in USD and 16.9% in LC terms. Performance in the EM Asia regional benchmark detracted from emerging market index with the EM Asia Index posting returns of -0.9% in USD and 1.4% in LCL terms. As a result, the broad MSCI Emerging Markets Index returned a muted 1.7% in USD and 3.3% in LCL terms for the year.

Quarter Performance



1-Year Performance



Source: MSCI Global Index Monitor (Returns are Net)



The Market Environment
US Dollar International Index Attribution & Country Detail
As of June 30, 2023

MSCI - EAFE	Sector Weight	Quarter Return	1-Year Return
Communication Services	4.1%	-2.6%	2.2%
Consumer Discretionary	12.6%	5.0%	30.6%
Consumer Staples	10.1%	-0.6%	9.9%
Energy	4.2%	0.1%	14.3%
Financials	18.3%	4.6%	20.2%
Health Care	13.2%	2.0%	9.8%
Industrials	16.2%	6.2%	29.6%
Information Technology	8.2%	5.9%	32.7%
Materials	7.4%	-1.7%	16.4%
Real Estate	2.3%	-2.0%	-7.4%
Utilities	3.5%	4.0%	16.5%
Total	100.0%	3.0%	18.8%

MSCI - ACWixUS	Sector Weight	Quarter Return	1-Year Return
Communication Services	5.5%	-4.6%	-0.7%
Consumer Discretionary	12.1%	1.5%	12.6%
Consumer Staples	8.6%	-0.4%	9.0%
Energy	5.4%	3.4%	9.4%
Financials	20.6%	4.9%	13.2%
Health Care	9.6%	1.5%	7.4%
Industrials	13.2%	5.4%	24.9%
Information Technology	11.9%	6.1%	24.1%
Materials	7.9%	-2.7%	10.7%
Real Estate	2.0%	-2.5%	-9.5%
Utilities	3.2%	3.7%	7.8%
Total	100.0%	2.4%	12.7%

MSCI - Emerging Mkt	Sector Weight	Quarter Return	1-Year Return
Communication Services	9.8%	-6.8%	-3.6%
Consumer Discretionary	13.2%	-6.3%	-15.3%
Consumer Staples	6.4%	0.3%	4.4%
Energy	5.0%	12.1%	13.5%
Financials	21.9%	5.7%	6.4%
Health Care	3.8%	-2.5%	-9.6%
Industrials	6.3%	1.8%	5.3%
Information Technology	21.2%	5.1%	14.1%
Materials	8.1%	-4.2%	1.8%
Real Estate	1.8%	-4.9%	-17.7%
Utilities	2.6%	4.2%	-6.7%
Total	100.0%	0.9%	1.7%

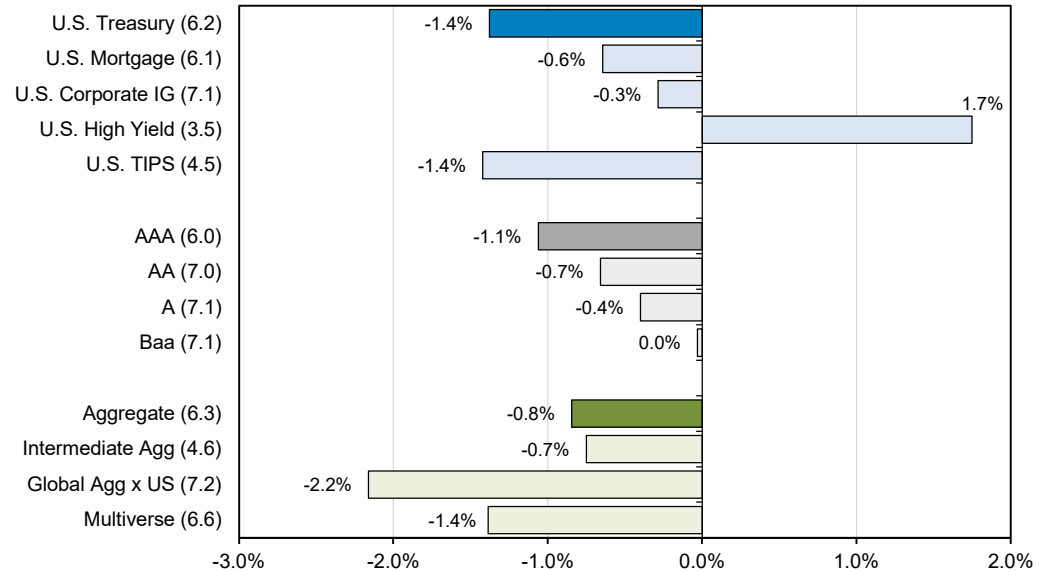
Country	MSCI-EAFE Weight	MSCI-ACWixUS Weight	Quarter Return	1-Year Return
Japan	22.4%	14.5%	6.4%	18.1%
United Kingdom	14.7%	9.5%	2.2%	13.2%
France	12.4%	8.0%	3.2%	31.7%
Switzerland	10.1%	6.5%	4.0%	13.3%
Germany	8.6%	5.6%	2.8%	28.4%
Australia	7.3%	4.7%	0.3%	11.2%
Netherlands	4.6%	3.0%	4.1%	31.2%
Sweden	3.3%	2.1%	-1.2%	16.6%
Denmark	3.1%	2.0%	1.7%	31.9%
Spain	2.6%	1.7%	5.6%	29.0%
Italy	2.5%	1.6%	8.2%	43.4%
Hong Kong	2.5%	1.6%	-5.1%	-9.0%
Singapore	1.4%	0.9%	-5.6%	10.0%
Belgium	0.9%	0.6%	-6.1%	6.1%
Finland	0.9%	0.6%	-8.1%	-1.2%
Ireland	0.8%	0.5%	4.3%	45.3%
Norway	0.6%	0.4%	-1.0%	-9.0%
Israel	0.6%	0.4%	-4.0%	-4.7%
Portugal	0.2%	0.1%	-1.1%	6.7%
New Zealand	0.2%	0.1%	-6.0%	15.5%
Austria	0.2%	0.1%	4.4%	18.9%
Total EAFE Countries	100.0%	64.6%	3.0%	18.8%
Canada		7.6%	3.7%	7.0%
Total Developed Countries		72.2%	3.0%	17.4%
China		8.2%	-9.7%	-16.8%
Taiwan		4.3%	4.5%	12.5%
India		4.1%	12.2%	14.2%
Korea		3.4%	4.4%	13.0%
Brazil		1.5%	20.7%	29.8%
Saudi Arabia		1.2%	6.3%	-1.7%
South Africa		0.9%	-4.9%	-1.9%
Mexico		0.8%	5.6%	35.1%
Indonesia		0.6%	2.8%	13.2%
Thailand		0.5%	-8.2%	1.7%
Malaysia		0.4%	-8.4%	-6.4%
United Arab Emirates		0.4%	5.8%	-6.1%
Qatar		0.3%	-2.4%	-15.4%
Poland		0.2%	24.5%	36.4%
Kuwait		0.2%	-0.9%	-4.7%
Philippines		0.2%	-1.3%	5.8%
Chile		0.2%	2.4%	18.1%
Turkey		0.2%	-10.7%	53.3%
Greece		0.1%	23.9%	71.3%
Peru		0.1%	6.5%	34.0%
Hungary		0.1%	24.8%	48.8%
Czech Republic		0.0%	-5.1%	8.7%
Colombia		0.0%	11.7%	-5.7%
Egypt		0.0%	3.9%	27.0%
Total Emerging Countries		27.8%	0.9%	1.7%
Total ACWixUS Countries		100.0%	2.4%	12.7%

Source: Morningstar Direct, MSCI Global Index Monitor (Returns are Net in USD)
As a result of the GICS classification changes on 9/28/2018 and certain associated reporting limitations, sector performance represents backward looking performance for the prior year of each sector's current constituency, post creation of the Communication Services sector.

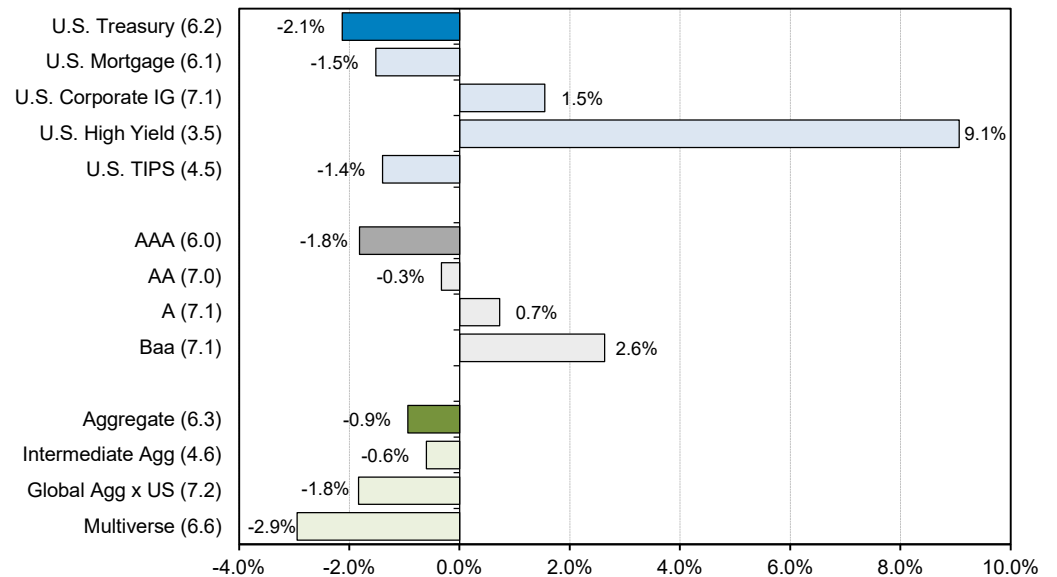


- Fixed income markets started 2023 strong but performance stalled during the second quarter. Yields remain elevated on the back of the Federal Reserve's decision to hike policy rates an additional 0.25% in May. After a challenging 2022 in fixed-income markets brought on by the largest and most rapid increase in interest rates since the early 1980s, higher yields and an expected slower pace of rate increase led investors to expect better outcomes in 2023. That expectation was at least temporarily frustrated during the second quarter, as the quarter's 0.25% rate hike and increased expectations for future rate hikes weighed on the asset class and many of the major domestic fixed-income indices posted negative absolute returns.
- The Bloomberg US Aggregate Bond Index, the bellwether US investment grade benchmark, returned a mild negative result, returning -0.8% for the quarter. Performance across the investment grade index's segments soured during the period with the Bloomberg US Corporate Investment Grade Index returning -0.3% and the US Mortgage Index sliding -0.6%.
- Outside of the aggregate index's sub-components, high-yield bonds continued to rise with a return of 1.7% as credit spreads narrowed during the quarter. US TIPS lost -1.4% for the quarter. The Bloomberg Global Aggregate ex-US Index lagged most domestic fixed-income indexes and the multiverse benchmark, posting a loss of -2.2% for the quarter.
- Over the trailing one-year period, the Bloomberg US Aggregate Bond Index declined by -0.9%. The benchmark's sub-components fell in a narrow band above and below the broad index's return. US TIPS, which are excluded from the aggregate index, dropped by -1.4% for the year. High-yield corporate bonds, which have a much shorter duration, have outpaced their investment grade counterparts with the Bloomberg US High Yield Index returning a strong 9.1% for the last year.
- Performance for non-US bonds was also negative for the year with the Bloomberg Global Aggregate ex-US Index falling by -1.8%. The combination of rising interest rates, elevated inflation, and geopolitical risks were a hindrance for non-US index performance.

Quarter Performance



1-Year Performance

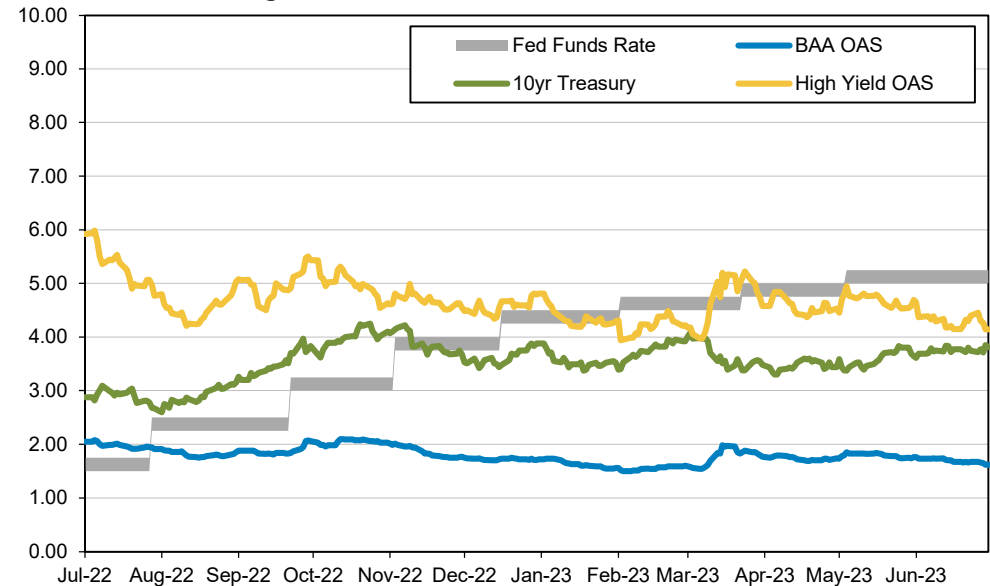


Source: Bloomberg

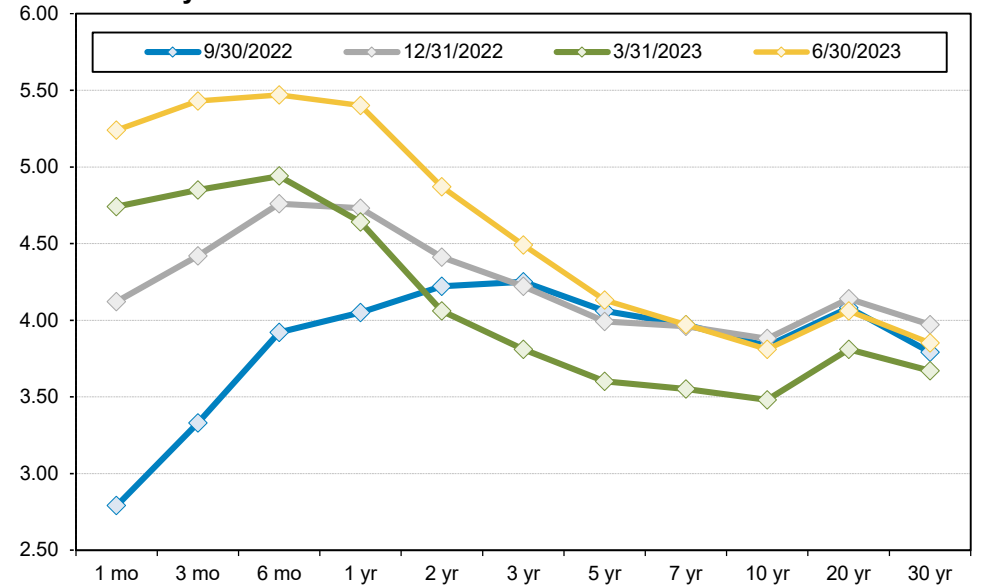


- The gray band across the graph illustrates the range of the current Fed Funds target rate. During the second quarter, the Federal Open Market Committee (FOMC) raised the lower end of its target rate range from 4.75% to 5.00% at their May meeting. While the FOMC pushed pause on a rate increase at their June meeting, several speeches and public comments since that meeting have made it clear that additional rate hikes should not be ruled out. The FOMC is continuing its policy of removing liquidity from the market by allowing bonds held on its balance sheet to mature without reinvesting those proceeds. Despite the potential for further rate increases, market participants appear to believe the Fed may be nearing the end of its rate hiking cycle.
- The yield on the US 10-year Treasury (green line) rose a modest 0.33% partially due to increases in the policy rate and renewed prospects for future growth. The closing yield on the 10-Year Treasury was 3.81% as of June 30, 2023, down just 7 basis points from its 3.88% yield at year-end. The benchmark's rate peaked in October 2022, cresting at just over 4.00% before pulling back to its current level.
- The blue line illustrates changes in the BAA OAS (Option Adjusted Spread) for BAA-rated corporate bonds. This measure quantifies the additional yield premium that investors require to purchase and hold non-US Treasury investment grade issues with the lowest investment grade rating. For the full year, the spread has narrowed from 2.05% to 1.62%, signaling a lower premium for credit risk than was the case a year prior. High Yield OAS spreads have narrowed from 5.92% in July 2022 to 4.14% as of the end of Q2. High-yield spreads reached their highs in July 2022 before trading lower the remainder of the year and have continued to tighten in 2023. A spike in both the BAA OAS and High Yield spreads is visible in March following a short-lived crisis of confidence in the banking sector, which was addressed quickly by the FDIC and supported further by the Fed's aggressive short-term par loan program. Both spread measures traded lower on the news of the Government's intervention, and as fears of possible contagion waned, credit spreads returned to their levels prior to February.
- The lower graph provides a snapshot of the US Treasury yield curve at the end of each of the last four quarters. Short-term rates continued to rise during the second quarter as the Fed increased interest rates to continue combatting inflation. Despite these short-term rate increases, at the end of the quarter, both intermediate and longer-term yields were slightly lower than they were at the end of 2022. The yield curve has further inverted (short-term rates higher than long-term rates) between two- and 10-year maturities. Historically, a persistent inversion of these two key rates has been a precursor of an economic recession within six- to 24 months.

1-Year Trailing Market Rates



Treasury Yield Curve



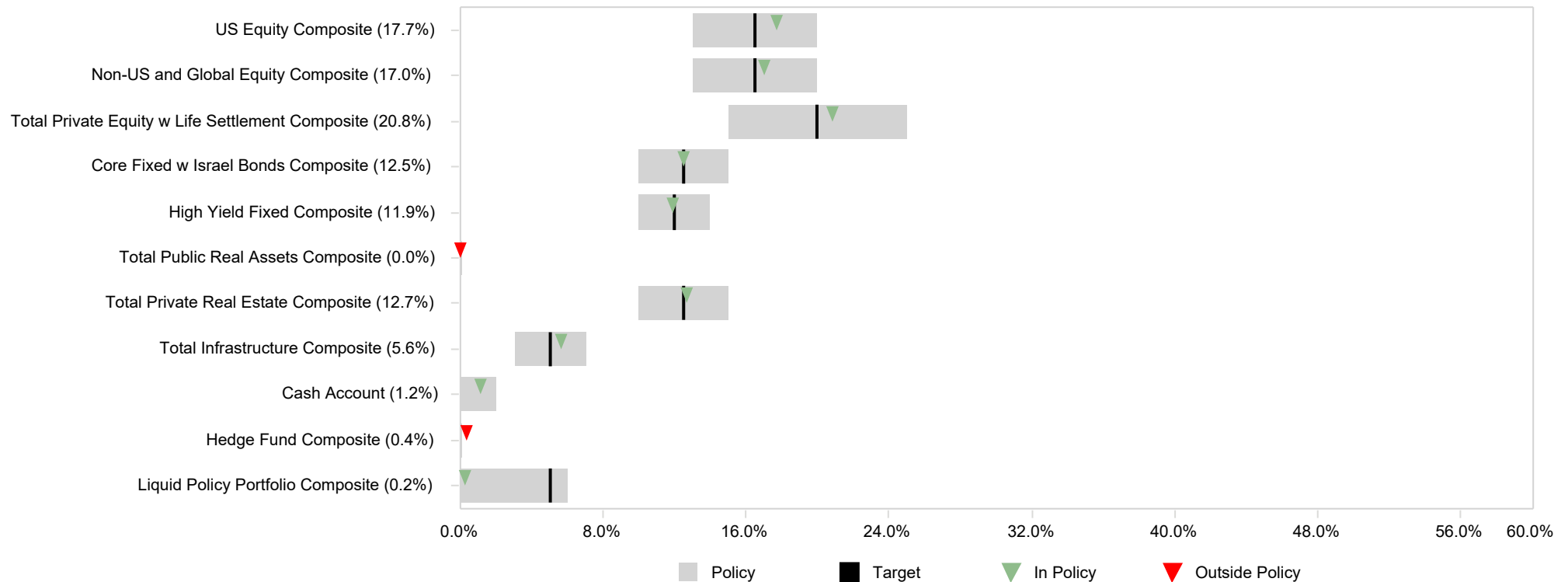
Source: US Department of Treasury, FRED (Federal Reserve of St. Louis)



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Executive Summary



Asset Allocation Compliance

	Asset Allocation \$	Current Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)
Total Fund	937,425,450	100.0	N/A	N/A	100.0
US Equity Composite	166,105,782	17.7	13.0	20.0	16.5
Non-US and Global Equity Composite	159,471,630	17.0	13.0	20.0	16.5
Total Private Equity w Life Settlement Composite	195,327,757	20.8	15.0	25.0	20.0
Core Fixed w Israel Bonds Composite	117,164,123	12.5	10.0	15.0	12.5
High Yield Fixed Composite	111,131,924	11.9	10.0	14.0	12.0
Total Public Real Assets Composite	8	0.0	0.0	0.0	0.0
Total Private Real Estate Composite	119,242,962	12.7	10.0	15.0	12.5
Total Infrastructure Composite	52,684,337	5.6	3.0	7.0	5.0
Cash Account	10,822,720	1.2	0.0	2.0	0.0
Hedge Fund Composite	3,361,656	0.4	0.0	0.0	0.0
Liquid Policy Portfolio Composite	2,112,549	0.2	0.0	6.0	5.0

Asset Allocation includes assets of the Emerging, Minority, and Women owned Investment Manager Program. The Investment Policy Statement for the Retirement Board of Allegheny County allows for the Pension's asset allocation to temporarily fall outside of the stated policy ranges due to market fluctuations and the Pension's short-term cash flow needs. Recommendations are provided by the Pension's investment consultant regarding rebalancing of the Pension's asset allocation.



**Historical Asset Allocation
Total Fund**

As of June 30, 2023

Asset Allocation Attributes

	Jun-2023		Mar-2023		Dec-2022		Sep-2022	
	(\$)	%	(\$)	%	(\$)	%	(\$)	%
Total Fund	937,425,450	100.00	938,305,485	100.00	931,015,197	100.00	915,856,819	100.00
US Equity Composite	166,105,782	17.72	157,495,414	16.79	147,543,825	15.85	144,264,998	15.75
SSgA S&P 500 Index	76,668,718	8.18	72,461,658	7.72	67,423,331	7.24	67,354,093	7.35
Fragasso Large Core (EMWO)	6,514,854	0.69	6,174,508	0.66	5,871,405	0.63	5,548,895	0.61
Twin Capital Enhanced Equity	39,172,552	4.18	37,894,009	4.04	35,361,960	3.80	33,271,566	3.63
Vesper U.S. Large Cap Short-Term Reversal Strategy ETF (UTRN) (EMWO)	1,011,859	0.11	1,004,742	0.11	1,321,390	0.14	1,245,181	0.14
Earnest Small Value	14,402,333	1.54	13,994,072	1.49	13,246,310	1.42	13,728,777	1.50
Emerald Advisors Small Cap	13,808,919	1.47	12,680,868	1.35	12,167,091	1.31	11,397,795	1.24
Emerald Advisors All Cap (EMWO)	6,159,383	0.66	5,368,321	0.57	4,632,778	0.50	4,679,112	0.51
Ethos (EMWO)	1,779,982	0.19	1,743,916	0.19	1,650,527	0.18	1,543,065	0.17
CIM Small Cap (EMWO)	5,226,265	0.56	4,926,729	0.53	4,647,267	0.50	4,362,503	0.48
Cookson Peirce (EMWO)	1,360,917	0.15	1,246,591	0.13	1,221,766	0.13	1,134,011	0.12
Non US Equity Composite	159,471,630	17.01	156,358,968	16.66	143,544,302	15.42	124,485,700	13.59
SSgA ACWI ex US	36,485,530	3.89	35,576,881	3.79	33,256,835	3.57	29,105,249	3.18
Baillie Gifford Intl Equity	57,818,555	6.17	56,814,777	6.06	50,257,224	5.40	43,596,829	4.76
FIAM Select International Equity	30,847,483	3.29	29,921,274	3.19	27,817,679	2.99	24,379,716	2.66
Segall, Bryant & Hamill	34,320,062	3.66	34,046,036	3.63	32,212,563	3.46	27,403,906	2.99
Global Equity Composite	-	0.00	-	0.00	63	0.00	63	0.00
Columbus Macro (EMWO)	-	0.00	-	0.00	63	0.00	63	0.00
Core Fixed w Israel Bonds Composite	117,164,123	12.50	117,220,055	12.49	114,877,809	12.34	114,454,306	12.50
C S McKee	34,368,823	3.67	34,435,623	3.67	33,587,514	3.61	37,897,799	4.14
Federated Core Broad	27,170,913	2.90	27,289,985	2.91	26,563,367	2.85	30,981,986	3.38
CIM Investment Mgmt	27,053,613	2.89	27,157,783	2.89	26,629,153	2.86	26,211,750	2.86
StoneRidge Partners (EMWO)	5,118,349	0.55	5,152,204	0.55	5,043,347	0.54	4,971,485	0.54
Gridiron Capital Fixed Income	13,281,285	1.42	13,190,618	1.41	12,982,933	1.39	4,437,279	0.48
FNB (EMWO)	2,651,005	0.28	2,674,748	0.29	2,612,198	0.28	2,577,556	0.28
Israel Bonds	7,520,136	0.80	7,319,095	0.78	7,459,297	0.80	7,376,451	0.81
High Yield Fixed Composite	111,131,924	11.86	115,344,781	12.29	111,801,527	12.01	110,842,500	12.10
Oaktree High Yield	55,836,105	5.96	60,848,305	6.48	59,143,921	6.35	60,226,495	6.58
Federated High Yield	51,775,709	5.52	51,012,900	5.44	49,248,902	5.29	47,246,527	5.16
Sound Point	3,520,110	0.38	3,483,576	0.37	3,408,704	0.37	3,369,478	0.37
TIPS Fixed Composite	-	0.00	-	0.00	-	0.00	13,461,193	1.47
MCM TIPS	-	0.00	-	0.00	-	0.00	13,461,193	1.47



**Historical Asset Allocation
Total Fund**

As of June 30, 2023

	Jun-2023		Mar-2023		Dec-2022		Sep-2022	
	(\$)	%	(\$)	%	(\$)	%	(\$)	%
Real Estate Composite	108,705,827	11.60	113,827,663	12.13	122,648,191	13.17	128,736,426	14.06
Morgan Stanley Prime Property Fund	81,949,355	8.74	86,388,725	9.21	94,836,523	10.19	97,863,068	10.69
Oaktree Real Estate	4,887,273	0.52	5,352,160	0.57	5,941,114	0.64	6,378,697	0.70
Washington Alliance (EMWO)	13,211,365	1.41	13,455,267	1.43	13,336,153	1.43	15,377,402	1.68
Washington Alliance II (EMWO)	2,094,365	0.22	2,184,727	0.23	2,131,883	0.23	2,220,553	0.24
Siguler Guff Distressed RE	6,091,672	0.65	6,272,072	0.67	6,273,307	0.67	6,896,706	0.75
Artemis Real Estate Partners Fund IV	471,798	0.05	174,712	0.02	129,211	0.01	-	0.00
ERECT Composite	10,537,135	1.12	11,599,821	1.24	11,645,104	1.25	11,465,104	1.25
ERECT Fund II	10,537,135	1.12	11,599,821	1.24	11,645,104	1.25	11,465,104	1.25
Infrastructure Composite	52,684,337	5.62	52,036,702	5.55	26,465,271	2.84	25,069,973	2.74
JP Morgan Infrastructure Fund (IIF Hedged)	26,394,147	2.82	26,394,147	2.81	26,465,271	2.84	25,069,973	2.74
IFM Global Infrastructure LP	26,290,190	2.80	25,642,555	2.73	-	0.00	-	0.00
Private Equity Composite	185,578,029	19.80	190,625,466	20.32	198,747,496	21.35	206,178,260	22.51
Life Settlement Composite	9,749,729	1.04	10,310,047	1.10	10,321,948	1.11	10,403,116	1.14
Hedge Fund Composite	3,361,656	0.36	3,245,107	0.35	3,109,271	0.33	2,965,030	0.32
Gridiron Capital Multi-Asset (EMWO)	3,361,656	0.36	3,245,106	0.35	3,109,100	0.33	2,964,861	0.32
Liquid Policy Portfolio Composite	2,112,549	0.23	2,039,539	0.22	6,866,138	0.74	11,811,936	1.29
BlackRock Liquidity iShares Public Pension Fund	2,112,549	0.23	2,039,539	0.22	6,866,138	0.74	11,811,936	1.29
Cash Account	10,822,720	1.15	8,201,914	0.87	33,444,243	3.59	11,718,206	1.28



Financial Reconciliation	Market Value 04/01/2023	Net Flows	Return On Investment	Market Value 06/30/2023
Total Fund	938,305,485	-13,585,457	13,083,252	937,425,450
SSgA S&P 500 Index	72,461,658	-2,000,000	6,207,060	76,668,718
Fragasso Large Core (EMWO)	6,174,508	8,965	340,346	6,514,854
Twin Capital Enhanced Equity	37,894,009	-1,966,662	3,278,543	39,172,552
Vesper U.S. Large Cap Short-Term Reversal Strategy ETF (UTRN) (EMWO)	1,004,742	-	7,117	1,011,859
Earnest Small Value	13,994,072	32,192	408,261	14,402,333
Emerald Advisors Small Cap	12,680,868	26,924	1,126,841	13,808,919
Emerald Advisors All Cap (EMWO)	5,368,321	8,616	791,062	6,159,383
Ethos (EMWO)	1,743,916	-6,017	42,082	1,779,982
CIM Small Cap (EMWO)	4,926,729	9,490	299,537	5,226,265
Cookson Peirce (EMWO)	1,246,591	1,611	114,326	1,360,917
US Equity Composite	157,495,414	-3,884,880	12,615,175	166,105,782
SSgA ACWI ex US	35,576,881	-	908,649	36,485,530
Baillie Gifford Intl Equity	56,814,777	-	1,003,778	57,818,555
FIAM Select International Equity	29,921,274	24,434	926,209	30,847,483
Segall, Bryant & Hamill	34,046,036	54,106	274,026	34,320,062
Non US Equity Composite	156,358,968	78,540	3,112,663	159,471,630
C S McKee	34,435,623	19,762	-66,800	34,368,823
Federated Core Broad	27,289,985	19,359	-119,071	27,170,913
CIM Investment Mgmt	27,157,783	16,909	-104,171	27,053,613
StoneRidge Partners (EMWO)	5,152,204	2,578	-33,855	5,118,349
Gridiron Capital Fixed Income	13,190,618	21,511	90,667	13,281,285
FNB (EMWO)	2,674,748	2,338	-23,743	2,651,005
Israel Bonds	7,319,095	3,749	201,041	7,520,136
Core Fixed w Israel Bonds Composite	117,220,055	86,205	-55,932	117,164,123
Oaktree High Yield	60,848,305	-6,000,000	1,073,981	55,836,105
Federated High Yield	51,012,900	-	762,810	51,775,709
Sound Point	3,483,576	-	36,534	3,520,110
High Yield Fixed Composite	115,344,781	-6,000,000	1,873,325	111,131,924



Financial Reconciliation
Total Fund
1 Quarter Ending June 30, 2023

	Market Value 04/01/2023	Net Flows	Return On Investment	Market Value 06/30/2023
Morgan Stanley Prime Property Fund	86,388,725	-2,503,184	-1,936,186	81,949,355
Oaktree Real Estate	5,352,160	-420,000	-44,887	4,887,273
Washington Alliance (EMWO)	13,455,267	-243,902	-	13,211,365
Washington Alliance II (EMWO)	2,184,727	-90,362	-	2,094,365
Siguler Guff Distressed RE	6,272,072	-180,400	-	6,091,672
Artemis Real Estate Partners Fund IV	174,712	287,639	9,447	471,798
Real Estate Composite	113,827,663	-3,150,209	-1,971,626	108,705,827
ERECT Composite	11,599,821	-	-1,062,686	10,537,135
Infrastructure Composite	52,036,702	-	647,635	52,684,337
JP Morgan Infrastructure Fund (IIF Hedged)	26,394,147	-	-	26,394,147
IFM Global Infrastructure LP	25,642,555	-	647,635	26,290,190
Private Equity Composite	190,625,466	-2,615,396	-2,432,041	185,578,029
Life Settlement Composite	10,310,047	-616,568	56,250	9,749,729
Gridiron Capital Multi-Asset (EMWO)	3,245,106	6,172	116,550	3,361,656
Maplewood (EMWO)	1	-	-	1
Hedge Fund Composite	3,245,107	6,172	116,550	3,361,656
BlackRock Liquidity iShares Public Pension Fund	2,039,539	-	73,010	2,112,549
Liquid Policy Portfolio Composite	2,039,539	-	73,010	2,112,549
MLP Composite	8	-	-	8
Cash Account	8,201,914	2,510,681	110,931	10,822,720

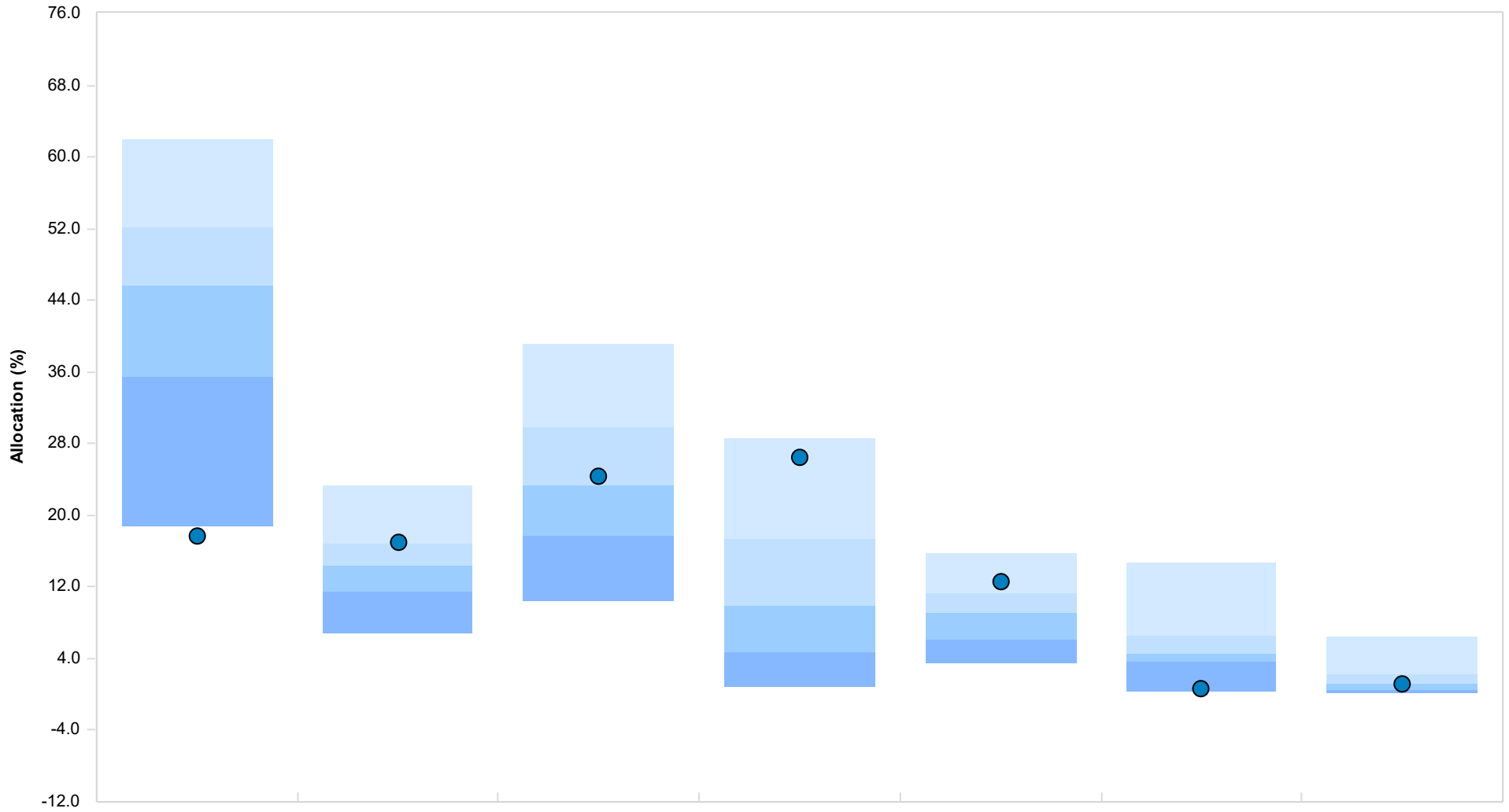


Financial Reconciliation	Market Value 01/01/2023	Net Flows	Income	Return On Investment	Market Value 06/30/2023
Total Fund	931,015,197	-26,680,708	-136,638	33,908,828	937,425,450
SSgA S&P 500 Index	67,423,331	-1,996,640	-	11,245,387	76,668,718
Fragasso Large Core (EMWO)	5,871,405	17,787	4,440	643,449	6,514,854
Twin Capital Enhanced Equity	35,361,960	-1,933,873	-10,737	5,810,565	39,172,552
Vesper U.S. Large Cap Short-Term Reversal Strategy ETF (UTRN) (EMWO)	1,321,390	-323,012	-	13,481	1,011,859
Earnest Small Value	13,246,310	66,614	-3,214	1,156,022	14,402,333
Emerald Advisors Small Cap	12,167,091	55,787	1,324	1,635,005	13,808,919
Emerald Advisors All Cap (EMWO)	4,632,778	16,135	-436	1,526,358	6,159,383
Ethos (EMWO)	1,650,527	-9,359	-	138,814	1,779,982
CIM Small Cap (EMWO)	4,647,267	19,667	642	578,253	5,226,265
Cookson Peirce (EMWO)	1,221,766	3,169	22	139,151	1,360,917
US Equity Composite	147,543,825	-4,083,725	-7,960	22,886,485	166,105,782
SSgA ACWI ex US	33,256,835	6,103	-	3,228,695	36,485,530
Baillie Gifford Intl Equity	50,257,224	-	-	7,561,331	57,818,555
FIAM Select International Equity	27,817,679	47,159	-	3,029,804	30,847,483
Segall, Bryant & Hamill	32,212,563	108,639	-	2,107,499	34,320,062
Non US Equity Composite	143,544,302	161,901	-	15,927,328	159,471,630
Columbus Macro (EMWO)	63	-63	-	-	-
Global Equity Composite	63	-63	-	-	-
C S McKee	33,587,514	39,563	28,114	781,309	34,368,823
Federated Core Broad	26,563,367	38,702	16,752	607,547	27,170,913
CIM Investment Mgmt	26,629,153	33,882	14,885	424,459	27,053,613
StoneRidge Partners (EMWO)	5,043,347	5,133	3,540	75,002	5,118,349
Gridiron Capital Fixed Income	12,982,933	42,995	-248,825	298,352	13,281,285
FNB (EMWO)	2,612,198	4,649	6	38,807	2,651,005
Israel Bonds	7,459,297	7,426	67,680	60,840	7,520,136
Core Fixed w Israel Bonds Composite	114,877,809	172,349	-117,848	2,286,314	117,164,123
Oaktree High Yield	59,143,921	-6,000,000	-	2,865,660	55,836,105
Federated High Yield	49,248,902	-	-	2,526,807	51,775,709
Sound Point	3,408,704	-	-	111,406	3,520,110
High Yield Fixed Composite	111,801,527	-6,000,000	-	5,503,873	111,131,924



	Market Value 01/01/2023	Net Flows	Income	Return On Investment	Market Value 06/30/2023
Morgan Stanley Prime Property Fund	94,836,523	-6,208,816	-	-6,678,352	81,949,355
Oaktree Real Estate	5,941,114	-420,000	-	-633,841	4,887,273
Washington Alliance (EMWO)	13,336,153	-243,902	-	119,114	13,211,365
Washington Alliance II (EMWO)	2,131,883	-90,362	-	52,844	2,094,365
Siguler Guff Distressed RE	6,273,307	-181,168	-	-467	6,091,672
Artemis Real Estate Partners Fund IV	129,211	376,323	-	-23,152	471,798
Real Estate Composite	122,648,191	-6,767,925	-	-7,163,854	108,705,827
ERECT Composite	11,645,104	-	-	-1,107,969	10,537,135
Infrastructure Composite	26,465,271	24,375,842	-	1,843,224	52,684,337
JP Morgan Infrastructure Fund (IIF Hedged)	26,465,271	-624,158	-	553,034	26,394,147
IFM Global Infrastructure LP	-	25,000,000	-	1,290,190	26,290,190
Private Equity Composite	198,747,496	-6,109,469	-	-7,015,076	185,578,029
Life Settlement Composite	10,321,948	-616,568	-	44,349	9,749,729
Gridiron Capital Multi-Asset (EMWO)	3,109,100	12,244	-1,905	252,556	3,361,656
Maplewood (EMWO)	171	-170	-	-	1
Hedge Fund Composite	3,109,271	12,074	-1,905	252,556	3,361,656
BlackRock Liquidity iShares Public Pension Fund	6,866,138	-5,001,126	-	247,537	2,112,549
Liquid Policy Portfolio Composite	6,866,138	-5,001,126	-	247,537	2,112,549
MLP Composite	8	-	-	-	8
Cash Account	33,444,243	-22,823,995	-8,926	204,060	10,822,720

Plan Sponsor TF Asset Allocation vs. All Public DB Plans



	US Equity	Global ex-US Equity	US Fixed	Alternatives	Total Real Estate	Global TAA	Cash & Equivalents
● Total Fund	17.72 (96)	17.01 (24)	24.35 (45)	26.51 (9)	12.67 (17)	0.58 (94)	1.15 (51)
5th Percentile	62.01	23.25	39.15	28.49	15.75	14.68	6.42
1st Quartile	52.07	16.81	29.74	17.30	11.37	6.54	2.29
Median	45.69	14.37	23.24	9.92	9.10	4.45	1.18
3rd Quartile	35.46	11.47	17.66	4.73	6.11	3.72	0.55
95th Percentile	18.68	6.75	10.51	0.78	3.38	0.28	0.09



Asset Allocation & Performance

	Allocation		Performance(%)							
	Market Value \$	%	MTH	QTR	YTD	1 YR	3 YR	5 YR	Inception	Inception Date
Total Fund	937,425,450	100.0	1.68	1.37	3.59	3.30	6.50	5.32	7.10	12/1993
Total Fund Policy Index			1.79	1.55	4.20	3.83	7.39	6.26	7.30	
US Equity Composite	166,105,782	17.7	6.80	8.11	15.56	18.05	13.16	10.43	9.14	11/1993
FT Wilshire 5000 Total Market TR Index			6.86	8.43	16.34	19.06	14.24	11.67	9.89	
Non US Equity Composite	159,471,630	17.0	4.20	1.94	10.98	14.55	5.45	3.09	4.77	01/2001
Non US Equity Policy Index			4.49	2.44	9.47	12.72	7.53	3.50	4.06	
Core Fixed w Israel Bonds Composite*	117,164,123	12.5	-0.18	-0.12	1.84	0.00	-2.43	1.54	6.32	01/1983
Bimbg. U.S. Aggregate Index			-0.36	-0.84	2.09	-0.94	-3.97	0.77	6.27	
High Yield Fixed Composite	111,131,924	11.9	1.66	1.63	4.85	8.87	3.35	3.07	5.78	04/2008
FTSE High Yield Market Capped Index			1.64	1.87	5.57	9.13	3.36	3.06	6.08	
Real Estate Composite	108,705,827	11.6	-1.73	-1.73	-5.90	-7.65	6.90	5.89	8.29	04/2003
NCREIF Fund Index-ODCE (VW) (Net)			-2.84	-2.84	-6.12	-10.70	7.06	5.57	6.89	
ERECT Composite	10,537,135	1.1	-9.16	-9.16	-9.51	-7.66	2.73	5.22	5.91	09/2010
CPI - All Urban Consumers (SA)			0.18	0.67	1.62	3.09	5.74	3.89	2.62	
Total Infrastructure Composite	52,684,337	5.6	1.31	1.24	3.64	9.72	N/A	N/A	9.72	07/2022
CPI + 3%			0.43	1.42	3.14	6.18	8.91	7.01	6.18	
Total Private Equity w Life Settlement Composite*	195,327,757	20.8	-0.46	-1.19	-3.41	-8.84	10.40	9.78	7.20	04/2003
Total Private Equity Policy Index			-0.46	-1.19	-3.39	-8.82	11.18	10.25	7.31	
Hedge Fund Composite	3,361,656	0.4	3.49	3.40	7.72	8.22	6.97	3.06	2.25	04/2003
90 Day T-Bill Index + 3%			0.70	1.92	3.77	6.69	4.31	4.59	4.35	
Liquid Policy Portfolio Composite	2,112,549	0.2	4.36	3.58	9.11	10.17	N/A	N/A	1.57	03/2021
Liquid Policy Benchmark			4.14	3.52	8.88	10.32	N/A	N/A	1.41	
Cash Account	10,822,720	1.2	0.46	1.38	2.57	4.63	1.86	1.91	1.06	01/2012
90 Day U.S. Treasury Bill			0.46	1.17	2.25	3.59	1.27	1.55	0.86	

* All returns prior to March 2021 are from the original Core Fixed Composite and the Private Equity Composite, respectively. All returns from March 2021 and forward are from the composites inclusive of the Israel Bonds and Life Settlement funds, respectively



Asset Allocation & Performance

	Allocation		Performance(%)						
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	Inception	Inception Date
Total Fund	937,425,450	100.0	1.37	3.59	3.30	6.50	5.32	7.10	12/1993
Total Fund Policy Index			1.55	4.20	3.83	7.39	6.26	7.30	
US Equity Composite	166,105,782	17.7	8.11	15.56	18.05	13.16	10.43	9.14	11/1993
FT Wilshire 5000 Total Market TR Index			8.43	16.34	19.06	14.24	11.67	9.89	
SSgA S&P 500 Index	76,668,718	8.2	8.74	16.86	19.55	14.59	12.32	9.19	11/2007
S&P 500 Index			8.74	16.89	19.59	14.60	12.31	9.15	
Fragasso Large Core (EMWO)	6,514,854	0.7	5.37	10.65	9.37	9.38	9.10	10.62	09/2012
S&P 500 Index			8.74	16.89	19.59	14.60	12.31	13.39	
Twin Capital Enhanced Equity	39,172,552	4.2	8.92	16.62	17.67	13.73	11.02	9.39	01/2006
S&P 500 Index			8.74	16.89	19.59	14.60	12.31	9.71	
Vesper U.S. Large Cap Short-Term Reversal Strategy ETF (UTRN) (EMWO)	1,011,859	0.1	0.71	1.26	0.42	N/A	N/A	-10.42	01/2022
S&P 500 Index			8.74	16.89	19.59	14.60	12.31	-2.87	
Earnest Small Value	14,402,333	1.5	2.69	8.23	14.99	14.83	6.79	12.33	06/2009
Russell 2000 Value Index			3.18	2.50	6.01	15.43	3.54	10.48	
Emerald Advisors Small Cap	13,808,919	1.5	8.68	13.02	20.19	7.36	5.67	9.98	11/2004
Russell 2000 Growth Index			7.05	13.55	18.53	6.10	4.22	8.54	
Emerald Advisors All Cap (EMWO)	6,159,383	0.7	14.58	32.58	26.03	14.53	14.43	15.14	10/2015
Russell 3000 Growth Index			12.47	28.05	26.60	13.24	14.39	15.89	
Ethos (EMWO)	1,779,982	0.2	2.42	8.42	13.33	9.75	9.28	11.22	08/2016
S&P 500 Index			8.74	16.89	19.59	14.60	12.31	12.96	
CIM Small Cap (EMWO)	5,226,265	0.6	5.89	12.02	13.38	8.05	1.69	4.73	01/2014
Russell 2000 Index			5.21	8.09	12.31	10.82	4.21	6.66	
Cookson Peirce (EMWO)	1,360,917	0.1	9.04	11.12	17.71	10.87	N/A	12.76	12/2018
Russell 3000 Index			8.39	16.17	18.95	13.89	11.39	12.19	
Non US Equity Composite	159,471,630	17.0	1.94	10.98	14.55	5.45	3.09	4.77	01/2001
Non US Equity Policy Index			2.44	9.47	12.72	7.53	3.50	4.06	
SSgA ACWI ex US	36,485,530	3.9	2.55	9.69	12.88	7.52	3.87	3.79	05/2015
MSCI AC World ex USA (Net)			2.44	9.47	12.72	7.22	3.52	3.45	



	Allocation		Performance(%)						
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	Inception	Inception Date
Baillie Gifford Intl Equity MSCI AC World ex USA (Net)	57,818,555	6.2	1.77 2.44	15.05 9.47	17.23 12.72	1.21 7.22	3.25 3.52	7.26 5.16	08/2009
FIAM Select International Equity FIAM Policy Index	30,847,483	3.3	3.01 2.44	10.72 9.47	13.08 12.72	7.34 7.22	4.51 3.52	4.47 3.99	01/2001
Segall, Bryant & Hamill MSCI EAFE Small Cap (net) Index	34,320,062	3.7	0.65 0.58	6.20 5.53	13.29 10.18	9.85 5.70	-0.41 1.30	3.02 4.39	05/2015
Core Fixed w Israel Bonds Composite* Blmbg. U.S. Aggregate Index	117,164,123	12.5	-0.12 -0.84	1.84 2.09	0.00 -0.94	-2.43 -3.97	1.54 0.77	6.32 6.27	01/1983
C S McKee Blmbg. U.S. Aggregate Index	34,368,823	3.7	-0.25 -0.84	2.21 2.09	-0.51 -0.94	-3.59 -3.97	1.06 0.77	6.63 6.27	01/1983
Federated Core Broad Blmbg. U.S. Aggregate Index	27,170,913	2.9	-0.51 -0.84	2.14 2.09	-0.60 -0.94	-2.57 -3.97	1.97 0.77	3.84 3.03	09/2006
CIM Investment Mgmt Bloomberg Intermediate US Govt/Credit Idx	27,053,613	2.9	-0.45 -0.81	1.47 1.50	0.15 -0.10	-2.34 -2.46	1.14 1.23	2.56 2.87	11/2005
StoneRidge Partners (EMWO) StoneRidge Policy Index	5,118,349	0.5	-0.71 -0.61	1.39 1.77	-0.18 0.54	-2.92 -2.25	0.44 1.44	0.87 1.41	08/2015
Gridiron Capital Fixed Income Blmbg. U.S. Aggregate Index	13,281,285	1.4	0.52 -0.84	1.97 2.09	5.55 -0.94	3.40 -3.97	3.36 0.77	2.66 0.86	02/2017
FNB (EMWO) Bloomberg Intermed Aggregate Index	2,651,005	0.3	-0.98 -0.75	1.31 1.62	-0.35 -0.60	-2.12 -2.89	1.18 0.83	0.80 0.63	07/2017
Israel Bonds	7,520,136	0.8	2.70	0.71	1.99	0.56	1.73	2.30	01/2012
High Yield Fixed Composite FTSE High Yield Market Capped Index	111,131,924	11.9	1.63 1.87	4.85 5.57	8.87 9.13	3.35 3.36	3.07 3.06	5.78 6.08	04/2008
Oaktree High Yield FTSE High Yield Market Capped Index	55,836,105	6.0	1.78 1.87	4.71 5.57	9.78 9.13	3.72 3.36	2.71 3.06	5.53 6.08	04/2008
Federated High Yield Blmbg. U.S. High Yield - 2% Issuer Cap	51,775,709	5.5	1.50 1.75	5.13 5.38	8.06 9.07	2.86 3.12	3.61 3.34	3.32 3.22	07/2017
Sound Point Credit Suisse Leveraged Loan Index	3,520,110	0.4	1.05 3.12	3.27 6.33	4.58 10.10	4.16 6.16	2.05 4.02	3.51 4.07	08/2013

* All returns prior to March 2021 are from the original Core Fixed Composite. All returns March 2021 and forward are from the composite inclusive of the Israel Bonds.



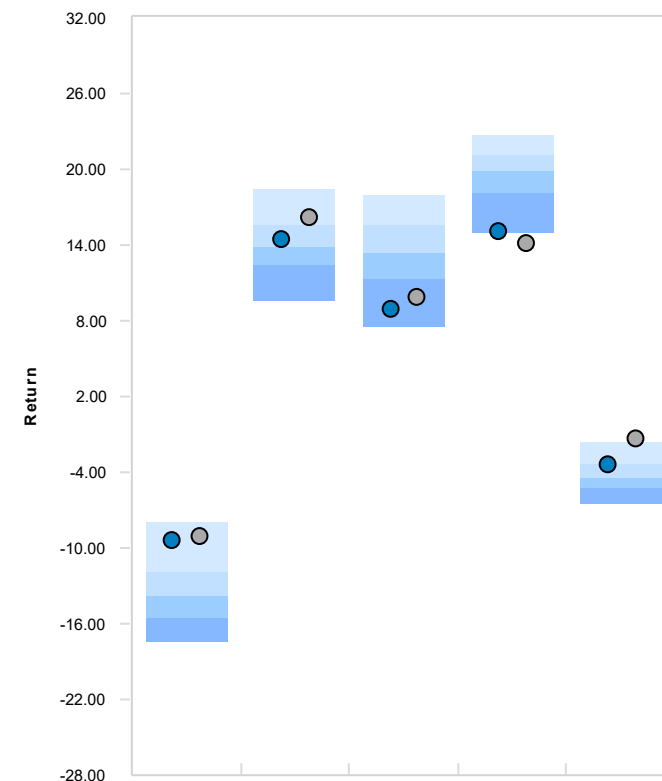
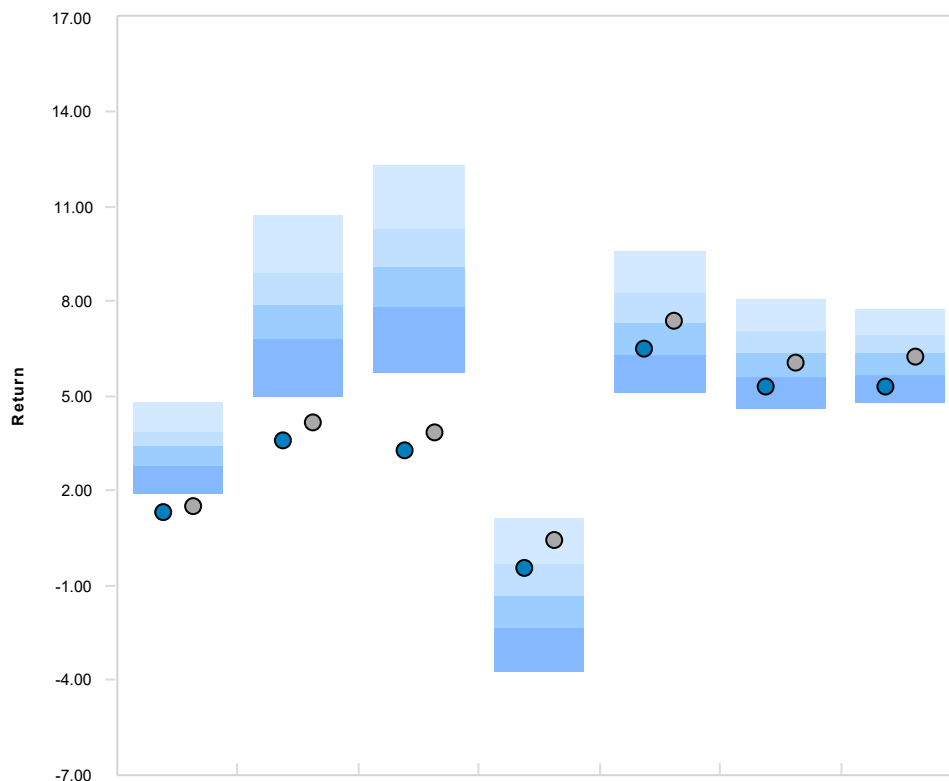
	Allocation		Performance(%)						
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	Inception	Inception Date
Real Estate Composite	108,705,827	11.6	-1.73	-5.90	-7.65	6.90	5.89	8.29	04/2003
NCREIF Fund Index-ODCE (VW) (Net)			-2.84	-6.12	-10.70	7.06	5.57	6.89	
Morgan Stanley Prime Property Fund	81,949,355	8.7	-2.24	-7.13	-7.18	8.44	6.80	8.44	04/2003
NCREIF Fund Index-ODCE (VW) (Net)			-2.84	-6.12	-10.70	7.06	5.57	6.89	
Oaktree Real Estate	4,887,273	0.5	-0.84	-10.67	-14.58	-7.82	-4.98	2.00	08/2013
Washington Alliance (EMWO)	13,211,365	1.4	0.00	0.89	-8.64	8.85	6.87	11.41	08/2013
Washington Alliance II (EMWO)	2,094,365	0.2	0.00	2.48	5.16	13.78	N/A	12.32	03/2020
Siguler Guff Distressed RE	6,091,672	0.6	0.00	-0.01	-7.60	-0.04	2.37	4.98	03/2014
Artemis Real Estate Partners Fund IV	471,798	0.1	1.85	-28.61	N/A	N/A	N/A	-28.61	01/2023
ERECT Composite	10,537,135	1.1	-9.16	-9.51	-7.66	2.73	5.22	5.91	09/2010
CPI - All Urban Consumers (SA)			0.67	1.62	3.09	5.74	3.89	2.62	
Total Infrastructure Composite	52,684,337	5.6	1.24	3.64	9.72	N/A	N/A	9.72	07/2022
CPI + 3%			1.42	3.14	6.18	8.91	7.01	6.18	
JP Morgan Infrastructure Fund (IIF Hedged)	26,394,147	2.8	0.00	2.14	8.13	N/A	N/A	8.13	07/2022
CPI + 3%			1.42	3.14	6.18	8.91	7.01	6.18	
IFM Global Infrastructure LP	26,290,190	2.8	2.72	N/A	N/A	N/A	N/A	N/A	01/2023
CPI + 3%			1.42	3.14	6.18	8.91	7.01	3.14	
Private Equity Composite	185,578,029	19.8	-1.28	-3.61	-9.25	10.96	10.11	7.28	04/2003
Private Equity Policy Index			-1.28	-3.61	-9.25	10.96	10.11	7.28	
Life Settlement Composite	9,749,729	1.0	0.58	0.47	-0.52	-3.59	-2.79	4.74	09/2009
Hedge Fund Composite	3,361,656	0.4	3.40	7.72	8.22	6.97	3.06	2.25	04/2003
90 Day T-Bill Index + 3%			1.92	3.77	6.69	4.31	4.59	4.35	
Gridiron Capital Multi-Asset (EMWO)	3,361,656	0.4	3.40	7.72	8.22	7.00	N/A	5.49	02/2019
HFRI FoF Composite Lagged			1.53	2.30	3.70	5.05	3.33	4.31	
Liquid Policy Portfolio Composite	2,112,549	0.2	3.58	9.11	10.17	N/A	N/A	1.57	03/2021
Liquid Policy Benchmark			3.52	8.88	10.32	N/A	N/A	1.41	
BlackRock Liquidity iShares Public Pension Fund	2,112,549	0.2	3.58	9.11	10.17	N/A	N/A	0.71	04/2021
Liquid Policy Benchmark			3.52	8.88	10.32	N/A	N/A	0.58	
Cash Account	10,822,720	1.2	1.38	2.57	4.63	1.86	1.91	1.06	01/2012



Comparative Performance - IRR							
	1 YR	3 YR	5 YR	7 YR	Inception	Inception Date	
Oaktree Real Estate NEW	-15.89	-8.25	-5.04	-1.04	4.74	09/18/2013	
Siguler Guff Distressed RE	-7.69	0.87	3.50	8.88	6.93	06/30/2014	
Washington Alliance (EMWO)	-8.73	9.33	7.09	13.14	12.92	03/31/2014	
Washington Alliance II (EMWO)	5.16	13.33	N/A	N/A	12.30	03/13/2020	
Artemis Real Estate Partners Fund IV	N/A	N/A	N/A	N/A	-12.04	12/31/2022	



Plan Sponsor Peer Group Analysis - All Public DB Plans



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Total Fund	1.37 (98)	3.59 (99)	3.30 (99)	-0.43 (29)	6.50 (73)	5.34 (84)	5.32 (87)
● Total Fund Policy Index	1.55 (97)	4.20 (98)	3.83 (99)	0.45 (10)	7.39 (49)	6.08 (62)	6.26 (56)
Median	3.39	7.87	9.09	-1.30	7.31	6.40	6.39

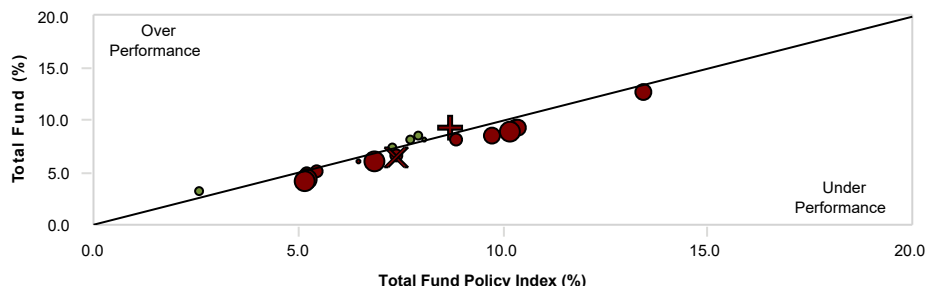
	2022	2021	2020	2019	2018
● Total Fund	-9.30 (10)	14.48 (38)	8.93 (92)	15.16 (94)	-3.36 (25)
● Total Fund Policy Index	-8.99 (8)	16.27 (17)	9.82 (88)	14.24 (97)	-1.27 (4)
Median	-13.84	13.82	13.37	19.89	-4.51

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Total Fund	2.19	3.54	-3.69	-6.80	-2.40	4.64
Total Fund Policy Index	2.60	3.62	-3.83	-6.95	-1.85	4.84

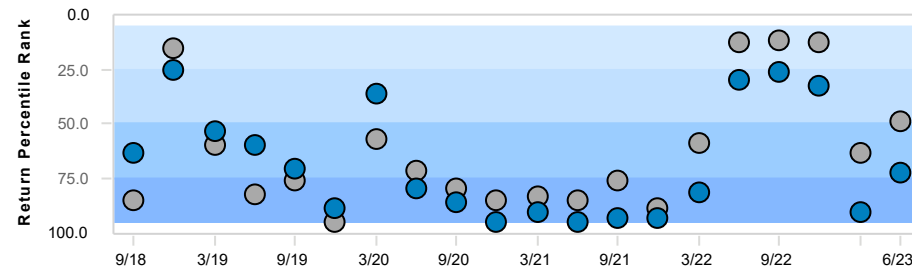


3 Yr Rolling Under/Over Performance - 5 Years



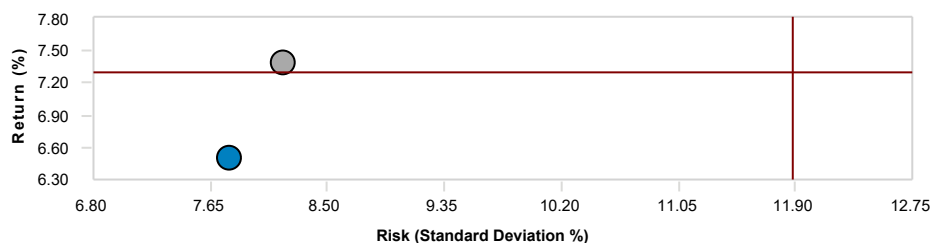
- Over Performance
- Under Performance
- +** Earliest Date
- X** Latest Date

3 Yr Rolling Percentile Ranking - 5 Years



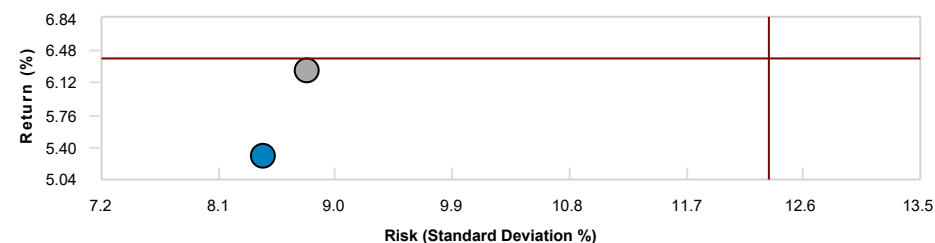
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
● Total Fund	20	1 (5%)	4 (20%)	5 (25%)	10 (50%)
● Total Fund Policy Index	20	4 (20%)	1 (5%)	5 (25%)	10 (50%)

Peer Group Scattergram - 3 Years



	Return	Standard Deviation
● Total Fund	6.50	7.79
● Total Fund Policy Index	7.39	8.17
— Median	7.31	11.88

Peer Group Scattergram - 5 Years



	Return	Standard Deviation
● Total Fund	5.32	8.44
● Total Fund Policy Index	6.26	8.78
— Median	6.40	12.34

Historical Statistics - 3 Years

	Tracking Error	Up Market Capture	Down Market Capture	Alpha	Information Ratio	Sharpe Ratio	Beta	Downside Risk
Total Fund	0.97	94.68	100.22	-0.47	-0.89	0.68	0.95	4.82
Total Fund Policy Index	0.00	100.00	100.00	0.00	N/A	0.75	1.00	4.91

Historical Statistics - 5 Years

	Tracking Error	Up Market Capture	Down Market Capture	Alpha	Information Ratio	Sharpe Ratio	Beta	Downside Risk
Total Fund	1.30	95.86	103.20	-0.61	-0.71	0.47	0.95	5.80
Total Fund Policy Index	0.00	100.00	100.00	0.00	N/A	0.56	1.00	5.80



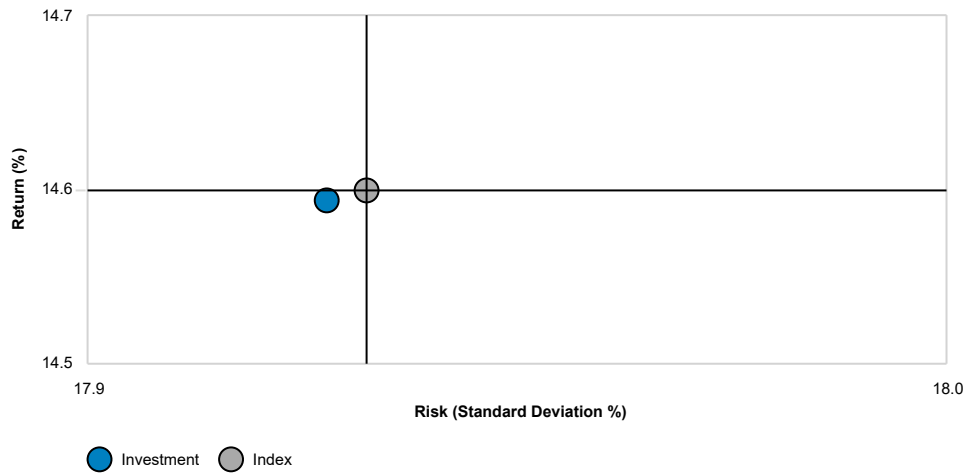
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	14.59	17.93	0.78	99.93	9	99.91	3
Index	14.60	17.93	0.78	100.00	9	100.00	3

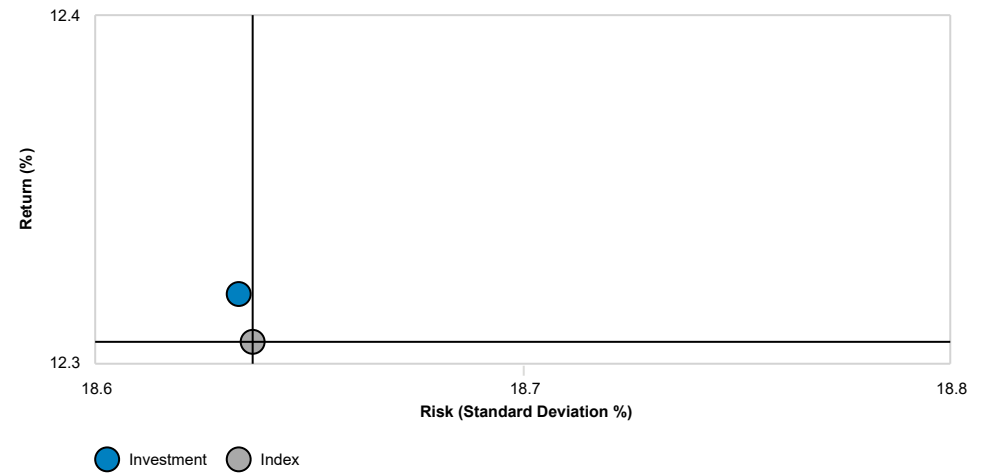
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	12.32	18.63	0.64	100.00	15	99.95	5
Index	12.31	18.64	0.64	100.00	15	100.00	5

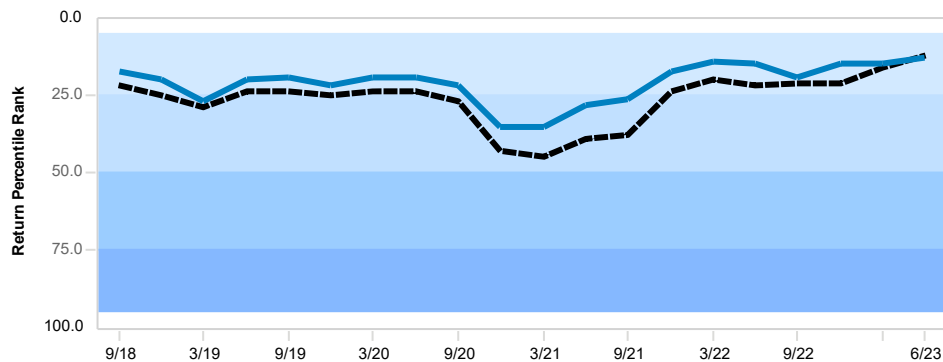
Risk and Return 3 Years



Risk and Return 5 Years

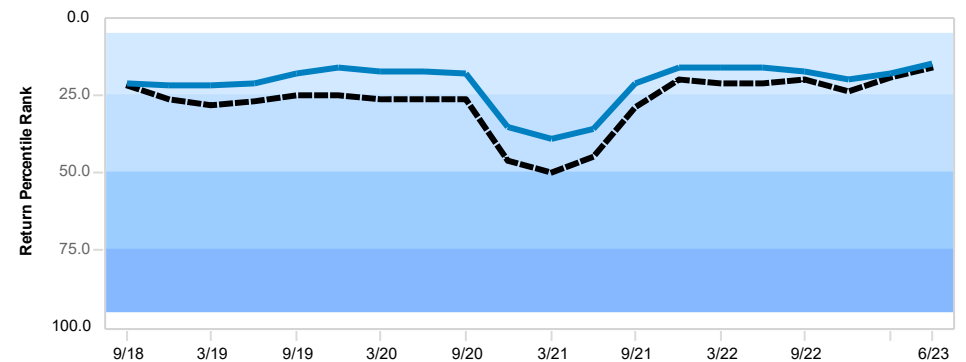


3 Year Rolling Percentile Rank IM U.S. Large Cap Index Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	15 (75%)	5 (25%)	0 (0%)	0 (0%)
Index	20	14 (70%)	6 (30%)	0 (0%)	0 (0%)

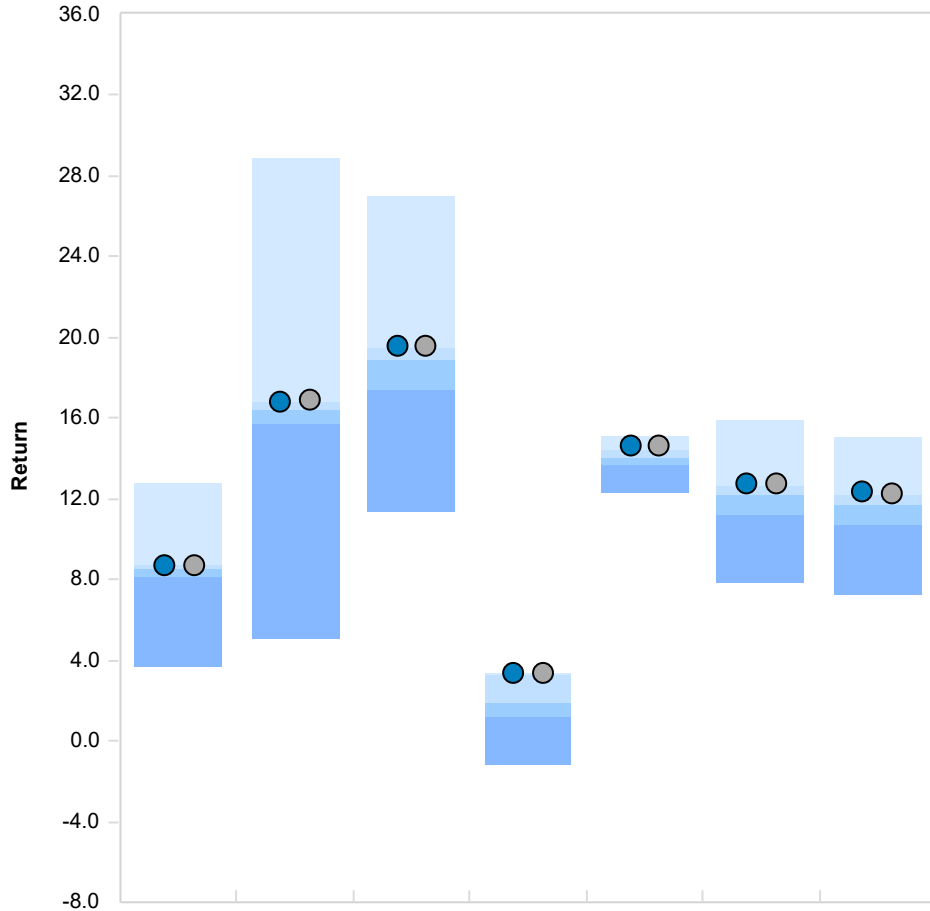
5 Year Rolling Percentile Rank IM U.S. Large Cap Index Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	17 (85%)	3 (15%)	0 (0%)	0 (0%)
Index	20	10 (50%)	10 (50%)	0 (0%)	0 (0%)

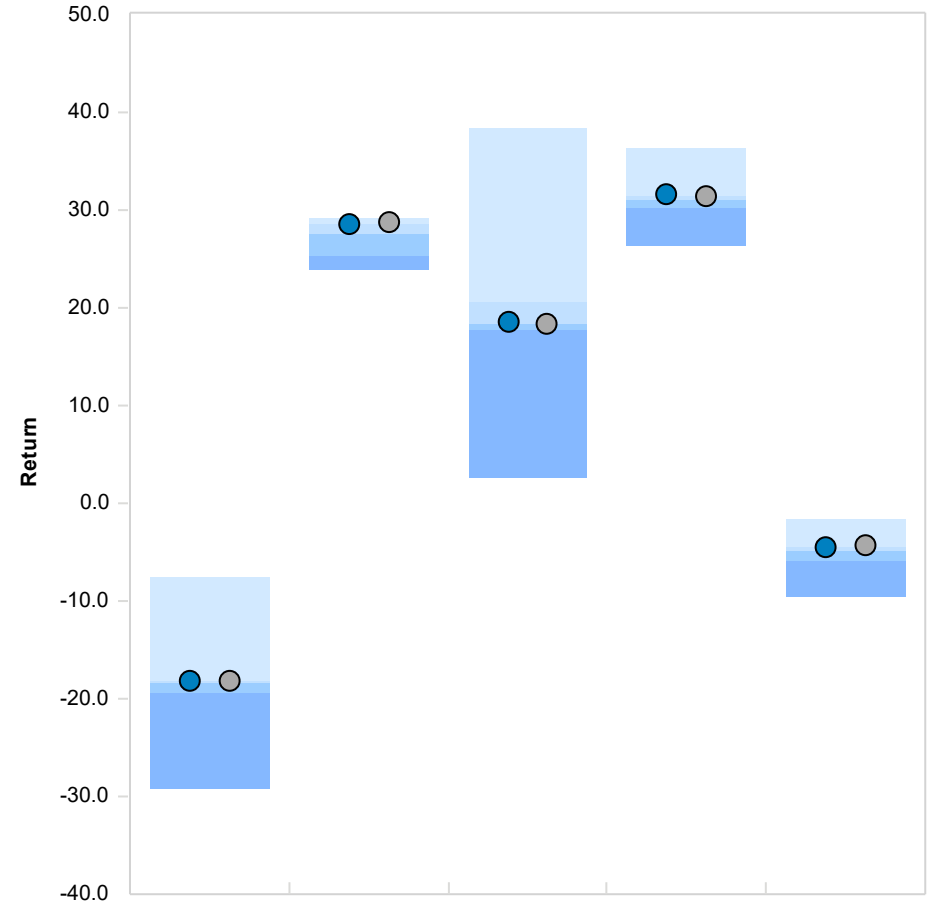


Peer Group Analysis - IM U.S. Large Cap Index Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	8.74 (17)	16.86 (25)	19.55 (21)	3.35 (16)	14.59 (13)	12.80 (12)	12.32 (15)
● Index	8.74 (13)	16.89 (13)	19.59 (11)	3.39 (5)	14.60 (12)	12.78 (16)	12.31 (16)
Median	8.54	16.45	18.94	1.90	14.05	12.19	11.63

Peer Group Analysis - IM U.S. Large Cap Index Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-18.12 (35)	28.65 (19)	18.53 (46)	31.54 (16)	-4.40 (24)
● Index	-18.11 (28)	28.71 (11)	18.40 (54)	31.49 (25)	-4.38 (23)
Median	-18.30	27.48	18.43	31.06	-4.84

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	7.47 (34)	7.56 (26)	-4.89 (57)	-16.11 (38)	-4.60 (29)	11.01 (27)
Index	7.50 (14)	7.56 (25)	-4.88 (50)	-16.10 (32)	-4.60 (28)	11.03 (18)
Median	7.34	7.41	-4.88	-16.16	-4.67	9.98



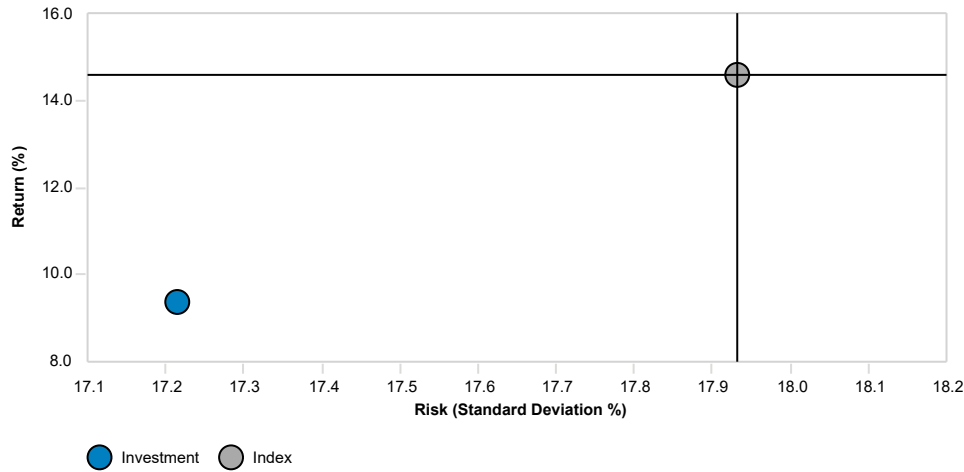
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	9.38	17.22	0.53	88.01	9	103.13	3
Index	14.60	17.93	0.78	100.00	9	100.00	3

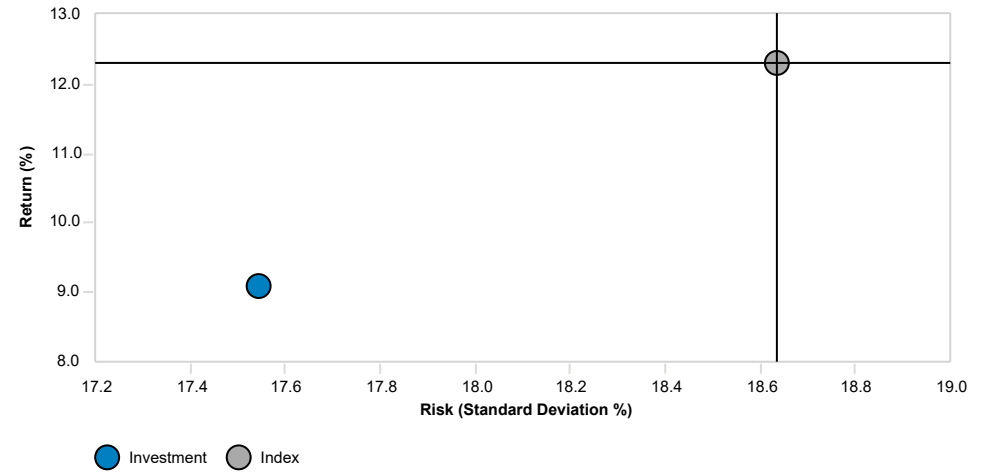
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	9.10	17.54	0.50	89.53	15	97.78	5
Index	12.31	18.64	0.64	100.00	15	100.00	5

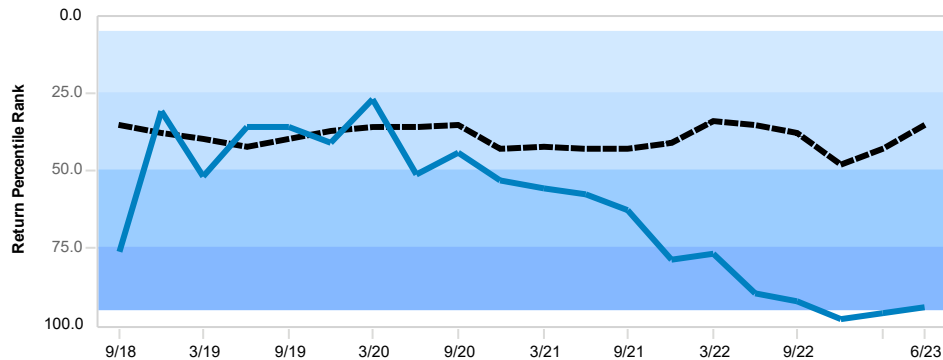
Risk and Return 3 Years



Risk and Return 5 Years

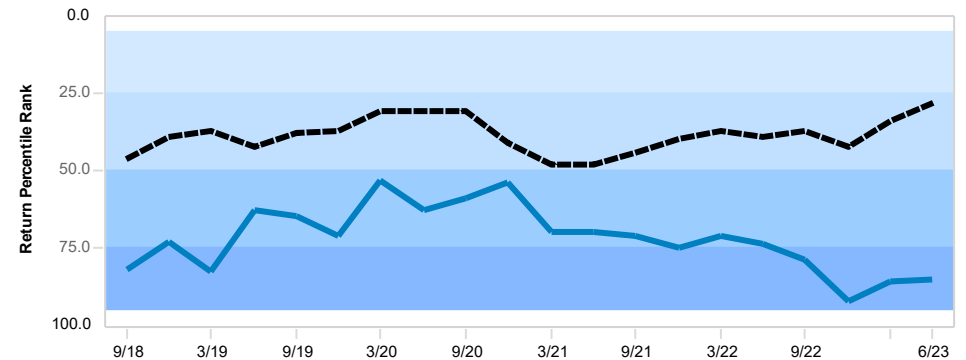


3 Year Rolling Percentile Rank IM U.S. Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	6 (30%)	6 (30%)	8 (40%)
Index	20	0 (0%)	20 (100%)	0 (0%)	0 (0%)

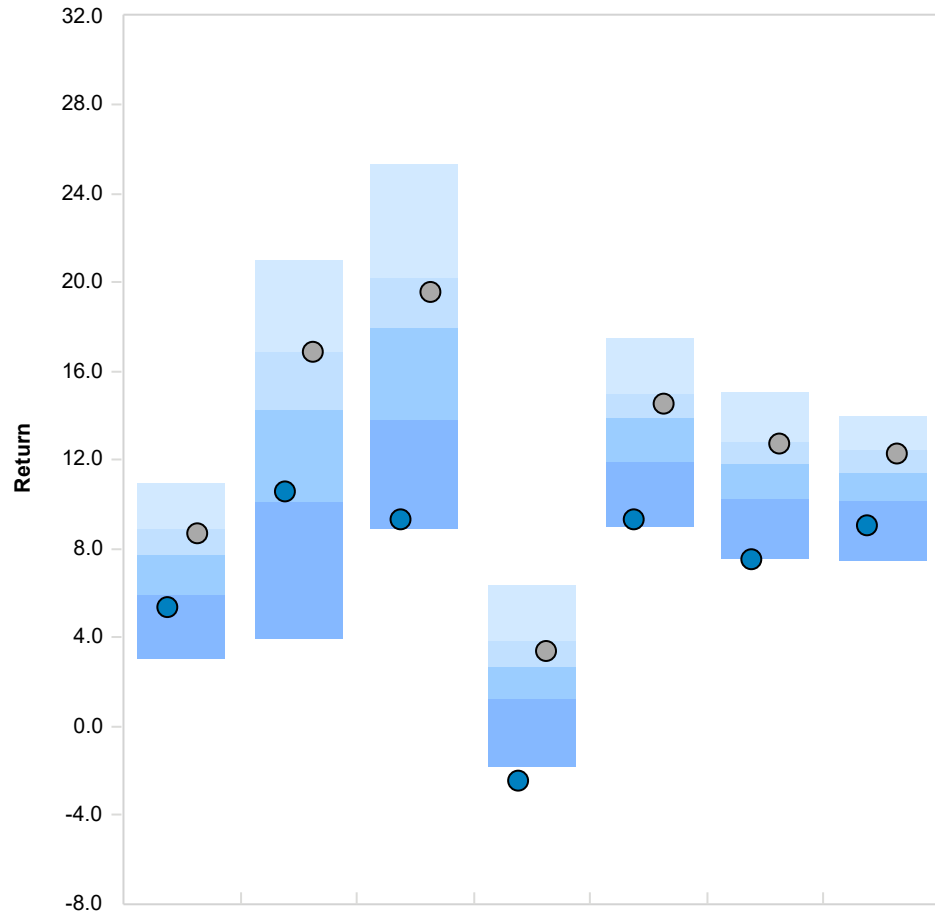
5 Year Rolling Percentile Rank IM U.S. Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	0 (0%)	14 (70%)	6 (30%)
Index	20	0 (0%)	20 (100%)	0 (0%)	0 (0%)

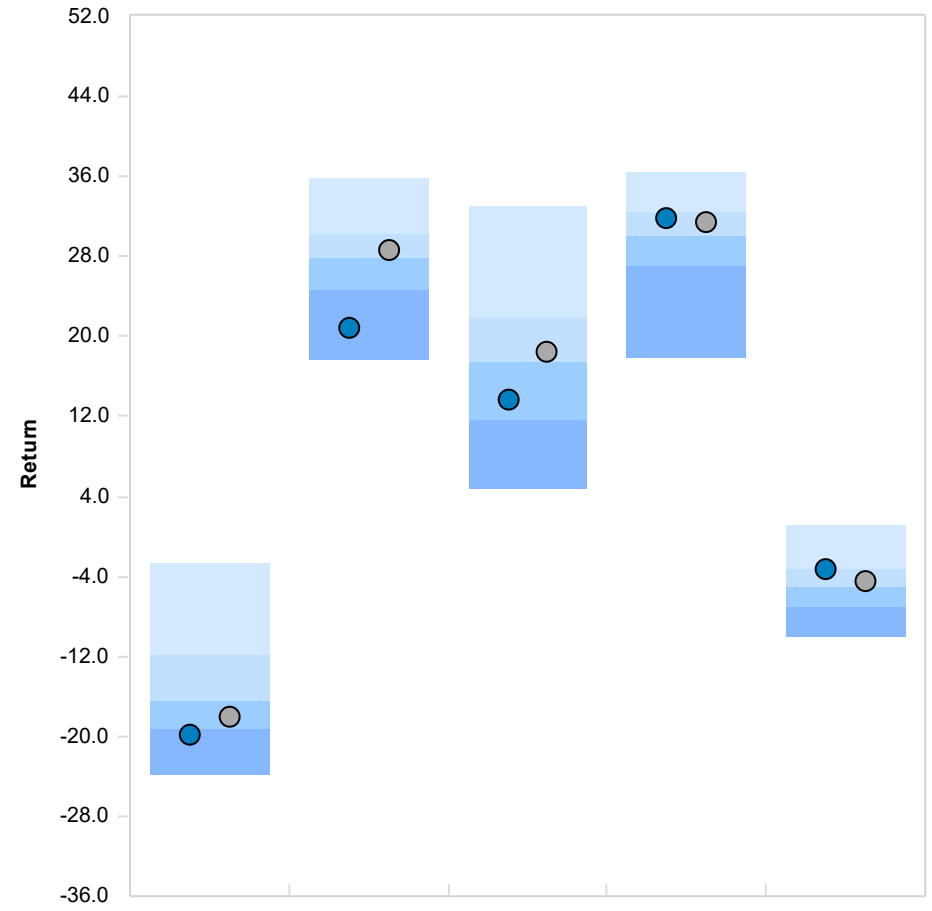


Peer Group Analysis - IM U.S. Large Cap Core Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	5.37 (80)	10.65 (72)	9.37 (95)	-2.40 (96)	9.38 (94)	7.56 (95)	9.10 (85)
● Index	8.74 (28)	16.89 (25)	19.59 (31)	3.39 (36)	14.60 (35)	12.78 (28)	12.31 (28)
Median	7.74	14.33	17.98	2.65	13.94	11.87	11.39

Peer Group Analysis - IM U.S. Large Cap Core Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-19.85 (84)	20.79 (89)	13.61 (68)	31.87 (29)	-3.35 (26)
● Index	-18.11 (66)	28.71 (38)	18.40 (45)	31.49 (33)	-4.38 (41)
Median	-16.49	27.77	17.53	30.00	-5.07

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	5.01 (67)	5.66 (89)	-6.45 (92)	-15.38 (55)	-4.17 (39)	7.31 (85)
Index	7.50 (26)	7.56 (62)	-4.88 (56)	-16.10 (69)	-4.60 (50)	11.03 (33)
Median	6.37	7.99	-4.79	-15.10	-4.60	10.20



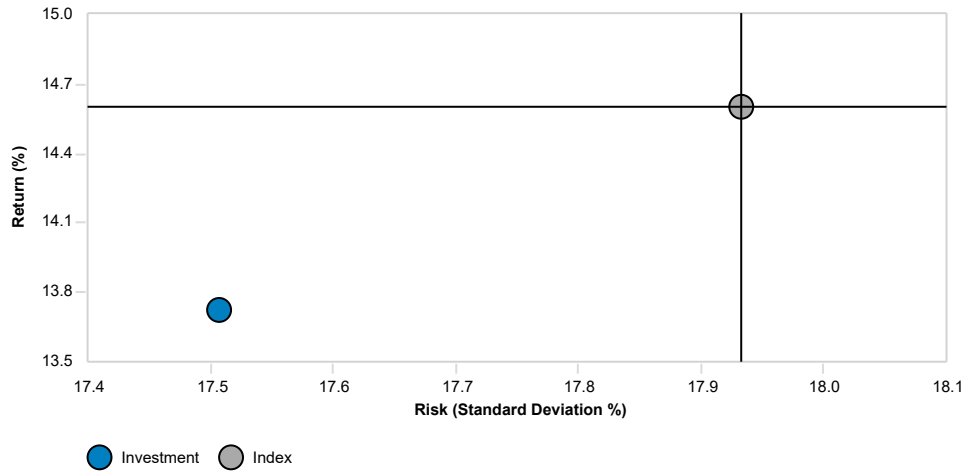
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	13.73	17.51	0.75	96.27	9	97.66	3
Index	14.60	17.93	0.78	100.00	9	100.00	3

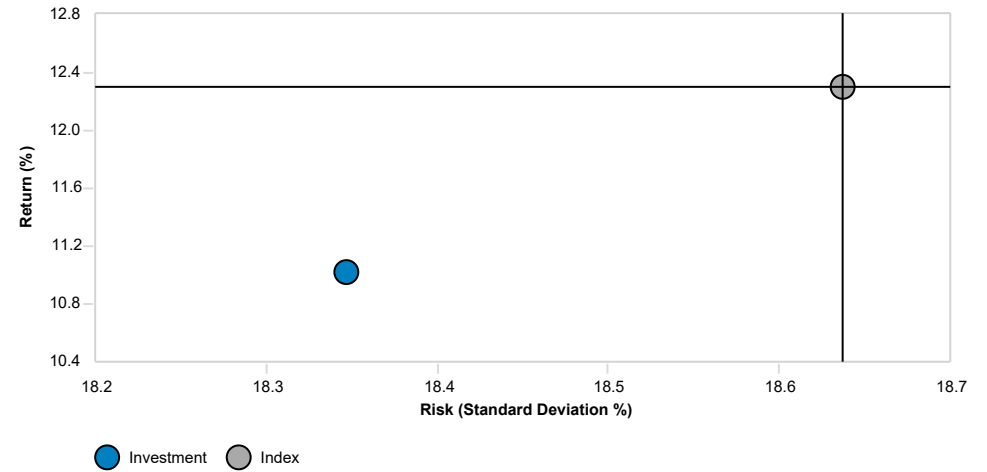
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	11.02	18.35	0.58	96.05	15	99.32	5
Index	12.31	18.64	0.64	100.00	15	100.00	5

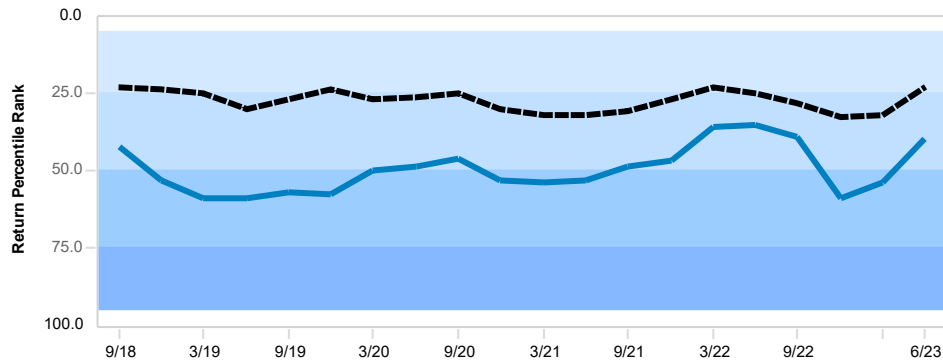
Risk and Return 3 Years



Risk and Return 5 Years

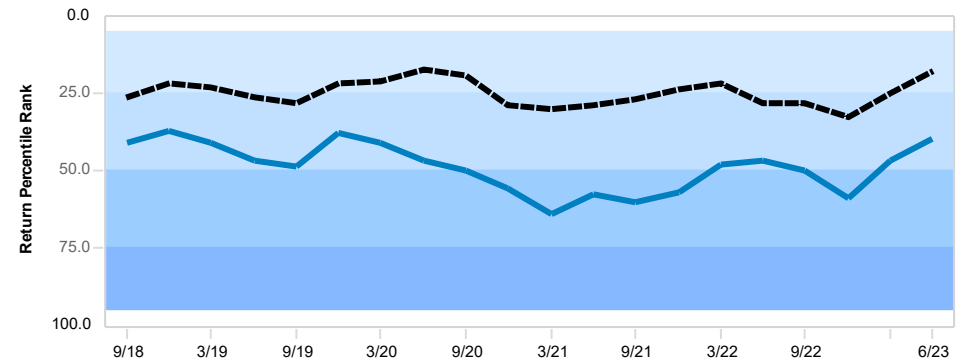


3 Year Rolling Percentile Rank IM U.S. Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	10 (50%)	10 (50%)	0 (0%)
Index	20	8 (40%)	12 (60%)	0 (0%)	0 (0%)

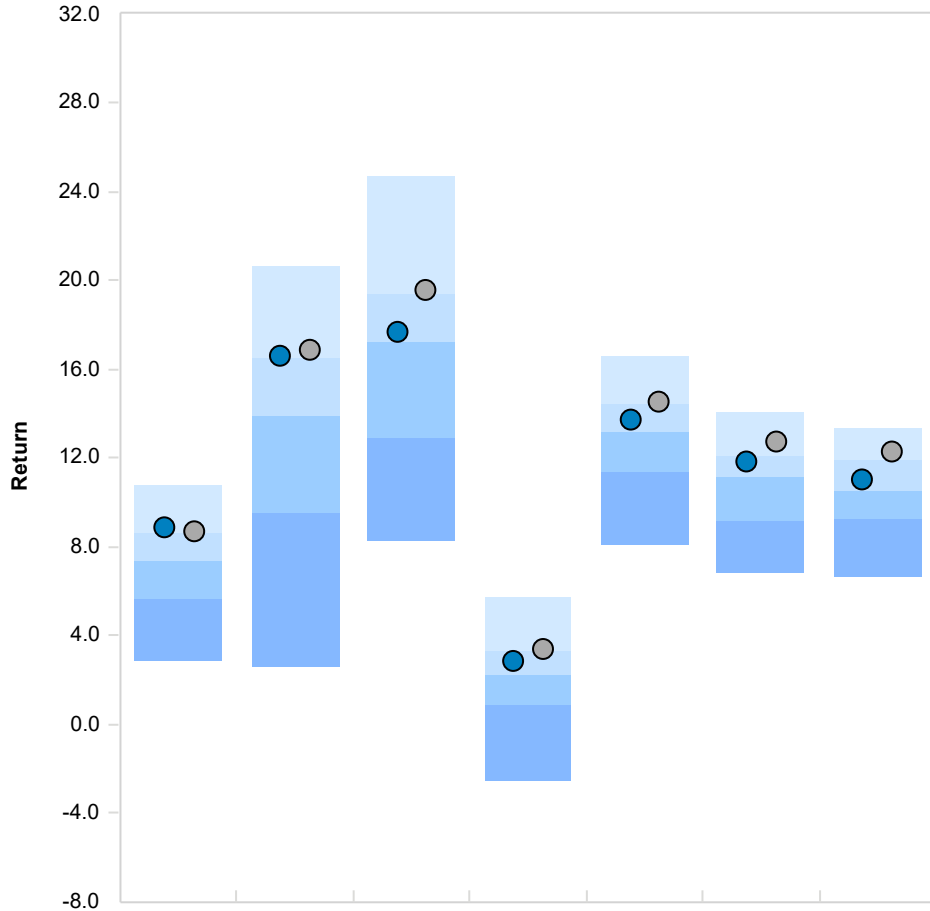
5 Year Rolling Percentile Rank IM U.S. Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	14 (70%)	6 (30%)	0 (0%)
Index	20	10 (50%)	10 (50%)	0 (0%)	0 (0%)

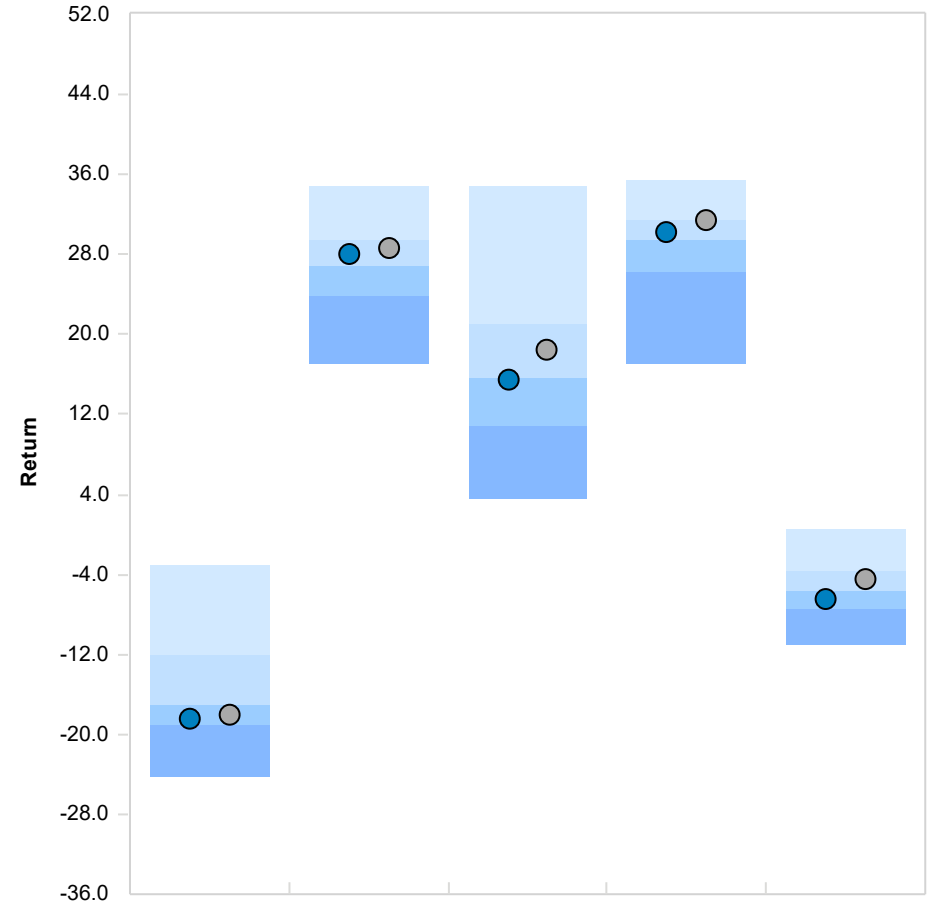


Peer Group Analysis - IM U.S. Large Cap Core Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	8.92 (21)	16.62 (24)	17.67 (44)	2.88 (35)	13.73 (40)	11.85 (31)	11.02 (40)
● Index	8.74 (22)	16.89 (21)	19.59 (24)	3.39 (23)	14.60 (23)	12.78 (19)	12.31 (18)
Median	7.34	13.91	17.23	2.26	13.19	11.17	10.49

Peer Group Analysis - IM U.S. Large Cap Core Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-18.40 (65)	28.13 (37)	15.56 (52)	30.24 (37)	-6.43 (62)
● Index	-18.11 (61)	28.71 (30)	18.40 (40)	31.49 (26)	-4.38 (32)
Median	-16.96	26.89	15.68	29.37	-5.67

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	7.07 (34)	6.18 (84)	-4.97 (53)	-15.58 (57)	-4.21 (39)	11.19 (24)
Index	7.50 (22)	7.56 (58)	-4.88 (48)	-16.10 (71)	-4.60 (46)	11.03 (27)
Median	6.20	7.90	-4.94	-15.20	-4.68	10.23



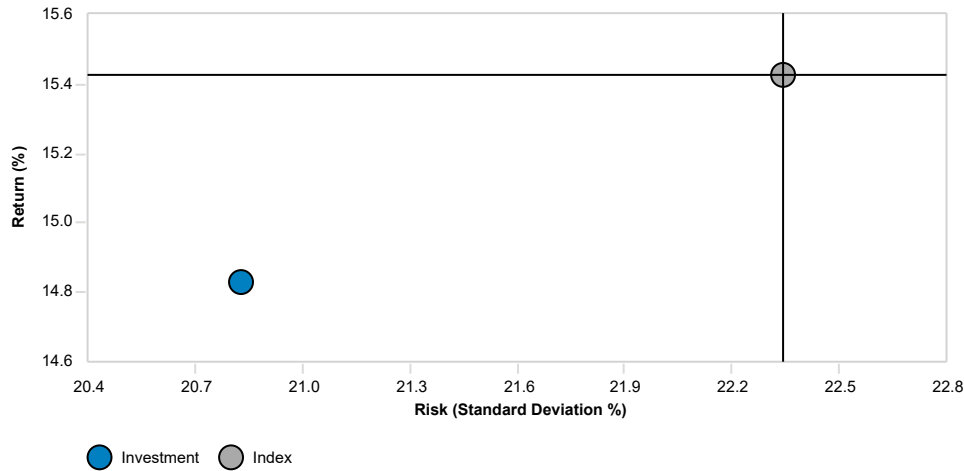
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	14.83	20.83	0.71	90.61	7	87.54	5
Index	15.43	22.34	0.70	100.00	7	100.00	5

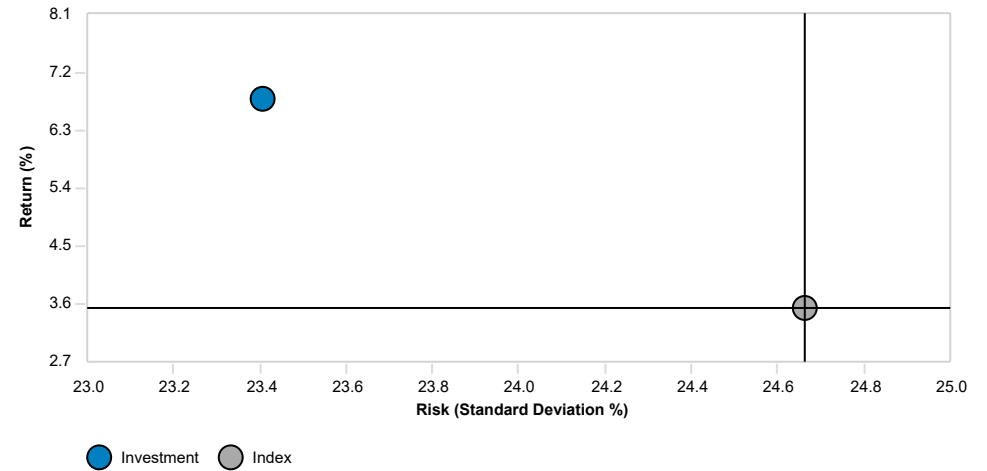
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	6.79	23.41	0.33	99.06	13	89.83	7
Index	3.54	24.66	0.20	100.00	12	100.00	8

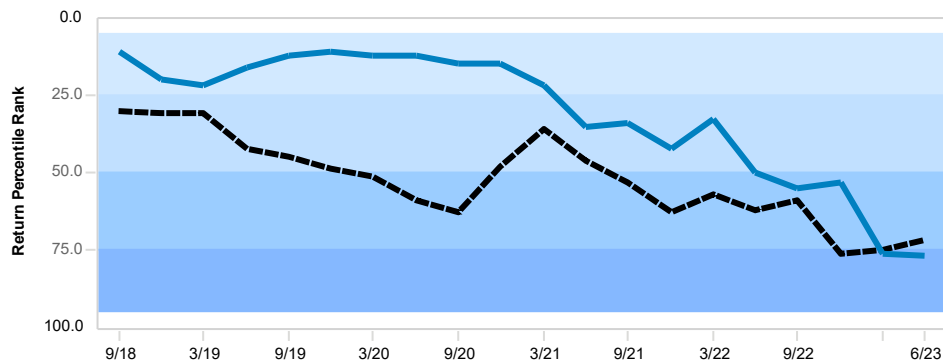
Risk and Return 3 Years



Risk and Return 5 Years

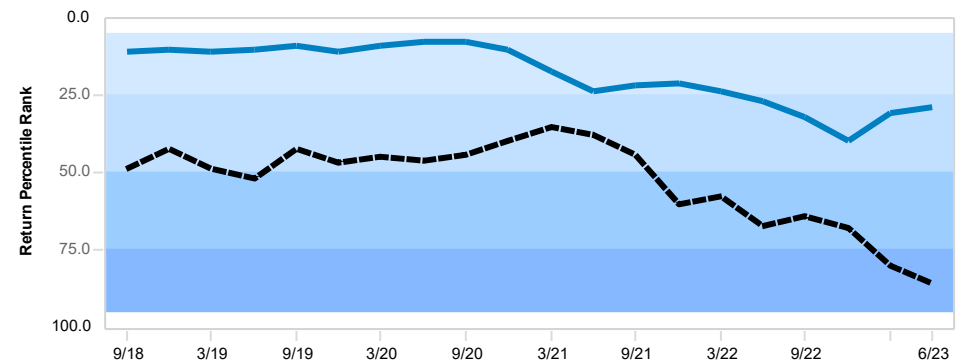


3 Year Rolling Percentile Rank IM U.S. Small Cap Value Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	11 (55%)	5 (25%)	2 (10%)	2 (10%)
Index	20	0 (0%)	9 (45%)	10 (50%)	1 (5%)

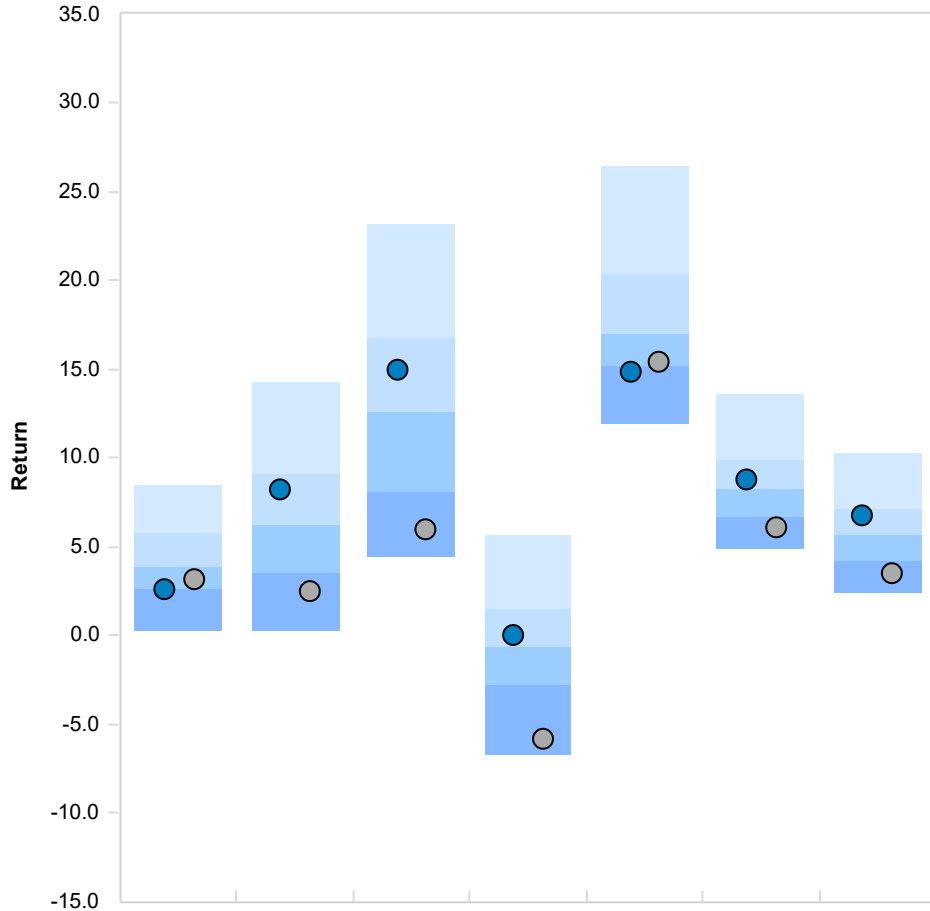
5 Year Rolling Percentile Rank IM U.S. Small Cap Value Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	15 (75%)	5 (25%)	0 (0%)	0 (0%)
Index	20	0 (0%)	12 (60%)	6 (30%)	2 (10%)

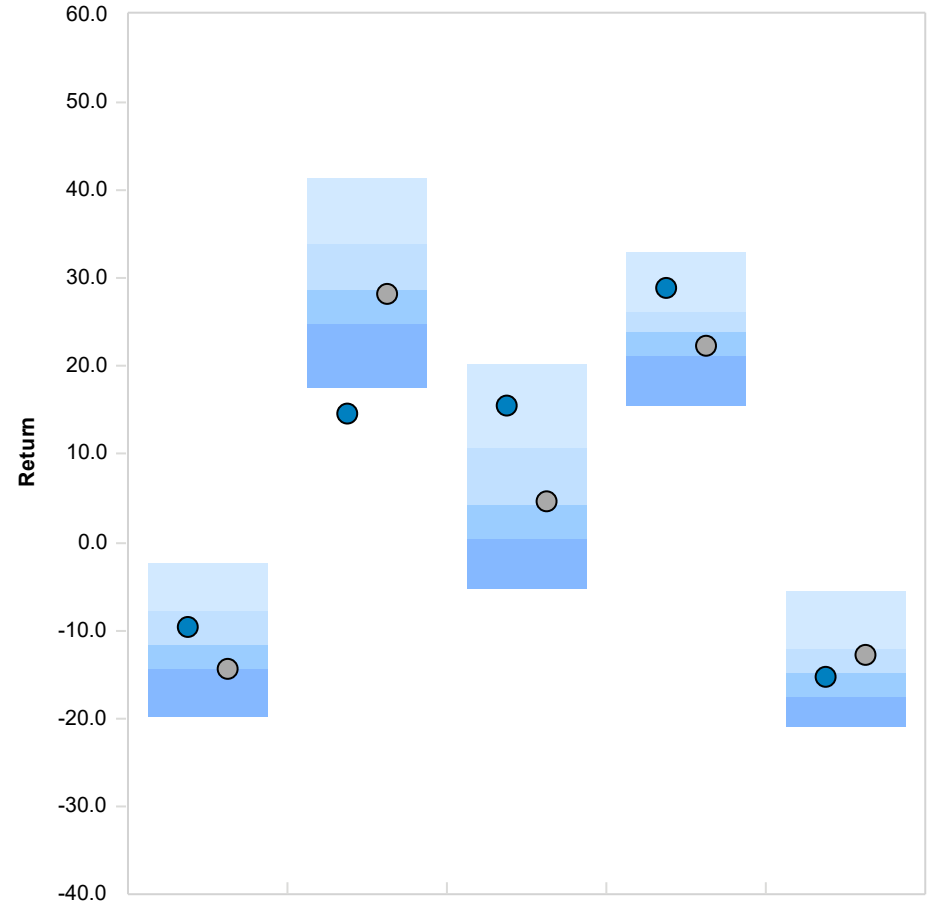


Peer Group Analysis - IM U.S. Small Cap Value Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	2.69 (75)	8.23 (35)	14.99 (35)	0.08 (41)	14.83 (77)	8.86 (40)	6.79 (29)
● Index	3.18 (68)	2.50 (84)	6.01 (89)	-5.79 (92)	15.43 (72)	6.14 (84)	3.54 (86)
Median	3.86	6.23	12.67	-0.66	16.99	8.28	5.67

Peer Group Analysis - IM U.S. Small Cap Value Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-9.57 (32)	14.64 (98)	15.50 (14)	28.89 (12)	-15.35 (57)
● Index	-14.48 (76)	28.27 (53)	4.63 (49)	22.39 (66)	-12.86 (32)
Median	-11.63	28.76	4.29	23.95	-14.81

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	5.40 (19)	10.97 (49)	-4.26 (43)	-13.55 (52)	-1.54 (29)	4.55 (85)
Index	-0.66 (87)	8.42 (82)	-4.61 (49)	-15.28 (77)	-2.40 (39)	4.36 (87)
Median	2.07	10.87	-4.66	-13.48	-3.07	6.67



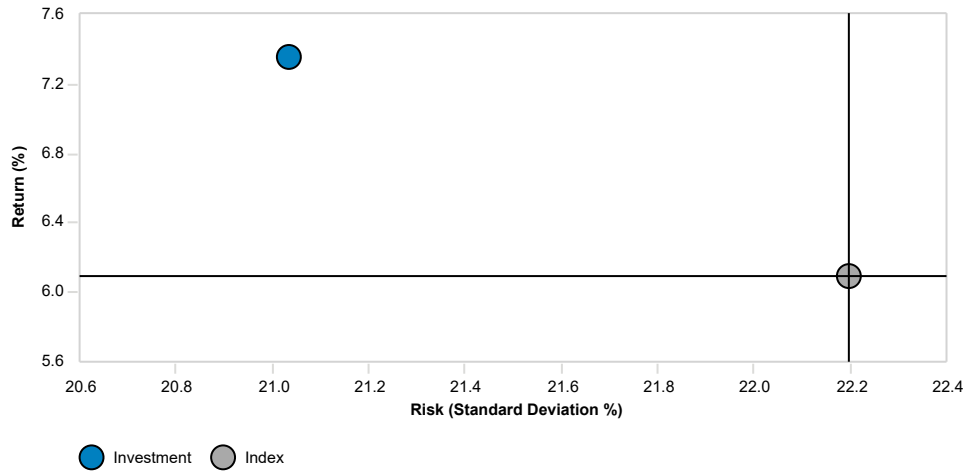
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	7.36	21.04	0.38	101.32	8	97.93	4
Index	6.10	22.20	0.32	100.00	9	100.00	3

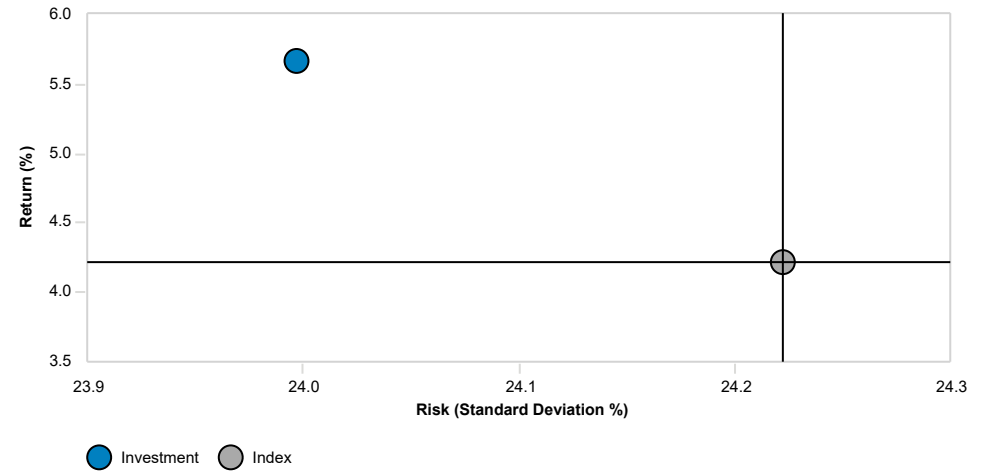
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	5.67	24.00	0.29	102.26	13	98.18	7
Index	4.22	24.22	0.23	100.00	14	100.00	6

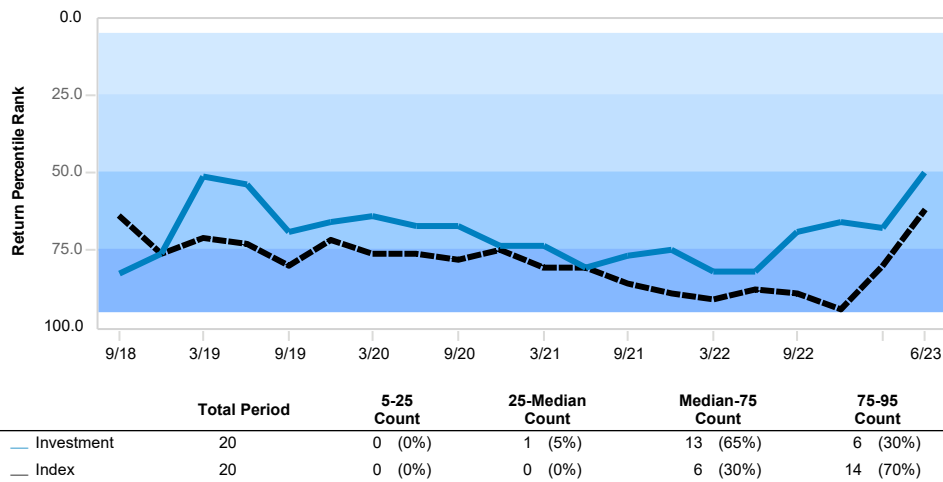
Risk and Return 3 Years



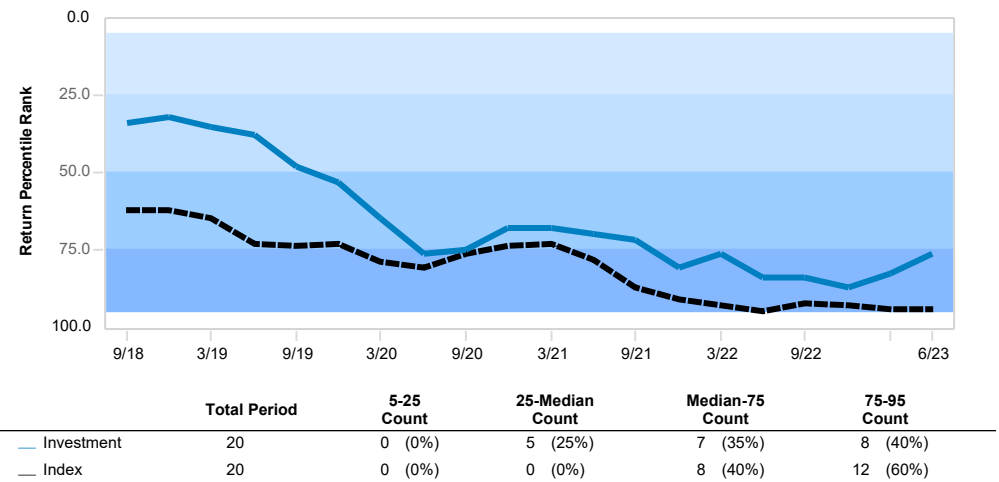
Risk and Return 5 Years



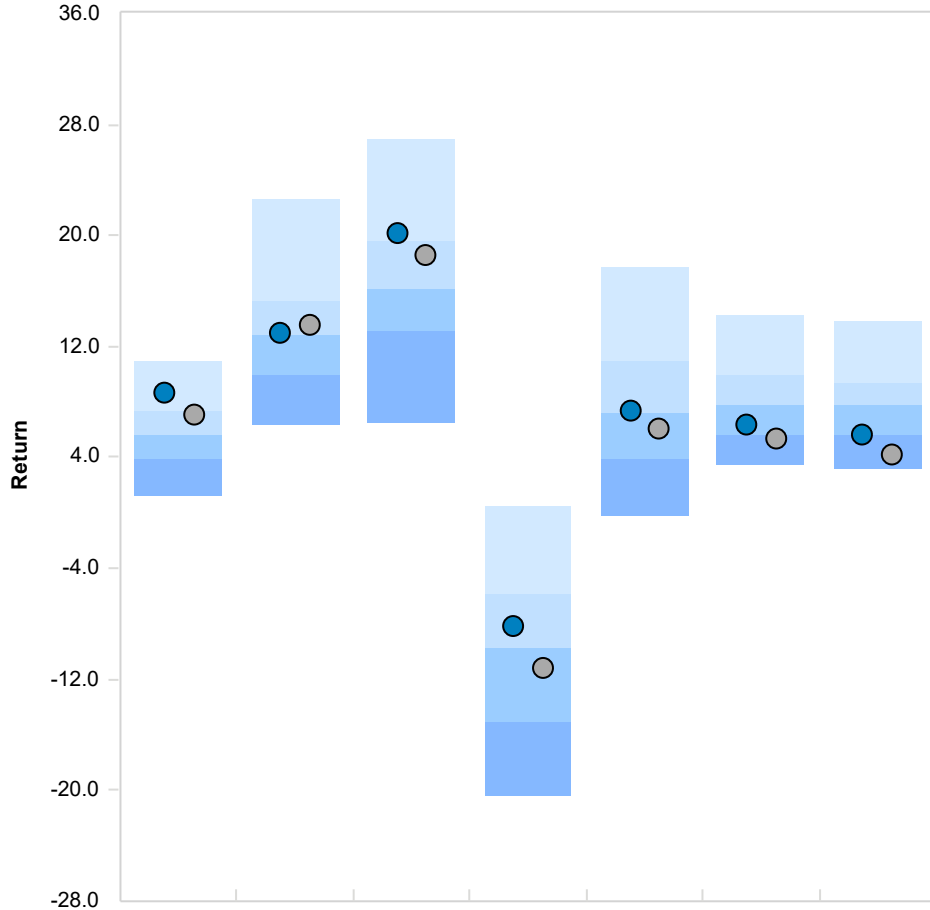
3 Year Rolling Percentile Rank IM U.S. Small Cap Growth Equity (SA+CF)



5 Year Rolling Percentile Rank IM U.S. Small Cap Growth Equity (SA+CF)

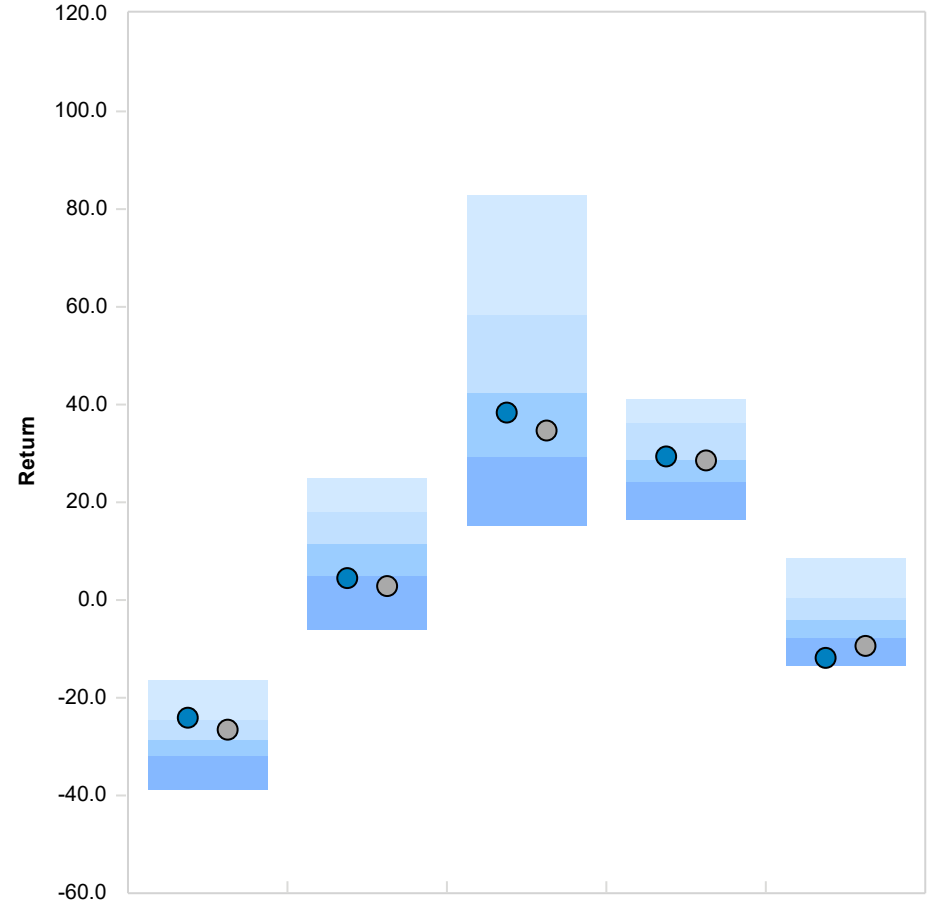


Peer Group Analysis - IM U.S. Small Cap Growth Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	8.68 (12)	13.02 (49)	20.19 (22)	-8.16 (40)	7.36 (50)	6.34 (67)	5.67 (76)
● Index	7.05 (28)	13.55 (39)	18.53 (38)	-11.17 (59)	6.10 (62)	5.44 (83)	4.22 (94)
Median	5.69	12.88	16.15	-9.67	7.20	7.77	7.86

Peer Group Analysis - IM U.S. Small Cap Growth Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-24.18 (23)	4.32 (79)	38.53 (60)	29.23 (49)	-11.94 (92)
● Index	-26.36 (35)	2.83 (83)	34.63 (66)	28.48 (50)	-9.31 (81)
Median	-28.57	11.62	42.49	28.42	-4.05

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	3.99 (84)	6.55 (22)	-0.19 (39)	-20.13 (47)	-10.74 (19)	0.01 (66)
Index	6.07 (67)	4.13 (52)	0.24 (30)	-19.25 (43)	-12.63 (42)	0.01 (67)
Median	7.07	4.23	-1.15	-20.28	-13.47	2.39



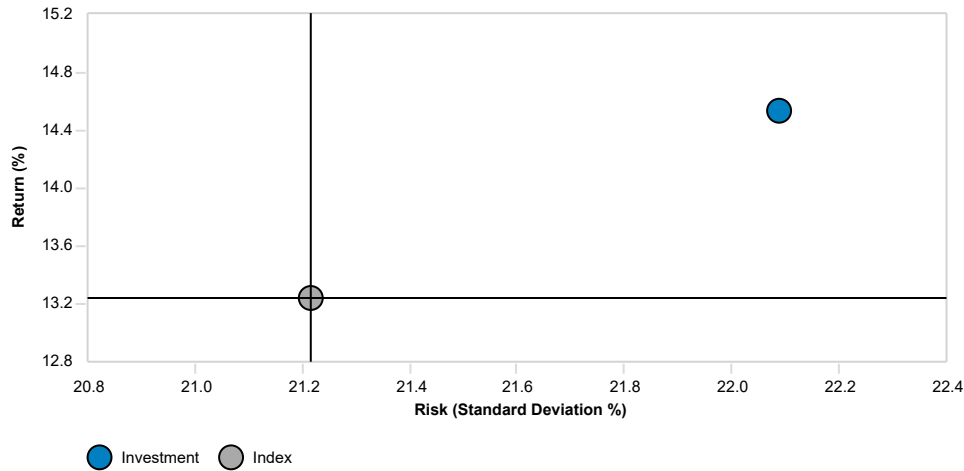
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	14.53	22.09	0.67	95.29	7	86.93	5
Index	13.24	21.22	0.64	100.00	9	100.00	3

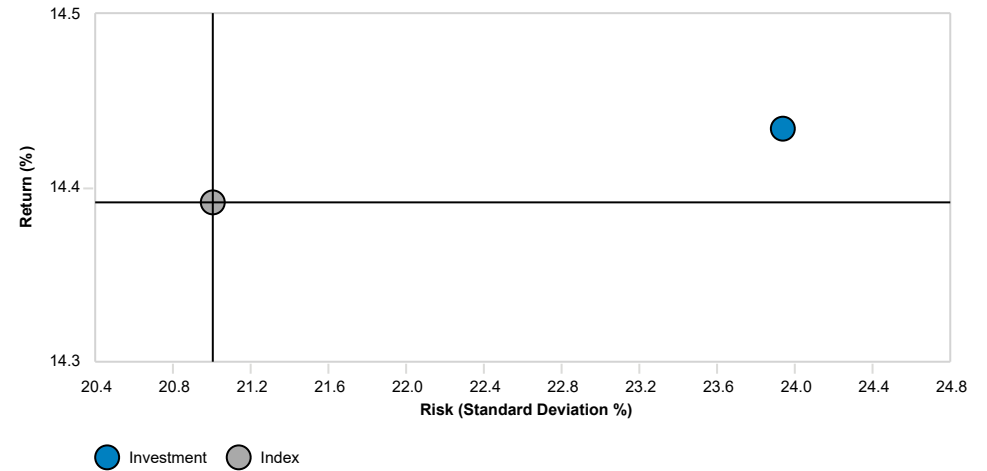
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	14.43	23.93	0.62	103.46	12	102.82	8
Index	14.39	21.00	0.67	100.00	15	100.00	5

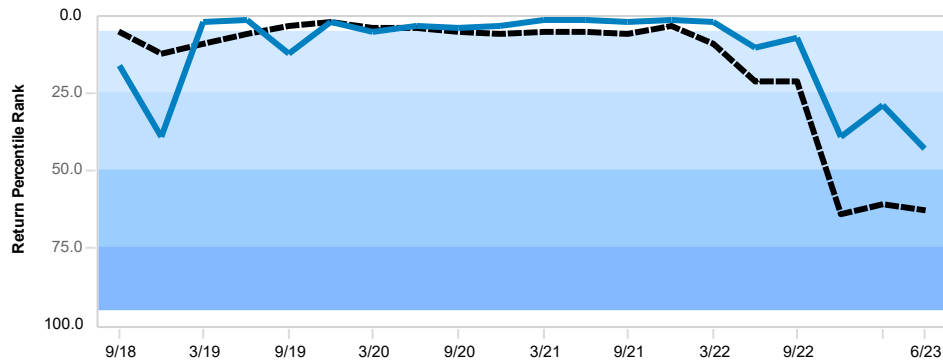
Risk and Return 3 Years



Risk and Return 5 Years

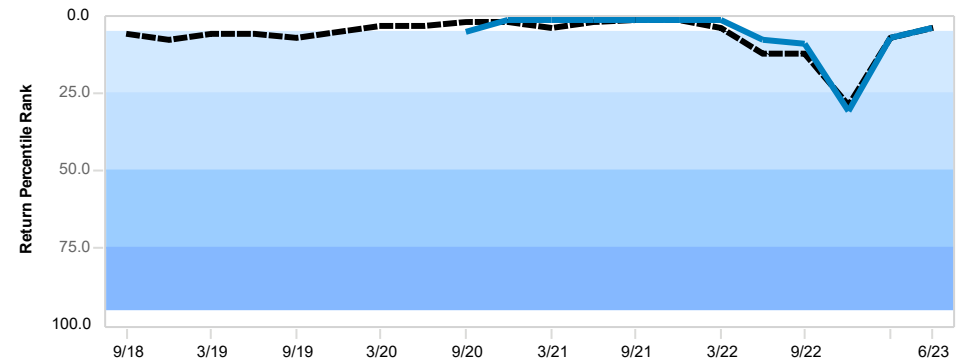


3 Year Rolling Percentile Rank IM U.S. All Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	16 (80%)	4 (20%)	0 (0%)	0 (0%)
Index	20	17 (85%)	0 (0%)	3 (15%)	0 (0%)

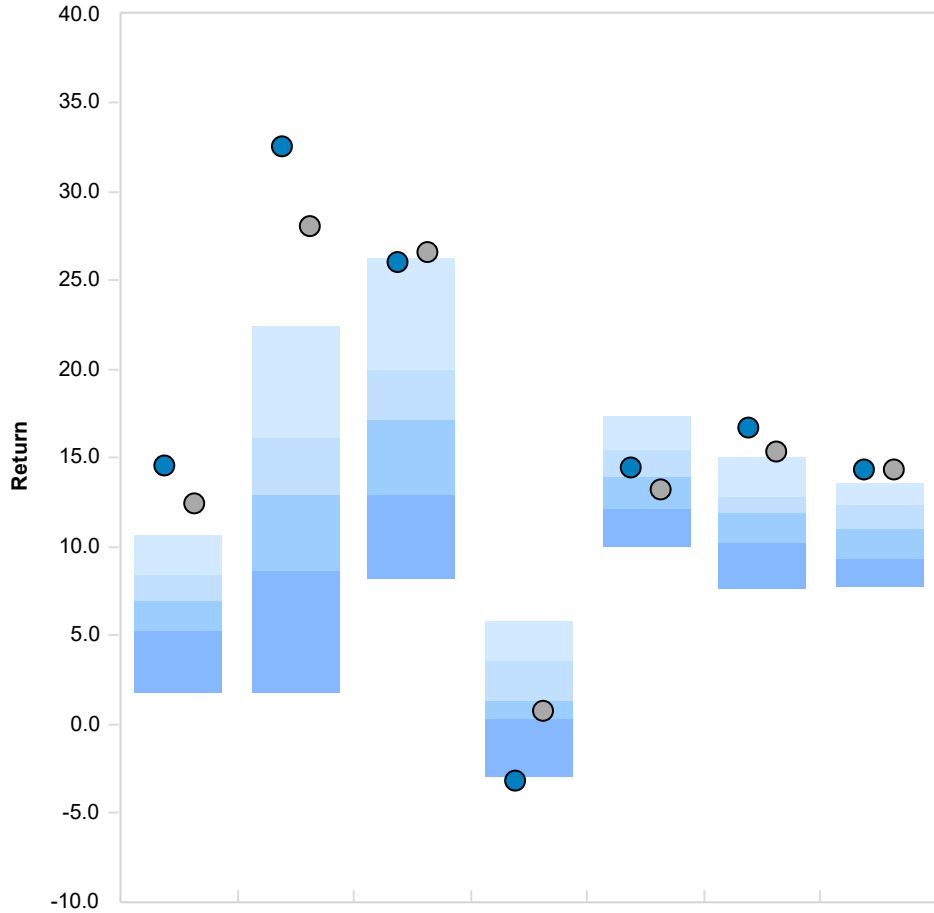
5 Year Rolling Percentile Rank IM U.S. All Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	12	11 (92%)	1 (8%)	0 (0%)	0 (0%)
Index	20	19 (95%)	1 (5%)	0 (0%)	0 (0%)

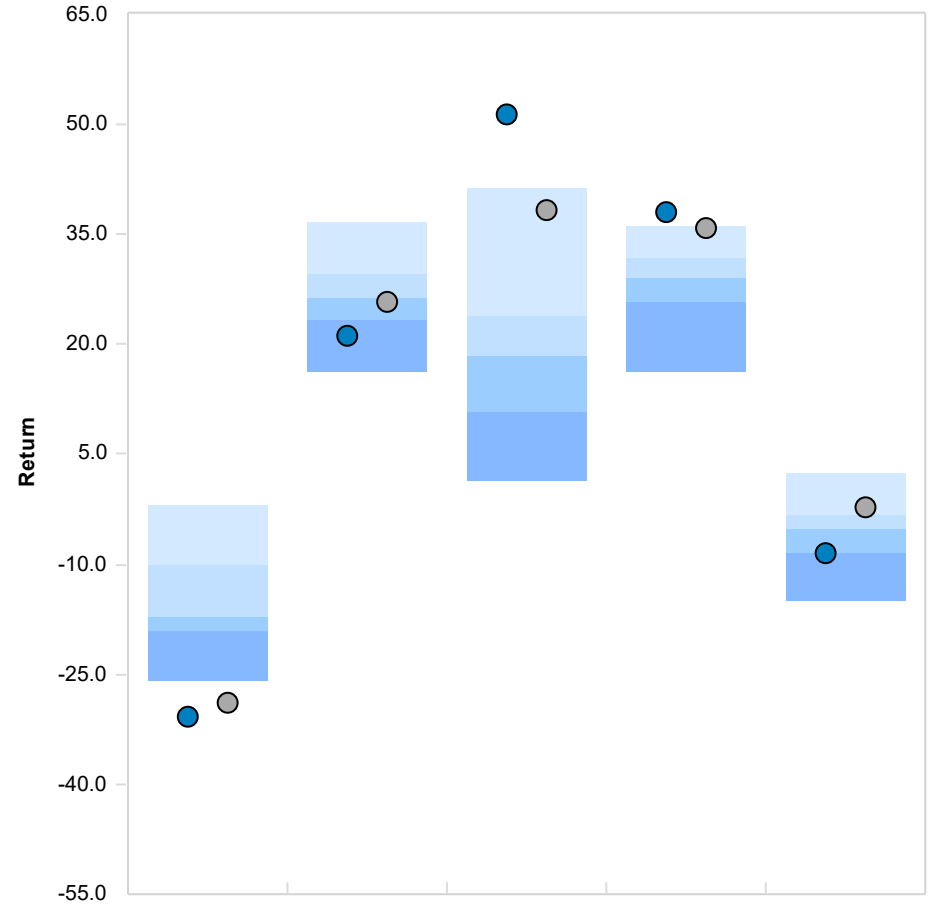


Peer Group Analysis - IM U.S. All Cap Core Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	14.58 (1)	32.58 (1)	26.03 (6)	-3.16 (97)	14.53 (43)	16.77 (3)	14.43 (4)
● Index	12.47 (1)	28.05 (1)	26.60 (5)	0.78 (68)	13.24 (63)	15.36 (5)	14.39 (4)
Median	7.00	12.90	17.24	1.37	13.91	11.88	10.97

Peer Group Analysis - IM U.S. All Cap Core Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-30.72 (100)	21.32 (83)	51.29 (2)	38.03 (2)	-8.39 (74)
● Index	-28.97 (98)	25.85 (55)	38.26 (9)	35.85 (6)	-2.12 (18)
Median	-17.15	26.28	18.60	29.22	-5.10

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	15.71 (1)	-1.15 (100)	-3.84 (23)	-23.88 (98)	-4.26 (32)	3.11 (97)
Index	13.85 (2)	2.31 (100)	-3.37 (18)	-20.83 (96)	-9.25 (91)	10.89 (25)
Median	5.59	8.78	-4.52	-15.00	-5.02	9.37



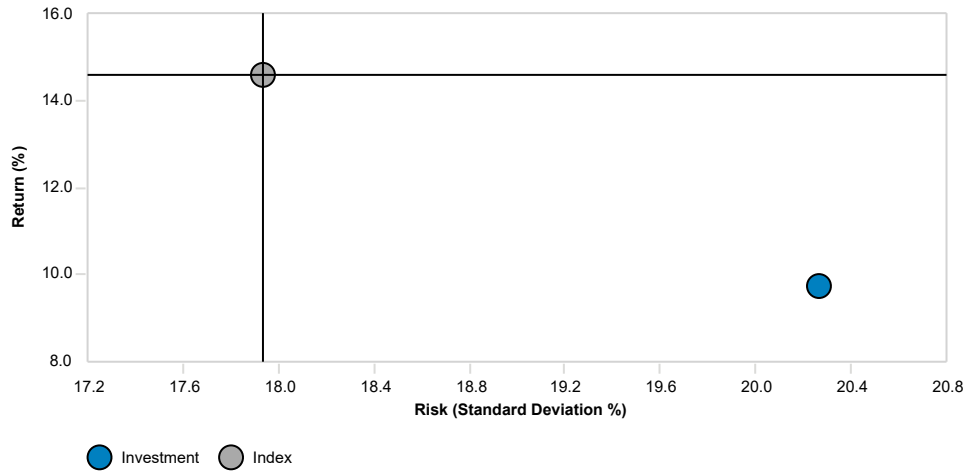
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	9.75	20.26	0.50	90.43	8	102.87	4
Index	14.60	17.93	0.78	100.00	9	100.00	3

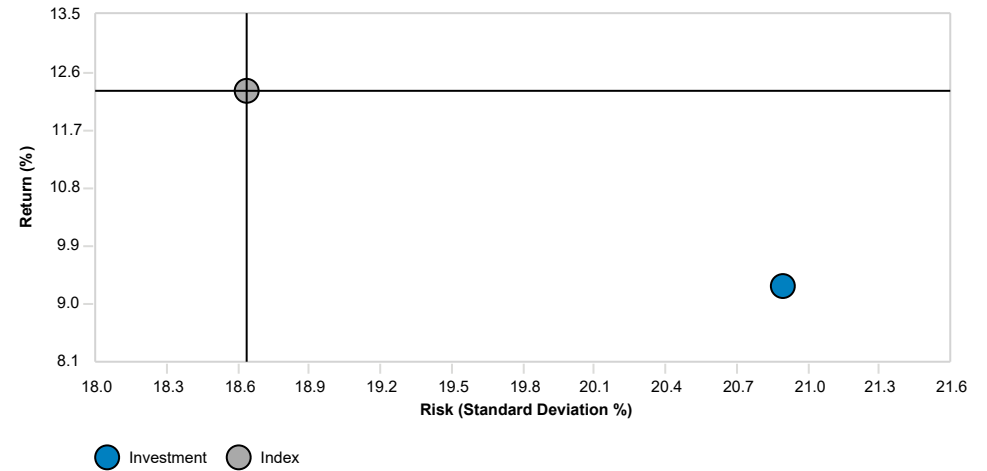
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	9.28	20.89	0.46	97.05	14	106.24	6
Index	12.31	18.64	0.64	100.00	15	100.00	5

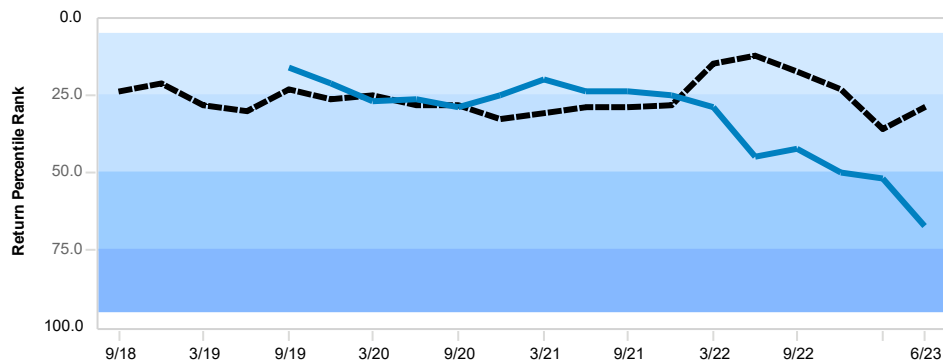
Risk and Return 3 Years



Risk and Return 5 Years

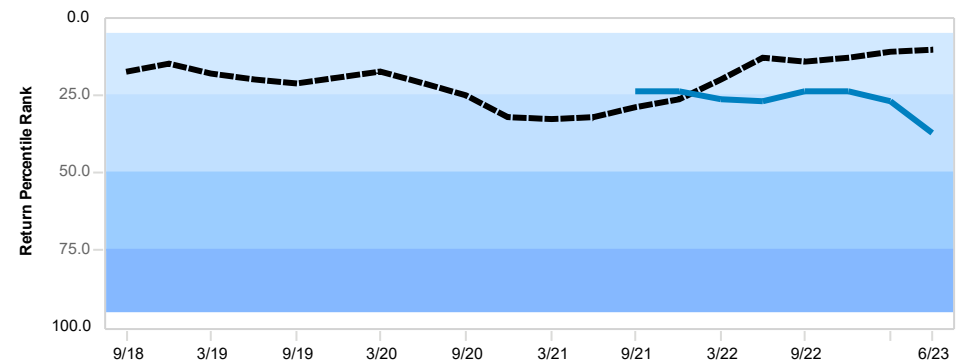


3 Year Rolling Percentile Rank IM U.S. Equity (MF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	16	7 (44%)	7 (44%)	2 (13%)	0 (0%)
Index	20	8 (40%)	12 (60%)	0 (0%)	0 (0%)

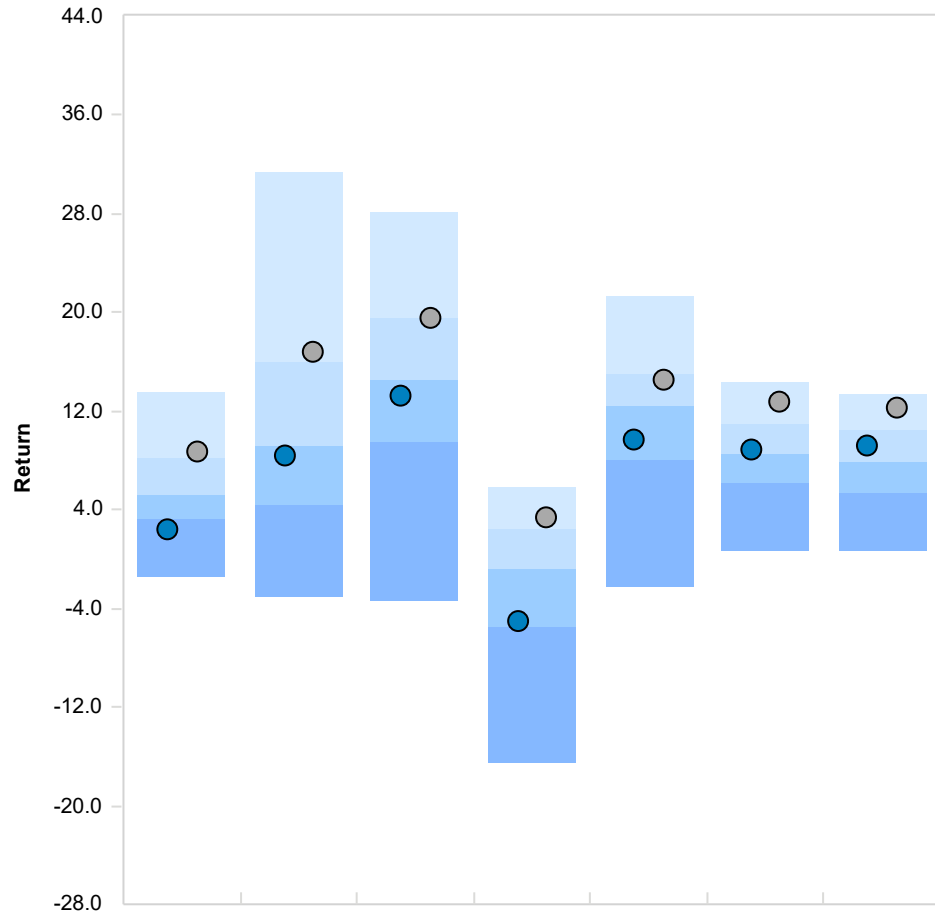
5 Year Rolling Percentile Rank IM U.S. Equity (MF)



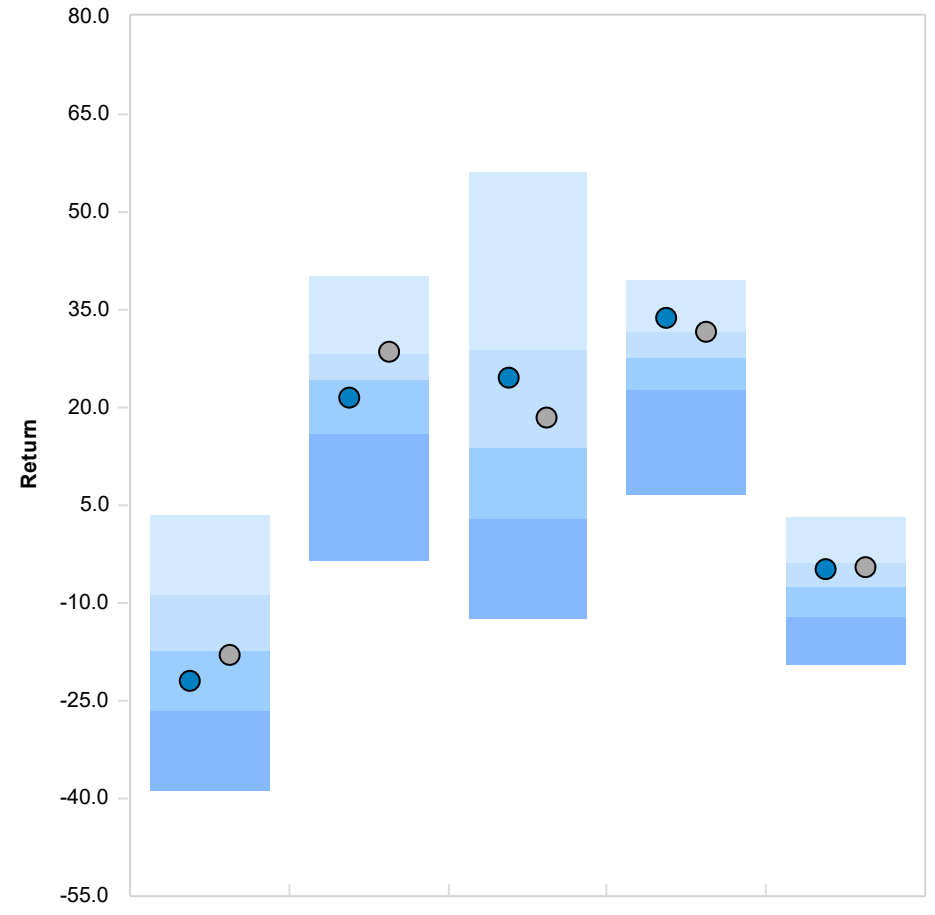
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	8	4 (50%)	4 (50%)	0 (0%)	0 (0%)
Index	20	15 (75%)	5 (25%)	0 (0%)	0 (0%)



Peer Group Analysis - IM U.S. Equity (MF)



Peer Group Analysis - IM U.S. Equity (MF)



Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	5.86 (41)	7.41 (58)	-2.69 (24)	-18.17 (71)	-8.83 (69)	8.32 (39)
Index	7.50 (27)	7.56 (56)	-4.88 (56)	-16.10 (57)	-4.60 (42)	11.03 (14)
Median	4.31	8.34	-4.64	-15.44	-5.54	7.27



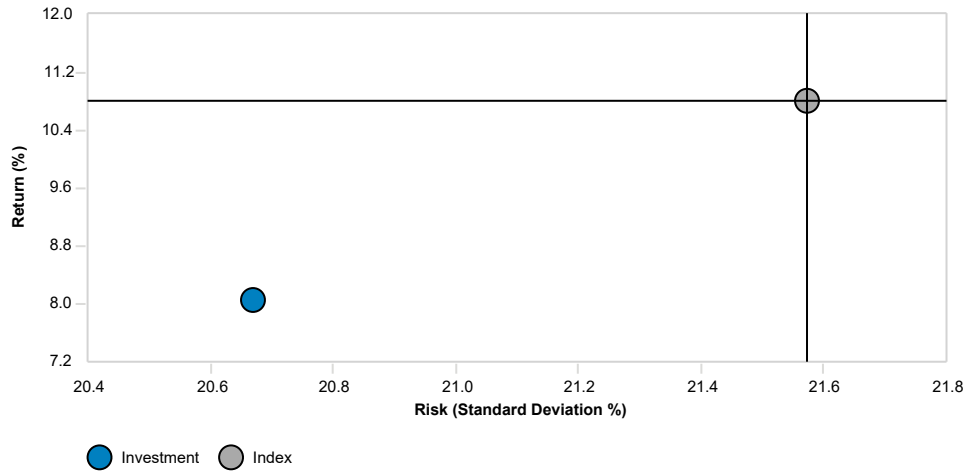
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	8.05	20.67	0.42	90.91	8	97.84	4
Index	10.82	21.57	0.52	100.00	8	100.00	4

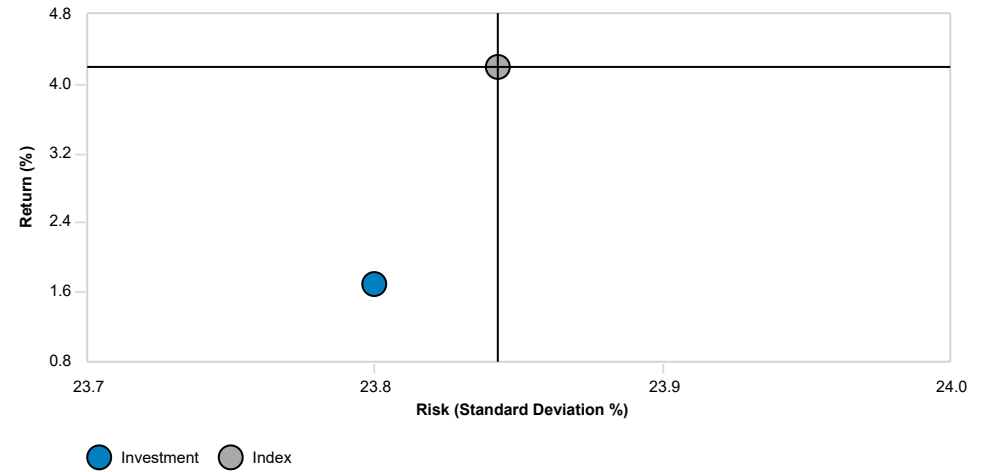
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.69	23.80	0.13	94.42	14	101.66	6
Index	4.21	23.84	0.23	100.00	13	100.00	7

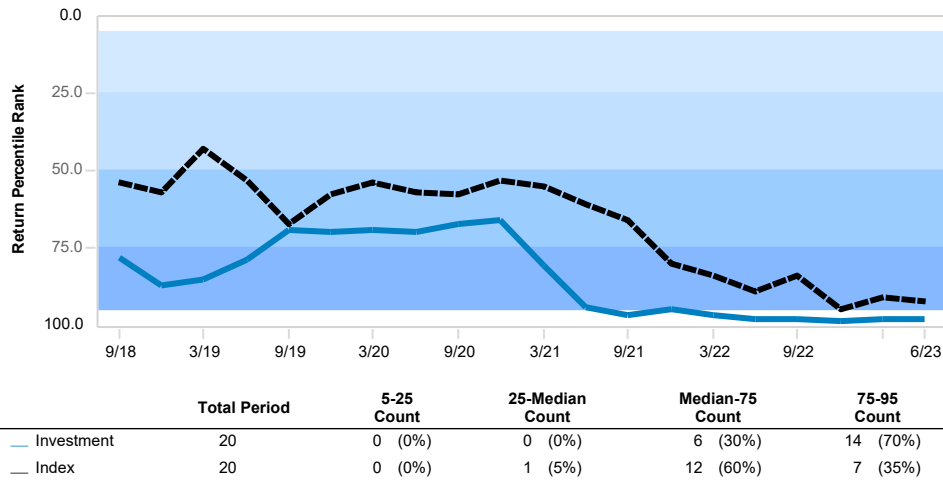
Risk and Return 3 Years



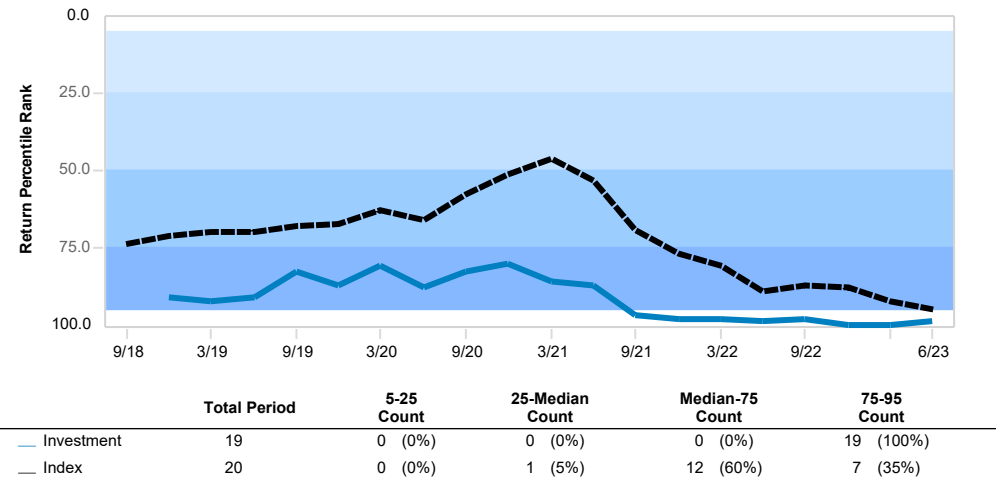
Risk and Return 5 Years



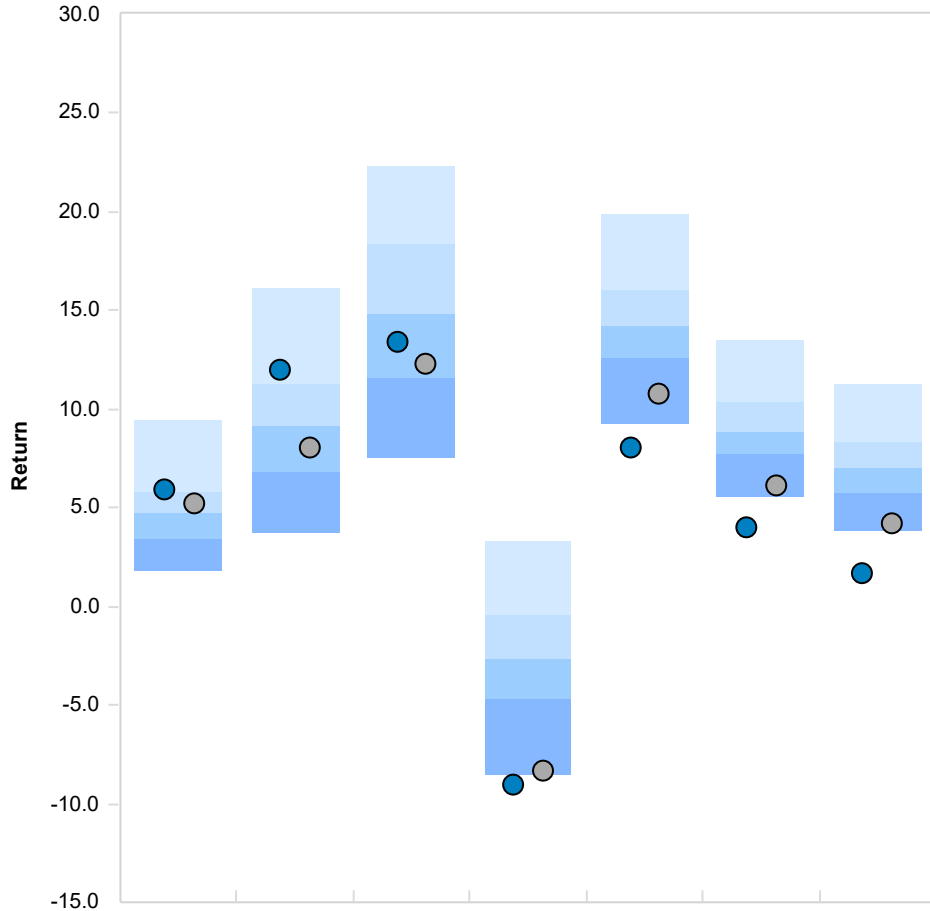
3 Year Rolling Percentile Rank IM U.S. Small Cap Core Equity (SA+CF)



5 Year Rolling Percentile Rank IM U.S. Small Cap Core Equity (SA+CF)

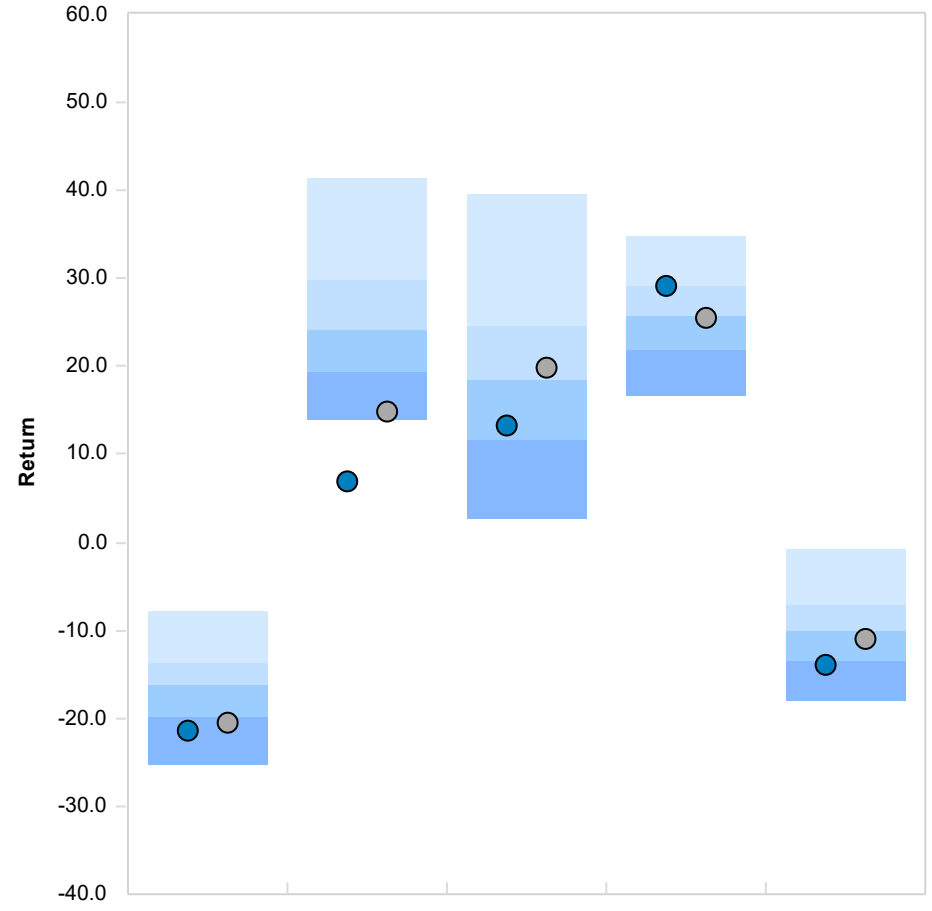


Peer Group Analysis - IM U.S. Small Cap Core Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	5.89 (24)	12.02 (19)	13.38 (59)	-9.03 (96)	8.05 (98)	3.96 (98)	1.69 (99)
● Index	5.21 (39)	8.09 (60)	12.31 (68)	-8.34 (95)	10.82 (92)	6.18 (94)	4.21 (95)
Median	4.77	9.16	14.81	-2.68	14.21	8.85	7.06

Peer Group Analysis - IM U.S. Small Cap Core Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-21.44 (82)	6.97 (99)	13.19 (69)	29.19 (26)	-13.87 (78)
● Index	-20.44 (81)	14.82 (93)	19.96 (40)	25.53 (51)	-11.01 (59)
Median	-16.17	24.14	18.54	25.82	-10.13

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	5.79 (25)	6.32 (87)	-4.80 (81)	-16.63 (68)	-6.89 (52)	1.79 (92)
Index	2.74 (71)	6.23 (88)	-2.19 (31)	-17.20 (80)	-7.53 (66)	2.14 (91)
Median	3.69	9.00	-3.33	-15.38	-6.81	5.96



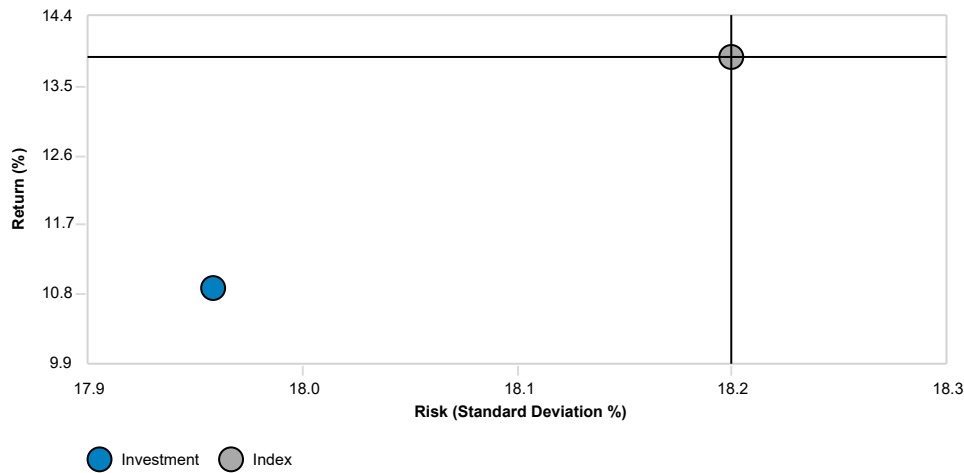
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	10.87	17.96	0.60	83.58	9	85.31	3
Index	13.89	18.20	0.74	100.00	8	100.00	4

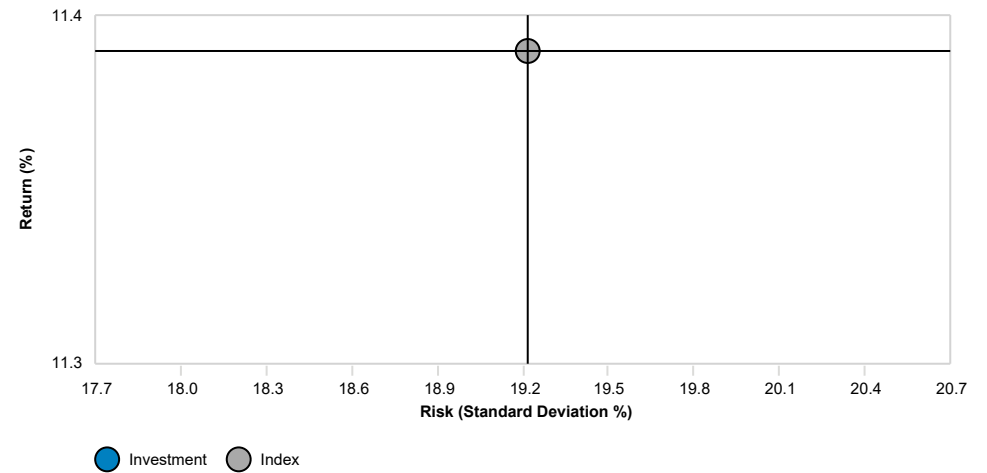
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Index	11.39	19.22	0.58	100.00	14	100.00	6

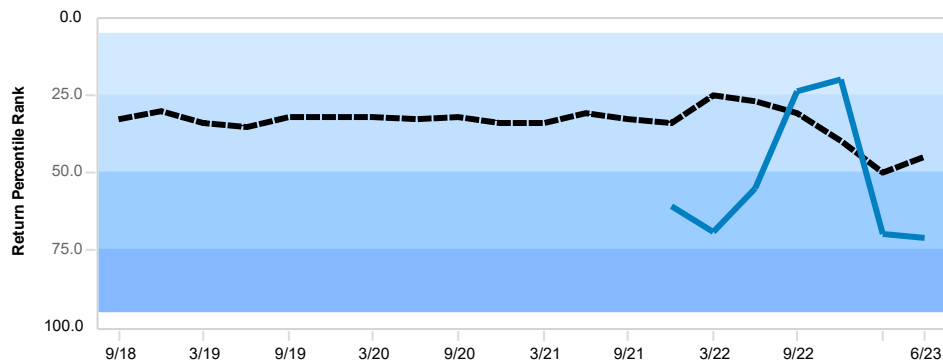
Risk and Return 3 Years



Risk and Return 5 Years

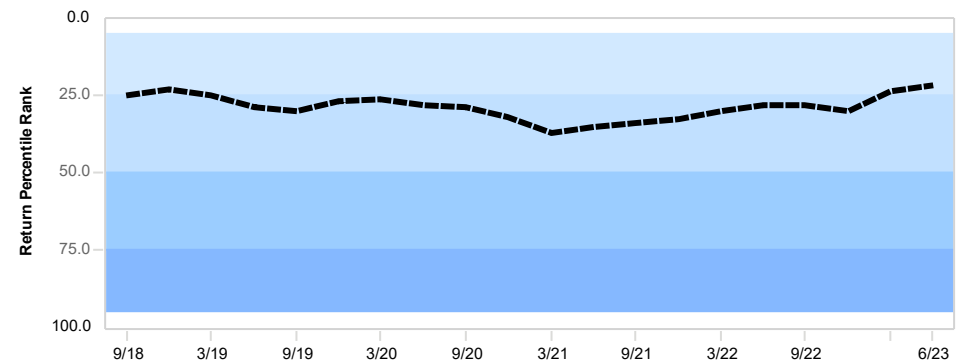


3 Year Rolling Percentile Rank IM U.S. Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	7	2 (29%)	0 (0%)	5 (71%)	0 (0%)
Index	20	1 (5%)	19 (95%)	0 (0%)	0 (0%)

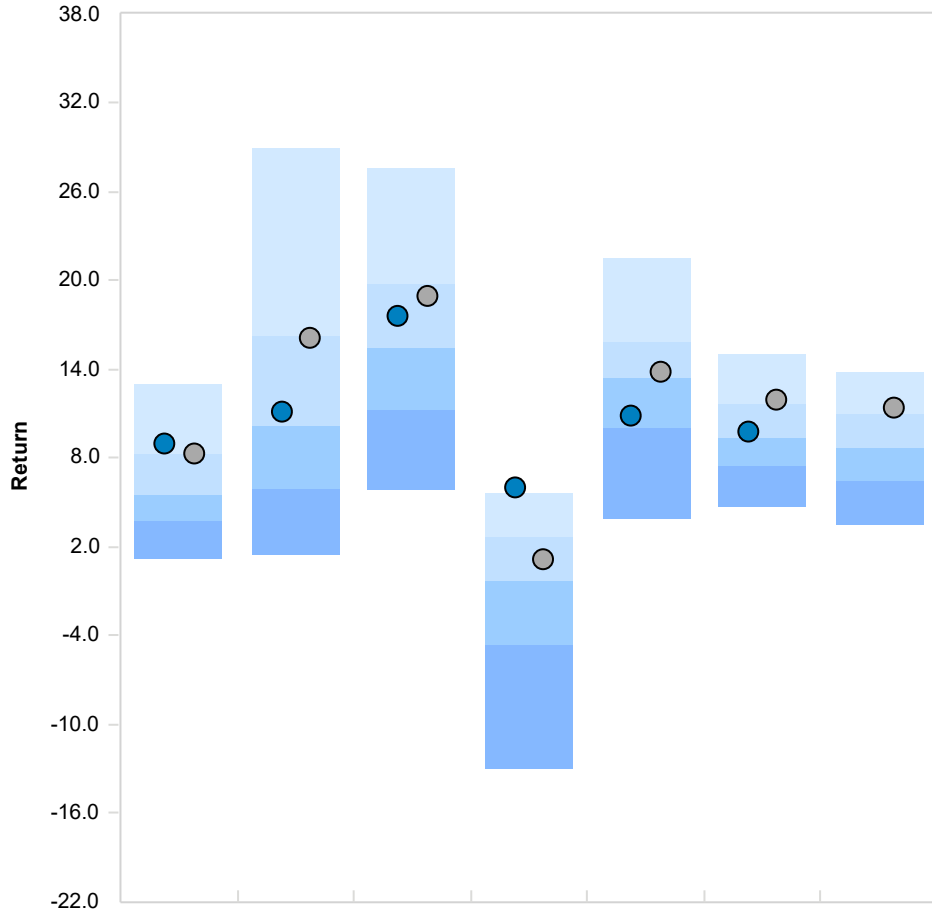
5 Year Rolling Percentile Rank IM U.S. Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	0	0	0	0	0
Index	20	5 (25%)	15 (75%)	0 (0%)	0 (0%)

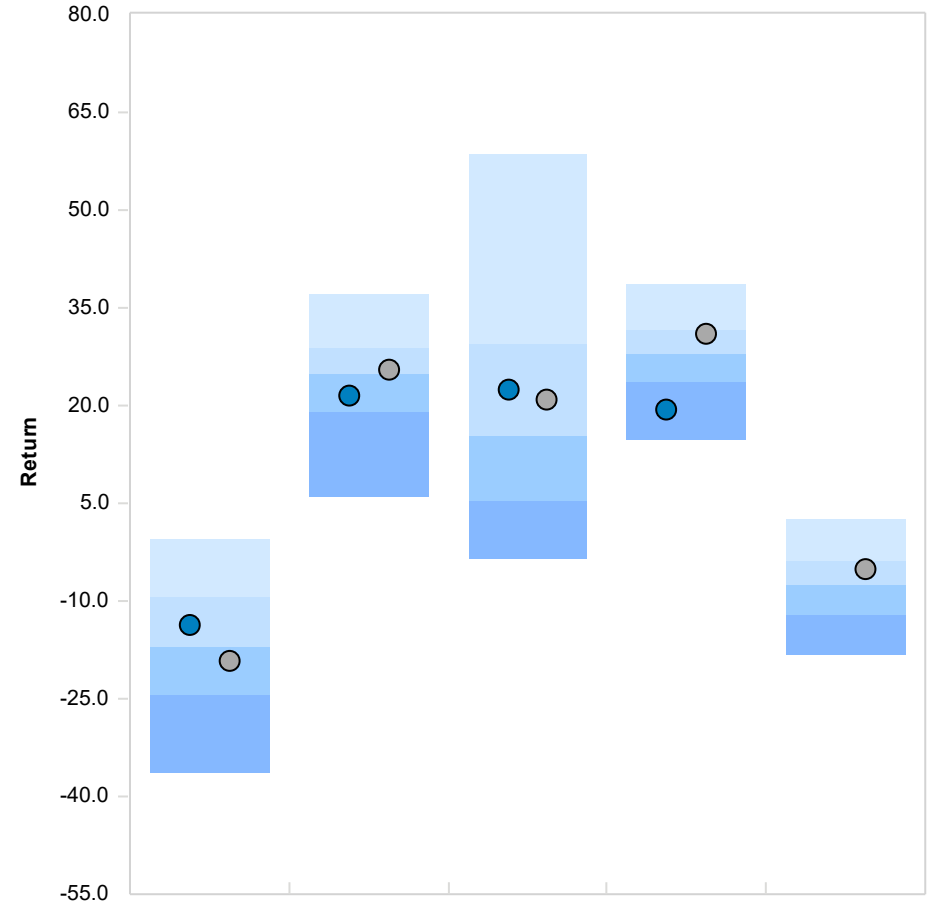


Peer Group Analysis - IM U.S. Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	9.04 (19)	11.12 (48)	17.71 (40)	6.00 (5)	10.87 (71)	9.86 (45)	N/A
● Index	8.39 (25)	16.17 (27)	18.95 (32)	1.22 (39)	13.89 (45)	12.00 (22)	11.39 (22)
Median	5.53	10.18	15.44	-0.27	13.43	9.40	8.72

Peer Group Analysis - IM U.S. Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-13.59 (39)	21.59 (68)	22.31 (35)	19.24 (90)	N/A
● Index	-19.21 (62)	25.66 (46)	20.89 (37)	31.02 (31)	-5.24 (35)
Median	-17.02	24.98	15.44	28.06	-7.65

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	1.90 (74)	7.60 (59)	-1.55 (16)	-13.46 (35)	-5.74 (53)	15.43 (1)
Index	7.18 (32)	7.18 (65)	-4.46 (52)	-16.70 (65)	-5.28 (49)	9.28 (27)
Median	4.81	8.48	-4.40	-15.31	-5.43	7.31



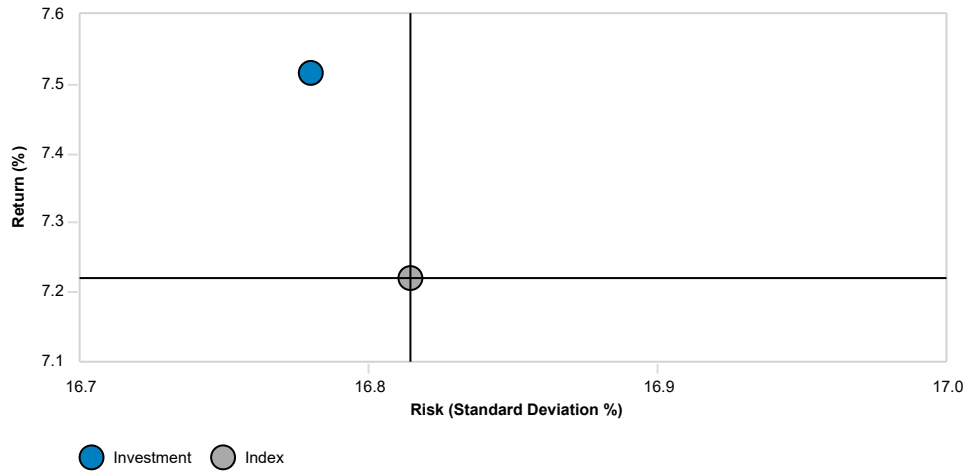
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	7.52	16.78	0.44	100.65	8	99.50	4
Index	7.22	16.81	0.42	100.00	8	100.00	4

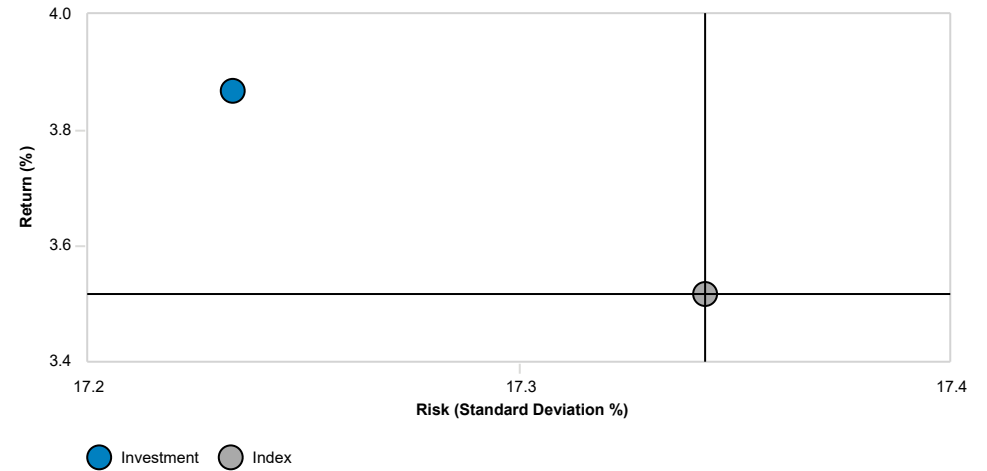
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.87	17.23	0.22	100.08	13	98.57	7
Index	3.52	17.34	0.20	100.00	13	100.00	7

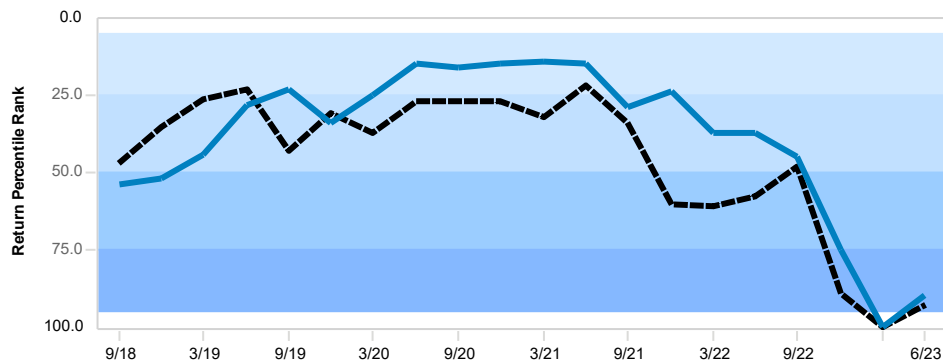
Risk and Return 3 Years



Risk and Return 5 Years

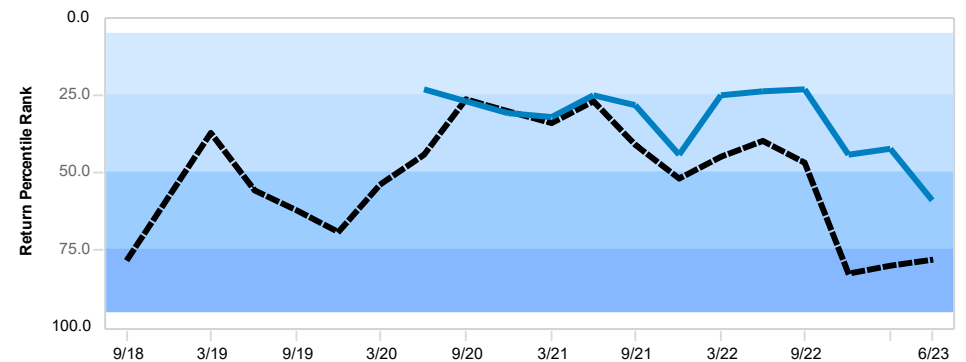


3 Year Rolling Percentile Rank IM Enhanced and Indexed International Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	8 (40%)	7 (35%)	3 (15%)	2 (10%)
Index	20	2 (10%)	12 (60%)	3 (15%)	3 (15%)

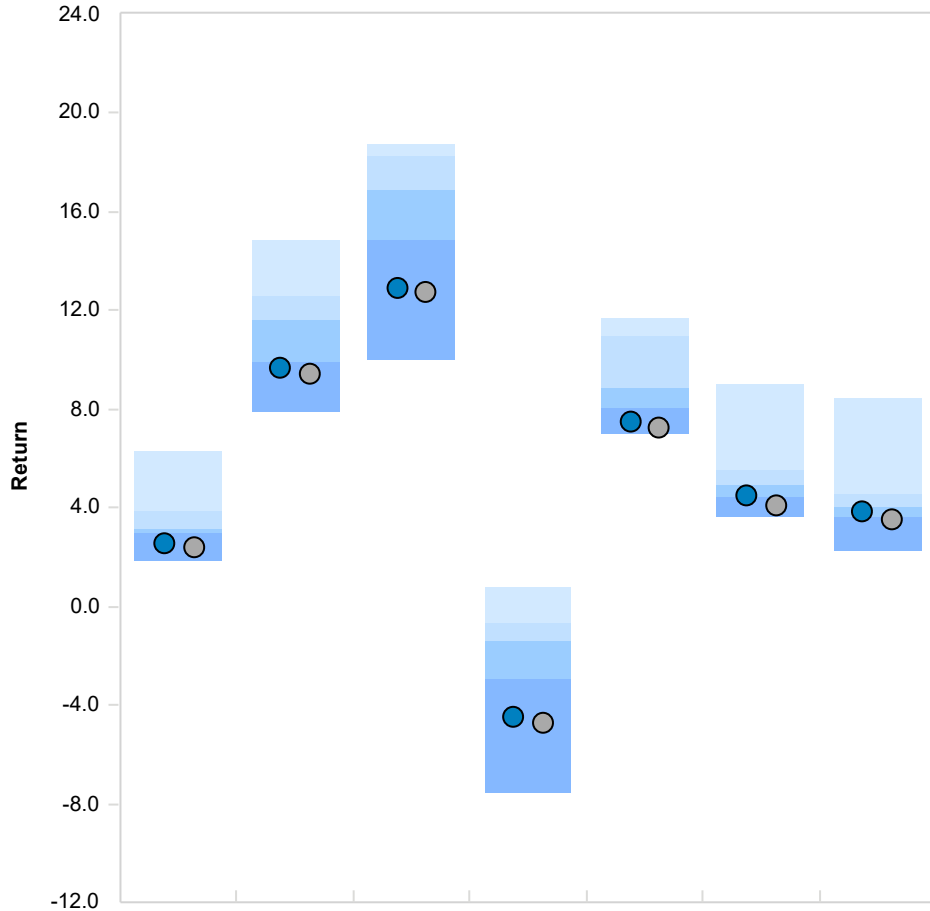
5 Year Rolling Percentile Rank IM Enhanced and Indexed International Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	5 (38%)	7 (54%)	1 (8%)	0 (0%)
Index	20	0 (0%)	10 (50%)	6 (30%)	4 (20%)

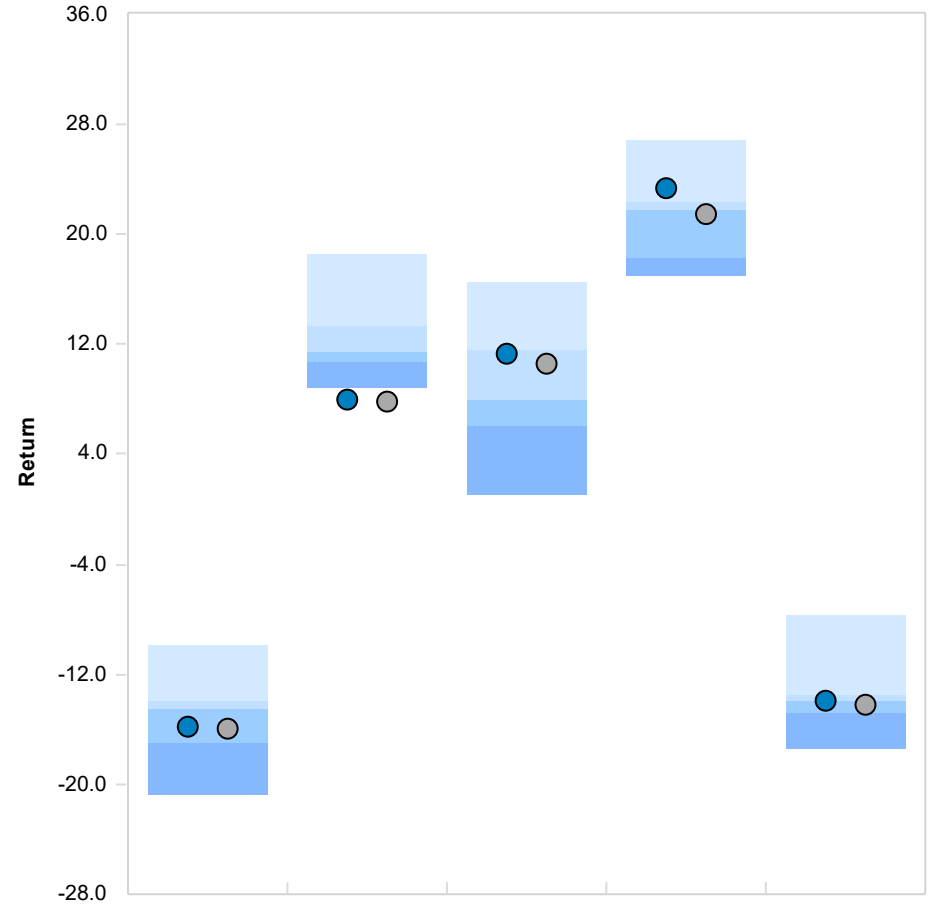


Peer Group Analysis - IM Enhanced and Indexed International Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	2.55 (85)	9.69 (84)	12.88 (82)	-4.50 (84)	7.52 (90)	4.47 (71)	3.87 (59)
● Index	2.44 (91)	9.47 (91)	12.72 (84)	-4.70 (86)	7.22 (93)	4.08 (85)	3.52 (78)
Median	3.12	11.63	16.87	-1.44	8.87	4.89	4.06

Peer Group Analysis - IM Enhanced and Indexed International Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-15.81 (66)	7.96 (100)	11.27 (29)	23.42 (19)	-13.88 (50)
● Index	-16.00 (66)	7.82 (100)	10.65 (33)	21.51 (55)	-14.20 (63)
Median	-14.52	11.50	7.92	21.72	-13.90

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	6.96 (69)	14.24 (78)	-9.92 (42)	-13.52 (49)	-5.40 (39)	1.84 (85)
Index	6.87 (71)	14.28 (78)	-9.91 (41)	-13.73 (54)	-5.44 (39)	1.82 (85)
Median	7.91	16.32	-10.16	-13.54	-5.86	3.02



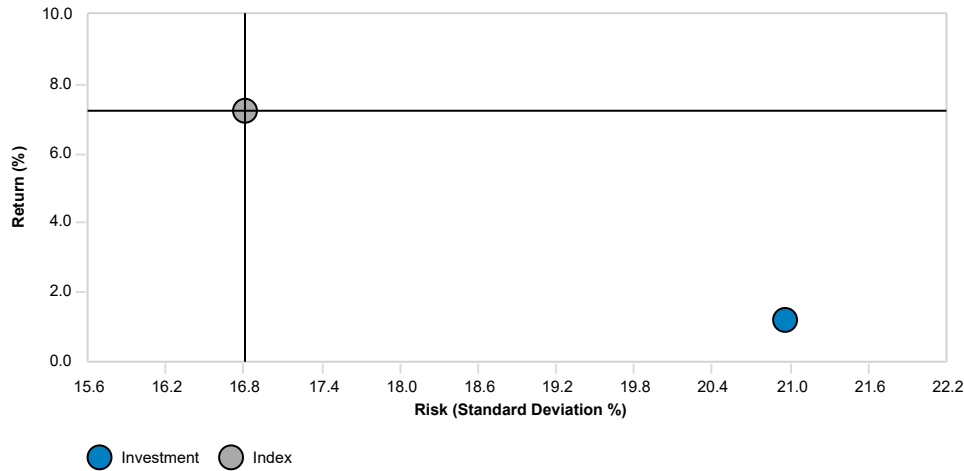
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.21	20.95	0.10	105.74	7	135.08	5
Index	7.22	16.81	0.42	100.00	8	100.00	4

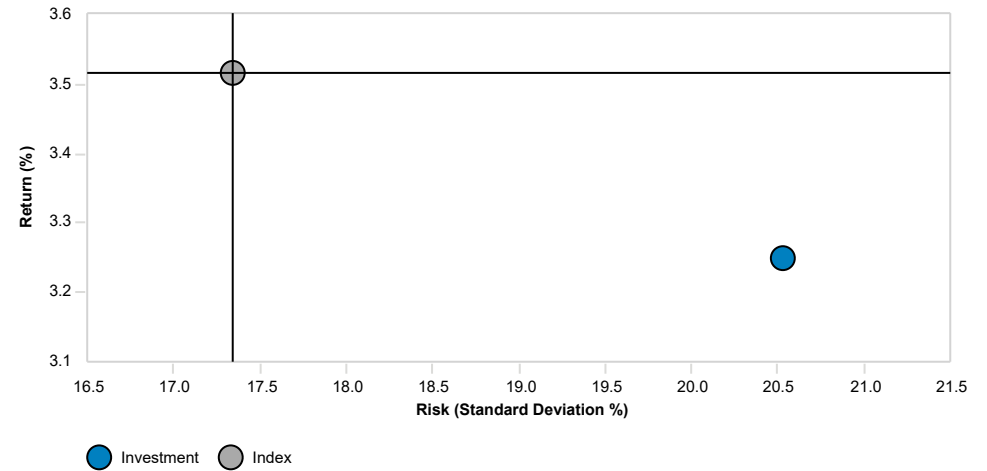
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.25	20.53	0.18	114.50	12	116.34	8
Index	3.52	17.34	0.20	100.00	13	100.00	7

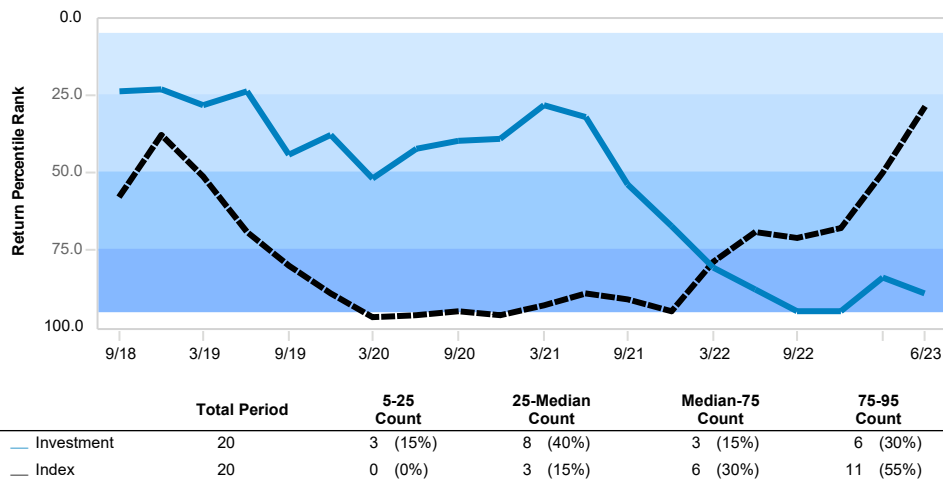
Risk and Return 3 Years



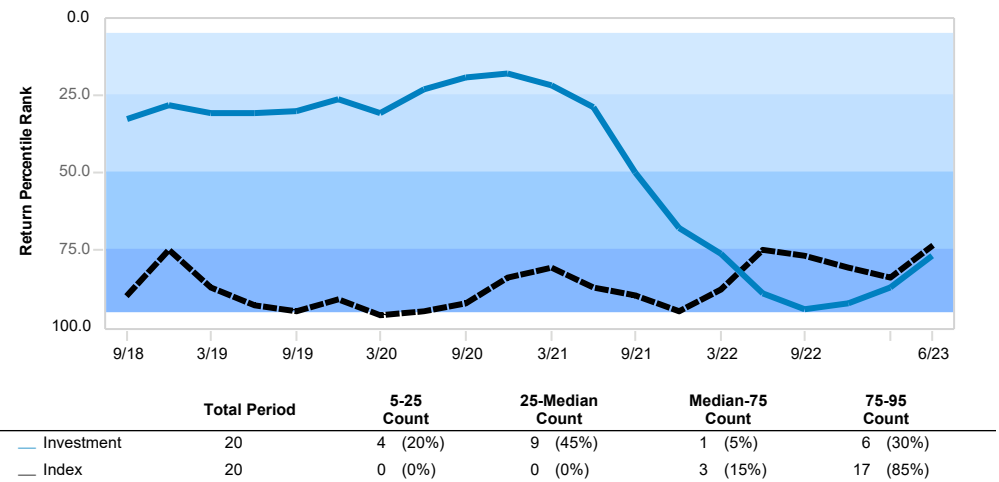
Risk and Return 5 Years



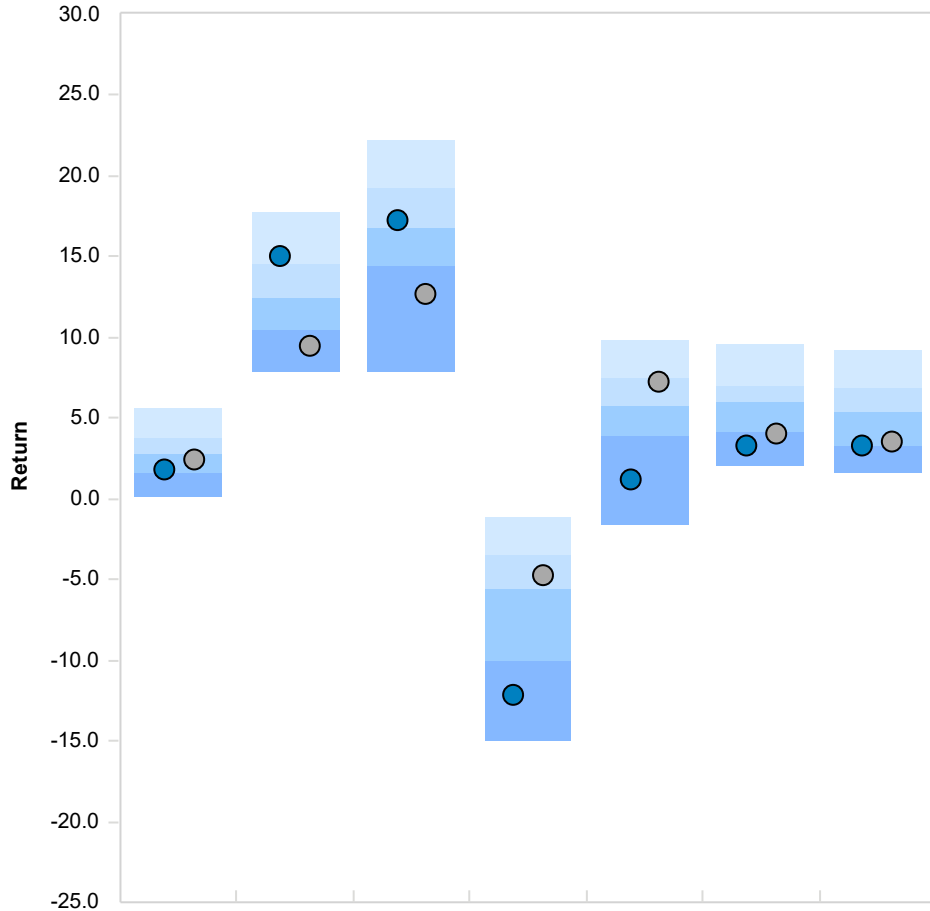
3 Year Rolling Percentile Rank IM International Large Cap Growth Equity (SA+CF)



5 Year Rolling Percentile Rank IM International Large Cap Growth Equity (SA+CF)

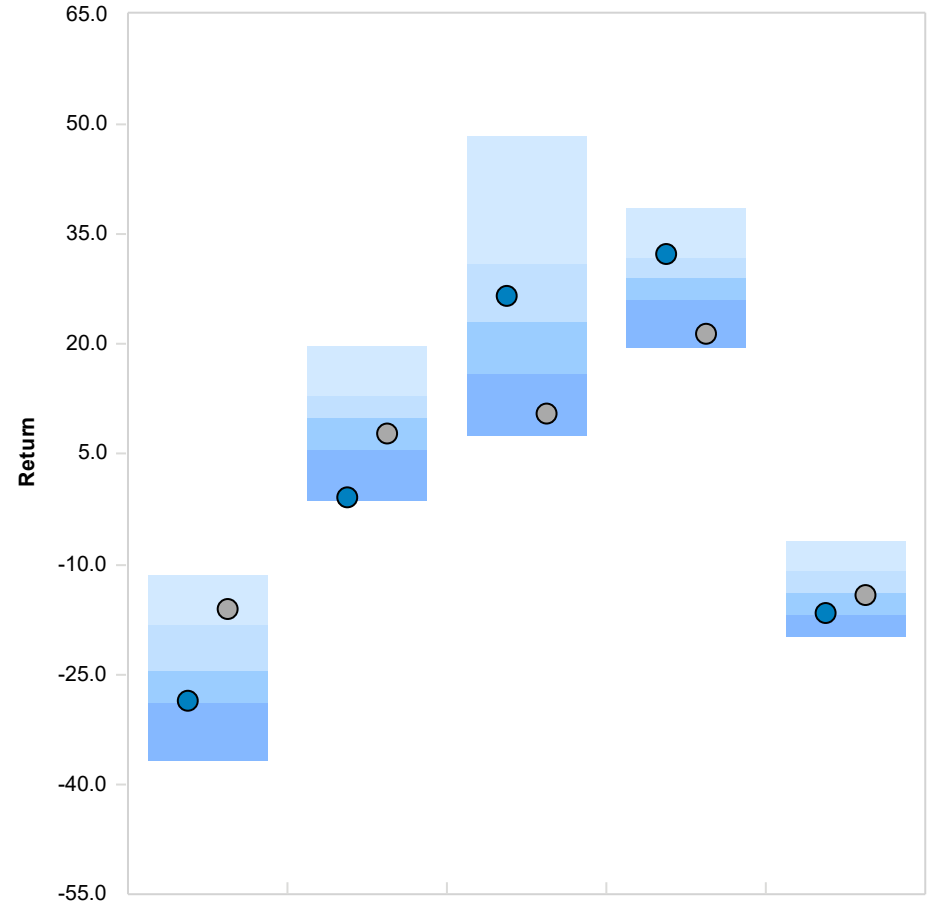


Peer Group Analysis - IM International Large Cap Growth Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	1.77 (72)	15.05 (20)	17.23 (45)	-12.15 (85)	1.21 (89)	3.24 (87)	3.25 (77)
● Index	2.44 (60)	9.47 (86)	12.72 (85)	-4.70 (40)	7.22 (29)	4.08 (77)	3.52 (74)
Median	2.81	12.44	16.83	-5.61	5.78	6.06	5.36

Peer Group Analysis - IM International Large Cap Growth Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-28.64 (72)	-0.72 (95)	26.60 (41)	32.23 (22)	-16.57 (69)
● Index	-16.00 (15)	7.82 (65)	10.65 (90)	21.51 (93)	-14.20 (54)
Median	-24.48	10.00	23.02	29.06	-13.86

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	13.05 (9)	15.28 (24)	-11.61 (94)	-17.09 (57)	-15.53 (79)	-0.60 (84)
Index	6.87 (92)	14.28 (42)	-9.91 (74)	-13.73 (21)	-5.44 (8)	1.82 (66)
Median	9.47	13.81	-8.83	-16.76	-12.39	2.53



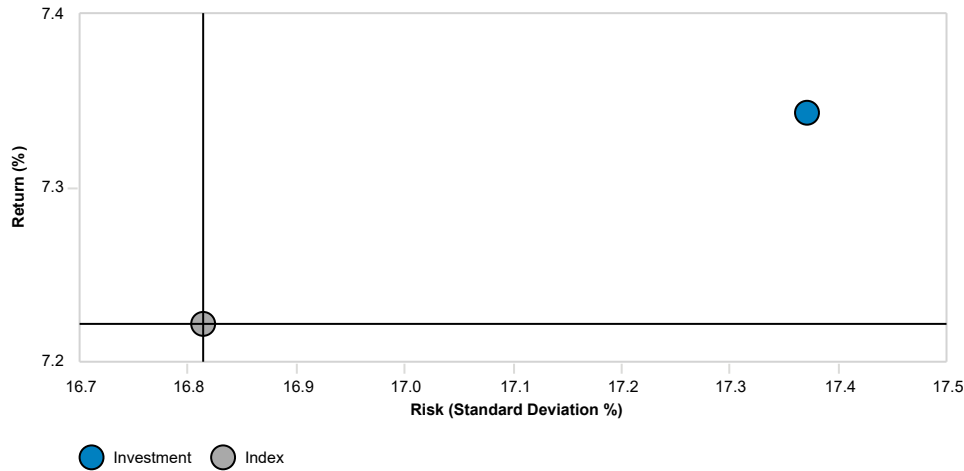
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	7.34	17.37	0.42	103.84	8	104.47	4
Index	7.22	16.81	0.42	100.00	8	100.00	4

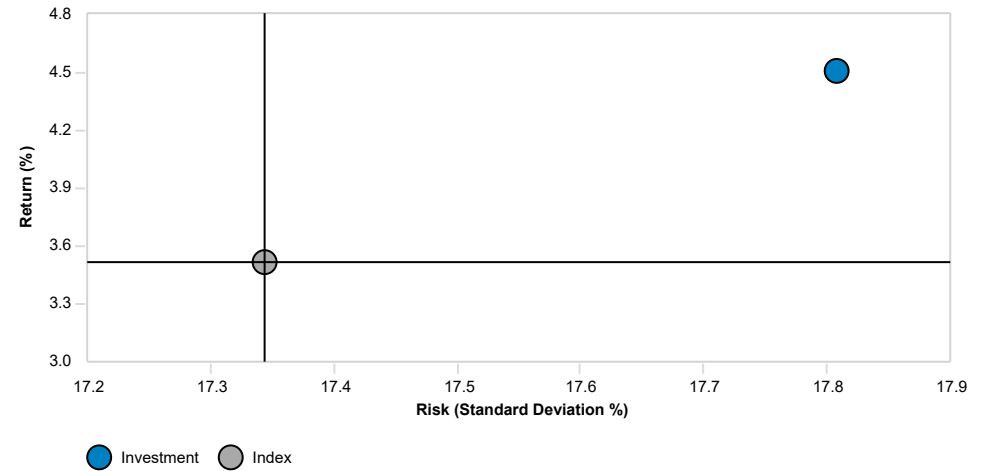
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	4.51	17.81	0.25	104.85	13	101.10	7
Index	3.52	17.34	0.20	100.00	13	100.00	7

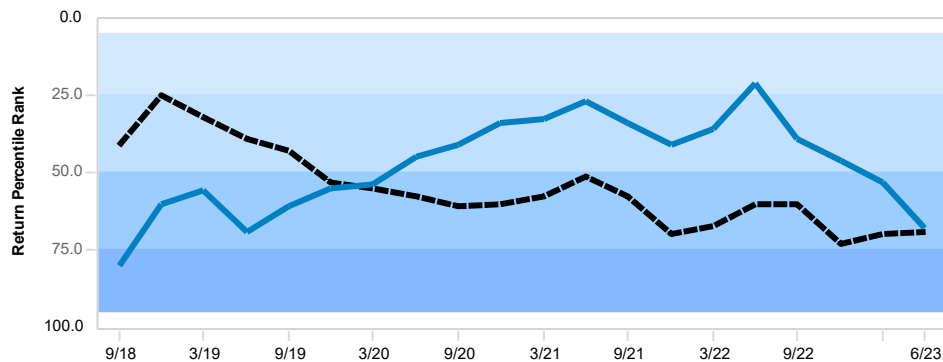
Risk and Return 3 Years



Risk and Return 5 Years

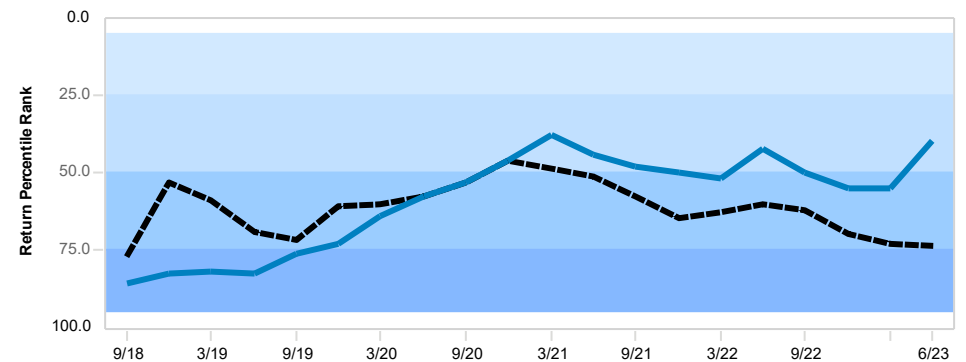


3 Year Rolling Percentile Rank IM International Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	1 (5%)	10 (50%)	8 (40%)	1 (5%)
Index	20	1 (5%)	4 (20%)	15 (75%)	0 (0%)

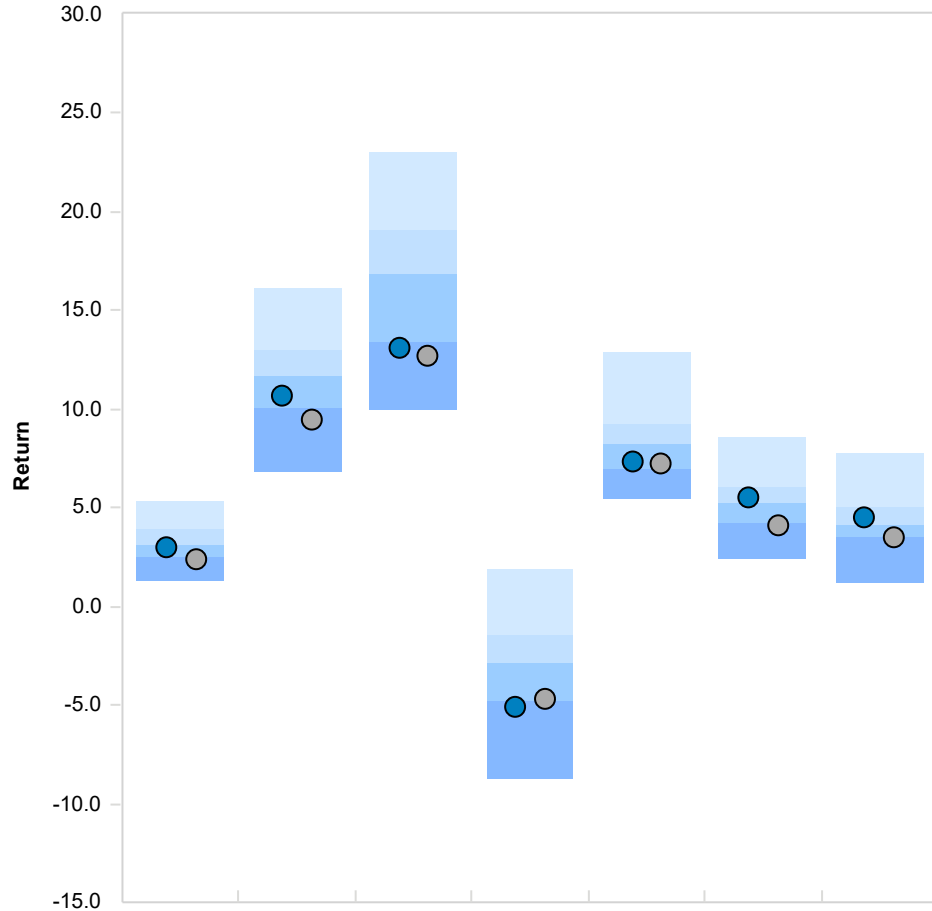
5 Year Rolling Percentile Rank IM International Large Cap Core Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	8 (40%)	7 (35%)	5 (25%)
Index	20	0 (0%)	2 (10%)	17 (85%)	1 (5%)

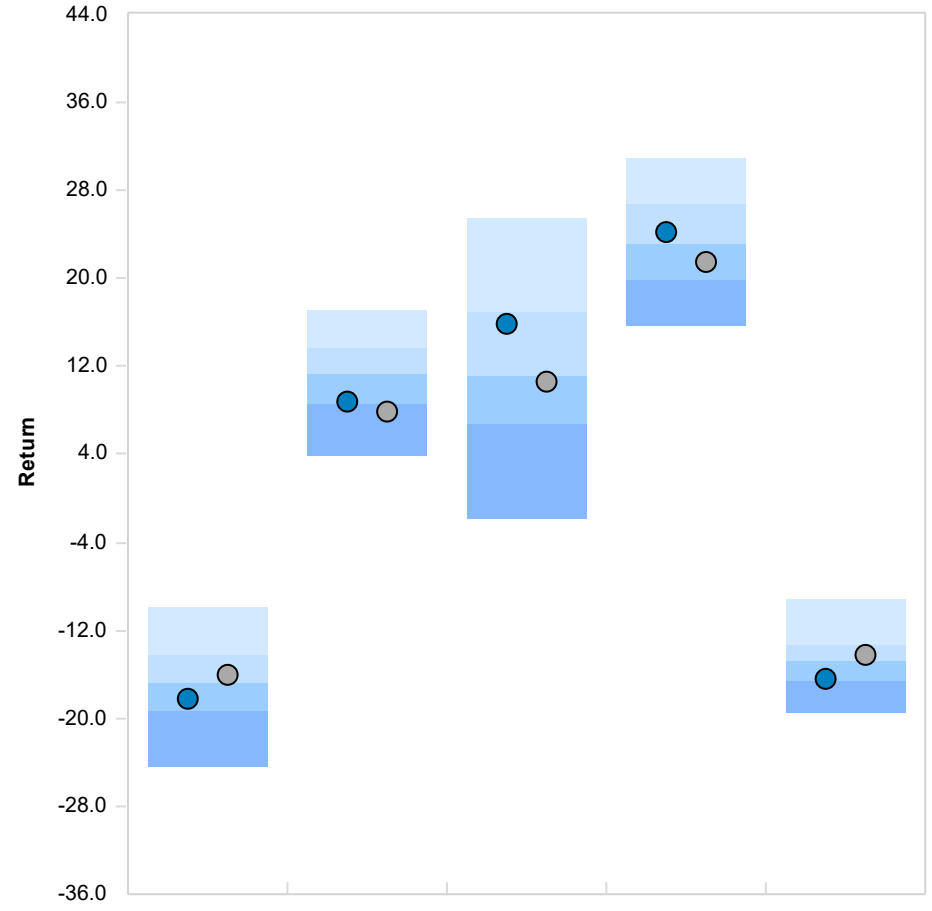


Peer Group Analysis - IM International Large Cap Core Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	3.01 (58)	10.72 (66)	13.08 (78)	-5.08 (82)	7.34 (68)	5.54 (40)	4.51 (40)
● Index	2.44 (78)	9.47 (81)	12.72 (82)	-4.70 (75)	7.22 (69)	4.08 (78)	3.52 (74)
Median	3.14	11.65	16.82	-2.86	8.23	5.24	4.16

Peer Group Analysis - IM International Large Cap Core Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-18.13 (67)	8.78 (73)	15.83 (30)	24.24 (39)	-16.33 (71)
● Index	-16.00 (44)	7.82 (80)	10.65 (55)	21.51 (63)	-14.20 (44)
Median	-16.69	11.35	11.10	23.08	-14.85

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	7.48 (67)	14.00 (79)	-10.41 (80)	-13.35 (35)	-7.49 (58)	2.23 (66)
Index	6.87 (76)	14.28 (75)	-9.91 (63)	-13.73 (39)	-5.44 (29)	1.82 (75)
Median	8.09	15.39	-9.42	-14.50	-6.65	2.95



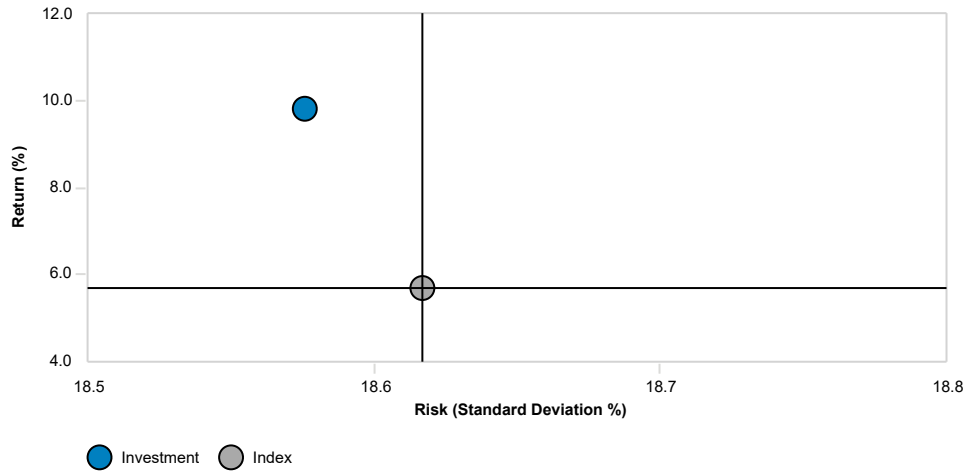
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	9.85	18.58	0.53	105.41	8	89.38	4
Index	5.70	18.62	0.32	100.00	9	100.00	3

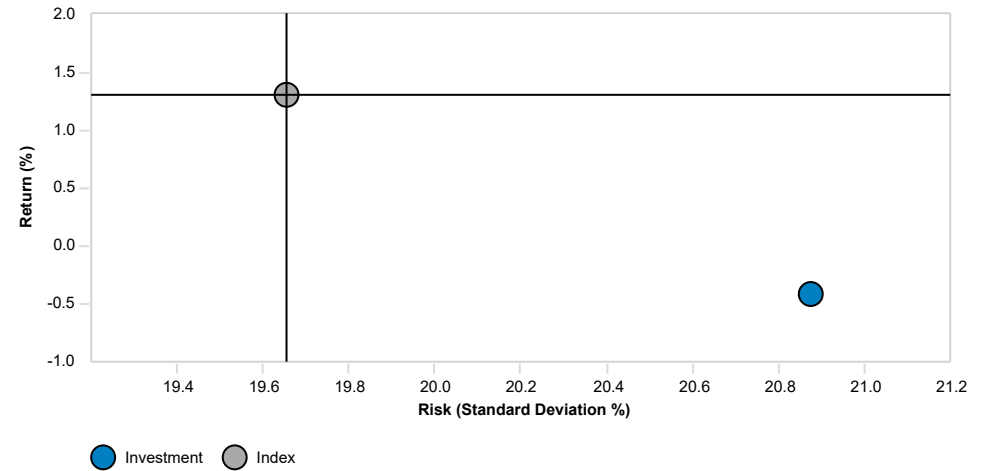
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-0.41	20.88	0.01	99.64	11	105.40	9
Index	1.30	19.66	0.09	100.00	13	100.00	7

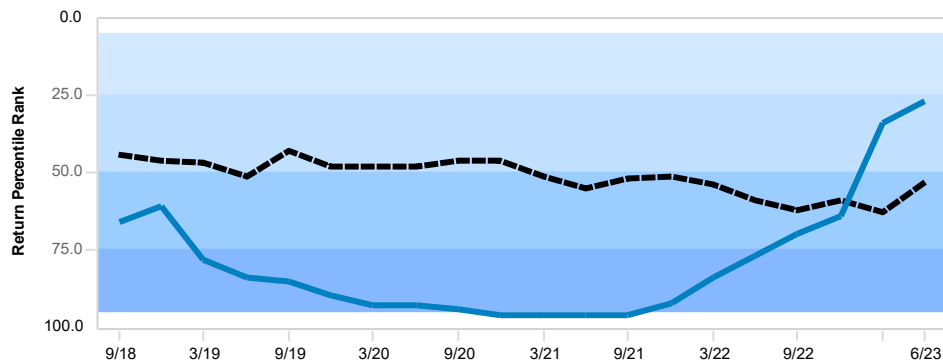
Risk and Return 3 Years



Risk and Return 5 Years

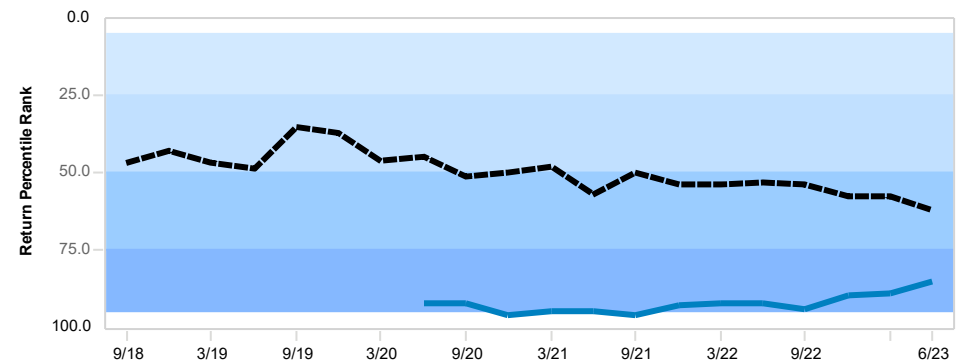


3 Year Rolling Percentile Rank IM International Small Cap Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	2 (10%)	4 (20%)	14 (70%)
Index	20	0 (0%)	9 (45%)	11 (55%)	0 (0%)

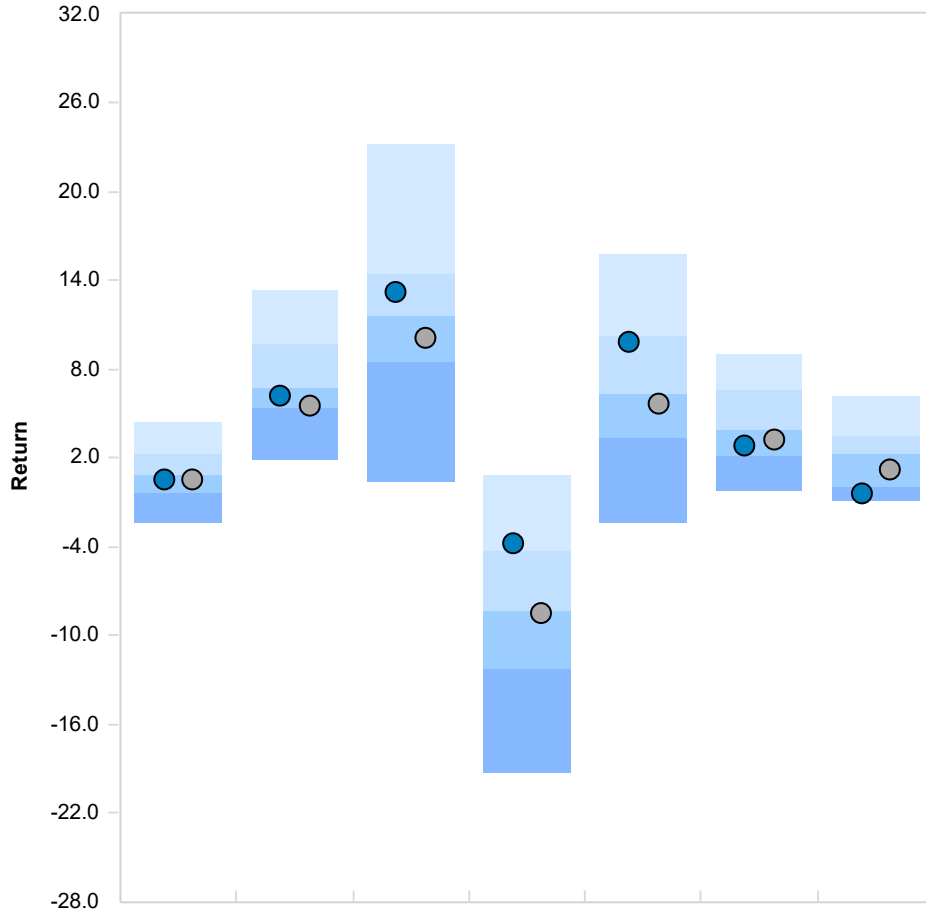
5 Year Rolling Percentile Rank IM International Small Cap Equity (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	0 (0%)	0 (0%)	0 (0%)	13 (100%)
Index	20	0 (0%)	11 (55%)	9 (45%)	0 (0%)

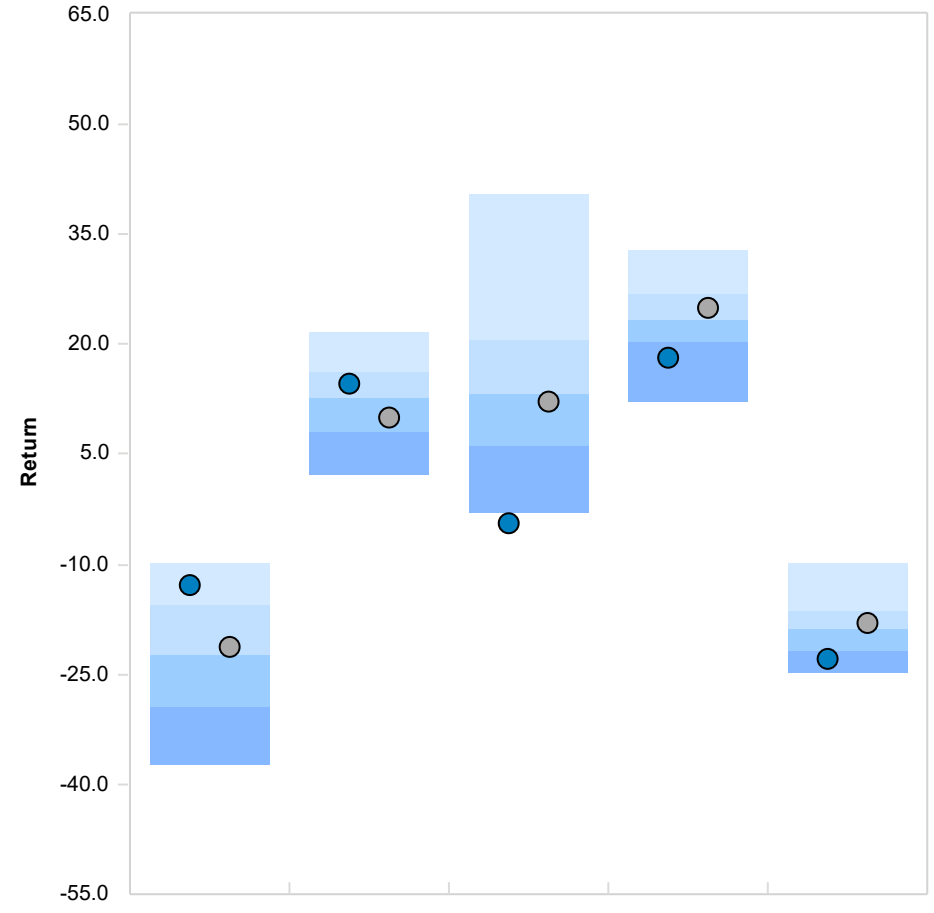


Peer Group Analysis - IM International Small Cap Equity (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	0.65 (57)	6.20 (61)	13.29 (33)	-3.77 (21)	9.85 (27)	2.93 (64)	-0.41 (85)
● Index	0.58 (58)	5.53 (74)	10.18 (60)	-8.48 (52)	5.70 (53)	3.31 (60)	1.30 (62)
Median	0.84	6.81	11.58	-8.27	6.39	3.97	2.27

Peer Group Analysis - IM International Small Cap Equity (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-12.84 (17)	14.56 (33)	-4.29 (96)	18.21 (81)	-22.85 (83)
● Index	-21.39 (47)	10.10 (67)	12.34 (52)	24.96 (34)	-17.89 (39)
Median	-22.23	12.87	13.23	23.30	-18.93

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	5.52 (64)	17.35 (32)	-9.09 (39)	-16.31 (44)	-2.37 (9)	0.97 (37)
Index	4.92 (73)	15.79 (48)	-9.83 (54)	-17.69 (69)	-8.53 (43)	0.07 (54)
Median	6.14	15.74	-9.63	-16.77	-10.42	0.43



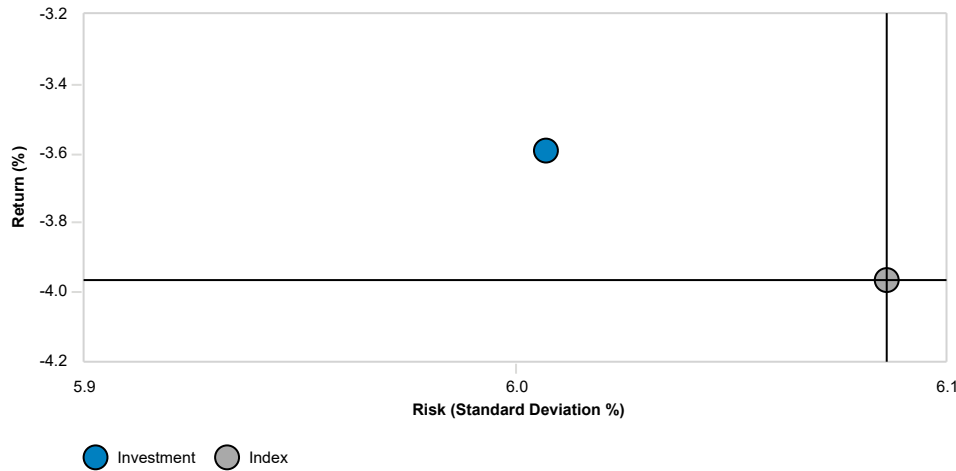
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-3.59	6.01	-0.80	97.11	5	94.40	7
Index	-3.97	6.09	-0.85	100.00	7	100.00	5

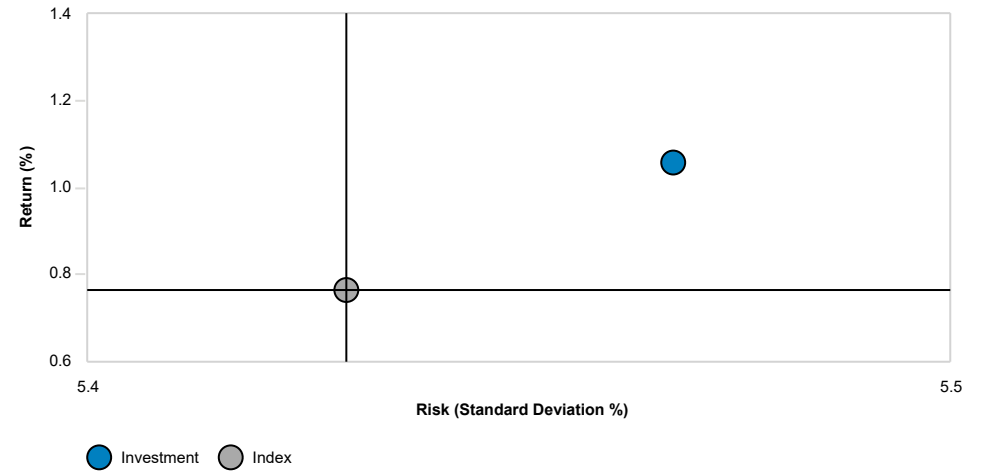
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.06	5.47	-0.06	101.86	13	97.66	7
Index	0.77	5.43	-0.12	100.00	15	100.00	5

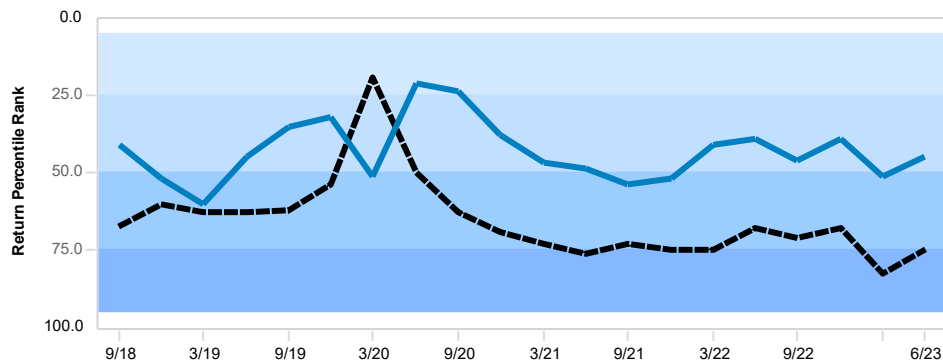
Risk and Return 3 Years



Risk and Return 5 Years

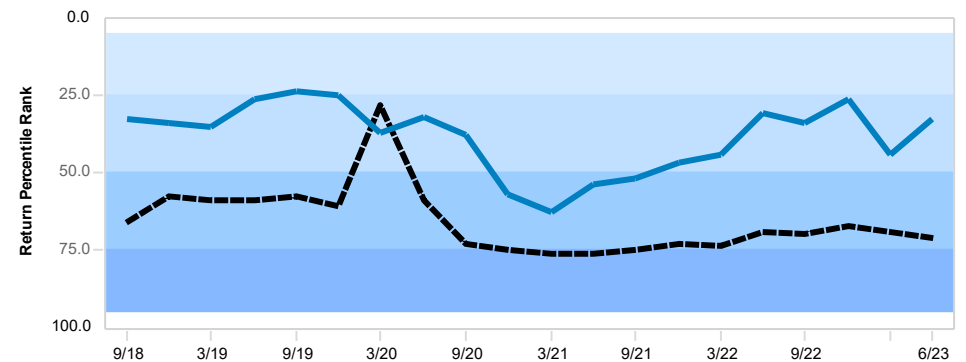


3 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	2 (10%)	12 (60%)	6 (30%)	0 (0%)
Index	20	1 (5%)	1 (5%)	16 (80%)	2 (10%)

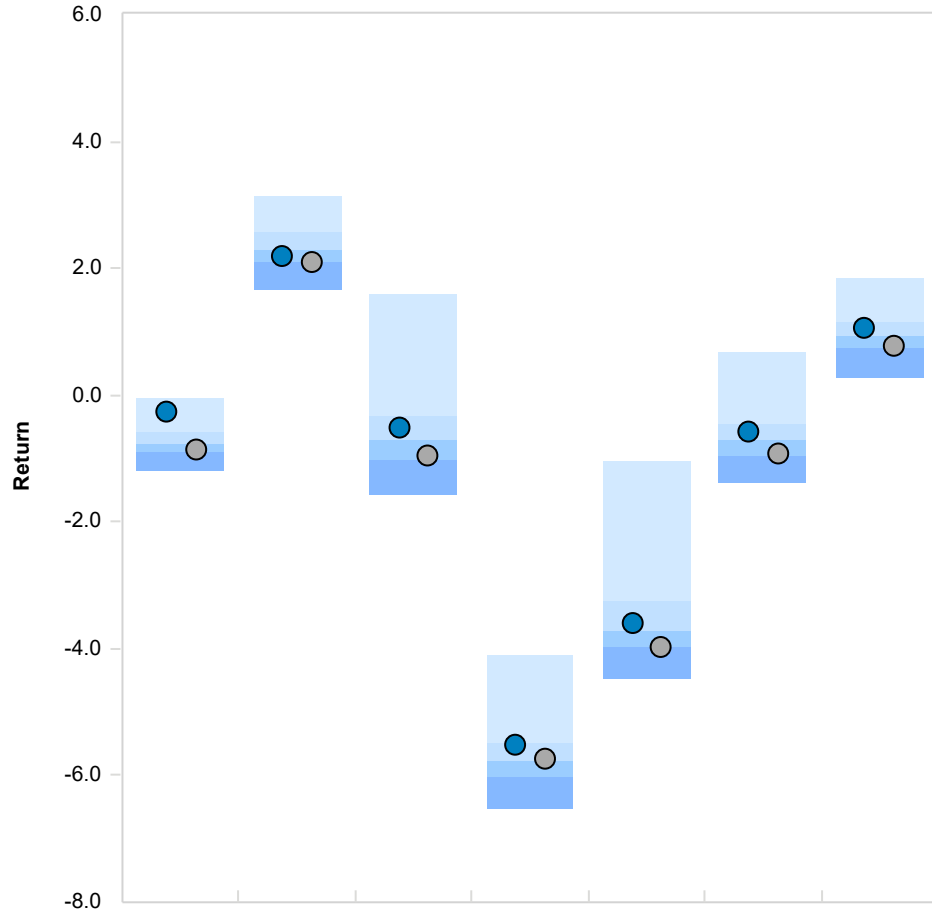
5 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



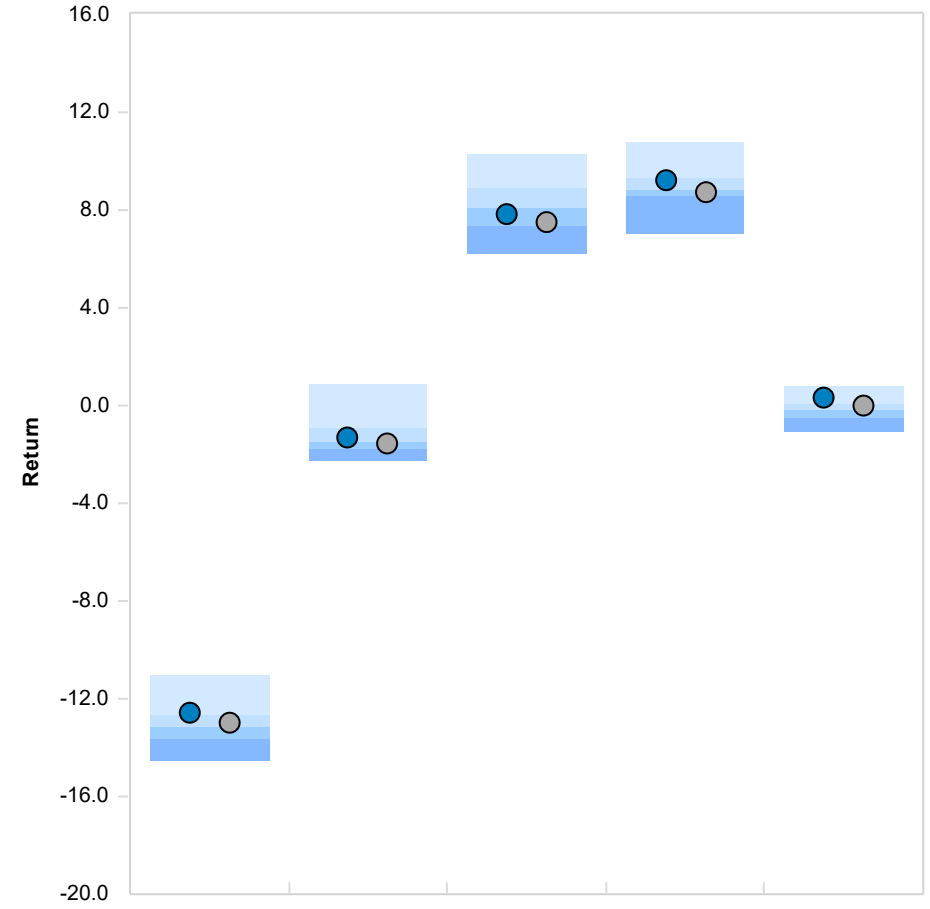
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	2 (10%)	14 (70%)	4 (20%)	0 (0%)
Index	20	0 (0%)	1 (5%)	17 (85%)	2 (10%)



Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.47 (96)	2.23 (8)	-4.78 (69)	-4.65 (23)	-5.83 (43)	-0.01 (23)
Index	2.96 (71)	1.87 (35)	-4.75 (64)	-4.69 (30)	-5.93 (60)	0.01 (17)
Median	3.12	1.74	-4.65	-4.90	-5.88	-0.10



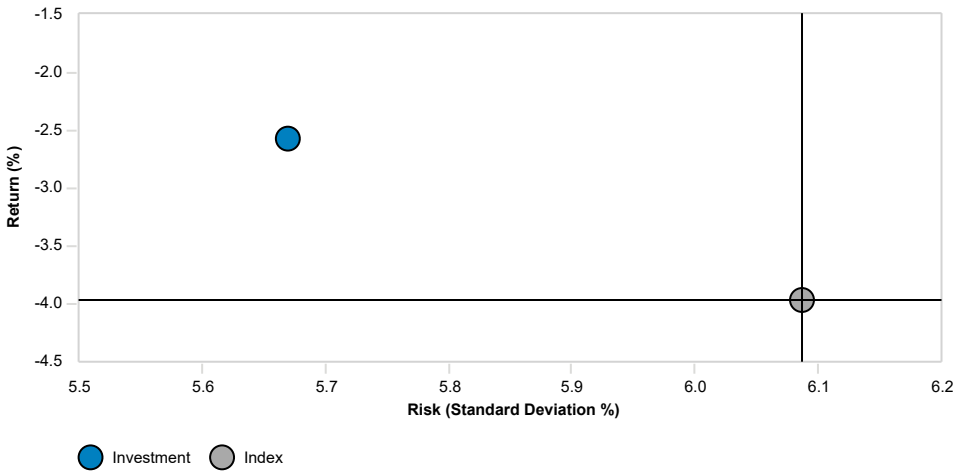
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-2.57	5.67	-0.66	98.84	7	85.31	5
Index	-3.97	6.09	-0.85	100.00	7	100.00	5

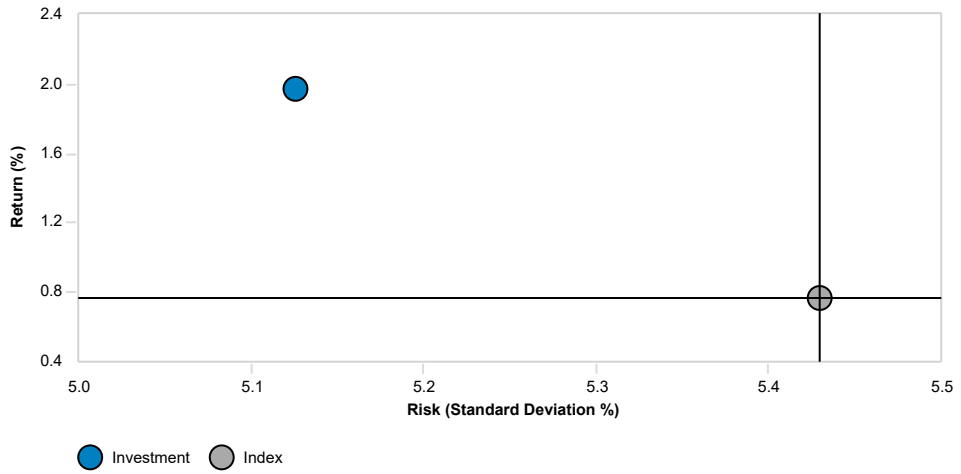
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.97	5.13	0.11	102.81	15	85.49	5
Index	0.77	5.43	-0.12	100.00	15	100.00	5

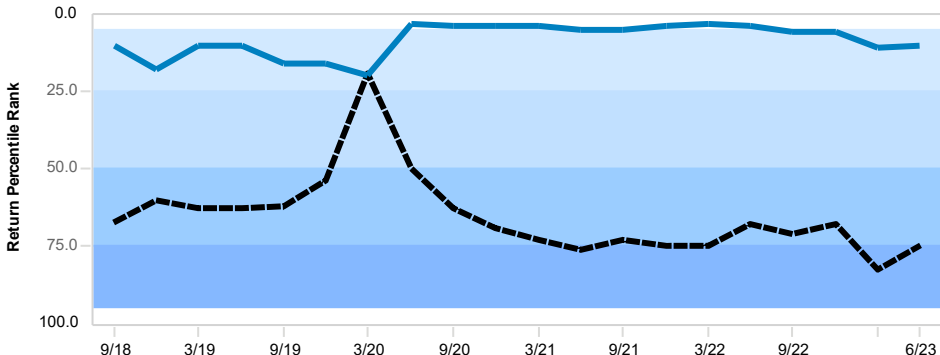
Risk and Return 3 Years



Risk and Return 5 Years

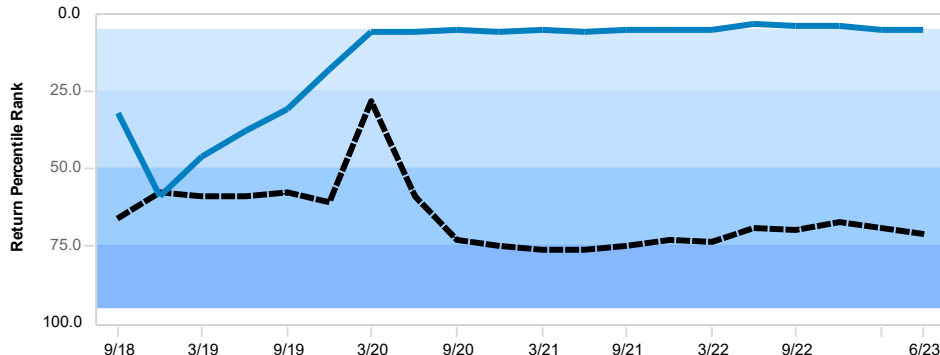


3 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	20 (100%)	0 (0%)	0 (0%)	0 (0%)
Index	20	1 (5%)	1 (5%)	16 (80%)	2 (10%)

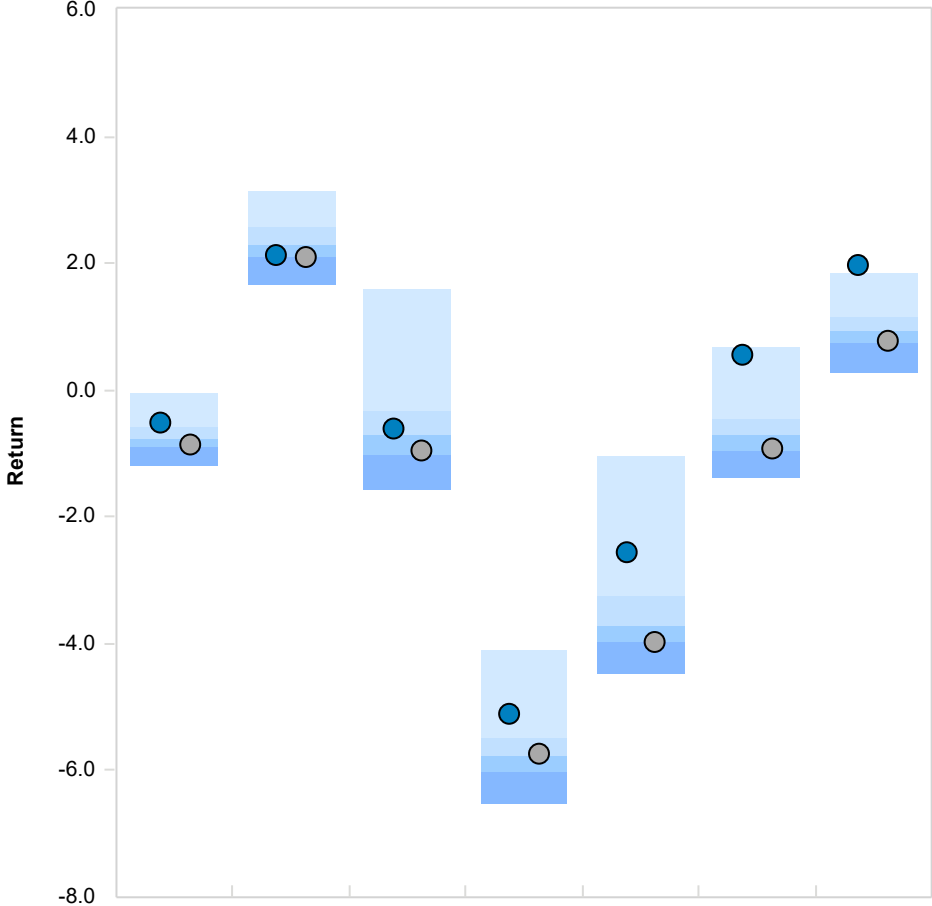
5 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	15 (75%)	4 (20%)	1 (5%)	0 (0%)
Index	20	0 (0%)	1 (5%)	17 (85%)	2 (10%)

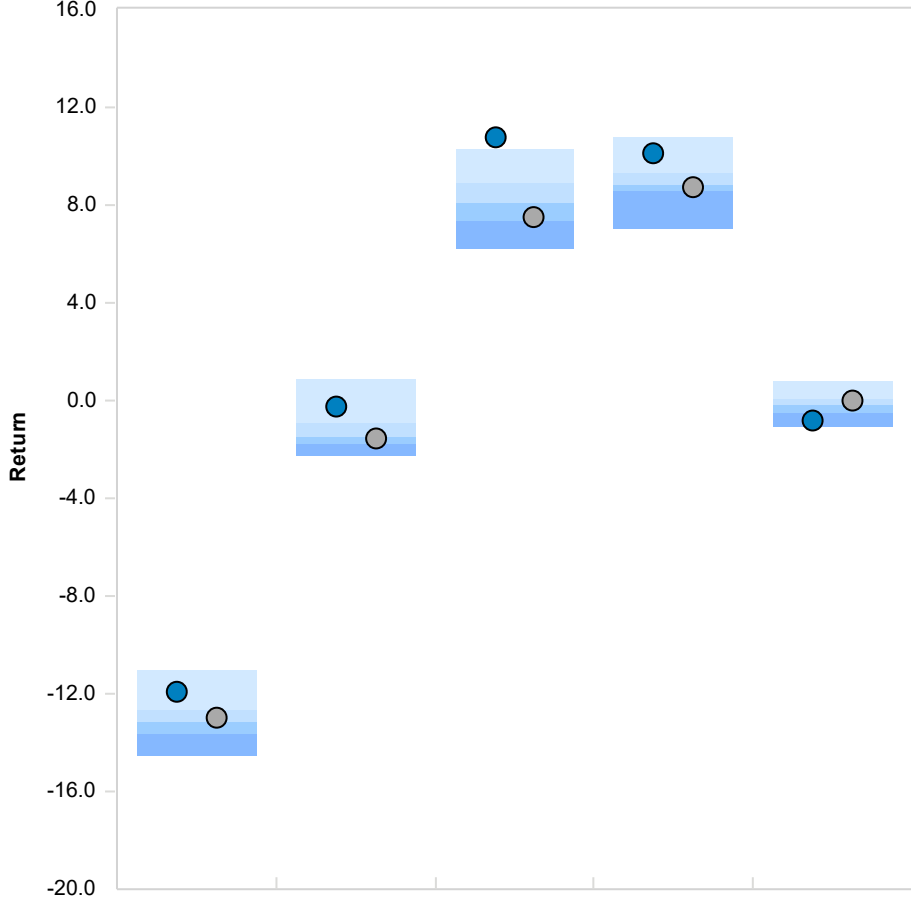


Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	-0.51 (15)	2.14 (73)	-0.60 (44)	-5.10 (13)	-2.57 (10)	0.55 (7)	1.97 (5)
● Index	-0.84 (66)	2.09 (78)	-0.94 (65)	-5.73 (45)	-3.97 (75)	-0.94 (73)	0.77 (71)
Median	-0.77	2.28	-0.70	-5.78	-3.71	-0.69	0.93

Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-11.92 (12)	-0.25 (9)	10.80 (3)	10.15 (8)	-0.81 (90)
● Index	-13.01 (35)	-1.55 (55)	7.51 (69)	8.72 (65)	0.01 (34)
Median	-13.14	-1.47	8.05	8.83	-0.13

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.66 (94)	1.80 (44)	-4.40 (22)	-4.36 (18)	-5.37 (16)	0.09 (9)
Index	2.96 (71)	1.87 (35)	-4.75 (64)	-4.69 (30)	-5.93 (60)	0.01 (17)
Median	3.12	1.74	-4.65	-4.90	-5.88	-0.10



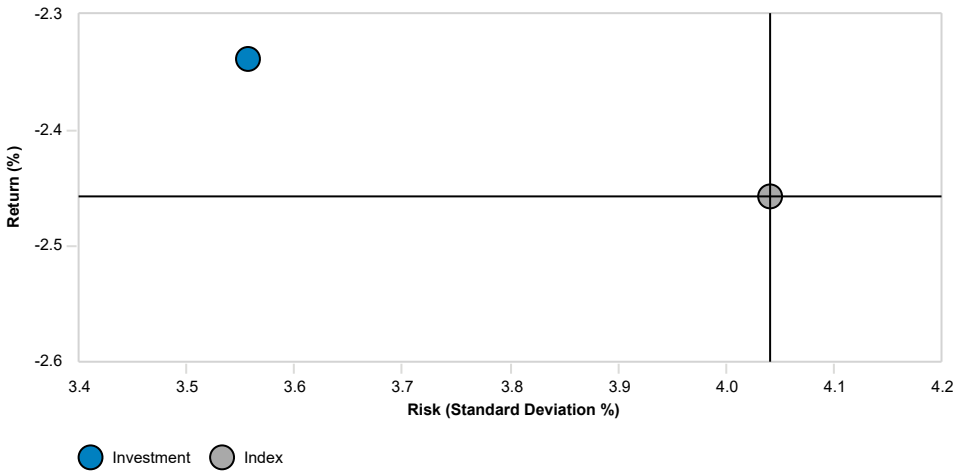
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-2.34	3.56	-1.02	85.76	5	89.38	7
Index	-2.46	4.04	-0.92	100.00	6	100.00	6

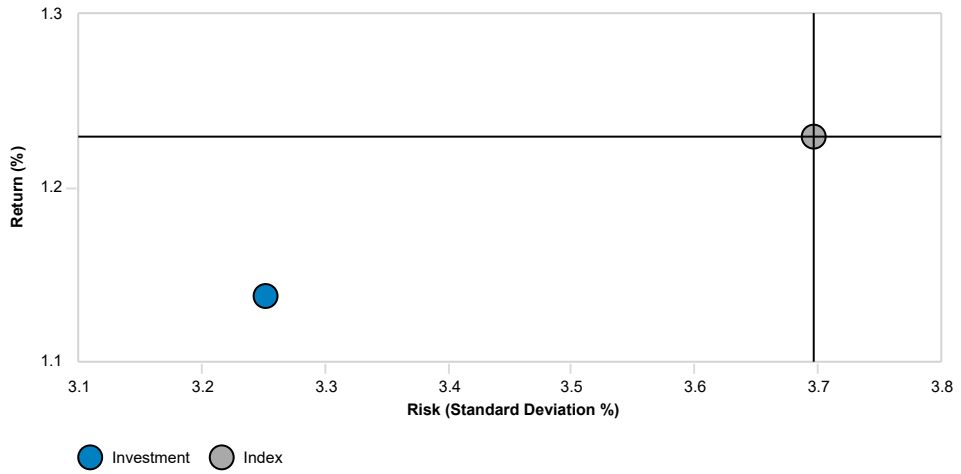
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.14	3.25	-0.11	86.24	13	84.58	7
Index	1.23	3.70	-0.07	100.00	14	100.00	6

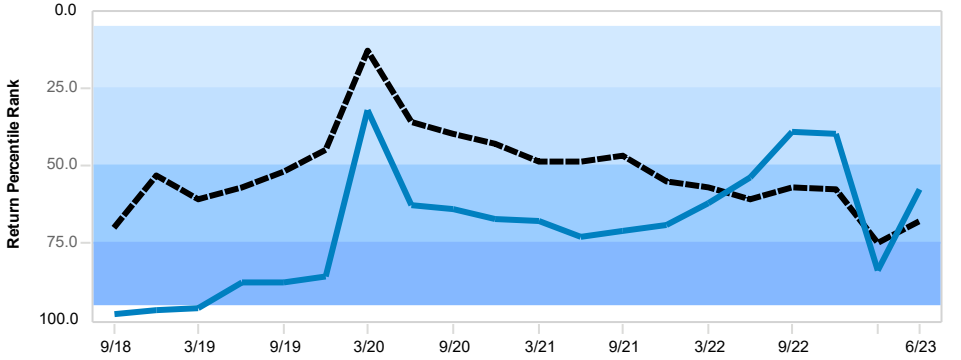
Risk and Return 3 Years



Risk and Return 5 Years

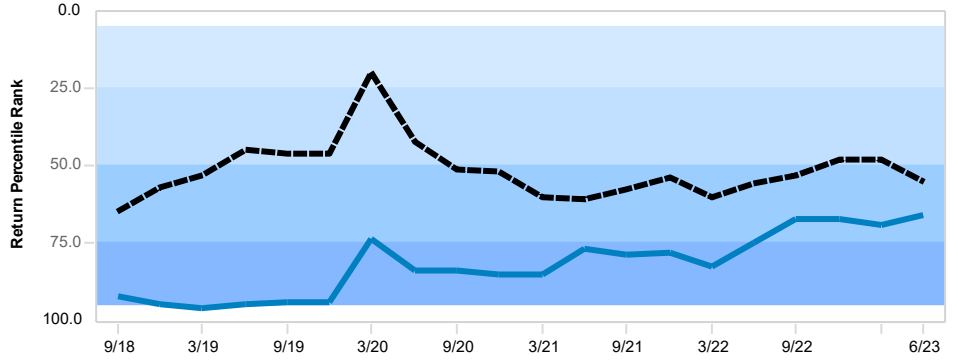


3 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	3 (15%)	10 (50%)	7 (35%)
Index	20	1 (5%)	7 (35%)	12 (60%)	0 (0%)

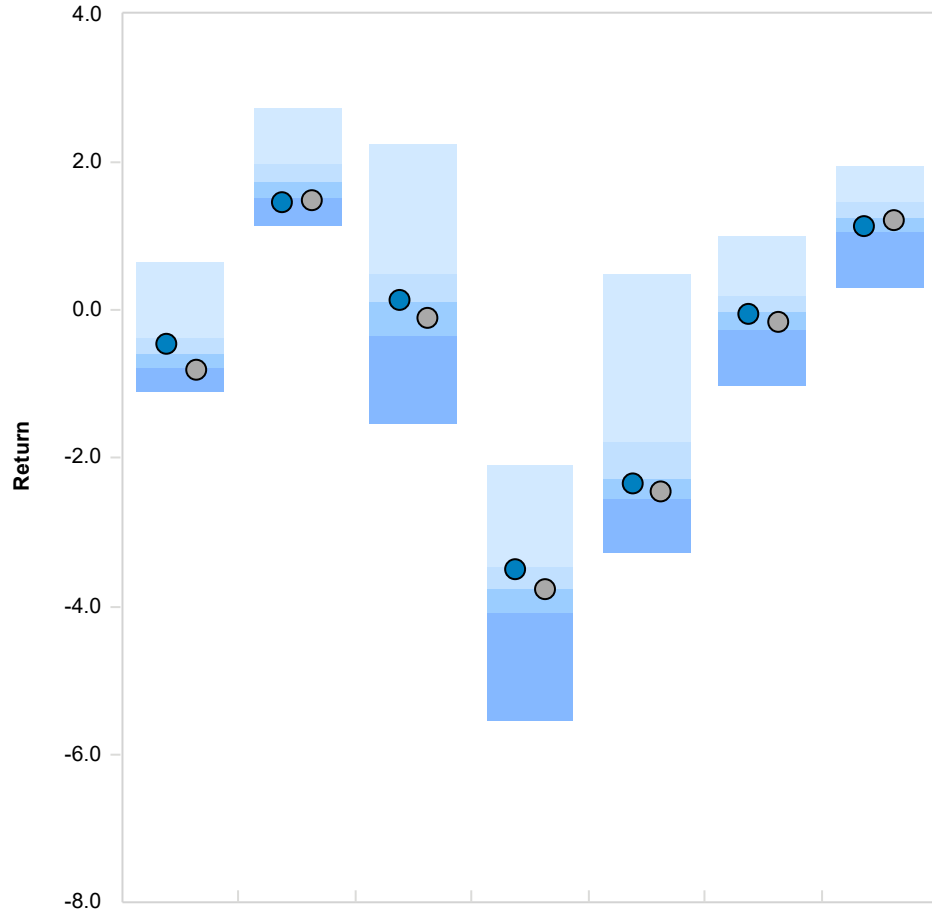
5 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	0 (0%)	6 (30%)	14 (70%)
Index	20	1 (5%)	6 (30%)	13 (65%)	0 (0%)

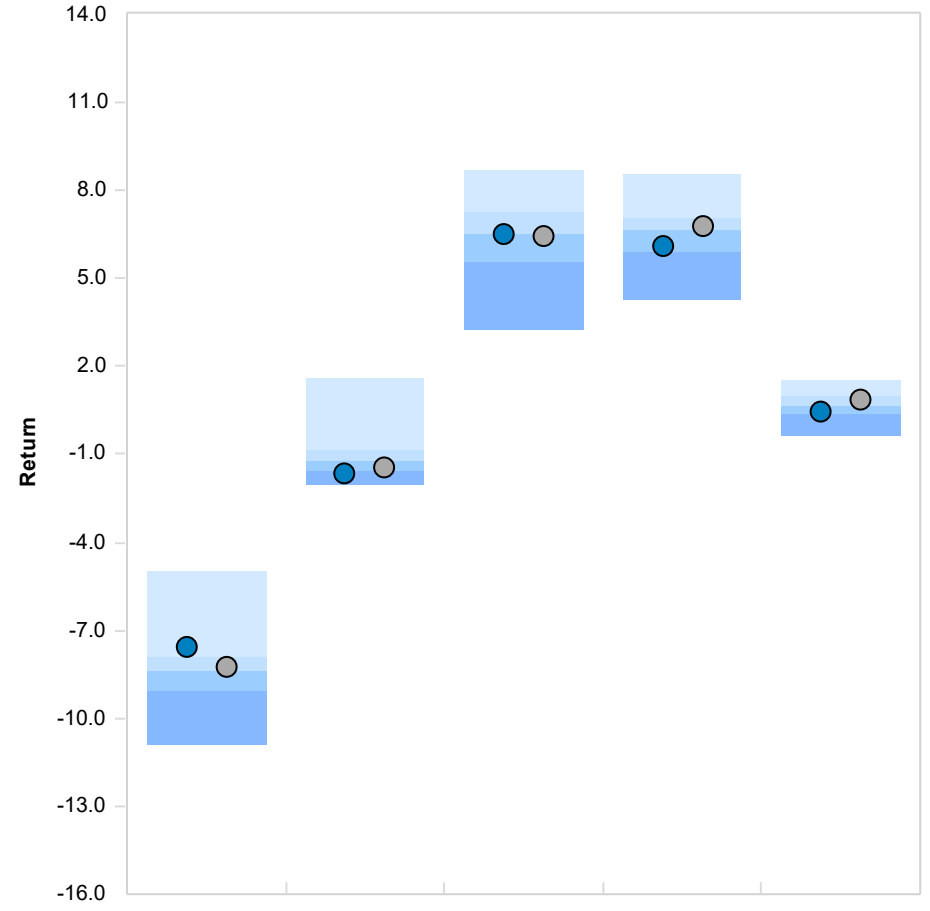


Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	-0.45 (34)	1.47 (79)	0.15 (48)	-3.49 (27)	-2.34 (58)	-0.05 (58)	1.14 (66)
● Index	-0.81 (80)	1.50 (76)	-0.10 (64)	-3.75 (49)	-2.46 (68)	-0.15 (68)	1.23 (55)
Median	-0.58	1.74	0.13	-3.76	-2.28	-0.02	1.24

Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-7.55 (21)	-1.65 (83)	6.52 (50)	6.11 (71)	0.47 (66)
● Index	-8.24 (41)	-1.44 (65)	6.43 (55)	6.80 (42)	0.88 (35)
Median	-8.36	-1.22	6.50	6.66	0.68

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	1.92 (86)	1.53 (46)	-2.79 (24)	-2.28 (22)	-4.15 (32)	-0.60 (59)
Index	2.33 (49)	1.54 (46)	-3.06 (52)	-2.37 (25)	-4.51 (63)	-0.57 (46)
Median	2.33	1.50	-3.05	-2.65	-4.41	-0.58



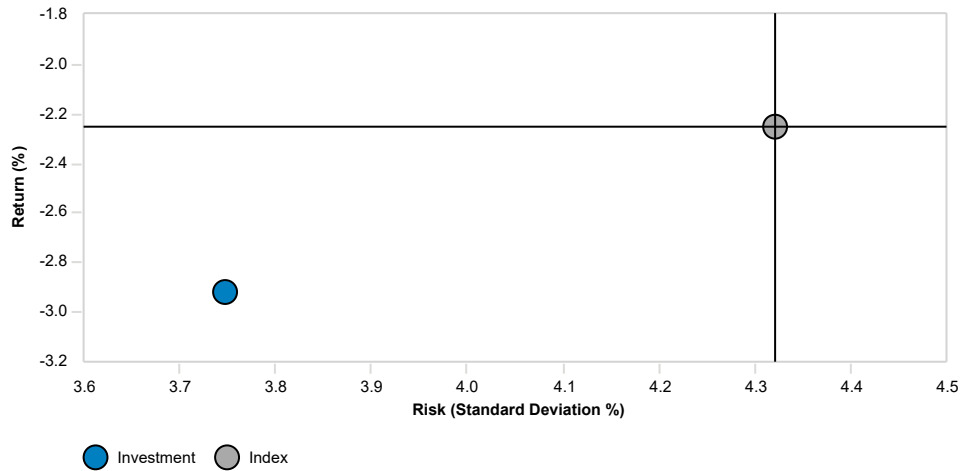
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-2.92	3.75	-1.13	79.27	4	96.26	8
Index	-2.25	4.32	-0.81	100.00	6	100.00	6

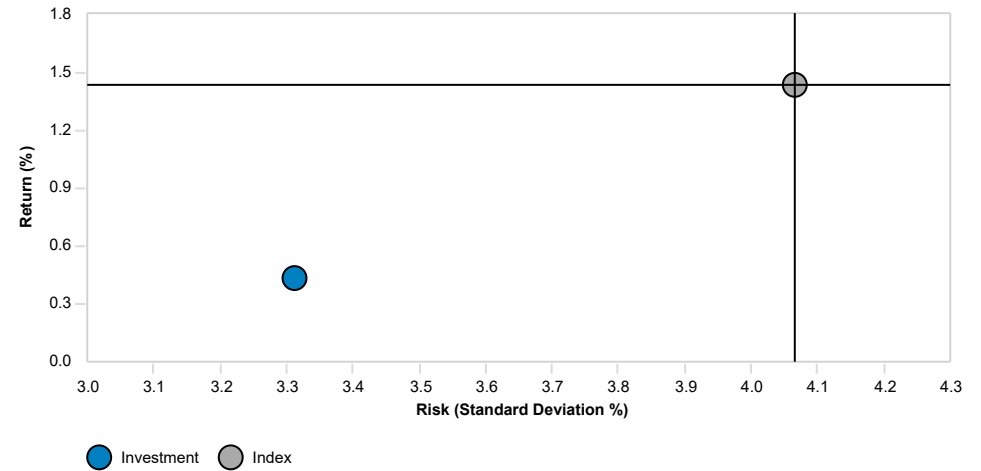
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	0.44	3.31	-0.32	72.60	12	85.45	8
Index	1.44	4.07	-0.01	100.00	14	100.00	6

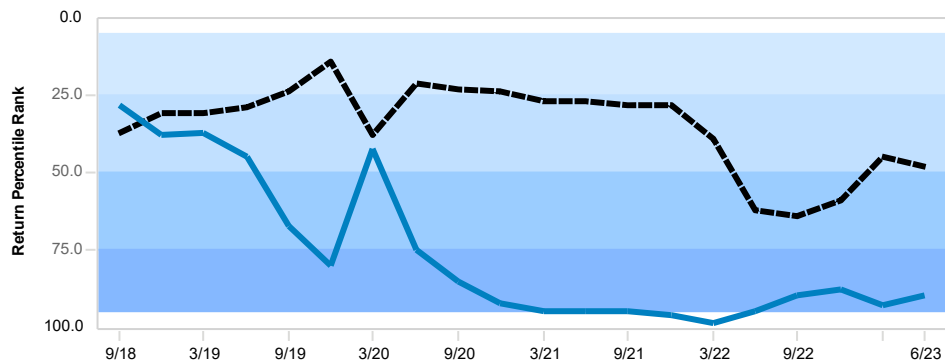
Risk and Return 3 Years



Risk and Return 5 Years

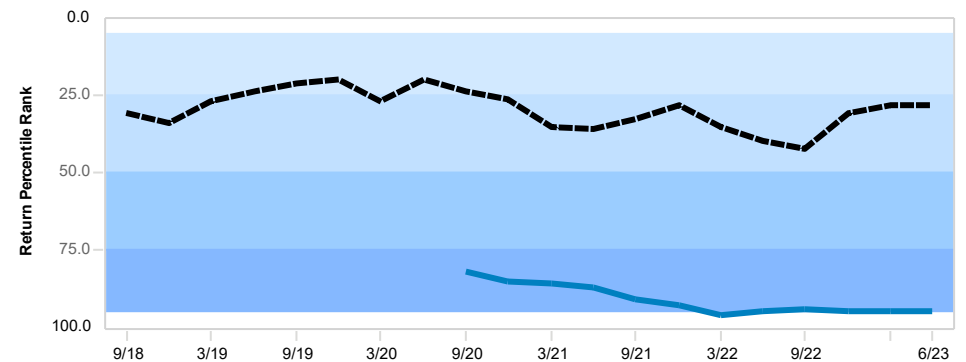


3 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	5 (25%)	2 (10%)	13 (65%)
Index	20	5 (25%)	12 (60%)	3 (15%)	0 (0%)

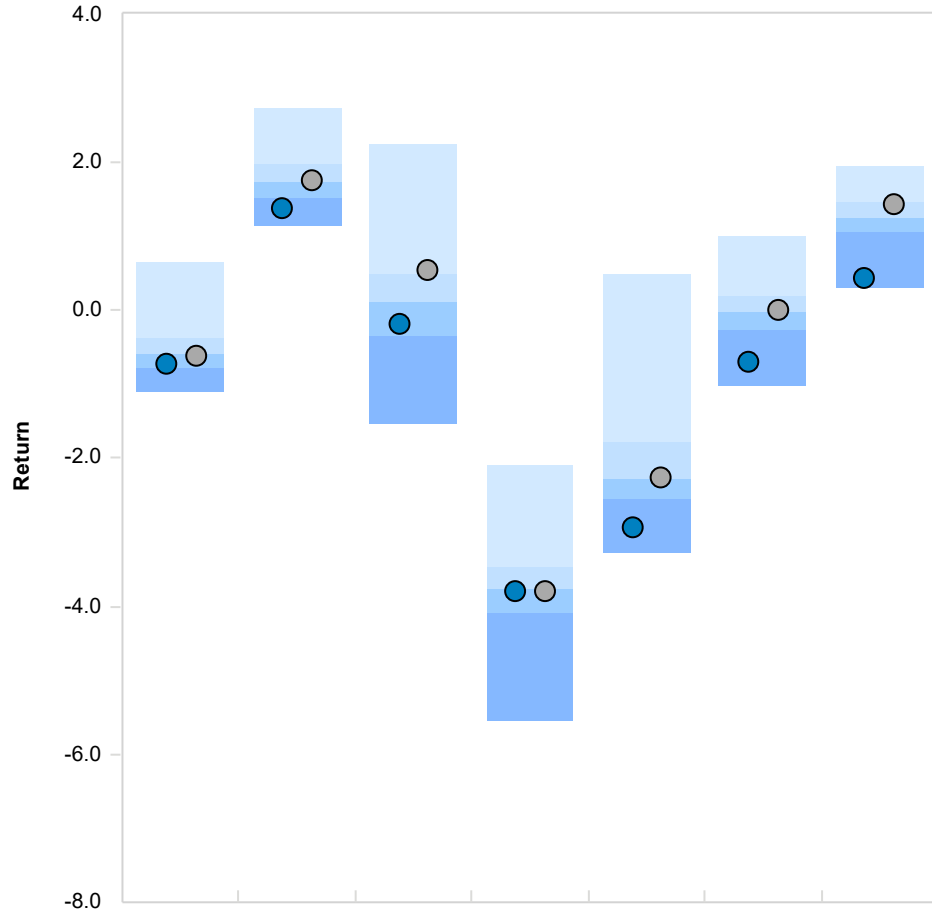
5 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	12	0 (0%)	0 (0%)	0 (0%)	12 (100%)
Index	20	5 (25%)	15 (75%)	0 (0%)	0 (0%)

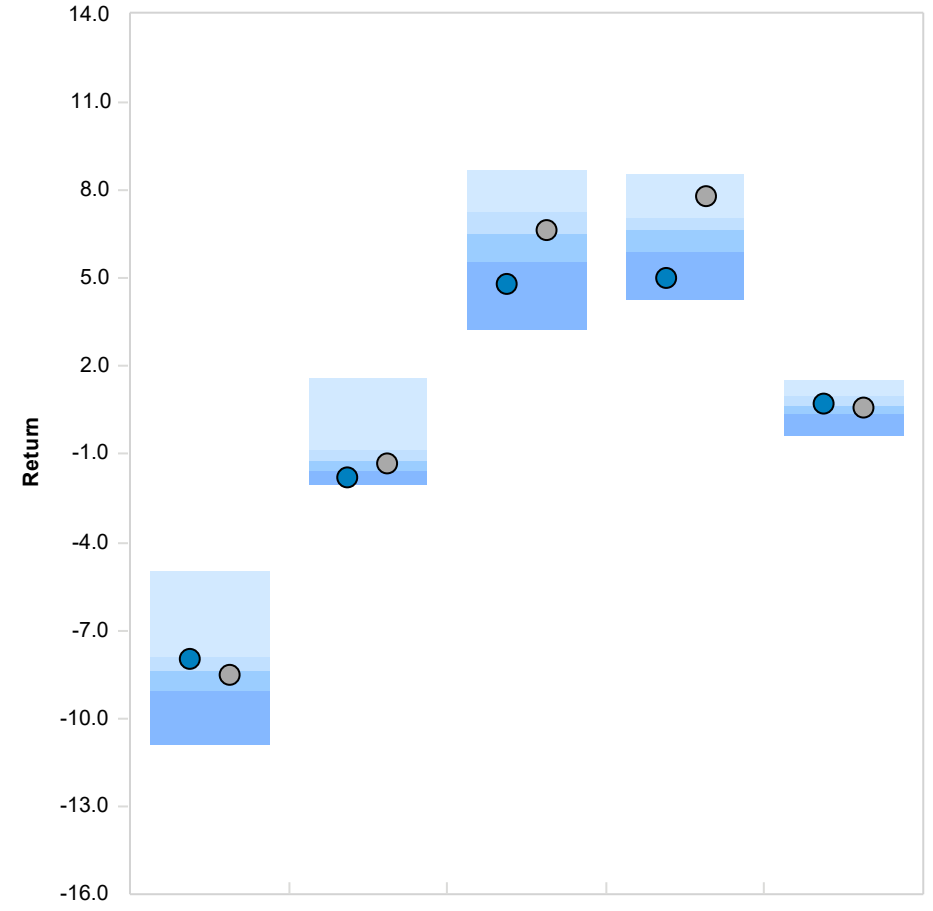


Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	-0.71 (65)	1.39 (82)	-0.18 (68)	-3.80 (56)	-2.92 (90)	-0.69 (93)	0.44 (95)
● Index	-0.61 (53)	1.77 (45)	0.54 (23)	-3.78 (52)	-2.25 (48)	0.00 (44)	1.44 (28)
Median	-0.58	1.74	0.13	-3.76	-2.28	-0.02	1.24

Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-8.01 (31)	-1.80 (90)	4.79 (89)	5.02 (92)	0.74 (47)
● Index	-8.55 (58)	-1.29 (57)	6.62 (47)	7.78 (11)	0.58 (59)
Median	-8.36	-1.22	6.50	6.66	0.68

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.11 (76)	1.40 (66)	-2.90 (30)	-2.41 (29)	-4.26 (39)	-0.69 (80)
Index	2.39 (42)	1.91 (14)	-3.07 (53)	-2.84 (65)	-4.72 (84)	-0.56 (45)
Median	2.33	1.50	-3.05	-2.65	-4.41	-0.58



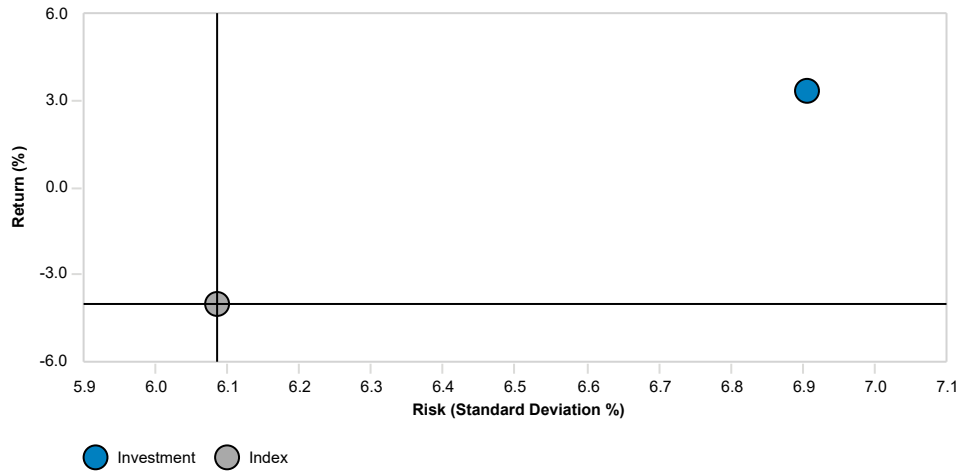
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.40	6.91	0.34	129.61	8	44.89	4
Index	-3.97	6.09	-0.85	100.00	7	100.00	5

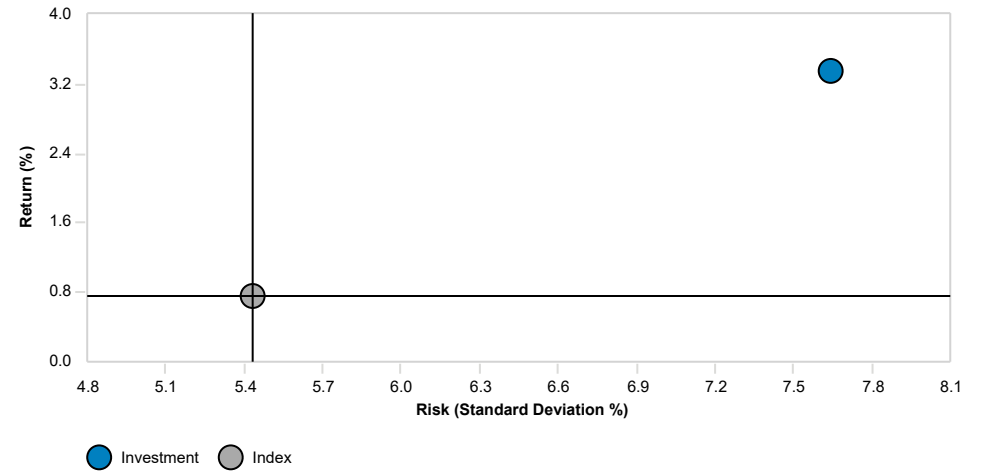
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.36	7.65	0.27	109.02	14	69.59	6
Index	0.77	5.43	-0.12	100.00	15	100.00	5

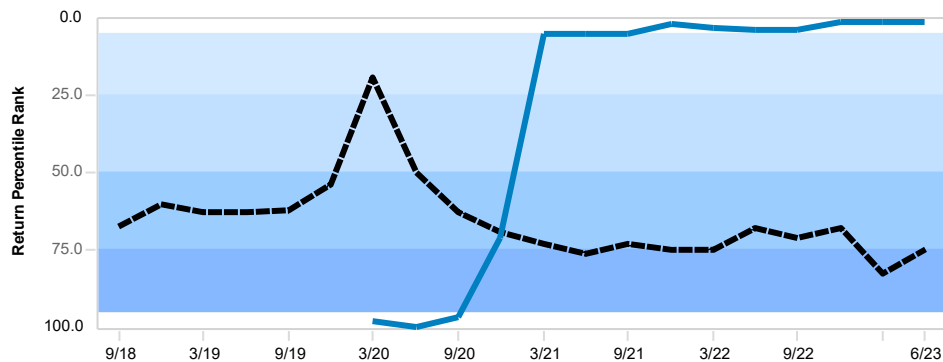
Risk and Return 3 Years



Risk and Return 5 Years

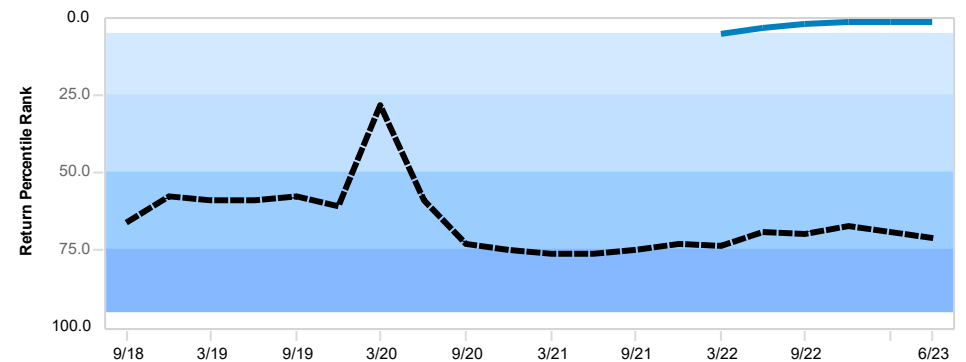


3 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	14	10 (71%)	0 (0%)	1 (7%)	3 (21%)
Index	20	1 (5%)	1 (5%)	16 (80%)	2 (10%)

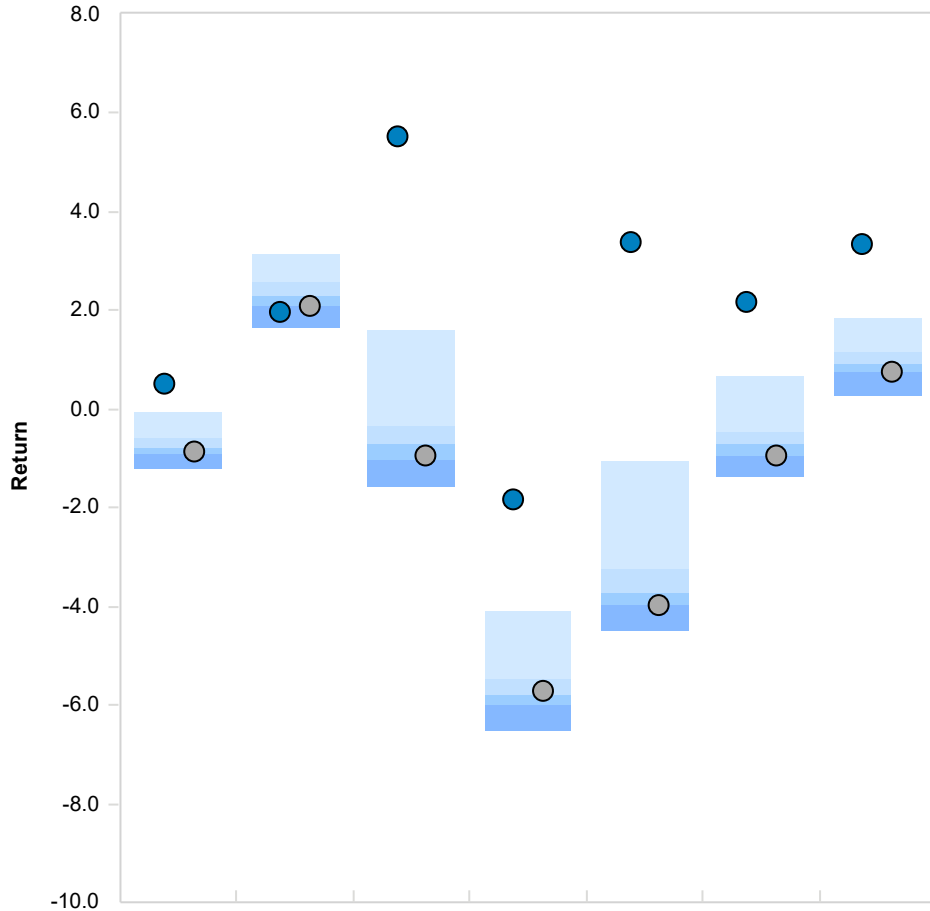
5 Year Rolling Percentile Rank IM U.S. Broad Market Core Fixed Income (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	6	6 (100%)	0 (0%)	0 (0%)	0 (0%)
Index	20	0 (0%)	1 (5%)	17 (85%)	2 (10%)

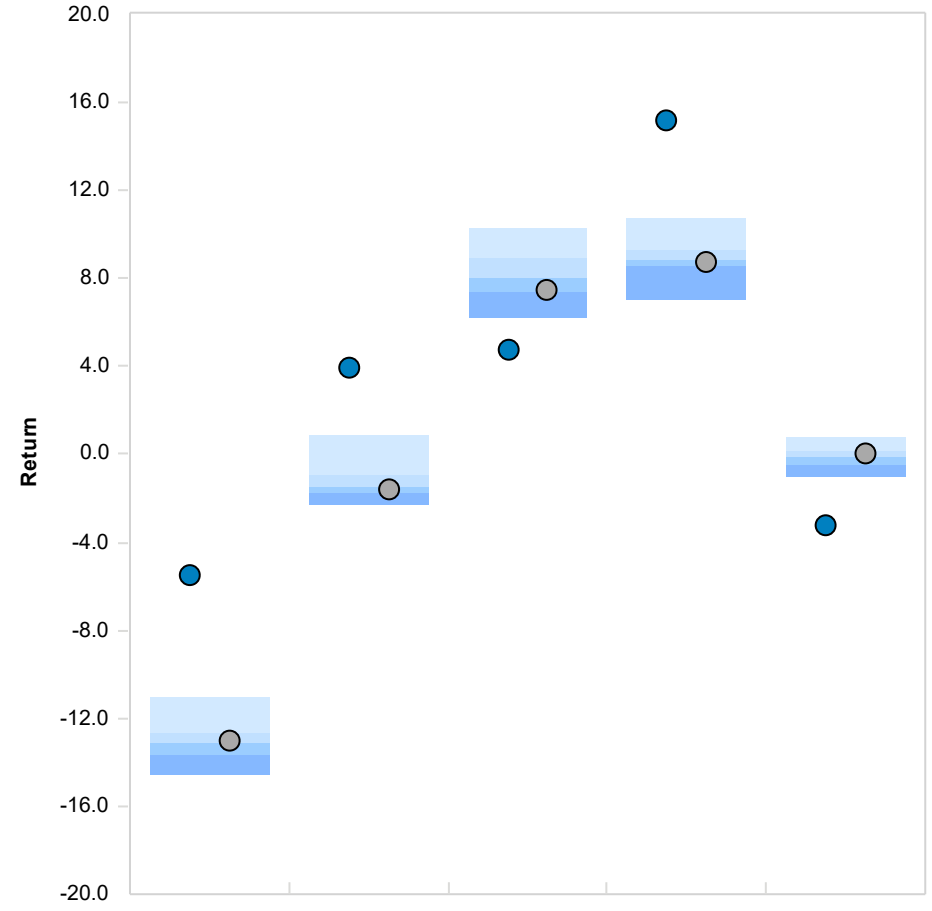


Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	0.52 (3)	1.97 (85)	5.55 (1)	-1.85 (1)	3.40 (1)	2.19 (1)	3.36 (1)
● Index	-0.84 (66)	2.09 (78)	-0.94 (65)	-5.73 (45)	-3.97 (75)	-0.94 (73)	0.77 (71)
Median	-0.77	2.28	-0.70	-5.78	-3.71	-0.69	0.93

Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-5.53 (1)	3.95 (1)	4.78 (98)	15.16 (1)	-3.20 (100)
● Index	-13.01 (35)	-1.55 (55)	7.51 (69)	8.72 (65)	0.01 (34)
Median	-13.14	-1.47	8.05	8.83	-0.13

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	1.43 (98)	6.25 (1)	-2.57 (4)	-4.89 (50)	-4.05 (1)	0.15 (5)
Index	2.96 (71)	1.87 (35)	-4.75 (64)	-4.69 (30)	-5.93 (60)	0.01 (17)
Median	3.12	1.74	-4.65	-4.90	-5.88	-0.10



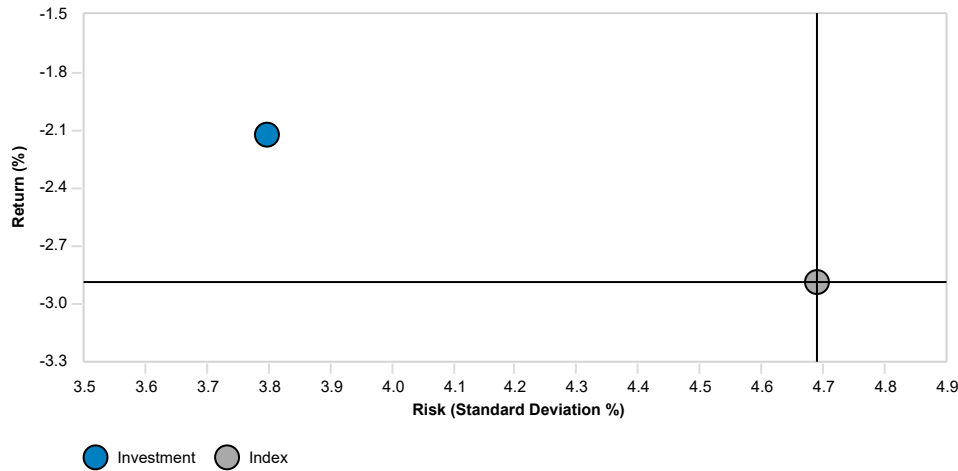
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-2.12	3.80	-0.88	90.45	5	83.91	7
Index	-2.89	4.69	-0.88	100.00	6	100.00	6

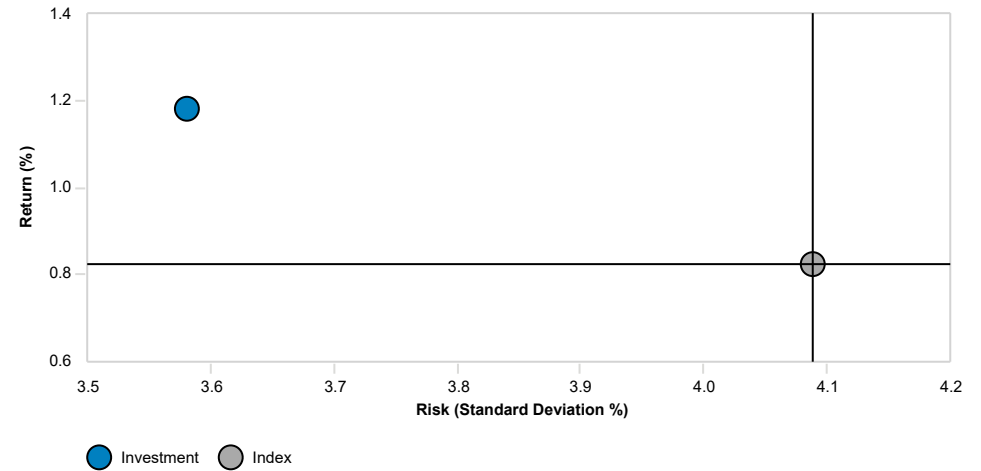
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.18	3.58	-0.08	96.53	13	88.64	7
Index	0.83	4.09	-0.16	100.00	14	100.00	6

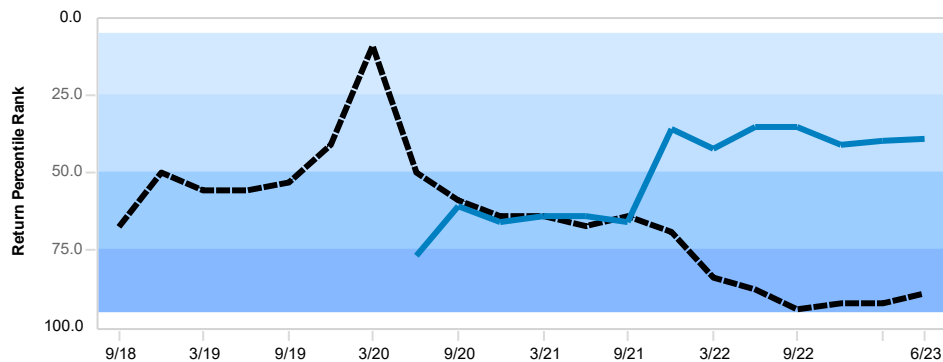
Risk and Return 3 Years



Risk and Return 5 Years

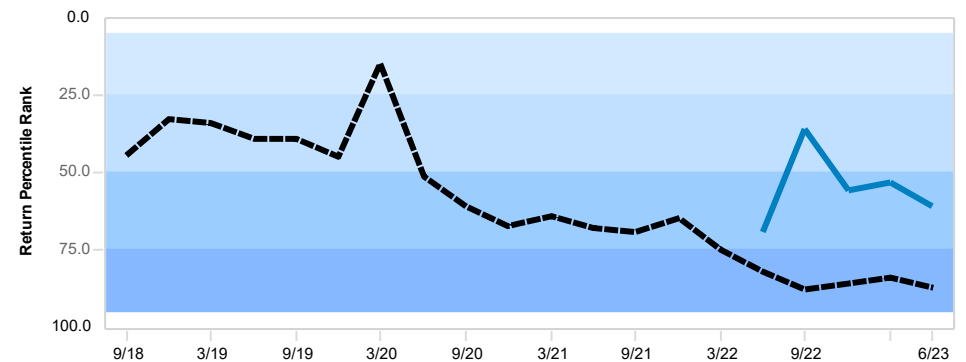


3 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	0 (0%)	7 (54%)	5 (38%)	1 (8%)
Index	20	1 (5%)	3 (15%)	10 (50%)	6 (30%)

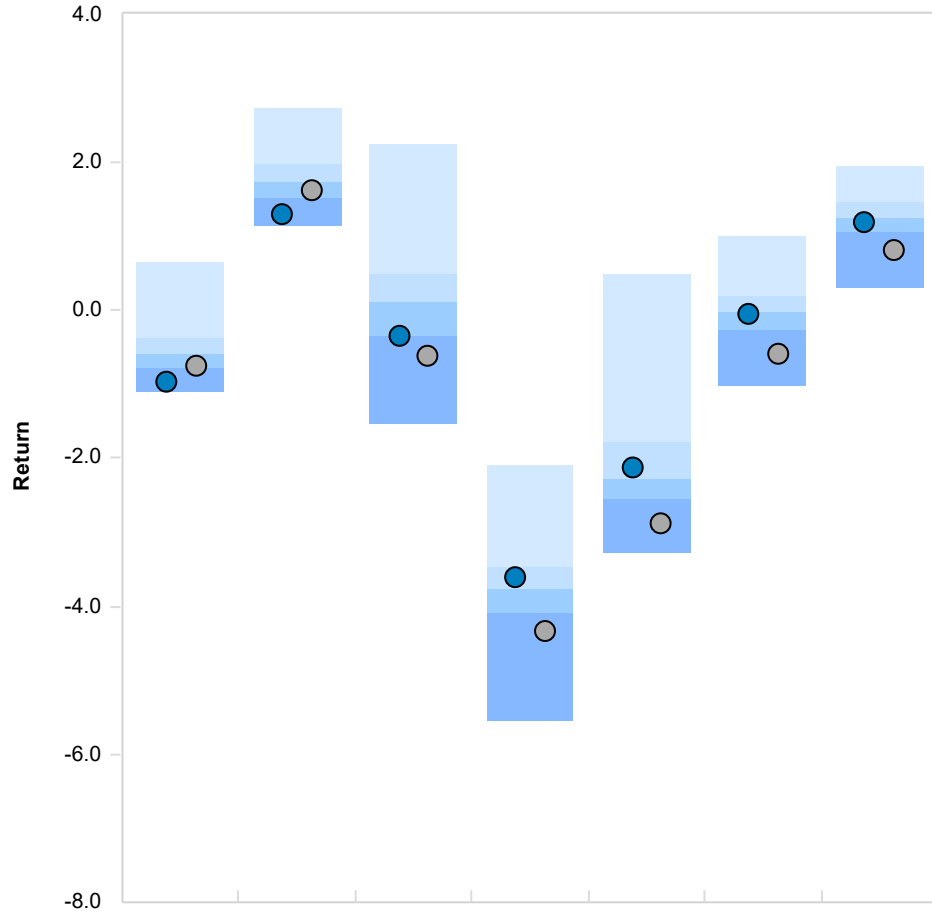
5 Year Rolling Percentile Rank IM U.S. Intermediate Duration (SA+CF)



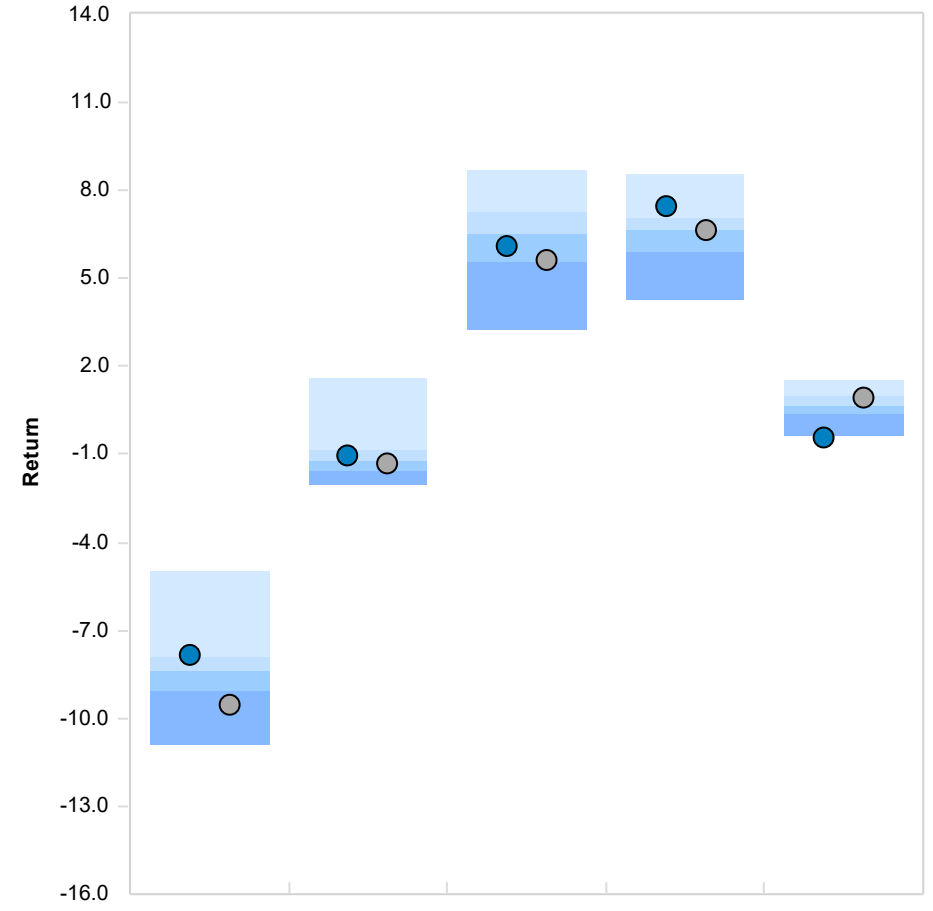
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	5	0 (0%)	1 (20%)	4 (80%)	0 (0%)
Index	20	1 (5%)	6 (30%)	8 (40%)	5 (25%)



Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



Peer Group Analysis - IM U.S. Intermediate Duration (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
Investment	-0.98 (91)	1.31 (87)	-0.35 (76)	-3.60 (36)	-2.12 (39)	-0.04 (53)	1.18 (61)
Index	-0.75 (72)	1.62 (62)	-0.60 (84)	-4.33 (85)	-2.89 (89)	-0.60 (89)	0.83 (87)
Median	-0.58	1.74	0.13	-3.76	-2.28	-0.02	1.24

	2022	2021	2020	2019	2018
Investment	-7.85 (25)	-1.04 (34)	6.13 (65)	7.47 (15)	-0.40 (96)
Index	-9.51 (86)	-1.29 (57)	5.60 (75)	6.67 (49)	0.92 (32)
Median	-8.36	-1.22	6.50	6.66	0.68

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.31 (54)	1.26 (75)	-2.86 (27)	-2.28 (22)	-4.13 (30)	-0.45 (21)
Index	2.39 (42)	1.72 (27)	-3.84 (91)	-2.93 (71)	-4.69 (80)	-0.51 (30)
Median	2.33	1.50	-3.05	-2.65	-4.41	-0.58



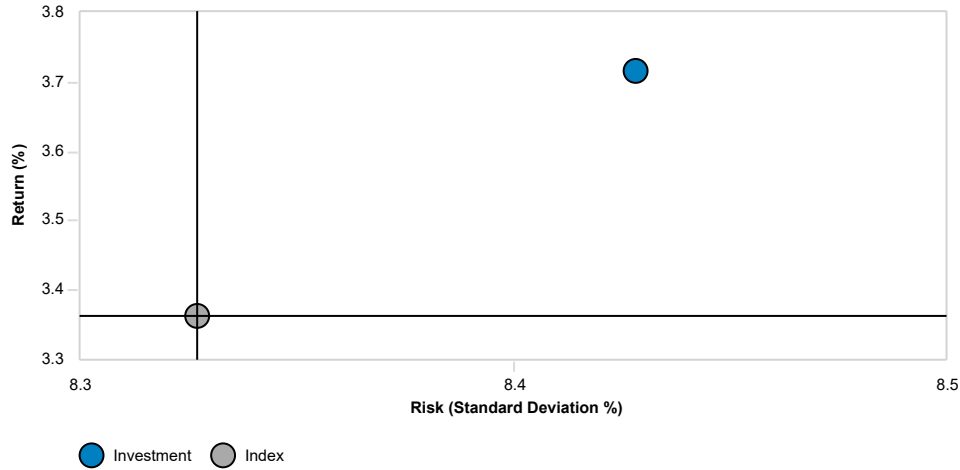
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.72	8.43	0.33	102.79	9	99.93	3
Index	3.36	8.33	0.29	100.00	9	100.00	3

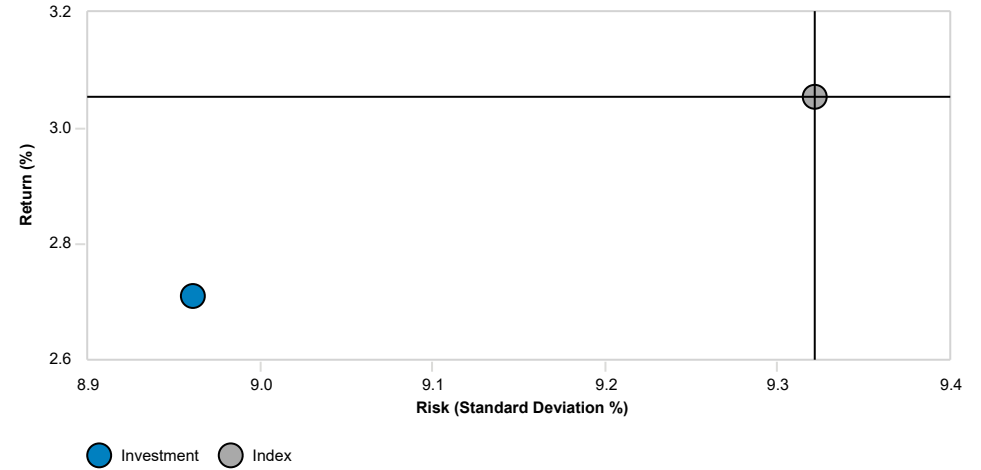
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	2.71	8.96	0.17	95.31	15	97.62	5
Index	3.06	9.32	0.20	100.00	15	100.00	5

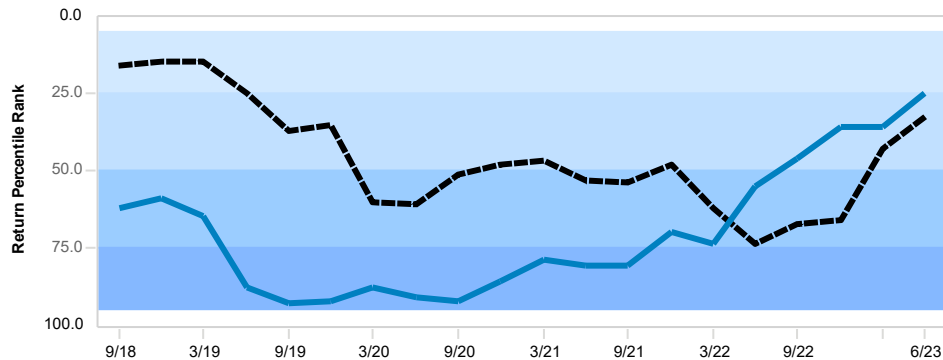
Risk and Return 3 Years



Risk and Return 5 Years

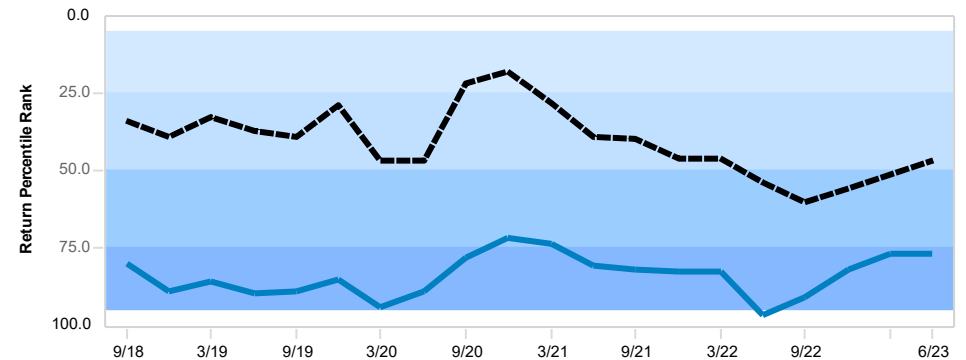


3 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	1 (5%)	3 (15%)	6 (30%)	10 (50%)
Index	20	4 (20%)	7 (35%)	9 (45%)	0 (0%)

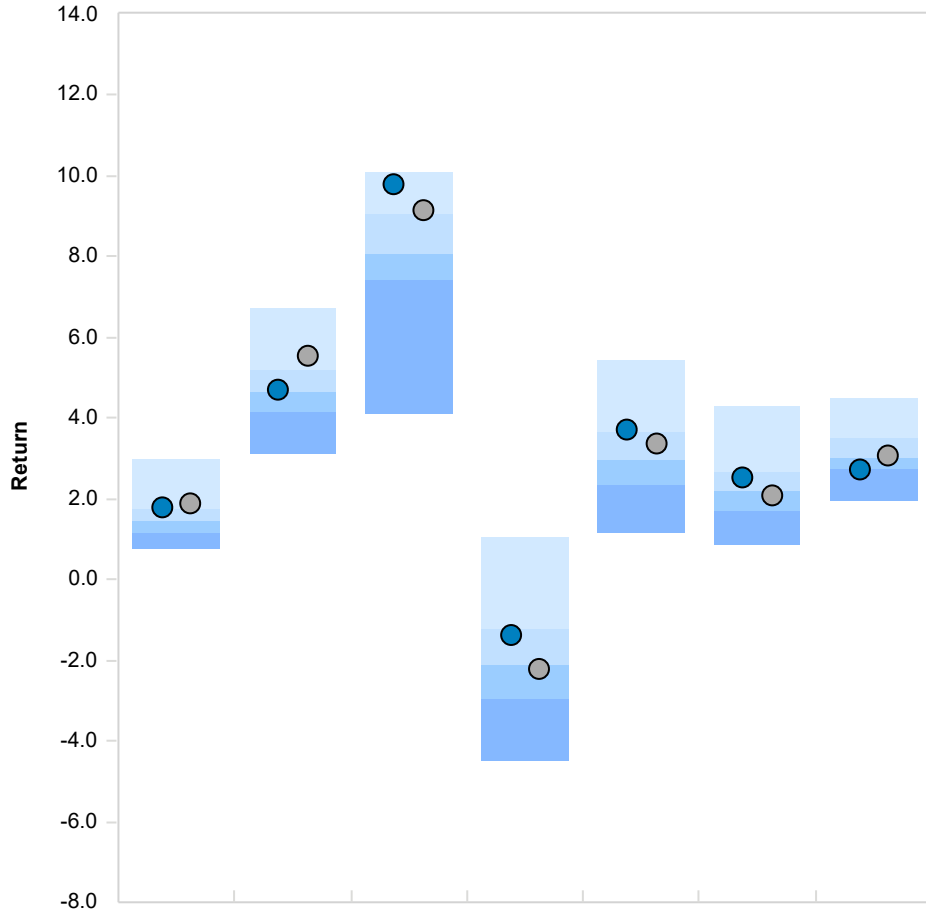
5 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	0 (0%)	2 (10%)	18 (90%)
Index	20	2 (10%)	14 (70%)	4 (20%)	0 (0%)

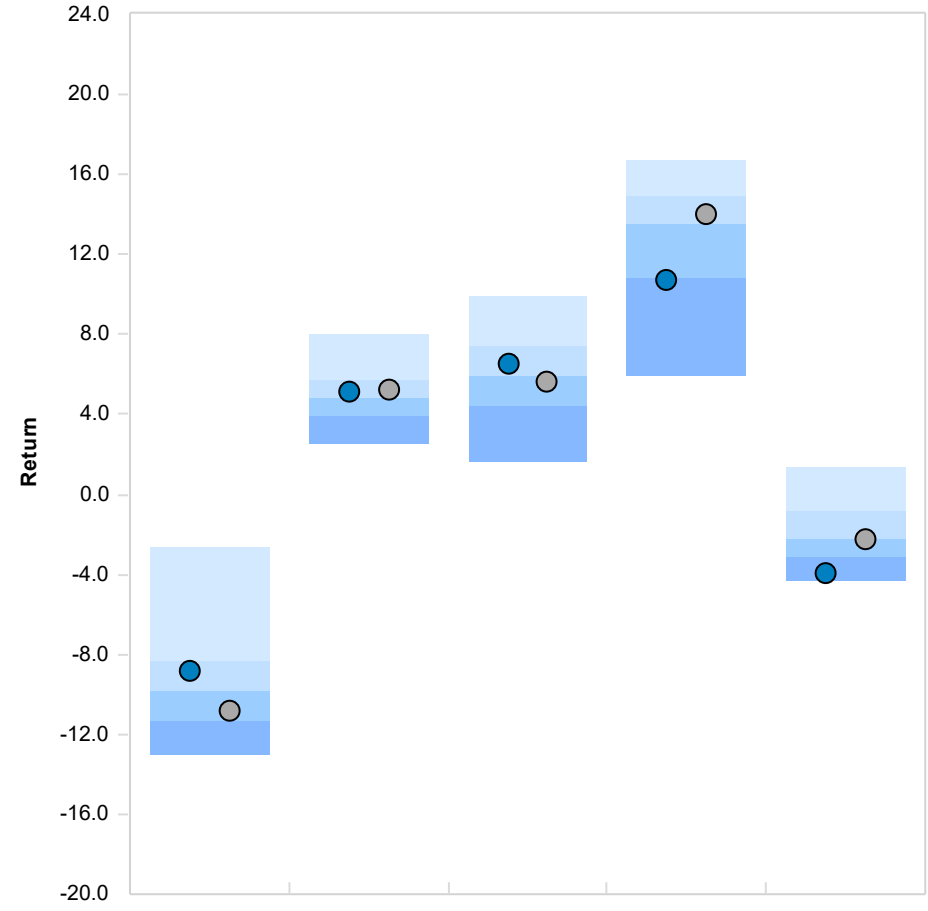


Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	1.78 (23)	4.71 (48)	9.78 (8)	-1.40 (29)	3.72 (25)	2.53 (30)	2.71 (77)
● Index	1.87 (17)	5.57 (14)	9.13 (22)	-2.21 (54)	3.36 (33)	2.07 (58)	3.06 (47)
Median	1.46	4.64	8.08	-2.13	2.99	2.21	3.03

Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-8.86 (33)	5.15 (44)	6.53 (43)	10.71 (76)	-3.94 (91)
● Index	-10.85 (67)	5.22 (42)	5.60 (62)	14.05 (44)	-2.22 (49)
Median	-9.81	4.82	5.95	13.52	-2.27

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.88 (72)	5.18 (2)	-0.32 (32)	-9.70 (62)	-3.73 (39)	0.93 (7)
Index	3.62 (26)	4.03 (46)	-0.63 (59)	-9.90 (72)	-4.29 (63)	0.67 (35)
Median	3.23	3.98	-0.51	-9.42	-3.96	0.58



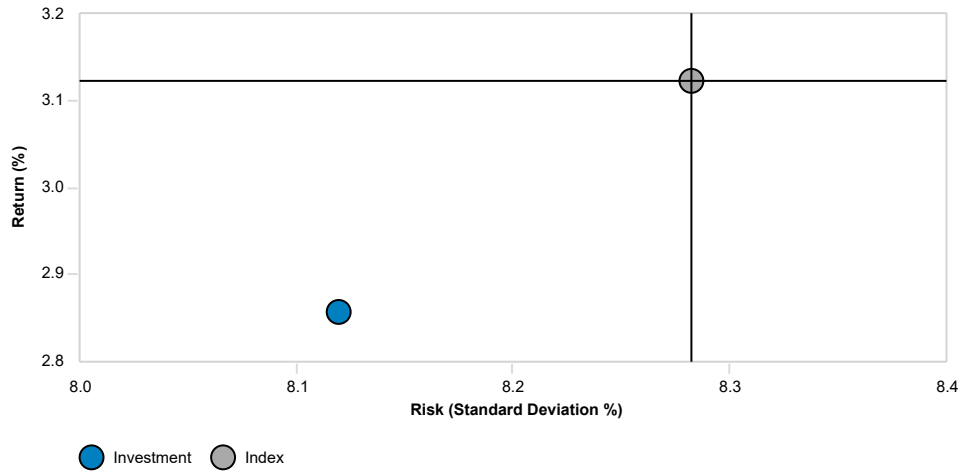
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	2.86	8.12	0.23	97.75	9	99.99	3
Index	3.12	8.28	0.26	100.00	9	100.00	3

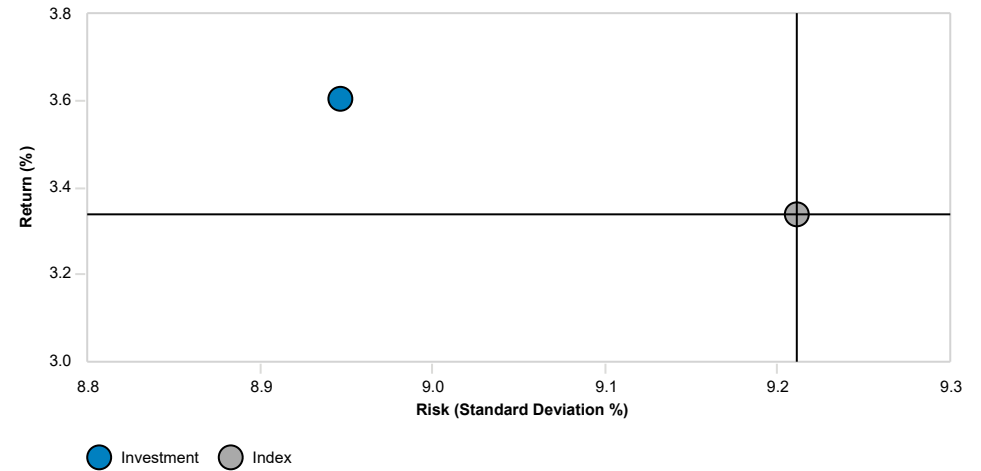
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.61	8.95	0.27	100.55	15	98.24	5
Index	3.34	9.21	0.24	100.00	15	100.00	5

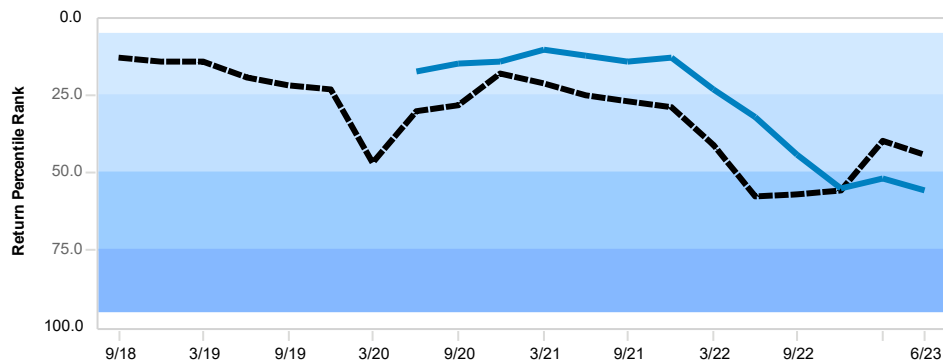
Risk and Return 3 Years



Risk and Return 5 Years

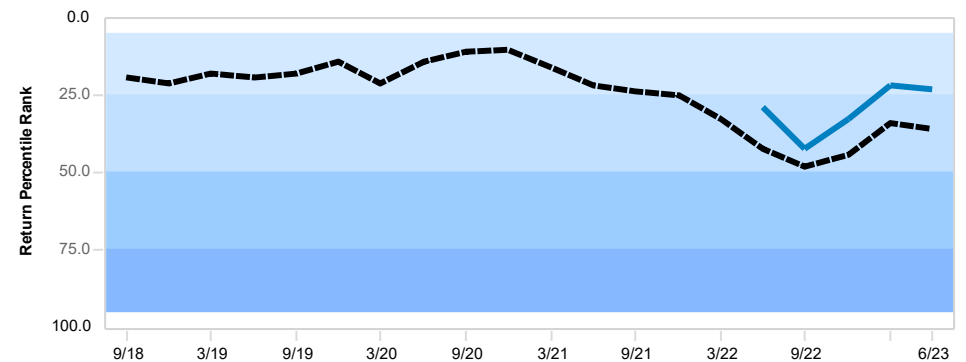


3 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	8 (62%)	2 (15%)	3 (23%)	0 (0%)
Index	20	9 (45%)	8 (40%)	3 (15%)	0 (0%)

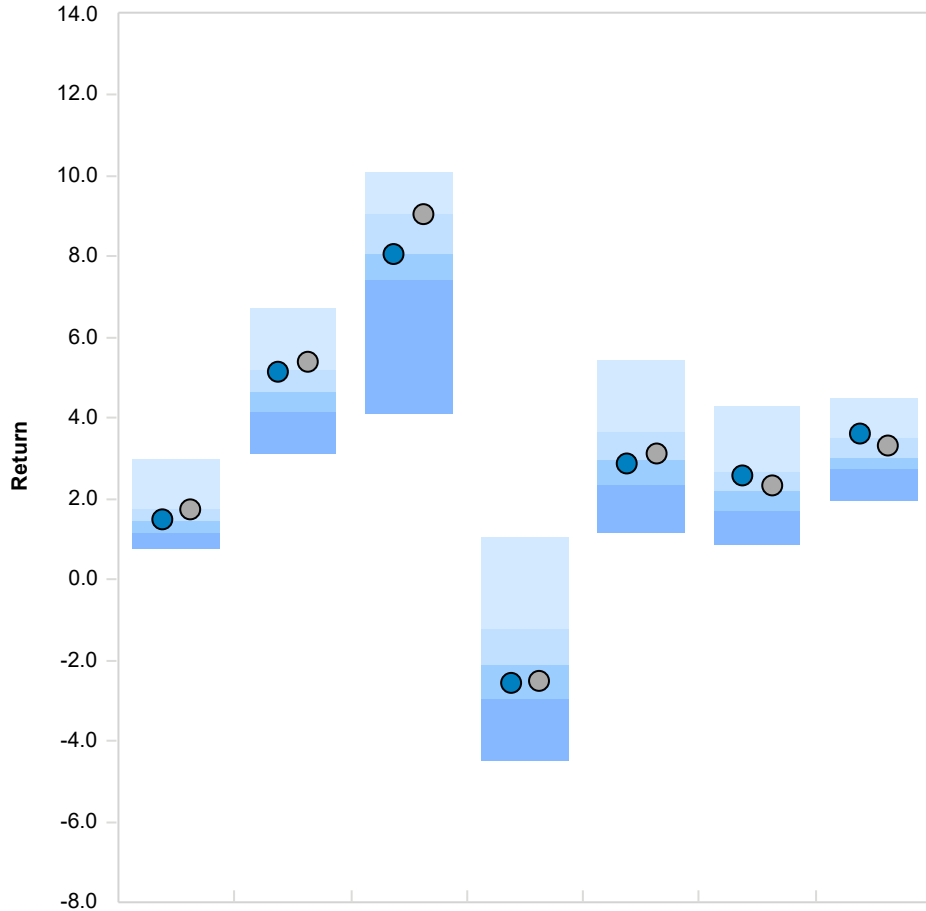
5 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	5	2 (40%)	3 (60%)	0 (0%)	0 (0%)
Index	20	14 (70%)	6 (30%)	0 (0%)	0 (0%)

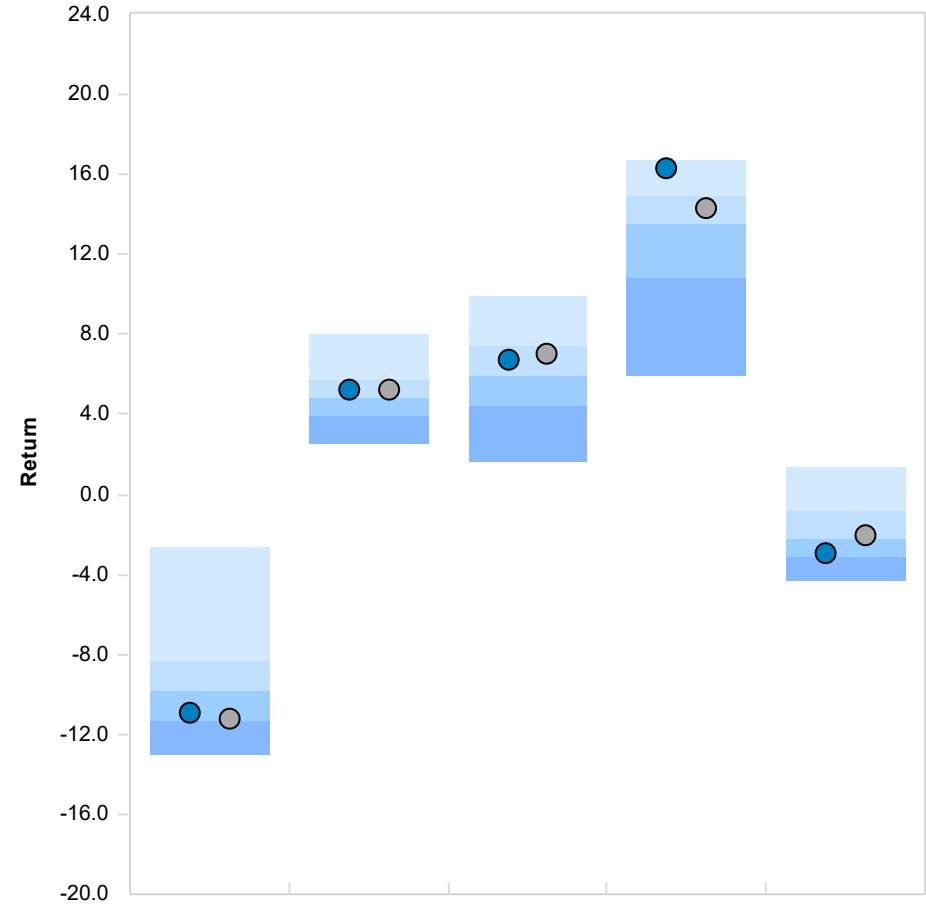


Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	1.50 (46)	5.13 (31)	8.06 (52)	-2.57 (64)	2.86 (56)	2.56 (30)	3.61 (23)
● Index	1.75 (24)	5.38 (18)	9.07 (25)	-2.49 (61)	3.12 (44)	2.33 (43)	3.34 (36)
Median	1.46	4.64	8.08	-2.13	2.99	2.21	3.03

Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-10.87 (67)	5.27 (41)	6.78 (37)	16.30 (8)	-2.90 (70)
● Index	-11.18 (74)	5.26 (41)	7.05 (32)	14.32 (35)	-2.08 (44)
Median	-9.81	4.82	5.95	13.52	-2.27

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	3.58 (29)	4.24 (28)	-1.39 (93)	-9.62 (58)	-4.06 (55)	0.61 (44)
Index	3.57 (30)	4.17 (31)	-0.64 (59)	-9.84 (68)	-4.82 (91)	0.69 (33)
Median	3.23	3.98	-0.51	-9.42	-3.96	0.58



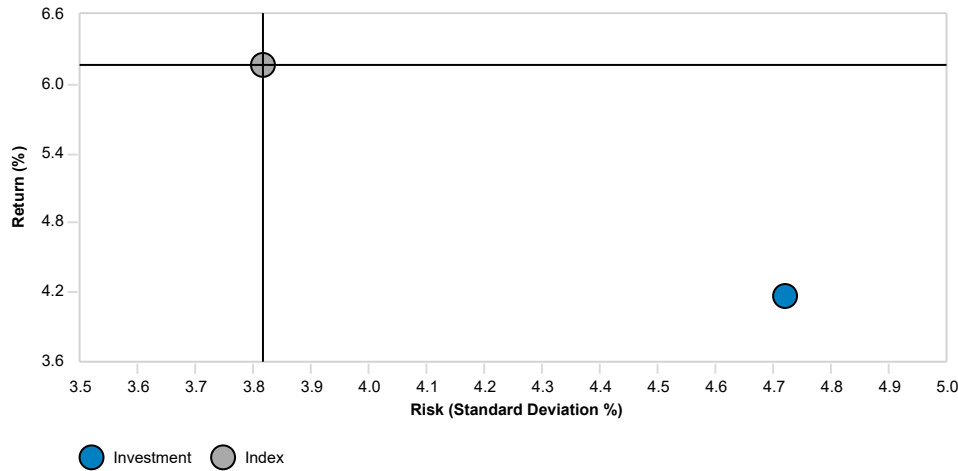
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	4.16	4.72	0.61	97.67	10	166.01	2
Index	6.16	3.82	1.26	100.00	10	100.00	2

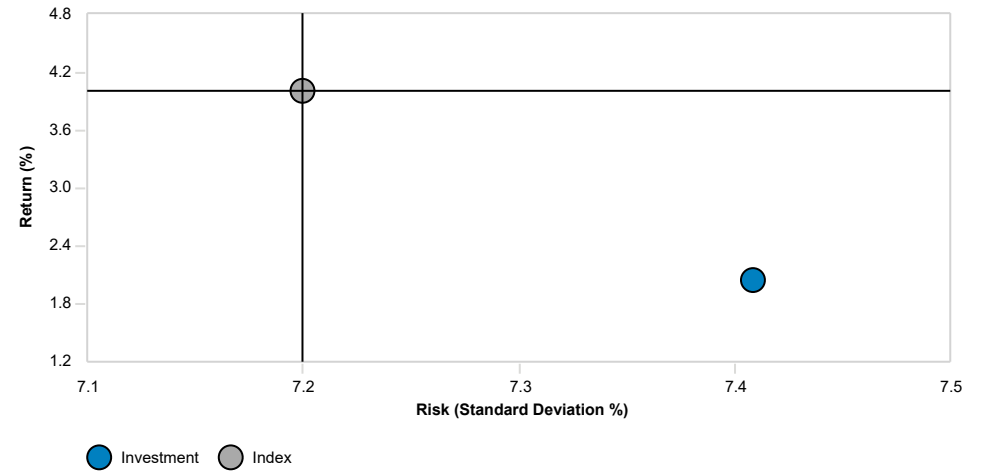
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	2.05	7.41	0.10	89.16	15	117.38	5
Index	4.02	7.20	0.37	100.00	16	100.00	4

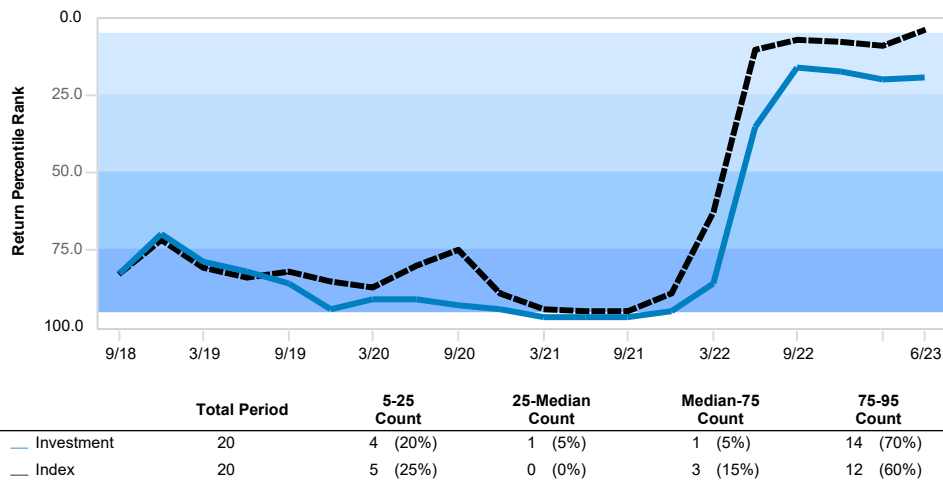
Risk and Return 3 Years



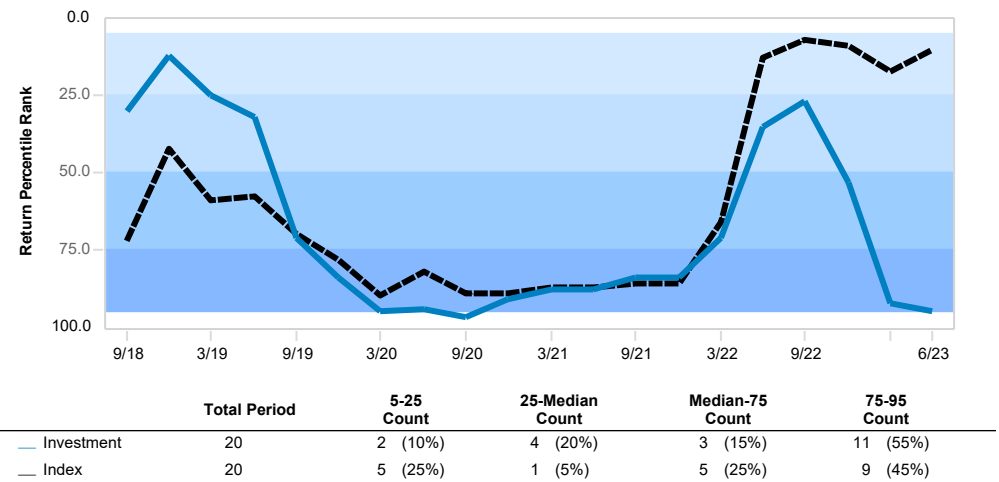
Risk and Return 5 Years



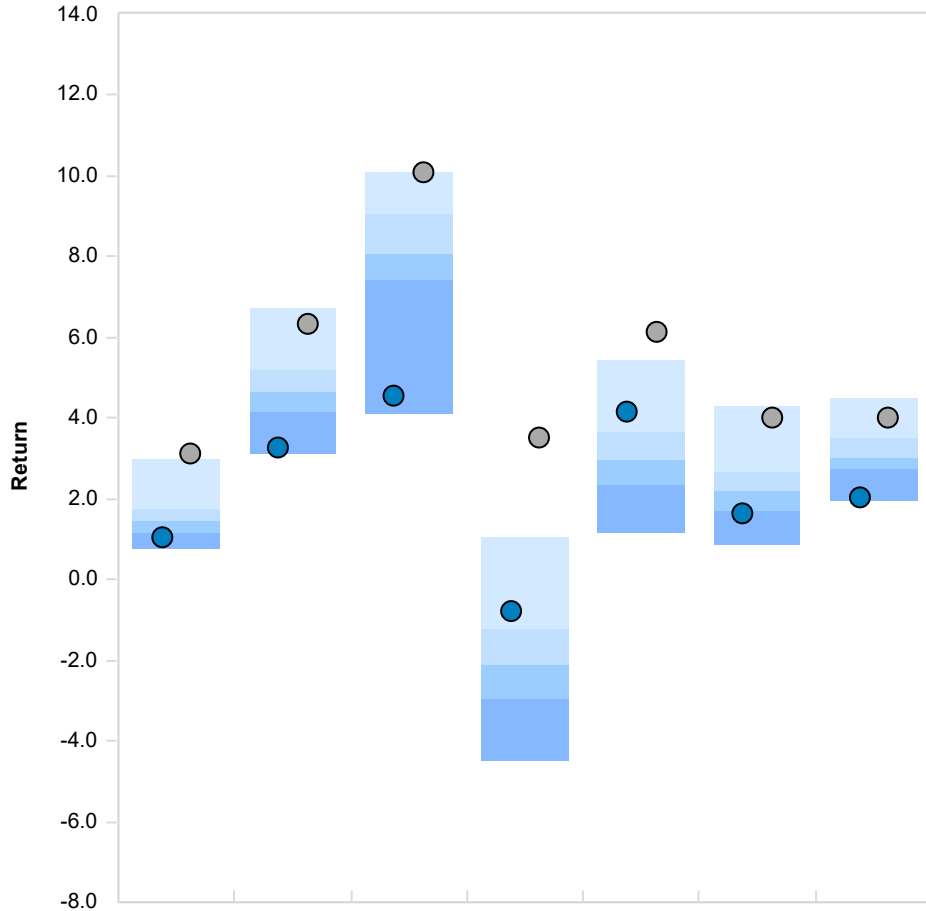
3 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)



5 Year Rolling Percentile Rank IM U.S. High Yield Bonds (SA+CF)

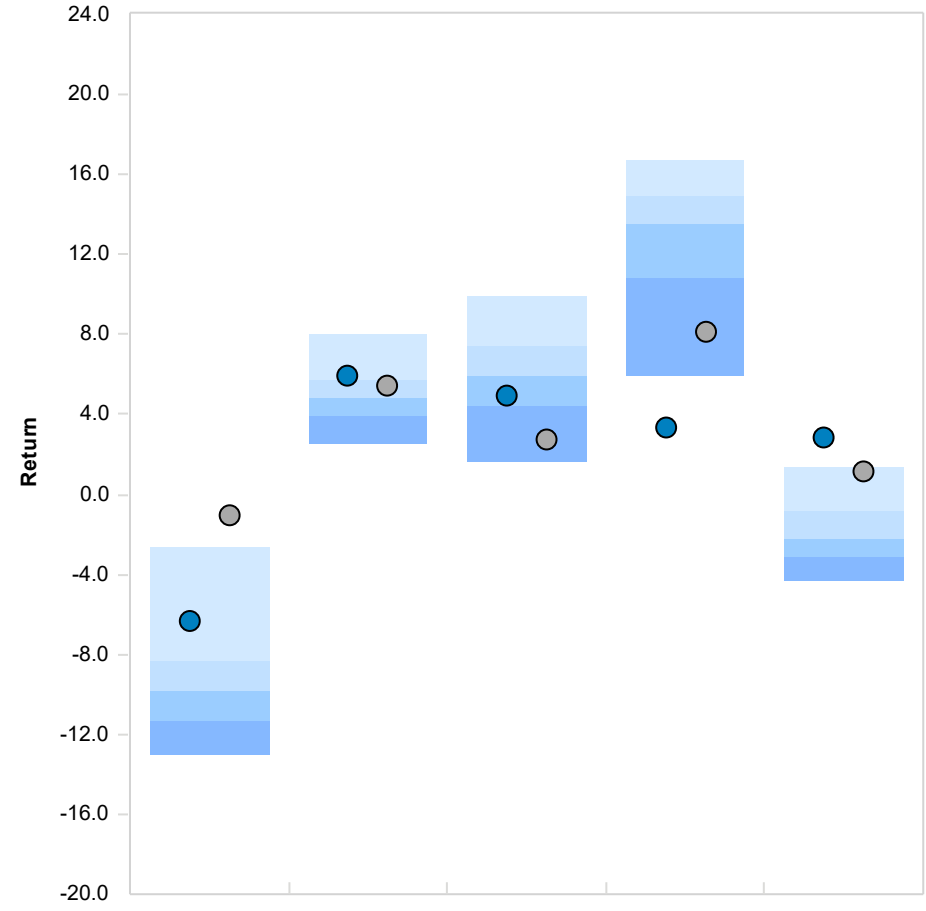


Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	1.05 (81)	3.27 (94)	4.58 (95)	-0.80 (21)	4.16 (19)	1.63 (78)	2.05 (95)
● Index	3.12 (5)	6.33 (6)	10.10 (5)	3.51 (1)	6.16 (4)	3.99 (6)	4.02 (10)
Median	1.46	4.64	8.08	-2.13	2.99	2.21	3.03

Peer Group Analysis - IM U.S. High Yield Bonds (SA+CF)



	2022	2021	2020	2019	2018
● Investment	-6.38 (19)	5.99 (20)	4.98 (69)	3.31 (99)	2.84 (2)
● Index	-1.06 (2)	5.41 (35)	2.78 (90)	8.16 (87)	1.14 (8)
Median	-9.81	4.82	5.95	13.52	-2.27

Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	2.20 (92)	1.16 (96)	0.10 (18)	-6.50 (16)	-1.12 (4)	0.60 (44)
Index	3.11 (57)	2.34 (88)	1.18 (2)	-4.36 (7)	-0.10 (2)	0.72 (29)
Median	3.23	3.98	-0.51	-9.42	-3.96	0.58



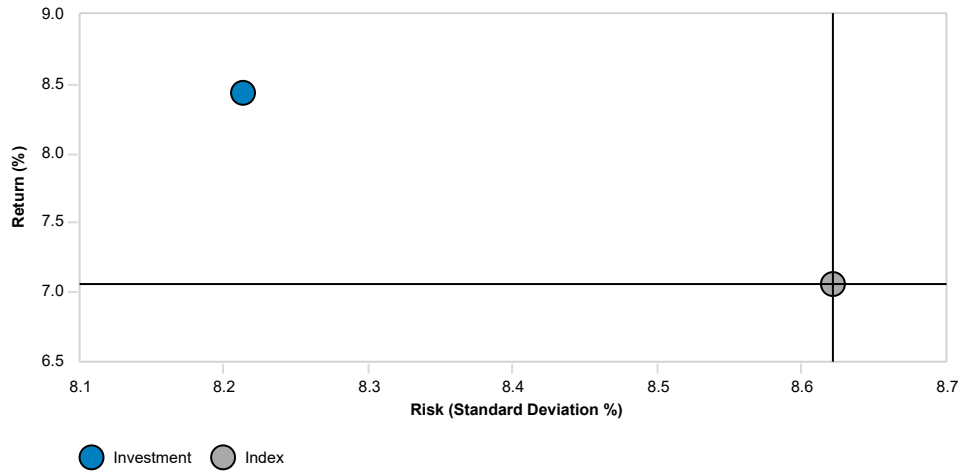
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	8.44	8.21	0.85	87.41	9	30.59	3
Index	7.06	8.62	0.67	100.00	9	100.00	3

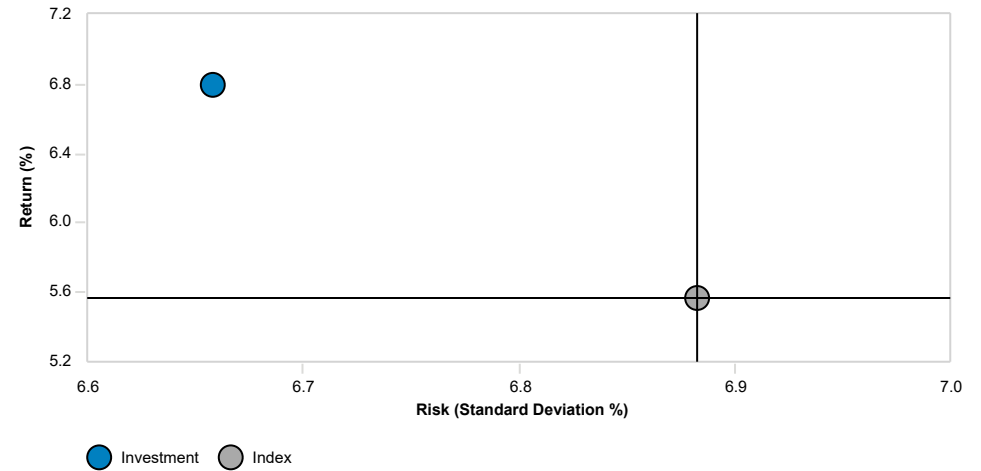
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	6.80	6.66	0.77	95.03	16	40.62	4
Index	5.57	6.88	0.58	100.00	16	100.00	4

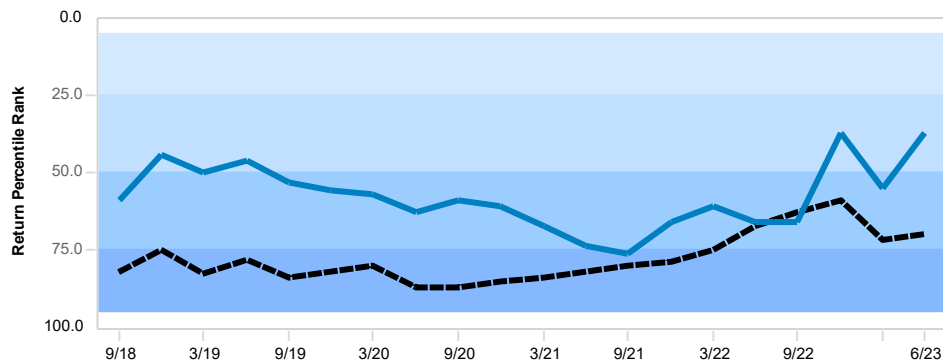
Risk and Return 3 Years



Risk and Return 5 Years

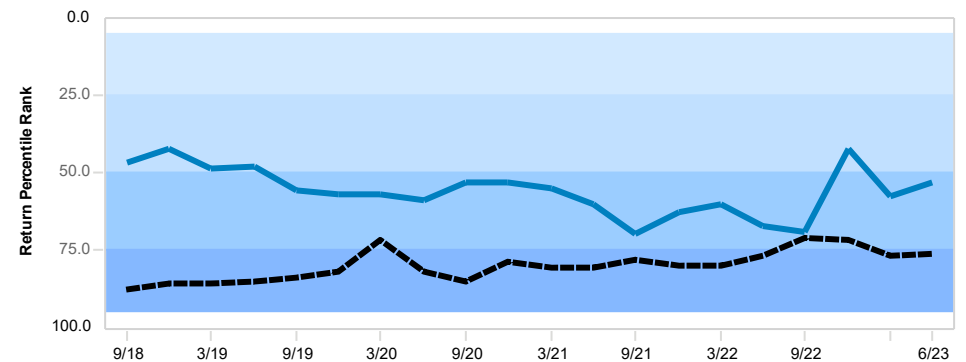


3 Year Rolling Percentile Rank IM U.S. Private Real Estate (SA+CF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	5 (25%)	14 (70%)	1 (5%)
Index	20	0 (0%)	0 (0%)	7 (35%)	13 (65%)

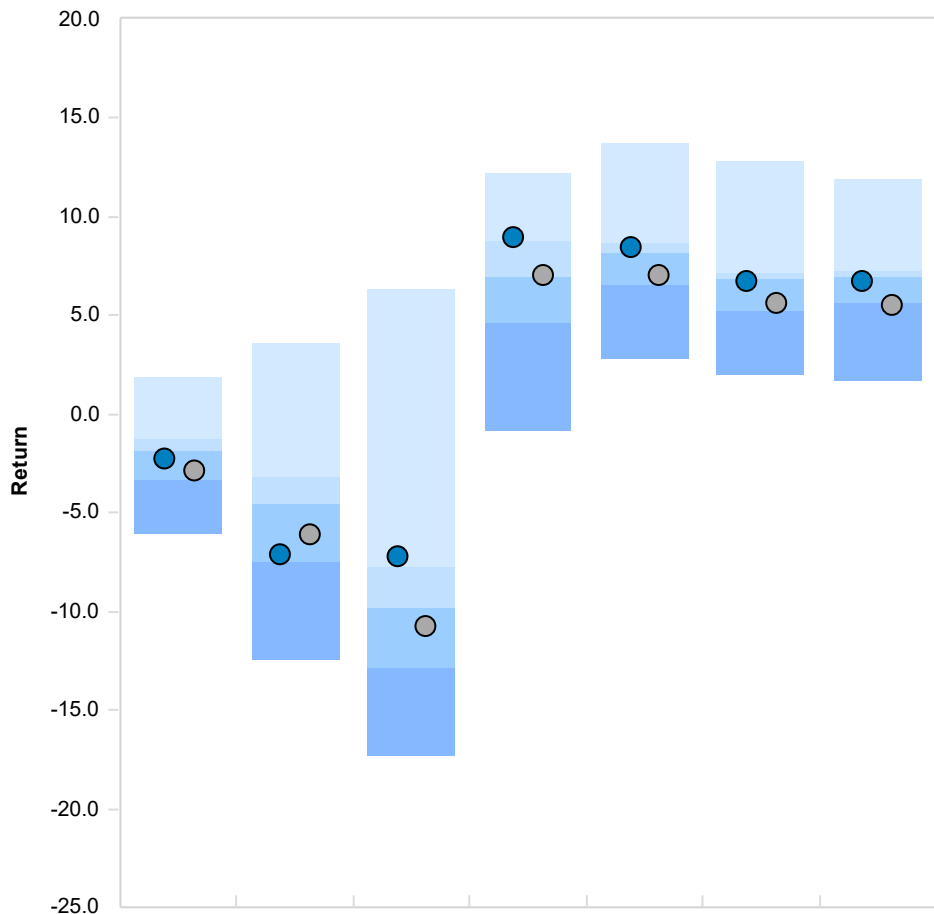
5 Year Rolling Percentile Rank IM U.S. Private Real Estate (SA+CF)



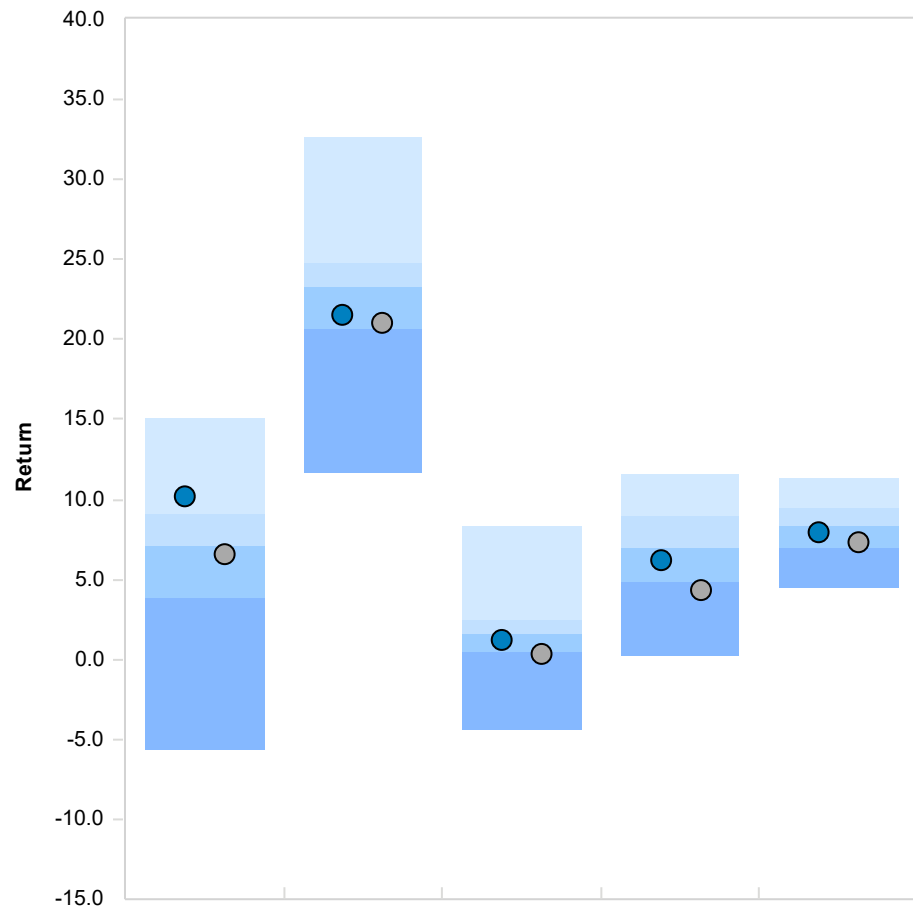
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	5 (25%)	15 (75%)	0 (0%)
Index	20	0 (0%)	0 (0%)	3 (15%)	17 (85%)



Peer Group Analysis - IM U.S. Private Real Estate (SA+CF)



Peer Group Analysis - IM U.S. Private Real Estate (SA+CF)



Comparative Performance

	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022	1 Qtr Ending Mar-2022	1 Qtr Ending Dec-2021
Investment	-5.00 (83)	0.00 (8)	-0.06 (65)	3.04 (76)	7.01 (43)	9.60 (20)
Index	-3.38 (66)	-5.17 (56)	0.31 (59)	4.54 (38)	7.14 (36)	7.66 (44)
Median	-2.98	-4.97	0.60	4.02	6.68	7.58



Private Equity Summary of Partnership
Total Private Equity w Life Settlement Composite
As of June 30, 2023

Private Equity Summary of Partnership

Partnerships	Vintage Year	Capital Commitment \$	Market Value \$
Total Private Equity w Life Settlement Composite		334,900,410	195,327,757
Accolade Partners V	2015	3,000,000	5,199,335
Accolade Partners VI	2018	3,000,000	2,936,831
Adams Street 2003 U.S Fund	2003	13,733,000	181,795
Adams Street 2008 Global	2008	10,000,000	3,481,907
Adams Street 2009 Global	2009	5,000,000	2,492,587
Auldbrass Spec Opps II	2018	4,000,000	4,225,952
Birchmere Ventures IV	2012	525,000	39,460
BlackRock Multi-Alternative Opps	2016	3,000,000	2,116,795
Blackstone Tac Op I	2012	2,000,000	317,544
Blackstone Tac Op II	2015	3,000,000	487,917
Blackstone Tac Op III	2019	5,000,000	4,111,178
CCA Black	2015	7,500,000	6,745,031
CCA Blue	2013	3,800,000	-
CCA Green	2009	15,000,000	-
CCA Longevity Fund VI LP	2019	5,000,000	3,004,698
Commonfund Venture Partners XII	2018	3,000,000	4,830,010
Constitution Ironsides Direct Investment Fund IV	2016	3,000,000	1,874,228
Constitution Ironsides Opportunities Fund	2018	4,000,000	2,269,161
Constitution Ironsides Partnership Fund II	2011	6,000,000	-
Constitution Ironsides Partnership Fund III	2014	8,000,000	4,243,727
Crestline Opportunity Fund III	2016	4,000,000	2,469,912
Crestline Recovery II	2011	3,000,000	51,223
DCM Fund IV	2015	3,000,000	3,426,985
Draper Triangle II	2005	10,000,000	4,551
Draper Triangle III	2013	13,500,000	11,220,134
Emerald Advisors Fin Srv I	2018	2,000,000	1,589,968
Entrust Special Opportunities Fund III	2015	3,000,000	1,135,740
Entrust Special Opportunities Fund IV	2018	3,000,000	2,608,190
Farol Fund II	2020	4,000,000	5,481,083
Five Points III	2017	3,000,000	3,037,247
Glouston Private Equity Opportunities IV	2011	3,000,000	222,036
Goldman Sachs Private Equity Partners 2004	2005	10,000,000	199,948
Greenspring Early Stage I LP	2018	4,000,000	5,564,170
Greenspring Opportunities II-A	2013	3,000,000	2,205,162
Greenspring Opportunities III	2014	3,000,000	2,472,920
Greenspring Opportunities IV	2015	3,000,000	3,386,059
Greenspring Opportunities V	2018	3,000,000	3,650,683
Greenspring Secondaries I	2014	1,000,000	673,133
Greenspring Secondaries II	2016	2,000,000	718,986

Data Sources:
Market Values - BNY Mellon and Investment Managers
Commitments - Asset Strategies



**Private Equity Summary of Partnership
Total Private Equity w Life Settlement Composite
As of June 30, 2023**

Partnerships	Vintage Year	Capital Commitment \$	Market Value \$
iNetworks INOF II	2013	-	6,659,083
iNetworks Opportunity Fund	2013	11,000,000	15,195,150
iNetworks Opportunity Fund II	2020	12,500,000	9,241,019
JMI Equity Fund IX-A	2019	3,000,000	4,498,691
Magarac Ventures	2022	10,000,000	1,600,021
Mellon PAM Fund V	2005	10,000,000	26,477
Mesirow Partners Fund IV	2006	17,000,000	2,432,161
North Haven Capital Partners VI	2015	3,000,000	2,265,150
North Haven Senior Loan Fund	2018	4,000,000	2,622,476
Pharos Capital Partners III	2013	3,000,000	2,157,103
PLSG Accelerator Fund	2011	250,000	47,907
ValStone Partners IV	2008	20,000,000	-
ValStone Partners V	2013	20,000,000	17,085,755
ValStone Partners VI	2017	20,000,000	18,488,175
Valstone Senior Living	2018	13,092,410	14,332,302

*Data Sources:
Market Values - BNY Mellon and Investment Managers
Commitments - Asset Strategies*



Historical Hybrid Composition			
Allocation Mandate	Weight (%)	Allocation Mandate	Weight (%)
Jan-1979			
Russell 3000 Index	65.00		
Blmbg. U.S. Aggregate Index	35.00		
Mar-2007			
FT Wilshire 5000 Total Market TR Index	45.00		
MSCI EAFE (Net) Index	10.00		
Blmbg. U.S. Aggregate Index	25.00		
Bloomberg Commodity Index Total Return	5.00		
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	5.00		
Private Equity Composite	5.00		
90 Day U.S. Treasury Bill	5.00		
Sep-2008			
FT Wilshire 5000 Total Market TR Index	45.00		
MSCI AC World ex USA (Net)	10.00		
Blmbg. U.S. Aggregate Index	25.00		
Bloomberg Commodity Index Total Return	5.00		
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	5.00		
Private Equity Composite	5.00		
90 Day U.S. Treasury Bill	5.00		
Dec-2008			
FT Wilshire 5000 Total Market TR Index	35.00		
MSCI AC World ex USA (Net)	15.00		
Blmbg. U.S. Aggregate Index	20.00		
FTSE High Yield Market Capped Index	5.00		
Bloomberg U.S. TIPS Index	5.00		
Bloomberg Commodity Index Total Return	5.00		
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	7.50		
Private Equity Composite	5.00		
90 Day U.S. Treasury Bill	2.50		
Sep-2009			
FT Wilshire 5000 Total Market TR Index	30.00		
MSCI AC World ex USA (Net)	20.00		
Blmbg. U.S. Aggregate Index	15.00		
FTSE High Yield Market Capped Index	10.00		
Bloomberg U.S. TIPS Index	7.50		
Bloomberg Commodity Index Total Return	2.50		
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	10.00		
Private Equity Composite	5.00		
Jun-2010			
		FT Wilshire 5000 Total Market TR Index	20.00
		MSCI AC World ex USA (Net)	25.00
		Blmbg. U.S. Aggregate Index	14.00
		FTSE High Yield Market Capped Index	10.00
		Bloomberg U.S. TIPS Index	6.00
		Bloomberg Commodity Index Total Return	5.00
		NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	10.00
		Private Equity Composite	10.00
Mar-2013			
		FT Wilshire 5000 Total Market TR Index	16.10
		MSCI AC World ex USA (Net)	18.90
		Blmbg. U.S. Aggregate Index	10.00
		FTSE High Yield Market Capped Index	12.00
		Bloomberg U.S. TIPS Index	5.00
		Bloomberg Commodity Index Total Return	8.00
		NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	10.00
		Private Equity Composite	20.00
Apr-2016			
		FT Wilshire 5000 Total Market TR Index	15.00
		MSCI AC World ex USA (Net)	15.00
		Blmbg. U.S. Aggregate Index	10.00
		FTSE High Yield Market Capped Index	12.00
		Bloomberg U.S. TIPS Index	8.00
		Bloomberg Commodity Index Total Return	2.50
		NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	10.00
		Private Equity Composite	22.50
		Alerian MLP Index	5.00
Jan-2019			
		FT Wilshire 5000 Total Market TR Index	16.50
		MSCI AC World ex USA (Net)	16.50
		Blmbg. U.S. Aggregate Index	12.50
		FTSE High Yield Market Capped Index	12.00
		Bloomberg U.S. TIPS Index	5.00
		NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	12.50
		Private Equity Composite	20.00
		Alerian MLP Index	5.00



Allocation Mandate	Weight (%)
Mar-2021	
Russell 3000 Index	16.50
MSCI AC World ex USA (Net)	16.50
Blmbg. U.S. Aggregate Index	12.50
FTSE High Yield Market Capped Index	12.00
Bloomberg U.S. TIPS Index	5.00
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	12.50
Liquid Policy Benchmark	5.00
Total Private Equity w Life Settlement Composite	20.00
Jul-2022	
Russell 3000 Index	16.50
MSCI AC World ex USA (Net)	16.50
Blmbg. U.S. Aggregate Index	12.50
FTSE High Yield Market Capped Index	12.00
CPI + 3%	5.00
NCREIF Fund Index-Open End Diversified Core Equity (VW) (Net) Monthly	12.50
Liquid Policy Benchmark	5.00
Total Private Equity w Life Settlement Composite	20.00



Historical Hybrid Composition

Allocation Mandate

Weight (%)

Nov-1993

FT Wilshire 5000 Total Market TR Index

100.00

Mar-2021

Russell 3000 Index

100.00



Historical Hybrid Composition

Allocation Mandate	Weight (%)
Dec-2000	
MSCI EAFE (Net) Index	100.00
Sep-2008	
MSCI AC World ex USA (Net)	100.00
Mar-2015	
MSCI AC World ex USA IMI (Net)	100.00
Mar-2021	
MSCI AC World ex USA (Net)	100.00



Historical Hybrid Composition

Allocation Mandate

Weight (%)

Mar-2021

S&P 500 Index	30.00
S&P MidCap 400 Index	2.00
S&P SmallCap 600 Index	10.50
MSCI EAFE IMI (Net)	16.90
MSCI Emerging Markets IMI (Net)	6.10
Blmbg. U.S. Aggregate Index	25.00
ICE BofAML 1-3 Year Treasury	4.50
FTSE NAREIT Equity REIT Index	5.00



	Estimated Annual Fee (%)	Market Value (\$)	Estimated Annual Fee (\$)	Fee Schedule
Domestic Equity				
SSgA S&P 500 Index	0.02	76,668,718	15,334	0.02 % of Assets
Fragasso Large Core (EMWO)	0.61	6,514,854	39,699	1.00 % of First \$0 M 0.95 % of Next \$0 M 0.75 % of Next \$1 M 0.65 % of Next \$2 M 0.55 % of Next \$3 M 0.50 % of Next \$3 M 0.25 % of Next \$3 M 0.20 % Thereafter
Twin Capital Enhanced Equity	0.35	39,172,552	137,104	0.35 % of Assets
Vesper U.S. Large Cap Short-Term Reversal Strategy ETF (UTRN) (EMWO)	0.75	1,011,859	7,589	0.75 % of Assets
Earnest Small Value	0.92	14,402,333	133,018	1.00 % of First \$10 M 0.75 % of Next \$15 M 0.60 % of Next \$25 M 0.50 % Thereafter
Emerald Advisors Small Cap	0.74	13,808,919	102,854	1.00 % of First \$2 M 0.75 % of Next \$8 M 0.60 % Thereafter
Emerald Advisors All Cap (EMWO)	0.60	6,159,383	36,956	0.60 % of Assets
Ethos (EMWO)	0.47	1,779,982	8,366	0.47 % of Assets
CIM Small Cap (EMWO)	0.73	5,226,265	38,405	0.75 % of First \$5 M 0.40 % of Next \$10 M 0.25 % Thereafter
Cookson Peirce (EMWO)	0.50	1,360,917	6,805	0.50 % of Assets
International Equity				
SSgA ACWI ex US	0.07	36,485,530	25,540	0.07 % of Assets
Baillie Gifford Intl Equity	0.61	57,818,555	352,693	0.61 % of Assets
FIAM Select International Equity	0.33	30,847,483	100,788	0.34 % of First \$25 M 0.27 % of Next \$25 M 0.24 % of Next \$150 M 0.20 % Thereafter
Segall, Bryant & Hamill	0.64	34,320,062	218,760	0.75 % of First \$15 M 0.55 % of Next \$20 M 0.45 % of Next \$30 M 0.35 % Thereafter

Fee information on this page is an illustrative estimate of management fees based on current reported portfolio values. Fee estimates do not reflect actual calculation methodologies or applicable carried interest.



	Estimated Annual Fee (%)	Market Value (\$)	Estimated Annual Fee (\$)	Fee Schedule
Core Fixed w Israel Bonds				
C S McKee	0.25	34,368,823	85,922	0.25 % of Assets
Federated Core Broad	0.30	27,170,913	80,427	0.30 % of First \$25 M 0.25 % of Next \$25 M 0.20 % Thereafter
CIM Investment Mgmt	0.25	27,053,613	67,634	0.25 % of Assets
StoneRidge Partners (EMWO)	0.30	5,118,349	15,355	0.30 % of Assets
Gridiron Capital Fixed Income	0.65	13,281,285	86,328	0.65 % of Assets
FNB (EMWO)	0.35	2,651,005	9,279	0.35 % of First \$5 M 0.30 % of Next \$5 M 0.25 % of Next \$10 M 0.20 % Thereafter
Israel Bonds	0.20	7,520,136	15,040	0.20 % of Assets
High Yield Fixed				
Oaktree High Yield	0.50	55,836,105	279,181	0.50 % of Assets
Federated High Yield	0.45	51,775,709	232,991	0.45 % of Assets
Sound Point	1.00	3,520,110	35,201	1.00 % of Assets
Real Estate				
Morgan Stanley Prime Property Fund	0.84	81,949,355	688,375	0.84 % of Assets
Oaktree Real Estate^	2.93	4,887,273	143,197	2.93 % of Assets
Washington Alliance (EMWO)	1.50	13,211,365	198,170	1.50 % of Assets
Washington Alliance II (EMWO)	1.50	2,094,365	31,415	1.50 % of Assets
Siguler Guff Distressed RE^	1.15	6,091,672	70,054	1.15 % of Assets
Artemis Real Estate Partners Fund IV	1.50	471,798	7,077	1.50 % of Assets
ERECT Fund II	1.35	10,537,135	142,251	1.35 % of Assets
Infrastructure				
JP Morgan Infrastructure Fund (IIF Hedged)	1.00	26,394,147	263,941	1.00 % of Assets
IFM Global Infrastructure LP	0.77	26,290,190	202,434	0.77 % of Assets
Hedge Fund				
Gridiron Capital Multi-Asset (EMWO)	0.75	3,361,656	25,212	Performance Based 0.75 and 10.00
Liquid Policy Portfolio				
BlackRock Liquidity iShares Public Pension Fund*	0.08	2,112,549	1,690	0.08 % of Assets
Investments ex Private Equity		678,118,829	3,431,634	

^ Due to limitations in reporting as a result of the variable and commitment based fee structure, AndCo calculated an approximation for this noted fee schedule. This figure demonstrates the "effective" basis point charge, computed based on the most recently available assessed quarterly fee + expenses, divided by the ending market value. The actual fee schedule can be found in Appendix A.

* Estimated fee based on average of underlying funds

Fee information on this page is an illustrative estimate of management fees based on current reported portfolio values. Fee estimates do not reflect actual calculation methodologies or applicable carried interest.



Allegheny County Employees' Retirement System
2020 Private Investment Management Fee Summary
June 30, 2021

****All fee information provided by Asset Strategies**

	Commitment Amount \$	2020 Mgmt Fees \$
Total Private Equity w Life Settlement Composite	324,900,410.00	2,674,986.40
Accolade Partners V	3,000,000.00	15,369.00
Accolade Partners VI	3,000,000.00	-
Adams Street 2003 U.S. Fund	13,733,000.00	-
Adams Street 2008 Global	10,000,000.00	41,884.00
Adams Street 2009 Global	5,000,000.00	26,463.00
Auldbrass Spec Opps II	4,000,000.00	50,000.00
Birchmere Ventures IV	525,000.00	3,800.00
Blackrock Multi-Alternative Opps	3,000,000.00	14,252.70
Blackstone Tac Op I	2,000,000.00	9,960.00
Blackstone Tac Op II	3,000,000.00	21,306.00
Blackstone Tac Op III	5,000,000.00	72,708.00
CCA Black	7,500,000.00	166,543.00
CCA Blue	3,800,000.00	51,149.00
CCA Green	15,000,000.00	(186,372.00)
CCA Longevity Fund VI LP	5,000,000.00	62,500.00
Commonfund Venture Partners XII*	3,000,000.00	21,000.00
Constitution Ironsides Direct Investment Fund IV	3,000,000.00	13,351.78
Constitution Ironsides Opportunities Fund	4,000,000.00	-
Constitution Ironsides Partnership Fund II	6,000,000.00	-
Constitution Ironsides Partnership Fund III	8,000,000.00	32,794.03
Crestline Opportunity Fund III	4,000,000.00	45,703.59
Crestline Recovery II	3,000,000.00	2,455.00
DCM Fund IV	3,000,000.00	19,853.00
Draper Triangle II	10,000,000.00	-
Draper Triangle III	13,500,000.00	209,629.00
Emerald Advisors Fin Srv I	2,000,000.00	30,000.00
Entrust Special Opportunities Fund III	3,000,000.00	16,835.00
Entrust Special Opportunities Fund IV	3,000,000.00	30,670.00
Farol Fund II	4,000,000.00	91,632.71
Five Points III	3,000,000.00	30,000.00
Glouston Private Equity Opportunities IV	3,000,000.00	16,410.59
Goldman Sachs Private Equity Partners 2004	10,000,000.00	5,179.00
Greenspring Early Stage I LP	4,000,000.00	9,868.00
Greenspring Opportunities II-A	3,000,000.00	58,200.00
Greenspring Opportunities III	3,000,000.00	54,106.00
Greenspring Opportunities IV	3,000,000.00	54,723.00
Greenspring Opportunities V	3,000,000.00	50,961.00
Greenspring Secondaries I	1,000,000.00	7,500.00
Greenspring Secondaries II	2,000,000.00	1,500.00



****All fee information provided by Asset Strategies**

	Commitment Amount \$	2020 Mgmt Fees \$
iNetworks INOF II	-	89,932.00
iNetworks Opportunity Fund	11,000,000.00	178,200.00
iNetworks Opportunity Fund II	12,500,000.00	250,000.00
JMI Equity Fund IX-A	3,000,000.00	36,522.00
Mellon PAM Fund V	10,000,000.00	25,000.00
Mesirow Partners Fund IV	17,000,000.00	78,860.00
North Haven Capital Partners VI	3,000,000.00	48,574.00
North Haven Senior Loan Fund	4,000,000.00	30,551.00
Pharos Capital Partners III	3,000,000.00	37,136.00
PLSG Accelerator Fund	250,000.00	-
Valstone Partners IV	20,000,000.00	-
Valstone Partners V	20,000,000.00	300,000.00
Valstone Partners VI	20,000,000.00	300,000.00
Valstone Senior Living	13,092,410.00	148,277.00

**Commonfund Ven XII management fees for 2020 estimate based on Committed Amount and fee percent outlined in fund documents*



Oaktree Real Estate Opportunities VI LP Fee Calculation

The annual Management Fee shall be an amount equal to the sum of the amounts determined with respect to each Limited Partner as follows: (a) prior to the end of the Investment Period, the product of the Management Fee Percentage attributable to such Limited Partner's Capital Commitment and the Capital Commitment of such Limited Partner and (b) from and after the day following the end of the Investment Period, the product of the Management Fee Percentage attributable to such Limited Partner's Capital Commitment and the lesser of (i) such Limited Partner's allocable portion of the Aggregate Contributed Capital and (ii) such Limited Partner's allocable portion of the cost basis of the Permitted Investments held by the Fund as of the end of the next-to-last month of the immediately preceding calendar quarter.

Siguler Guff Distressed Real Estate Opportunities Fund II, LP Fee Calculation

A management fee shall be payable with respect to each Limited Partner by the Partnership to the Investment Manager (the "Management Fee") quarterly in arrears on the last day of each fiscal quarter. Up to and including the end of the Direct Investment Commitment Period or, if earlier, the date on which pursuant to Section 7.03(b) the Partners and Parallel Company Partners have voted to require the General Partner to cease making both Direct Investments and additional commitments to Funds (the "Investment Termination Date"), the Management Fee, for each Limited Partner, shall be payable at that Limited Partner's Blended Rate multiplied by the aggregate amount of such Limited Partner's Capital Commitment. From and after the end of the Direct Investment Commitment Period or, if earlier, the Investment Termination Date, the Management Fee, for each Limited Partner, shall be payable at that Limited Partner's Applicable Percentage (as hereinafter defined) per annum multiplied by the aggregate amount of such Limited Partner's Capital Commitment. The "Blended Rate" shall be a percentage of a Limited Partner's Capital Commitment calculated by combining (x) one percent (1%) per annum on the first \$10,000,000 of such Limited Partner's Capital Commitment, (y) eighty-five one hundredths of one percent (0.85%) per annum on the next \$40,000,000 of such Limited Partner's Capital Commitment and (z) five tenths of one percent (0.50%) per annum on such Limited Partner's remaining Capital Commitment. The "Applicable Percentage" shall represent an amount equal to eighty percent (80%) of the Blended Rate used to calculate the Management Fee for the preceding year. For example, in the first year following the termination of the Direct Investment Commitment Period or the Investment Termination Date, as the case may be, the Applicable Percentage with respect to Limited Partners with Capital Commitments less than or equal to \$10,000,000 (and therefore with Blended Rates of 1%) shall be 0.80% (80% of 1%), and for the following year, the Applicable Percentage shall be 0.64% (80% of 0.80%).



Active Return	- Arithmetic difference between the manager's performance and the designated benchmark return over a specified time period.
Alpha	- A measure of the difference between a portfolio's actual performance and its expected return based on its level of risk as determined by beta. It determines the portfolio's non-systemic return, or its historical performance not explained by movements of the market.
Beta	- A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of the portfolio's systematic risk.
Consistency	- The percentage of quarters that a product achieved a rate of return higher than that of its benchmark. Higher consistency indicates the manager has contributed more to the product's performance.
Distributed to Paid In (DPI)	- The ratio of money distributed to Limited Partners by the fund, relative to contributions. It is calculated by dividing cumulative distributions by paid in capital. This multiple shows the investor how much money they got back. It is a good measure for evaluating a fund later in its life because there are more distributions to measure against.
Down Market Capture	- The ratio of average portfolio performance over the designated benchmark during periods of negative returns. A lower value indicates better product performance
Downside Risk	- A measure similar to standard deviation that utilizes only the negative movements of the return series. It is calculated by taking the standard deviation of the negative quarterly set of returns. A higher factor is indicative of a riskier product.
Excess Return	- Arithmetic difference between the manager's performance and the risk-free return over a specified time period.
Excess Risk	- A measure of the standard deviation of a portfolio's performance relative to the risk free return.
Information Ratio	- This calculates the value-added contribution of the manager and is derived by dividing the active rate of return of the portfolio by the tracking error. The higher the Information Ratio, the more the manager has added value to the portfolio.
Public Market Equivalent (PME)	- Designs a set of analyses used in the Private Equity Industry to evaluate the performance of a Private Equity Fund against a public benchmark or index.
R-Squared	- The percentage of a portfolio's performance that can be explained by the behavior of the appropriate benchmark. A high R-Squared means the portfolio's performance has historically moved in the same direction as the appropriate benchmark.
Return	- Compounded rate of return for the period.
Sharpe Ratio	- Represents the excess rate of return over the risk free return divided by the standard deviation of the excess return. The result is an absolute rate of return per unit of risk. A higher value demonstrates better historical risk-adjusted performance.
Standard Deviation	- A statistical measure of the range of a portfolio's performance. It represents the variability of returns around the average return over a specified time period.
Total Value to Paid In (TVPI)	- The ratio of the current value of remaining investments within a fund, plus the total value of all distributions to date, relative to the total amount of capital paid into the fund to date. It is a good measure of performance before the end of a fund's life
Tracking Error	- This is a measure of the standard deviation of a portfolio's returns in relation to the performance of its designated market benchmark.
Treynor Ratio	- Similar to Sharpe ratio but utilizes beta rather than excess risk as determined by standard deviation. It is calculated by taking the excess rate of return above the risk free rate divided by beta to derive the absolute rate of return per unit of risk. A higher value indicates a product has achieved better historical risk-adjusted performance.
Up Market Capture	- The ratio of average portfolio performance over the designated benchmark during periods of positive returns. A higher value indicates better product performance.



AndCo compiled this report for the sole use of the client for which it was prepared. AndCo is responsible for evaluating the performance results of the Total Fund along with the investment advisors by comparing their performance with indices and other related peer universe data that is deemed appropriate. AndCo uses the results from this evaluation to make observations and recommendations to the client.

AndCo uses time-weighted calculations which are founded on standards recommended by the CFA Institute. The calculations and values shown are based on information that is received from custodians. AndCo analyzes transactions as indicated on the custodian statements and reviews the custodial market values of the portfolio. As a result, this provides AndCo with a reasonable basis that the investment information presented is free from material misstatement. This methodology of evaluating and measuring performance provides AndCo with a practical foundation for our observations and recommendations. Nothing came to our attention that would cause AndCo to believe that the information presented is significantly misstated.

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