

Investment Performance Review  
Period Ending December 31, 2023

# Erie County Employees Retirement Plan

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On behalf of the entire AndCo team, thank you for the opportunity to serve you this past year and for the trust you have placed in us. We take our role as your consultant and trusted advisor seriously and will continue working hard to maintain your confidence.

Looking back at the year, we would like to provide a brief update on where we stand as a firm. 2023 marked the 23rd straight year of growth for the firm and we advise on approximately \$100 billion in client assets as of year-end. We won our second consecutive Greenwich Quality Leader Award based on feedback from our valued clients. Thank you! We continued to reinvest 100% of our net profits back into the organization so we can continue to evolve and adapt within a market environment that is constantly changing and challenging. As we have stated in previous updates, we do not believe the “status quo” is an effective strategy and we are convicted in our belief that a firm not focused on moving forward in our industry is moving backward.

To execute on our commitment to evolve and continue to enhance the organization, we made significant investments in technology during 2023 to embrace digital transformation. We also continued to invest in our proprietary software system to compile and share information firmwide to better serve our clients. We conducted an internal employee survey and received valuable feedback from team members that reinforced what is working and helped us put together action plans to address areas of opportunity to continue to invest in, and understand, our most important asset - our people. We believe this effort helps drive our differentiated culture.

At the beginning of each year, we also discuss the AndCo partnership and, when earned, announce new partners. This year I am thrilled to share five new team members were named partners at AndCo – Joe Carter, Tony Kay, Sara Searle, John Rodak, and Kevin Laake. Joe has been with the firm since 2017 and has held many roles. Most recently he has been in our Performance Reporting department with an eye on transitioning to our Consulting Department. Tony has been with our firm for 8 years and is a

valuable member of the Consulting Department. Sara Searle has been with the company for almost 6 years and is our Chief Compliance Officer. John Rodak has been with the firm for 13 years and has operated within many functional areas and service departments over the years. He currently resides in our Solutions & Growth function. Finally, Kevin has been with the firm for 7 years and operates within our Research Department, covering both public and private equity over his tenure. We could not be happier for the new partners of AndCo or more grateful for the contributions they have made to AndCo since joining the firm. Joe, Tony, Sara, John, and Kevin represent what it means to be an AndCo team member, and we are honored and fortunate to have them as partners at our firm.

The big news for 2024 is that AndCo will be joining Mariner as their new institutional advisory platform. We believe joining forces with Mariner will allow us to better serve our clients going forward and leverage a robust corporate infrastructure so we can continuously focus on a clients first approach.

In closing, while the name AndCo will soon be Mariner Institutional, what won't change is our commitment to you and driving decisions by first asking “how will this impact our clients?” We strongly believe we have found a partner that shares our client-first focus, and we look forward to leveraging our combined expertise to enhance your overall client experience. On the wall at Mariner's headquarters, just like at AndCo's, it proudly says “Clients First.”

Thank you again for your valued partnership and the opportunity to serve you. Happy New Year!



Mike Welker, CFA®  
CEO



# Organization Chart

## Partnership

Mike Welker, CFA®	Jason Purdy	Steve Gordon
Brian Green	Joe Carter, CPFA	Tony Kay
Brooke Wilson, CIPM®	John Rodak, CIPM®	Troy Brown, CFA®
Bryan Bakardjiev, CFA®	Jon Breth, CFP®	Tyler Grumbles, CFA®, CIPM®, CAIA®
Dan Johnson	Kerry Richardville, CFA®	
Dan Osika, CFA®	Kevin Laake, CFA®, CAIA®	
Evan Scussel, CFA®, CAIA®	Kim Spurlin, CPA	
Jacob Peacock, CPFA	Sara Searle	

## Leadership & Management

Mike Welker, CFA® CEO	Steve Gordon Solutions & Growth Director	Jacob Peacock, CPFA® Consulting Director
Bryan Bakardjiev, CFA® COO	Troy Brown, CFA® Executive Director of Consulting	Jason Purdy I.T. Director
Evan Scussel, CFA®, CAIA® Executive Director of Research	Brooke Wilson, CIPM® Executive Director of Performance Reporting	Molly Halcom Solutions & Growth Director
Kim Spurlin, CPA CFO	Dan Johnson Consulting Director	Rachel Brignoni, MHR People & Culture Director
Sara Searle CCO	Jack Evatt Consulting Director	
Stacie Runion CHRO		

## Investment Policy Committee

Bryan Bakardjiev, CFA®	Sara Searle
Evan Scussel, CFA®, CAIA®	Troy Brown, CFA®
Mike Welker, CFA®	Brooke Wilson, CIPM®

## Consulting

Annette Bidart	Chris Kuhn, CFA®, CAIA®	Gwelda Swilley	Jennifer Brozstek	CPFA	Kerry Richardville, CFA®	Mike Bostler	Tim Walters
Brad Hess, CFA®, CPFA	Christiaan Brokaw, CFA®	Ian Jones	Jennifer Gainfort, CFA®, CPFA	Jon Breth, CFP®	Mary Nye	Oleg Sydyak, CFA®, FSA, EA	Tony Kay
Brendon Vavrica, CFP®	Dave West, CFA®	James Ross	John Mellinger	Jorge Friguls, CPFA	Michael Fleiner	Paul Murray, CPFA	Tyler Grumbles, CFA®, CIPM®, CAIA®
Brian Green	Doug Anderson, CPFA	Jeff Kuchta, CFA®, CPFA	John Thinnis, CFA®, CAIA®,	Justin Lauver, Esq.	Michael Holycross	Peter Brown	

## Research

Abigail Torres Research Operations	David Julier Real Estate & Real Assets	Julie Baker, CFA®, CAIA® Public & Private Equity	Xinxin Liu, CFA®, CAIA®, FRM Private Equity & Private Debt
Andrew Mulhall, CFA® Public Equity & Fixed Income	Elizabeth Wolfe Public & Private Equity	Justin Ellsesser, CFA®, CAIA® Private Equity	Zac Chichinski, CFA®, CIPM® Public Equity
Ben Baldridge, CFA®, CAIA® Private & Hedged Fixed Income	Evan Scussel, CFA®, CAIA® Public & Private Equity	Kevin Laake, CFA®, CAIA® Private Equity	
Dan Lomelino, CFA® Fixed Income	Josue Christiansen, CFA®, CIPM® Public Equity	Michael Kosoff Hedge Funds	

## Performance Reporting

Albert Sauerland	Don Delaney	Jeff Pruniski
Alexandre Samuel	Donnell Lehrer, CPFA	Joe Carter, CPFA
Amy Steele	Edward Cha	Kim Hummel
Andrew Easton	Grace Niebrzydowski	Rotchild Dorson
Bob Bulas	James Culpepper	
David Gough, CPFA	James Reno	

## Operations

<b>Finance</b>	<b>Human Resources</b>	<b>IT &amp; Operations</b>	<b>Compliance</b>	<b>Marketing</b>	<b>Solutions &amp; Growth</b>
Michelle Boff	Kelly Pearce	Jerry Camel	Thay Arroyo	Linden Landry-Jennings	Dan Osika, CFA®
Robert Marquetti		Kenneth Day	Joseph Ivaszuk	Shelley Berthold	John Rodak, CIPM®
		Marcos Ferrer		Tara Redding	Jonathan Branch
					Patrick Perez

89 Employees

9 CAIA®

37 Advanced Degrees

12 CPFA

24 CFA®

5 CIPM®

## 4th Quarter 2023 Market Environment



## The Economy

- The US Federal Reserve Bank (the Fed) paused on additional rate hikes during the fourth quarter. As evidenced by capital market performance during the quarter, the pause was welcomed by participants. The Fed continued to prioritize fighting higher inflation over full employment. In its press release for the December meeting, the Fed said that in determining the extent of any additional policy firming that may be appropriate to return inflation to 2 percent over time, the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments. They also indicated the Committee will continue to reduce the holdings on its balance sheet.
- The Fed's prolonged pause in its rate-hiking cycle and the insertion of the word "any" in its December press release gave the market hope that the Fed may be ready to pivot in its stance and begin reducing rates to a less restrictive level in 2024.
- Muted growth in the US labor market continued in December, as nonfarm payrolls increased by 216,000, and unemployment held steady at 3.7%. Unemployment was little changed over the last year, closing 2022 at a level of 3.5%.

## Equity (Domestic and International)

- US equities moved broadly higher during the fourth quarter, led by a broad recovery across multiple sectors and expectations of a more favorable interest rate environment. The S&P 500 Index rose 11.7% for the quarter, its best-performing period since the first quarter of 2021. Small-cap value (15.3%) was the best-performing segment of the domestic equity market during the quarter, while large-cap value (9.5%), though solid, was the weakest relative performer for the period.
- International stocks experienced robust growth during the year, helped by a weakening US Dollar (USD). USD performance outpaced local currency (LCL) performance in most regions for the quarter, though both benchmarks were positive as the USD traded lower during the period.
- Global GDP growth continued to face challenges despite falling energy prices. European growth remained under pressure amid hawkish central bank policies. China continued to face economic challenges and drag on growth in the region. Additionally, renewed conflicts in the Middle East weighed on performance for the region and threatened to be a headwind going into 2024.

## Fixed Income

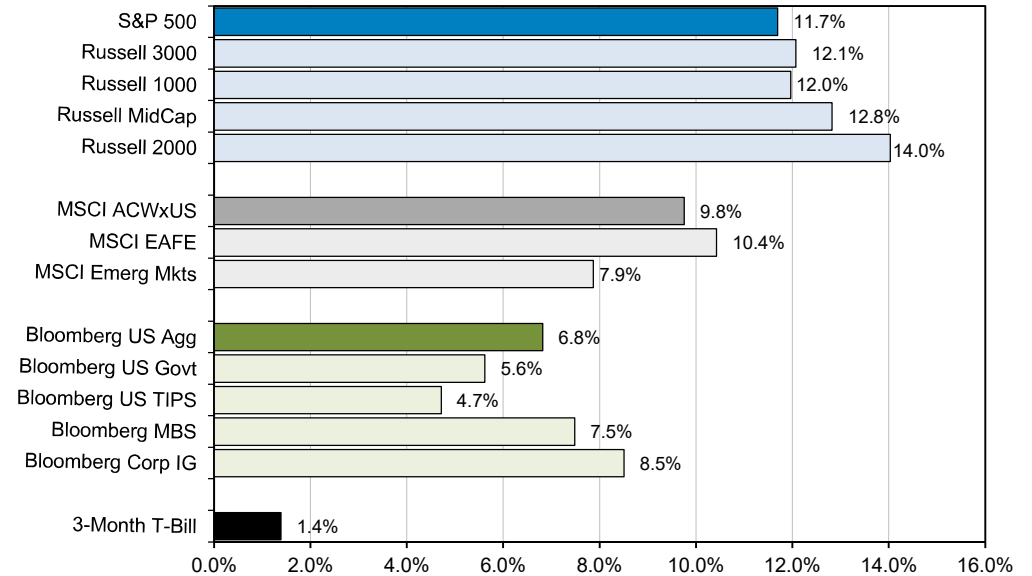
- While economic data signaled that inflation continued to moderate, the Fed maintained its conviction in fighting inflation by keeping the fed funds rate unchanged during the quarter. Equity and fixed-income markets rallied on the hope that this could signal a pivot in the Fed's policy stance in 2024.
- US Government securities were the lowest relative performing US Aggregate Bond sector during the quarter, but bond returns surged as longer maturity yields fell significantly. Credit spreads also narrowed during the quarter, lifting performance for non-government sectors.
- Lower quality investment grade corporate bonds outperformed higher quality corporate issues, aided by narrowing credit spreads as well as higher coupons. Although the high yield bond benchmark's duration is almost half of the US Aggregate Bond index's duration, the high yield index managed to edge out the bellwether bond benchmark for the quarter.
- Global bonds outpaced the domestic bond market with the Global Aggregate ex-US Index besting the US Aggregate Index by 2.4% due to USD weakness. This brought results for the full year slightly ahead of the domestic bond market.

## Market Themes

- Central banks remained vigilant in their stance against inflation going into the new year. Signs of cooling price pressures have shown up in most regions around the world, and many central banks have chosen to pause on their rate hiking cycle, much in line with the US Fed's stance.
- Geopolitical risk around the world continues to be a headwind for global growth and economic stability. In addition to the conflict in Ukraine, a proxy war arose in the Middle East in October between Israel and Palestine, which could drag on performance in the region in quarters to come.
- Short-term interest rates remained consistent across most developed markets as central banks continued their tight policy stance with an eye towards potential rate cuts in the indeterminate future.
- 2023 closed with both US and international equity markets affirming their recovery from the disappointing performance of 2022. Growth sectors significantly outpaced value sectors during the year.

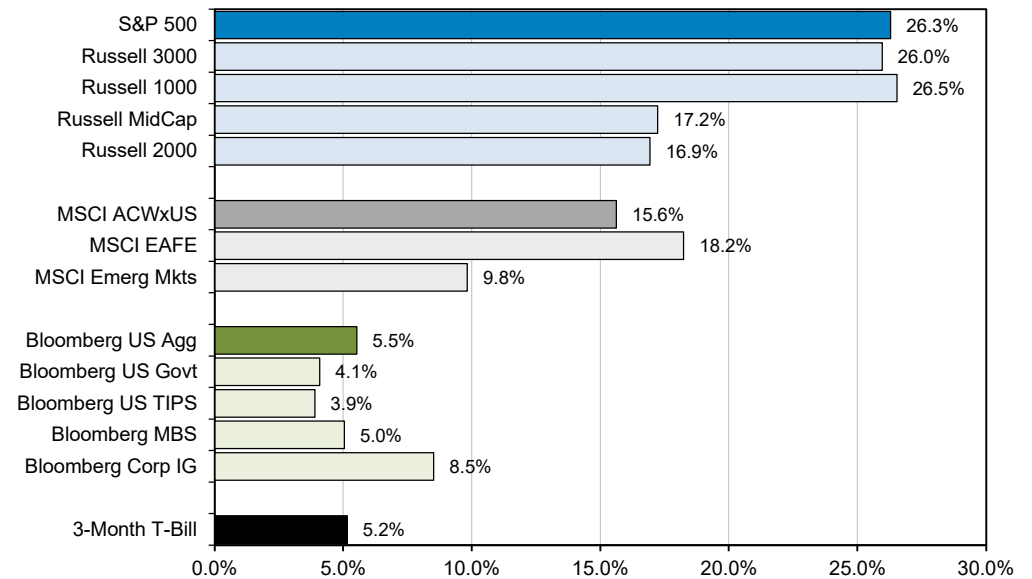
- Domestic equity market performance surged in the fourth quarter. Many of the challenges facing the U.S. economy over the past several quarters have begun to wane and forecasts for easing inflation and positive economic growth have been a growing consensus. For the period, the S&P 500 large-cap benchmark returned 11.7% versus 12.8% for the Russell Mid Cap Index and 14.0% for the Russell 2000 small-cap index.
- International developed and emerging market equities also delivered strong results. Europe continued to face geopolitical risks related to the conflict in Ukraine and elevated interest rates. The developed market MSCI EAFE Index returned 10.4% for the quarter and the MSCI Emerging Markets Index rose by 7.9%.
- The domestic bond market rallied during the final two months of the year as the Fed took on a more dovish tone at their recent meetings. The Bloomberg US Aggregate Index returned 6.8% for the period, while investment-grade corporate bonds beat out the government and securitized sectors with a gain of 8.5%.

Quarter Performance



- During the 2023 calendar year, US equity markets posted their strongest performance since 2021. The large-cap S&P 500 Index finished 2023 with an exceptional 26.3% return. The weakest relative performance for the year was from the Russell 2000 Index, which still climbed 16.9%.
- International markets also reverted from their poor performance of the year prior. The MSCI EAFE Index was the best international index performer, returning 18.2%, while the MSCI Emerging Markets Index added a more tempered, but still solid, 9.8%.
- Bond markets were broadly higher for the year. Investment-grade corporate bonds were the best-performing sector of the US Aggregate Index and gained 8.5% for the year. Treasuries lagged at 4.1% during the year but were still a welcome relief from 2022's negative bond market results. The bellwether fixed-income benchmark, the Bloomberg US Aggregate Index, climbed 5.5% in 2023.

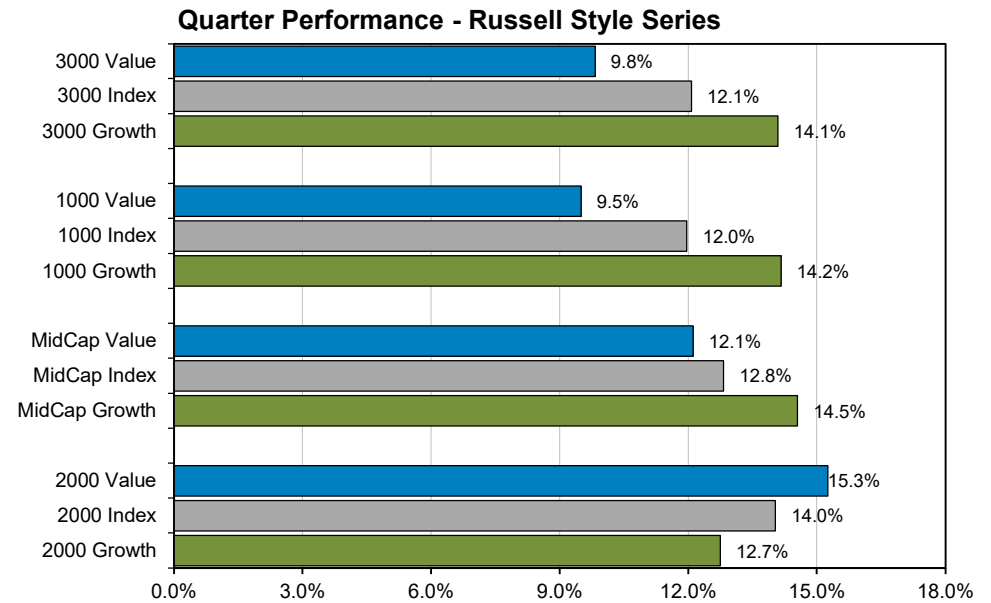
1-Year Performance



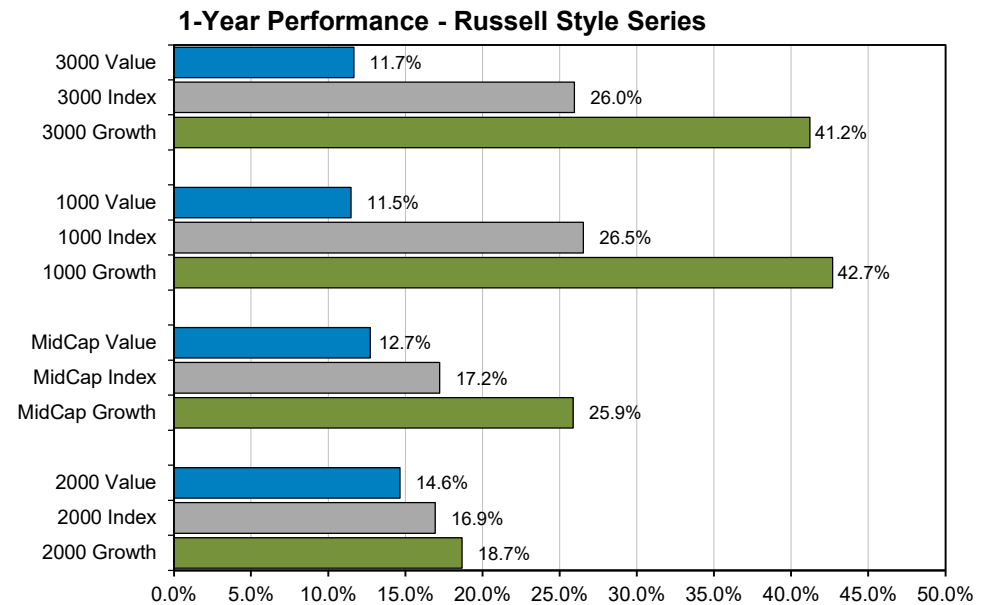
Source: Investment Metrics



- After softening in the third quarter, core domestic equity benchmarks finished 2023 on a strong note. Increasing optimism regarding taming inflation and future economic growth were the primary factors driving performance during the quarter. While the global economy still faces geopolitical risk in the Middle East and Eastern Europe, the US economy remains resilient heading into 2024. The small-cap Russell 2000 Index (14.0%) led results this quarter among the core capitalization-based benchmarks, besting both the mid-cap (12.8%) and large-cap (12.0%) indices. Growth was favored over value across the broad market as the Russell 3000 Growth Index outpaced its value counterpart by 4.3%. However, among small-cap stocks, value led the way with the Russell 2000 Value Index returning 15.3%. The Russell 2000 Growth Index was not far behind, gaining 12.7% for the quarter.
- Outside of small cap, growth stocks broadly outperformed their value counterparts by a sizable margin for the quarter. This continued a persistent theme for 2023 of growth-based benchmark outperformance. Despite these differentials, the large-, mid-, and small-cap value benchmarks each posted solid performance for the quarter with the Russell 2000 Value Index posting a chart-leading return of 15.3%.



- The broad rally in domestic equity markets during the fourth quarter contributed to a strong year of index results. Within large-cap stocks, the Russell 1000 Growth Index returned an exceptional 42.7% for the year, leading the way among style and market capitalization-based benchmark results. The lowest relative performing equity index was the Russell 1000 Value, but still posted a double-digit return of 11.5% for the year.
- Growth rebounded during 2023 and led value-based benchmarks at all market capitalization ranges for the year. The Russell 2000 Growth Index returned 18.7%, outpacing the Russell 2000 Value Index's 14.6% return by a span of 4.1%. The Russell 1000 Growth and Russell Midcap Growth benchmarks gained 42.7% and 25.9%, respectively, while their corresponding value index counterparts returned solid, but lagging, performance of 11.5% and 12.7%, respectively.

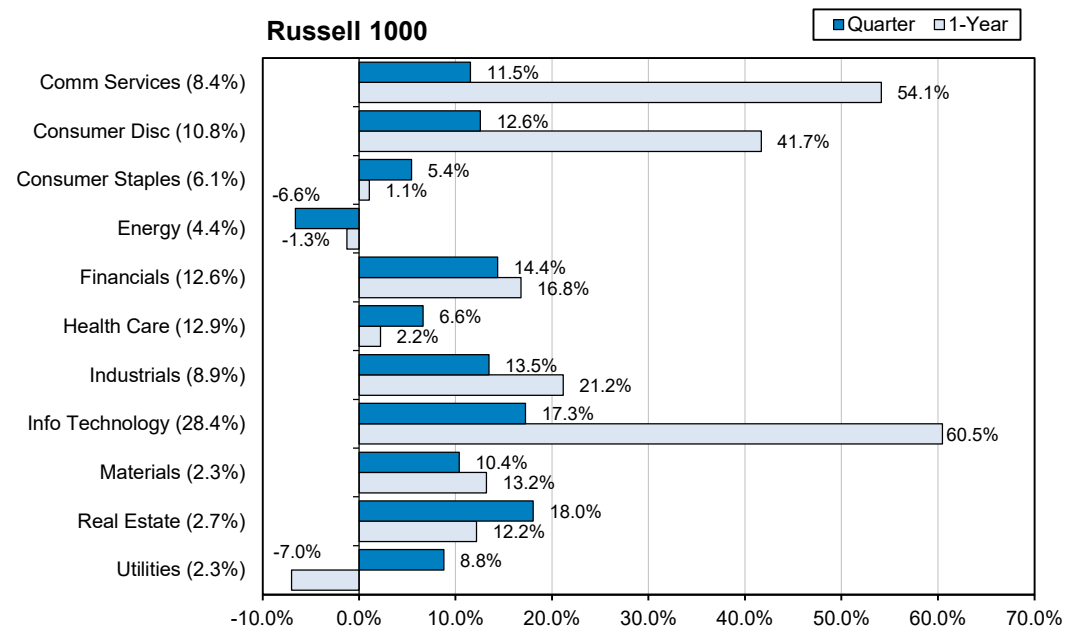


Source: Investment Metrics



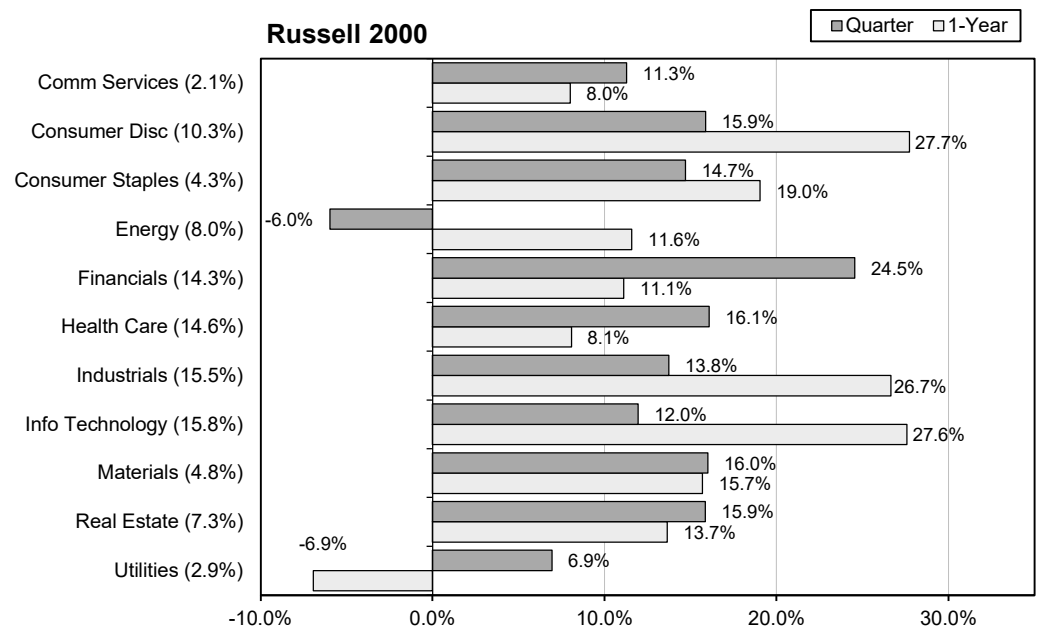
- Large-cap sector performance was generally positive for the fourth quarter. Ten of 11 economic sectors posted positive absolute performance for the quarter, with five sectors outpacing the return of the Russell 1000 Index.
- After being challenged by rapidly rising inflation and an uncertain growth trajectory in 2022, the information technology sector rebounded significantly during 2023, ending the year with an impressive 17.3% return in the fourth quarter. The other four sectors that outpaced the headline index's return for the quarter were consumer discretionary (12.6%), financials (14.4%), industrials (13.5%) and real estate (18.0%). Energy was the only sector to lose ground for the quarter, returning -6.6%.
- For the full year, just three economic sectors exceeded the return of the broad large-cap benchmark but nine of the 11 sectors posted positive performance. Performance in the Information technology (60.5%), communication services (54.1%), and consumer discretionary (41.7%) sectors made the greatest contributions to the index's 26.5% return during the year. The weakest economic sector in the Russell 1000 for the year was utilities, which declined by -7.0%.

**Russell 1000**



- Ten small-cap economic sectors posted positive results during the quarter while six of 11 sectors exceeded the 14.0% return of the Russell 2000 Index. Performance in the financials (24.5%) sector led the way for the quarter while the energy (-6.0%) was the only sector to post a negative result.
- Like large-cap sector performance over the trailing year, ten small-cap sectors were positive. Consumer discretionary (27.7%) posted the strongest sector result, with honorable mentions going to the industrials and information technology sectors, which each returned more than 20% for the year. Seven of the 11 economic sectors fell short of the core small-cap benchmark's return of 16.9% for the year. The worst-performing sector for the year was utilities, which slid -6.9% and was the only sector to post a negative return for 2023.

**Russell 2000**



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 December 31, 2023

Top 10 Weighted Stocks				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
Apple Inc	6.5%	12.6%	49.0%	Information Technology
Microsoft Corp	6.4%	19.3%	58.2%	Information Technology
Amazon.com Inc	3.1%	19.5%	80.9%	Consumer Discretionary
NVIDIA Corp	2.7%	13.9%	239.0%	Information Technology
Alphabet Inc Class A	1.9%	6.7%	58.3%	Communication Services
Meta Platforms Inc Class A	1.8%	17.9%	194.1%	Communication Services
Alphabet Inc Class C	1.6%	6.9%	58.8%	Communication Services
Tesla Inc	1.6%	-0.7%	101.7%	Consumer Discretionary
Berkshire Hathaway Inc Class B	1.5%	1.8%	15.5%	Financials
Eli Lilly and Co	1.1%	8.7%	60.9%	Health Care

Top 10 Performing Stocks (by Quarter)				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
Coinbase Global Inc Ordinary Shares	0.1%	131.6%	391.4%	Financials
Affirm Holdings Inc Ordinary Shares	0.0%	131.0%	408.2%	Financials
Gap Inc	0.0%	99.6%	96.8%	Consumer Discretionary
Spirit AeroSystems Holdings Inc	0.0%	96.9%	7.4%	Industrials
Karuna Therapeutics Inc	0.0%	87.2%	61.1%	Health Care
Rocket Companies Inc Ordinary Shares	0.0%	77.0%	106.9%	Financials
Block Inc Class A	0.1%	74.8%	23.1%	Financials
Macy's Inc	0.0%	74.8%	1.6%	Consumer Discretionary
SentinelOne Inc Class A	0.0%	62.8%	88.1%	Information Technology
Frontier Communications Parent Inc	0.0%	61.9%	-0.5%	Communication Services

Bottom 10 Performing Stocks (by Quarter)				
Russell 1000	Weight	1-Qtr Return	1-Year Return	Sector
ChargePoint Holdings Inc	0.0%	-52.9%	-75.4%	Industrials
Plug Power Inc	0.0%	-40.8%	-63.6%	Industrials
Maravai LifeSciences Holdings Inc	0.0%	-34.5%	-54.2%	Health Care
R1 RCM Inc	0.0%	-29.9%	-3.5%	Health Care
Agilon Health Inc	0.0%	-29.3%	-22.2%	Health Care
BILL Holdings Inc Ordinary Shares	0.0%	-24.9%	-25.1%	Information Technology
Lucid Group Inc Shs	0.0%	-24.7%	-38.4%	Consumer Discretionary
AMC Entertainment Holdings Inc	0.0%	-23.4%	-83.0%	Communication Services
Petco Health and Wellness Co Inc	0.0%	-22.7%	-66.7%	Consumer Discretionary
Hasbro Inc	0.0%	-21.6%	-12.0%	Consumer Discretionary

Top 10 Weighted Stocks				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
Super Micro Computer Inc	0.5%	3.7%	246.2%	Information Technology
Simpson Manufacturing Co Inc	0.3%	32.4%	125.3%	Industrials
e.l.f. Beauty Inc	0.3%	31.4%	161.0%	Consumer Staples
Cytokinetics Inc	0.3%	183.4%	82.2%	Health Care
MicroStrategy Inc Class A	0.3%	92.4%	346.2%	Information Technology
UFP Industries Inc	0.3%	22.9%	60.3%	Industrials
Light & Wonder Inc Ordinary Shares	0.3%	15.1%	40.1%	Consumer Discretionary
Onto Innovation Inc	0.3%	19.9%	124.6%	Information Technology
Rambus Inc	0.3%	22.3%	90.5%	Information Technology
BellRing Brands Inc Class A	0.3%	34.4%	116.2%	Consumer Staples

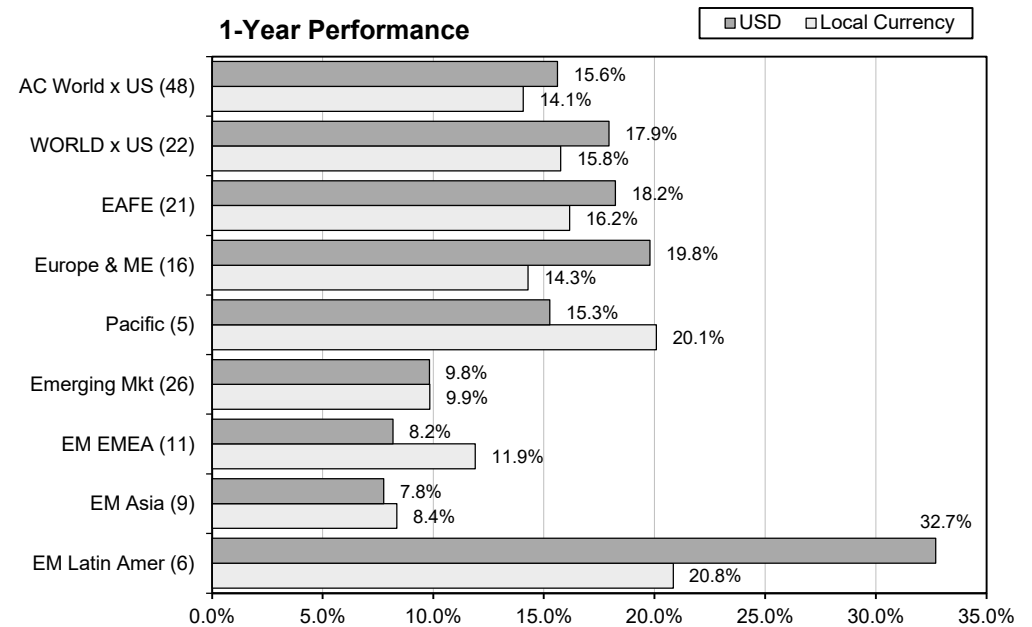
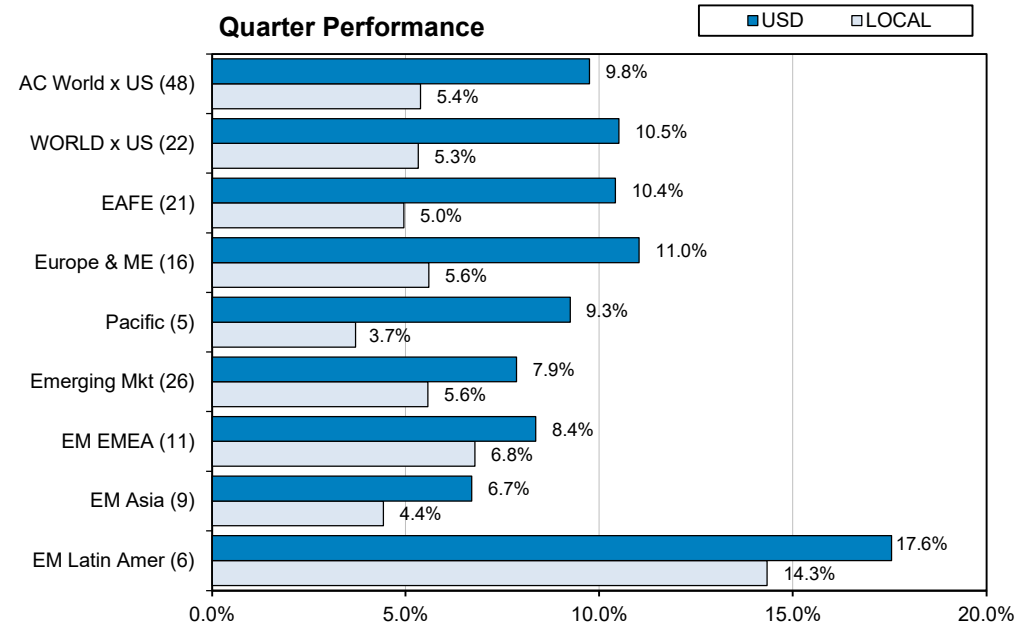
Top 10 Performing Stocks (by Quarter)				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
Nkarta Inc Ordinary Shares	0.0%	374.8%	10.2%	Health Care
Altimune Inc	0.0%	332.7%	-31.6%	Health Care
ALX Oncology Holdings Inc	0.0%	210.2%	32.1%	Health Care
Pulse Biosciences Inc	0.0%	203.7%	341.9%	Health Care
ImmunityBio Inc Ordinary Shares	0.0%	197.0%	-1.0%	Health Care
Cleanspark Inc	0.1%	189.5%	440.7%	Information Technology
EyePoint Pharmaceuticals Inc	0.0%	189.2%	560.3%	Health Care
Cytokinetics Inc	0.3%	183.4%	82.2%	Health Care
RayzeBio inc	0.0%	180.0%	N/A	Health Care
Marathon Digital Holdings Inc	0.2%	176.4%	586.8%	Information Technology

Bottom 10 Performing Stocks (by Quarter)				
Russell 2000	Weight	1-Qtr Return	1-Year Return	Sector
Ventix Biosciences Inc	0.0%	-92.9%	-92.5%	Health Care
Enviva Inc	0.0%	-86.7%	-98.1%	Energy
Aclaris Therapeutics Inc	0.0%	-84.7%	-93.3%	Health Care
Li-Cycle Holdings Corp Ordinary	0.0%	-83.5%	-87.7%	Industrials
Ocean Biomedical Inc	0.0%	-83.1%	N/A	Health Care
Reneo Pharmaceuticals Inc	0.0%	-79.0%	-31.3%	Health Care
Charge Enterprises Inc	0.0%	-77.1%	-90.8%	Communication Services
Cano Health Inc Ordinary Shares	0.0%	-76.9%	-95.7%	Health Care
CareMax Inc Ordinary Shares	0.0%	-76.5%	-86.4%	Health Care
Velo3D Inc	0.0%	-74.5%	-77.8%	Industrials

Source: Morningstar Direct



- The fourth quarter ended with strong performance across international equity markets in both in LCL and USD terms. The USD weakened substantially against most non-US currencies for the quarter, which boosted USD index performance relative to LCL returns. The developed market MSCI EAFE Index gained 10.4% in USD and 5.0% in LCL terms for the quarter. The MSCI Emerging Markets Index rose 7.9% in USD and a lower 5.6% in LCL terms.
- Latin America (LATAM) continued to lead the way, closing out 2023 with a quarterly return of 17.6% in USD 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 LCL strength in the region.
- The performance of the largest weighted country in the emerging market index (China, 26.7%) lagged during the year with a return of -4.4% for the fourth quarter and -13.3% for the year in USD terms. Investors have struggled to accurately forecast the pace of China's recovery after its economic reopening from COVID-19 lockdowns, which led to a flurry of spending that has since cooled.
- Similar to domestic markets, results for international developed and emerging markets were much stronger in 2023 after inflationary pressures and geopolitical risks stunted growth in 2022. Much of the strong USD performance in late 2022 abated in 2023 with many of the international indices showcasing modestly stronger performance in USD terms.
- Annual returns across emerging markets were bifurcated. The LATAM index finished significantly ahead of the other regional indexes in USD terms, with strengthening currencies contributing significantly to the region's strong performance. The LATAM index returned 32.7% in USD and 20.8% in LCL terms for year. Performance in the EM Asia regional benchmark detracted from the emerging market index, with the EM Asia index posting returns of 7.8% in USD and 8.4% in LCL terms versus an overall MSCI Emerging Markets index return of 9.8% and 9.9% in USD and LCL terms, respectively. The EMEA, Asia and Pacific regions saw local currencies depreciate overall in 2023 due to factors related to additional military conflicts in the region and China's sluggish growth.



Source: MSCI Global Index Monitor (Returns are Net)



**The Market Environment**  
**US Dollar International Index Attribution & Country Detail**  
As of December 31, 2023

MSCI - EAFE	Sector Weight	Quarter Return	1-Year Return
Communication Services	4.1%	8.9%	13.1%
Consumer Discretionary	11.8%	8.0%	21.7%
Consumer Staples	9.3%	5.2%	4.5%
Energy	4.3%	0.4%	12.5%
Financials	18.9%	10.0%	18.8%
Health Care	12.8%	4.9%	9.3%
Industrials	16.4%	14.3%	27.6%
Information Technology	8.6%	21.3%	36.4%
Materials	7.8%	17.1%	19.9%
Real Estate	2.5%	14.9%	9.1%
Utilities	3.5%	14.0%	17.0%
<b>Total</b>	<b>100.0%</b>	<b>10.4%</b>	<b>18.2%</b>

MSCI - ACWixUS	Sector Weight	Quarter Return	1-Year Return
Communication Services	5.2%	4.7%	5.7%
Consumer Discretionary	11.5%	5.7%	12.7%
Consumer Staples	8.0%	5.6%	4.9%
Energy	5.6%	2.3%	15.0%
Financials	21.2%	10.1%	16.2%
Health Care	9.3%	5.2%	8.0%
Industrials	13.4%	12.8%	23.2%
Information Technology	12.5%	20.0%	36.3%
Materials	8.0%	12.5%	12.2%
Real Estate	2.1%	11.1%	5.3%
Utilities	3.2%	13.6%	12.0%
<b>Total</b>	<b>100.0%</b>	<b>9.8%</b>	<b>15.6%</b>

MSCI - Emerging Mkt	Sector Weight	Quarter Return	1-Year Return
Communication Services	8.8%	0.1%	-1.1%
Consumer Discretionary	12.8%	0.8%	-3.4%
Consumer Staples	6.0%	6.1%	4.2%
Energy	5.1%	6.7%	26.8%
Financials	22.3%	8.3%	11.5%
Health Care	3.8%	7.3%	-1.3%
Industrials	6.8%	6.3%	5.4%
Information Technology	22.1%	17.8%	32.3%
Materials	7.9%	6.8%	1.5%
Real Estate	1.6%	-0.2%	-7.1%
Utilities	2.7%	12.8%	2.0%
<b>Total</b>	<b>100.0%</b>	<b>7.9%</b>	<b>9.8%</b>

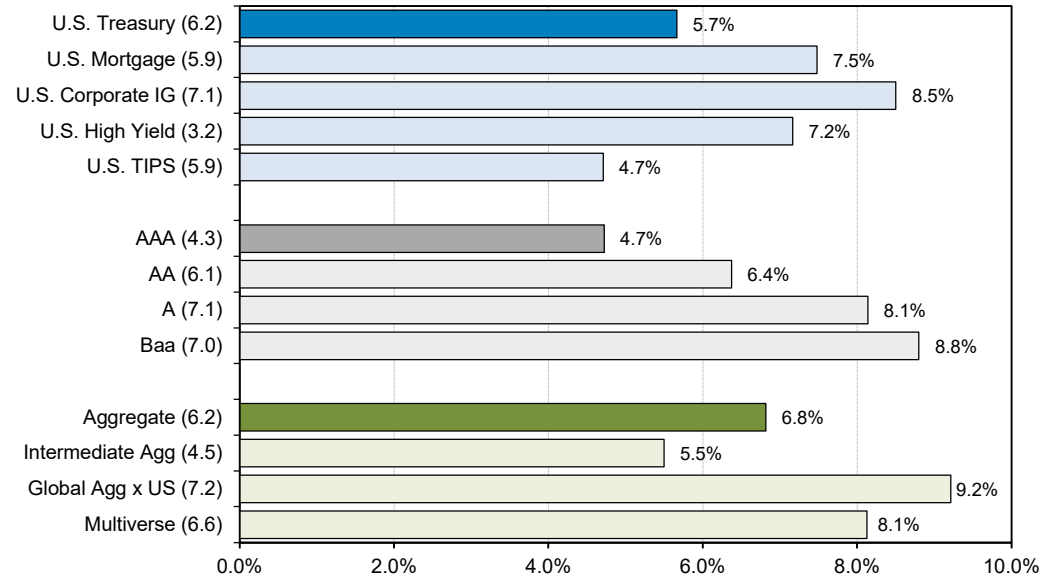
Country	MSCI-EAFE Weight	MSCI-ACWixUS Weight	Quarter Return	1-Year Return
Japan	22.5%	14.4%	8.0%	17.8%
United Kingdom	14.7%	9.5%	6.1%	9.5%
France	12.1%	7.7%	10.1%	18.8%
Switzerland	10.0%	6.4%	10.1%	13.4%
Germany	8.6%	5.5%	13.0%	19.9%
Australia	7.6%	4.9%	14.5%	10.0%
Netherlands	4.6%	3.0%	19.6%	23.7%
Denmark	3.3%	2.2%	12.2%	29.7%
Sweden	3.2%	2.1%	20.9%	21.0%
Spain	2.7%	1.7%	11.3%	28.2%
Italy	2.6%	1.7%	11.9%	31.7%
Hong Kong	2.2%	1.4%	2.9%	-17.8%
Singapore	1.4%	0.9%	3.8%	0.4%
Finland	1.1%	0.7%	8.8%	-8.2%
Belgium	1.0%	0.6%	6.1%	4.1%
Israel	0.7%	0.4%	9.0%	9.3%
Norway	0.7%	0.4%	2.2%	-0.4%
Ireland	0.5%	0.3%	6.2%	22.9%
Portugal	0.2%	0.1%	15.0%	5.1%
New Zealand	0.2%	0.1%	14.4%	3.4%
Austria	0.2%	0.1%	9.6%	12.8%
<b>Total EAFE Countries</b>	<b>100.0%</b>	<b>64.3%</b>	<b>10.4%</b>	<b>18.2%</b>
Canada		7.7%	10.6%	12.6%
<b>Total Developed Countries</b>		<b>72.0%</b>	<b>10.5%</b>	<b>17.9%</b>
China		7.5%	-4.4%	-13.3%
India		4.7%	11.6%	19.6%
Taiwan		4.5%	17.2%	26.9%
Korea		3.6%	14.7%	21.7%
Brazil		1.6%	15.8%	23.4%
Saudi Arabia		1.2%	8.5%	7.2%
South Africa		0.9%	12.1%	-1.6%
Mexico		0.8%	16.9%	36.2%
Indonesia		0.5%	1.7%	3.3%
Thailand		0.5%	3.6%	-12.6%
Malaysia		0.4%	4.2%	-7.2%
United Arab Emirates		0.4%	-3.2%	-3.0%
Poland		0.3%	37.7%	45.0%
Qatar		0.3%	4.7%	-2.9%
Kuwait		0.2%	-0.3%	-10.4%
Turkey		0.2%	-12.5%	-8.9%
Philippines		0.2%	6.1%	1.7%
Chile		0.1%	6.2%	-1.2%
Greece		0.1%	11.7%	44.2%
Peru		0.1%	22.8%	30.2%
Hungary		0.1%	17.0%	45.5%
Czech Republic		0.0%	4.6%	22.4%
Colombia		0.0%	12.8%	2.3%
Egypt		0.0%	20.2%	37.7%
<b>Total Emerging Countries</b>		<b>28.0%</b>	<b>7.9%</b>	<b>9.8%</b>
<b>Total ACWixUS Countries</b>		<b>100.0%</b>	<b>9.8%</b>	<b>15.6%</b>

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.

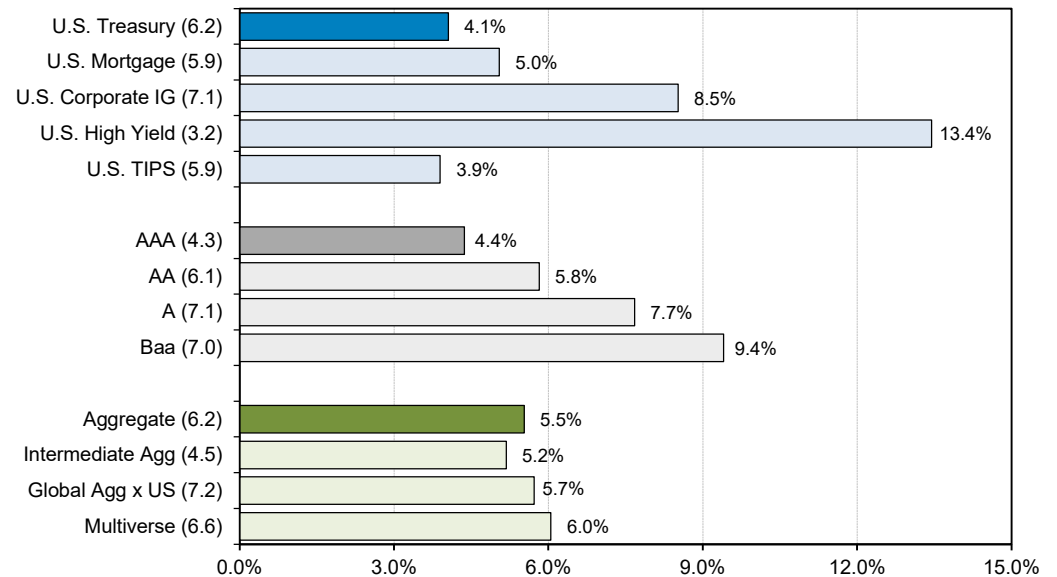


- Fixed-income markets rallied during the fourth quarter. Yields remained elevated for much of the year as economies across the globe attempted to stave off inflationary pressures. A five-month-long pause in rate hikes by the Fed coupled with expectations of cooler price pressures drove a rally in bonds globally. 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 starting yields and a slower pace of rate increases led to better results in 2023. While not without its challenges during the year, the fourth-quarter's rally helped some of the fixed income sectors realize their best calendar-year performance since prior to the COVID-19 pandemic.
- The Bloomberg US Aggregate Bond Index, the bellwether US investment grade benchmark, posted its best-performing quarter of the year to close out 2023, returning 6.8% for the period. Performance across the investment grade index's segments was broadly higher during the period with the Bloomberg US Corporate Investment Grade Index returning 8.5%, the US Mortgage Index finishing slightly lower at 7.5% and the US Treasury sector returning a more modest, but still solid, 5.7% for the quarter.
- Outside of the aggregate index's sub-components, high-yield bonds continued their strong performance for the year with a return of 7.2% for the quarter as credit spreads narrowed by more than 1.0%. US TIPS gained 4.7% for the quarter, lagging most of the fixed-income market. The Bloomberg Global Aggregate ex-US Index outpaced the domestic indices during the quarter, returning a strong 9.2%.
- Over the trailing one-year period, the Bloomberg US Aggregate Bond Index posted a return of 5.5%. The Corporate Investment-grade sector outperformed the broader index during the year, gaining 8.5%. US TIPS, which are excluded from the aggregate index, lagged at just 3.9% for the year. High-yield corporate bonds, which have a much shorter duration, outpaced their investment grade counterparts with the Bloomberg US High Yield Index returning a strong 13.4% for the calendar year.
- Non-US bonds exceeded their domestic counterparts for the quarter, lifting the 5.7% return of the Bloomberg Global Aggregate ex-US Index past the 5.5% return of US Aggregate Index for the year. Rising interest rates, elevated inflation, and geopolitical risks have hindered non-US index performance. Some of those headwinds eased in the fourth quarter, contributing to the index's positive performance for the calendar year.

**Quarter Performance**



**1-Year Performance**

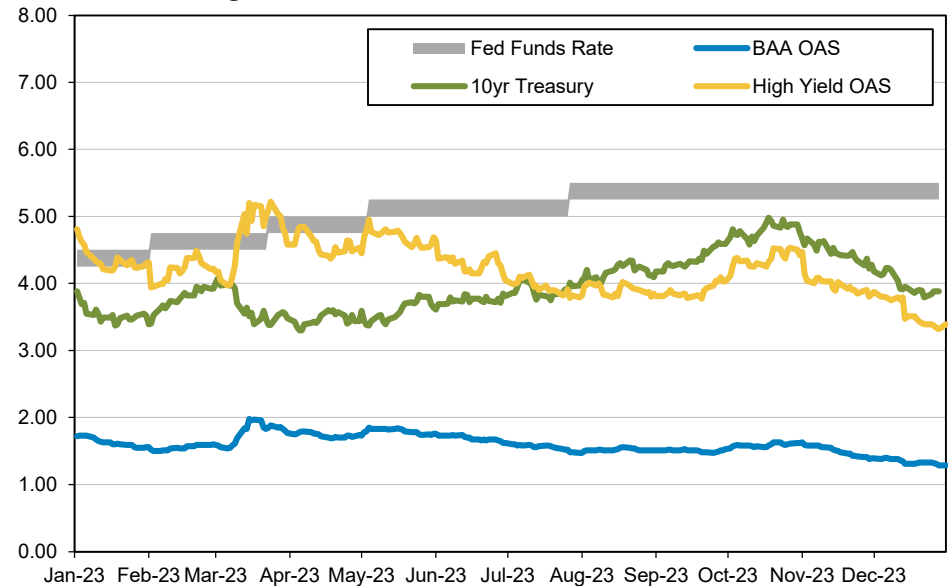


Source: Bloomberg

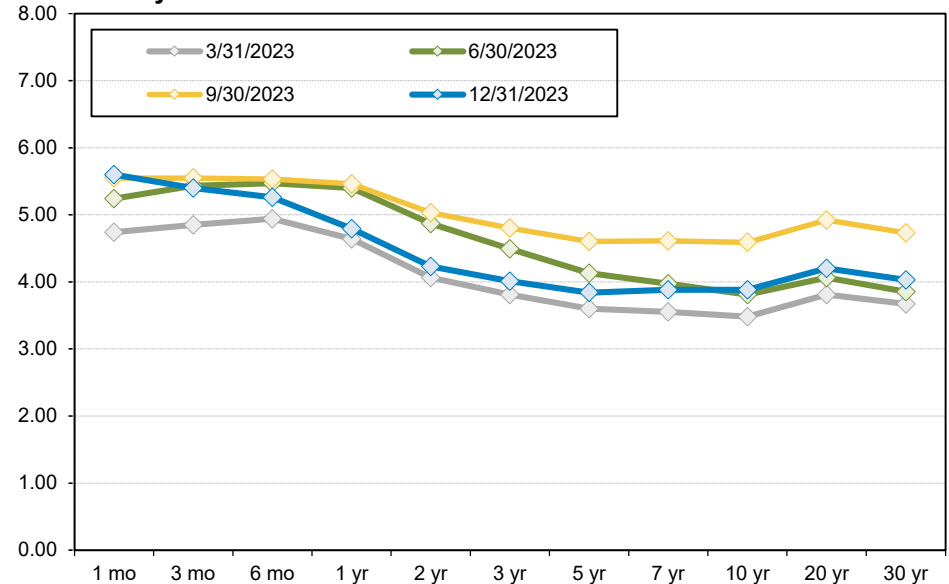


- The gray band across the graph illustrates the range of the fed funds target rate. The Fed last raised its rate range at the July 2023 meeting. The lower end of the range remained at 5.25% at year-end. The Fed’s decision to pause on additional rate increases for the remainder of 2023 and took on a more dovish tone in their December press release, which was well-received by market participants.
- The yield on the US 10-year Treasury (green line) exceeded 5.00% during the final week of October, its highest mark since July 2007. However, the benchmark yield proceeded to fall more than 1.00% over the final two months of the year, with the 10-Year Treasury finishing the year at a yield of 3.88%. The sharp decline in yields was likely a response to market participants anticipating rate cuts by the Fed in 2024.
- The blue line illustrates changes in the BAA OAS (Option Adjusted Spread) for lower-quality investment-grade corporate bonds. This measure quantifies the additional yield premium that investors require to purchase and hold non-US Treasury issues with the lowest investment grade rating. For the full calendar year, the spread narrowed 0.44% from 1.73% to 1.29%, signaling a lower premium for credit risk than the beginning of the year.
- High Yield OAS spreads have narrowed from 4.81% in January 2023 to 3.39% as of the end of 2023. High-yield spreads reached their widest point in March 2023, before trending lower for the remainder of the year. The spike in both the BAA OAS and High Yield spreads in March was a result of a short-lived crisis of confidence in the banking sector, which was addressed quickly by the Federal Deposit Insurance Corporation (FDIC) and supported further by the Fed's aggressive short-term par loan program. Though spreads tightened since the high, spreads traded slightly wider during October on the heels of a spark in the conflict between Israel and Palestine.
- The lower graph provides a snapshot of the US Treasury yield curve at the end of each of the last four quarters. Short-term yields rose modestly during the year and remained elevated. Despite this, both intermediate and longer-term yields are lower than they were at the end of the third quarter. Since September, the yield curve has further inverted (meaning that short-term rates are higher than long-term rates) between the two- and 10-year maturities. This is consistent with market expectations for a lower interest rate environment going forward. Since the Fed generally lowers rates to support economic growth, a persistent inversion of these two key rates has historically suggested an economic recession within six to 24 months, though this is an imprecise predictor of future economic growth.

1-Year Trailing Market Rates



Treasury Yield Curve



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



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- **The Fund's 4<sup>th</sup> quarter return was 7.88% and its 2023 return was 12.84%. As of 12-31-2023, the total Fund had an annualized 7-year return of 7.21%.**
- **The Fund's total equity weighting at 12-31-2023 was 52.5% versus its target equity weighting of 50%. Risk assets including public equities, private equity/debt, and private real estate as a percentage of the total Fund was 68.6%.**
- **In October, the Adams Street Co-Investment Fund V issued a capital call in the amount of \$750,000 with funding coming from the Vanguard Russell 1000 Value Index fund.**

- **The Portfolio Advisors Co-Investment Fund III issued two distributions (October \$22,461) and (December \$629,586) received in the Cash Disbursement account.**
- **Bentall GreenOak US Core Plus Real Estate called \$1,666,667 in October with funding coming from the Vanguard Russell 1000 Growth Index fund. There is still an additional \$4,222,221 yet to be called on the County's \$12M capital commitment.**
- **In January, the Vesper Large Cap Equity ETF was fully liquidated with proceeds transferred into the StoneRidge small cap growth equity strategy for an initial funding of \$4,000,000.**



**Wednesday, February 21, 2024 @ 12:00 pm**

Hamilton Lane Private Equity

Adams Street Partners Private Equity

DFA Large Cap and International Equity

Review of Investment Policy Statement (Every February)

**Wednesday, May 15, 2024 @ 12:00 pm**

Stoneridge Investment Partners

Boyd Watterson Fixed Income

Boyd Watterson GSA Real Estate

Review of Brokerage (Every May)

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**Wednesday, June 19, 2024 @ 12:00 pm**

Constitution Capital Partners Private Equity

Allspring Global Small Cap Value Equity

Vesper Capital Large Cap Core Equity

**Wednesday, August 21, 2024 @ 12:00 pm**

Vanguard Large Cap and Fixed Income

American Funds Europacific Growth Fund

**Wednesday, November 20, 2024 @ 12:00 pm**

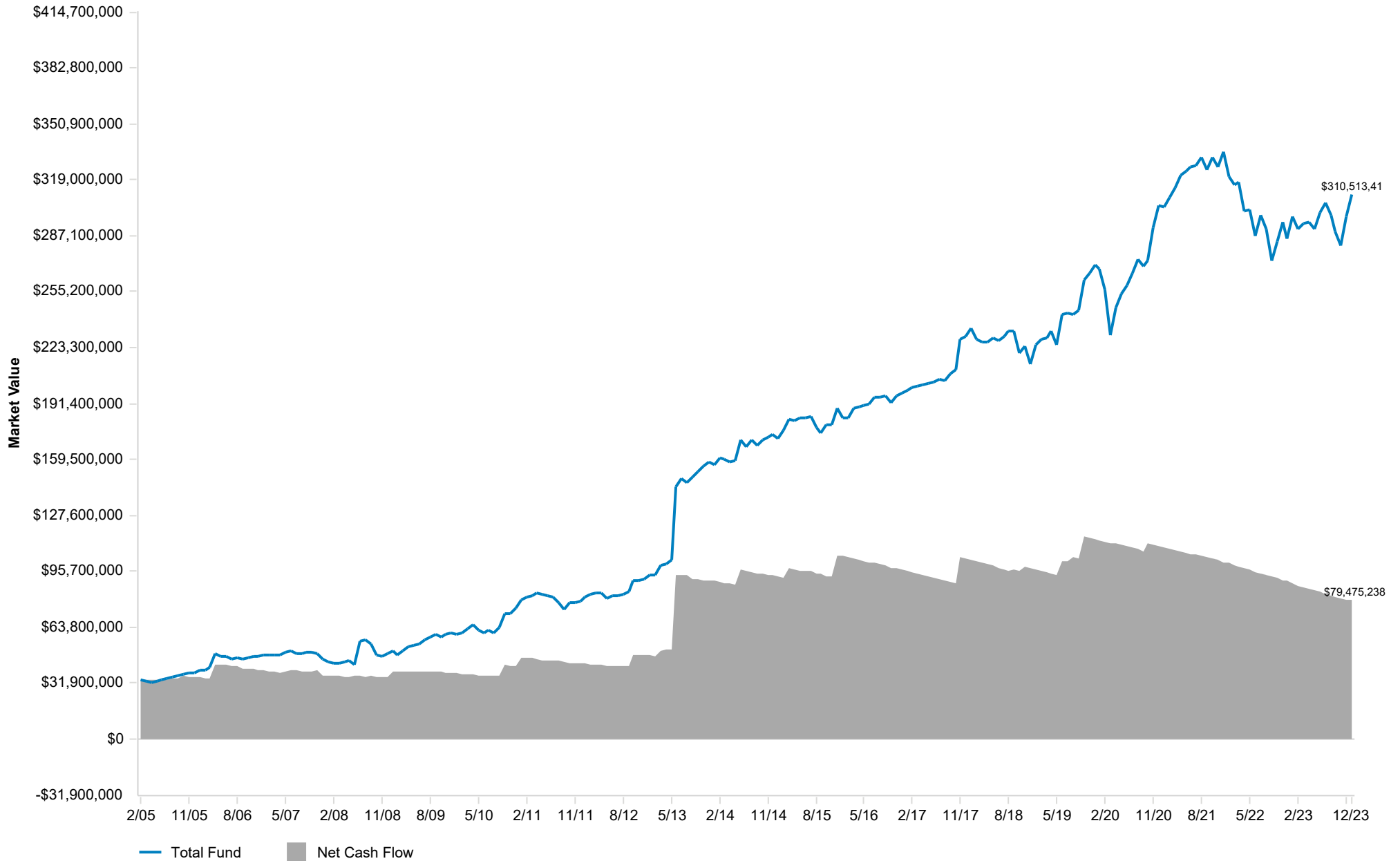
PNC Fixed Income and Custody

Emerald Advisors Small Cap Growth Equity

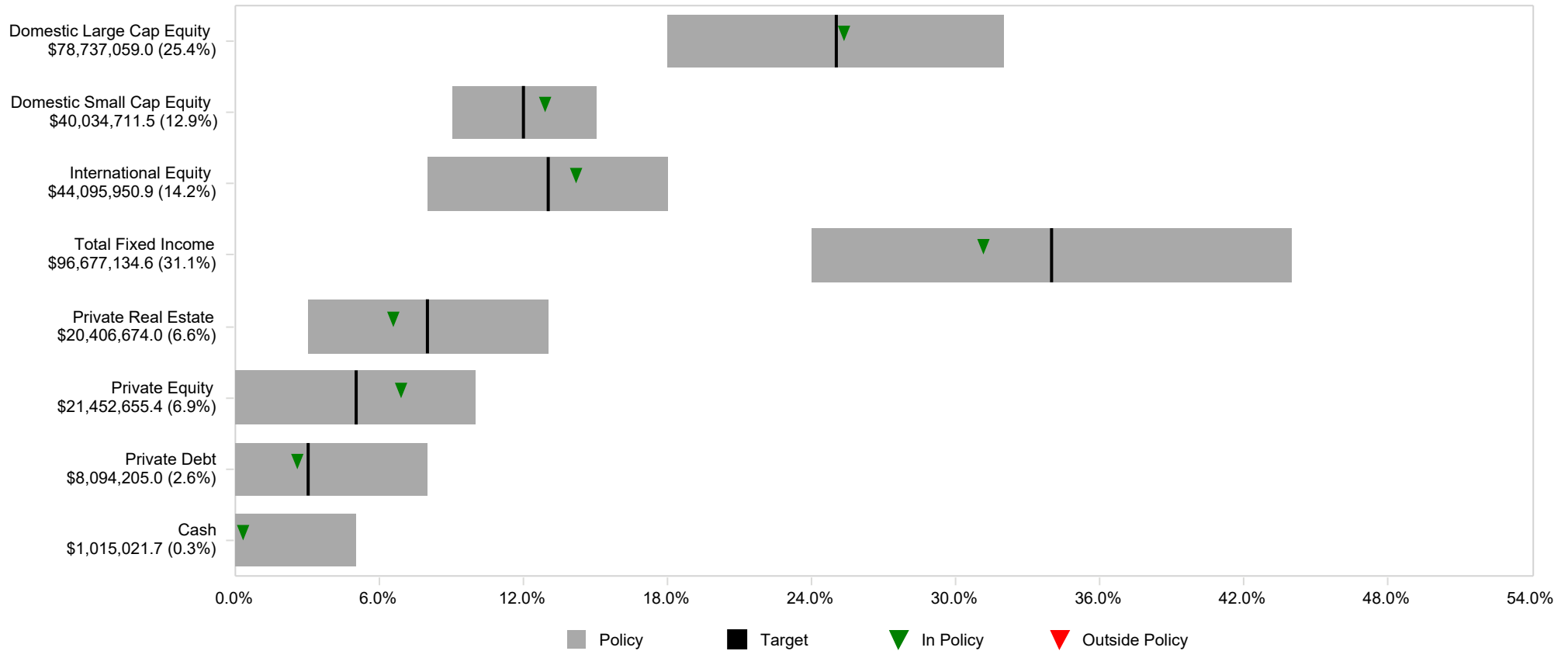
Portfolio Advisors Private Equity

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**Schedule of Investable Assets**



Executive Summary



Asset Allocation Compliance

	Asset Allocation \$	Current Allocation (%)	Minimum Allocation (%)	Maximum Allocation (%)	Target Allocation (%)
<b>Total Fund</b>	<b>310,513,412</b>	<b>100.0</b>	<b>N/A</b>	<b>N/A</b>	<b>100.0</b>
Domestic Large Cap Equity	78,737,059	25.4	18.0	32.0	25.0
Domestic Small Cap Equity	40,034,711	12.9	9.0	15.0	12.0
International Equity	44,095,951	14.2	8.0	18.0	13.0
Total Fixed Income	96,677,135	31.1	24.0	44.0	34.0
Private Real Estate	20,406,674	6.6	3.0	13.0	8.0
Private Equity	21,452,655	6.9	0.0	10.0	5.0
Private Debt	8,094,205	2.6	0.0	8.0	3.0
Cash	1,015,022	0.3	0.0	5.0	0.0



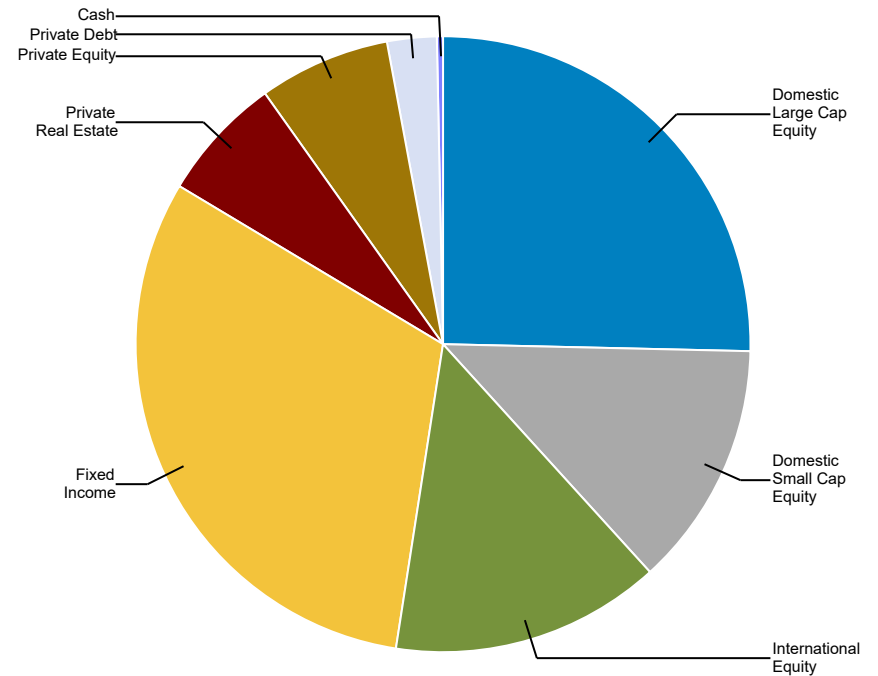
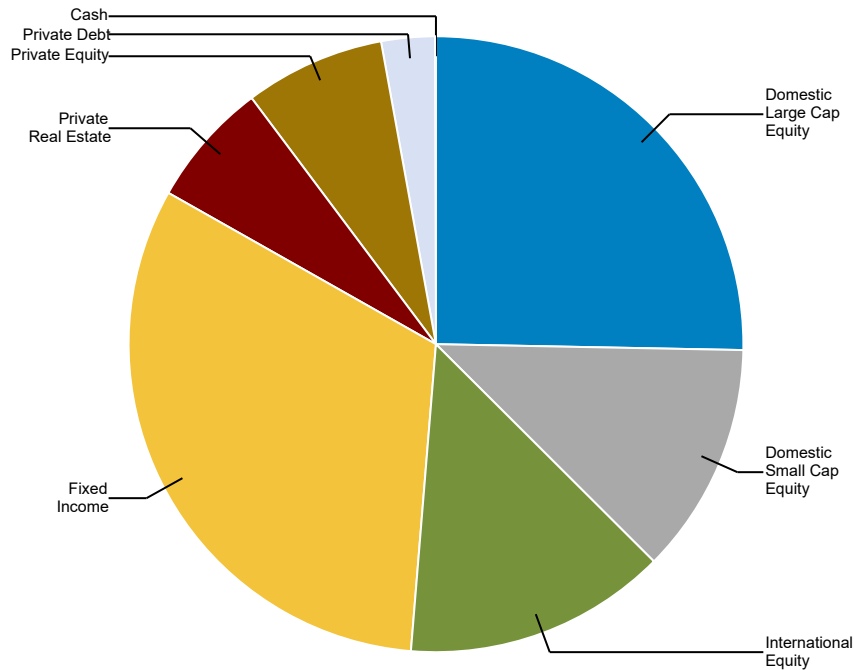
**Asset Allocation By Asset Class**

**Total Fund**

As of December 31, 2023

Sep-2023 : \$289,479,487

Dec-2023 : \$310,513,412



Allocation			Allocation		
	Market Value	Allocation		Market Value	Allocation
■ Domestic Large Cap Equity	73,240,252	25.3	■ Domestic Large Cap Equity	78,737,059	25.4
■ Domestic Small Cap Equity	35,201,226	12.2	■ Domestic Small Cap Equity	40,034,711	12.9
■ International Equity	40,062,200	13.8	■ International Equity	44,095,951	14.2
■ Total Fixed Income	92,296,371	31.9	■ Total Fixed Income	96,677,135	31.1
■ Private Real Estate	19,023,403	6.6	■ Private Real Estate	20,406,674	6.6
■ Private Equity	21,354,702	7.4	■ Private Equity	21,452,655	6.9
■ Private Debt	8,134,952	2.8	■ Private Debt	8,094,205	2.6
■ Cash	166,380	0.1	■ Cash	1,015,022	0.3



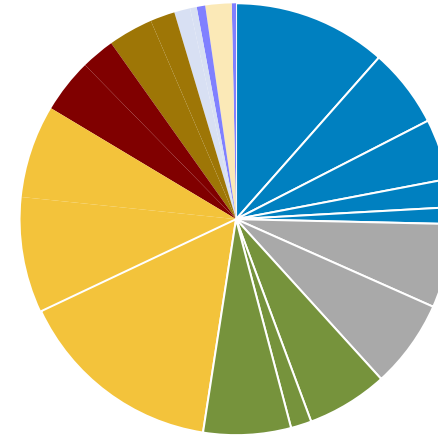
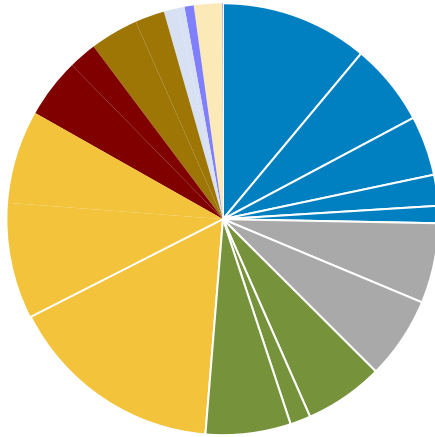
Asset Allocation by Asset Class

Total Fund

As of December 31, 2023

Sep-2023 : \$289,479,487

Dec-2023 : \$310,513,412



Allocation			Allocation		
	Market Value	Allocation		Market Value	Allocation
■ Vanguard S&P 500 Index Fund (VINIX)	32,035,409	11.1	■ Vanguard S&P 500 Index Fund (VINIX)	35,777,127	11.5
■ Vanguard Russell 1000 Growth Index (VRGWX)	17,811,690	6.2	■ Vanguard Russell 1000 Growth Index (VRGWX)	18,444,733	5.9
■ DFA Large Value Equity (DFLVX)	12,948,976	4.5	■ DFA Large Value Equity (DFLVX)	14,122,557	4.5
■ Vanguard Russell 1000 Value Index (VRVIX)	6,695,649	2.3	■ Vanguard Russell 1000 Value Index (VRVIX)	6,512,656	2.1
■ Vesper Capital Mgmt (UTRN)	3,748,527	1.3	■ Vesper Capital Mgmt (UTRN)	3,879,986	1.2
■ Allspring Global Small Value Eq.	17,350,189	6.0	■ Allspring Global Small Value Eq.	19,521,885	6.3
■ Emerald Small Growth Equity	17,851,038	6.2	■ Emerald Small Growth Equity	20,512,826	6.6
■ DFA International Equity (DFIEX)	17,150,873	5.9	■ DFA International Equity (DFIEX)	18,919,814	6.1
■ DFA Emerging Markets (DFCEX)	4,460,822	1.5	■ DFA Emerging Markets (DFCEX)	4,811,621	1.5
■ EuroPacific Growth Fund (RERGX)	18,450,505	6.4	■ EuroPacific Growth Fund (RERGX)	20,364,516	6.6
■ Boyd Watterson Fixed	46,985,431	16.2	■ Boyd Watterson Fixed	48,261,523	15.5
■ PNC Fixed	25,131,517	8.7	■ PNC Fixed	26,853,814	8.6
■ Vanguard Core Bond Fund (VCOBX)	20,179,423	7.0	■ Vanguard Core Bond Fund (VCOBX)	21,561,798	6.9
■ Boyd Watterson GSA Fund	12,905,410	4.5	■ Boyd Watterson GSA Fund	12,622,014	4.1
■ Bentall GreenOak US Core Plus RE	6,117,993	2.1	■ Bentall GreenOak US Core Plus RE	7,784,660	2.5
■ Ironsides Direct Investment Fund V	10,465,041	3.6	■ Ironsides Direct Investment Fund V	10,465,041	3.4
■ PA Co-Investment Fund III	6,383,035	2.2	■ PA Co-Investment Fund III	5,730,988	1.8
■ Adams Street Co-Investment Fund V	2,975,709	1.0	■ Adams Street Co-Investment Fund V	3,725,709	1.2
■ Hamilton Lane Secondary Fund VI	1,530,917	0.5	■ Hamilton Lane Secondary Fund VI	1,530,917	0.5
■ Ironsides Opportunities Fund	2,009,614	0.7	■ Ironsides Opportunities Fund	1,968,867	0.6
■ PA Credit Strategies Fund	6,125,338	2.1	■ PA Credit Strategies Fund	6,125,338	2.0
■ Cash Account	166,380	0.1	■ Cash Account	1,015,022	0.3



Financial Reconciliation								
	Market Value 10/01/2023	Net Transfers	Contributions	Distributions	Management Fees	Other Expenses	Return On Investment	Market Value 12/31/2023
<b>Total Fund</b>	<b>289,479,487</b>	<b>-</b>	<b>3,893,552</b>	<b>-5,460,834</b>	<b>-78,075</b>	<b>-84,622</b>	<b>22,763,904</b>	<b>310,513,412</b>
<b>Domestic Large Cap Equity</b>	<b>73,240,252</b>	<b>-2,523,315</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8,020,122</b>	<b>78,737,059</b>
Vanguard S&P 500 Index Fund (VINIX)	32,035,409	-	-	-	-	-	3,741,718	35,777,127
Vanguard Russell 1000 Growth Index (VRGWX)	17,811,690	-1,666,667	-	-	-	-	2,299,710	18,444,733
DFA Large Value Equity (DFLVX)	12,948,976	-	-	-	-	-	1,173,581	14,122,557
Vanguard Russell 1000 Value Index (VRVIX)	6,695,649	-750,000	-	-	-	-	567,006	6,512,656
Vesper Capital Mgmt (UTRN)	3,748,527	-106,648	-	-	-	-	238,106	3,879,986
<b>Domestic Small Cap Equity</b>	<b>35,201,226</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4,833,485</b>	<b>40,034,711</b>
Allspring Global Small Value Eq.	17,350,189	-	-	-	-	-	2,171,696	19,521,885
Emerald Small Growth Equity	17,851,038	-	-	-	-	-	2,661,789	20,512,826
<b>International Equity</b>	<b>40,062,200</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4,033,751</b>	<b>44,095,951</b>
DFA International Equity (DFIEX)	17,150,873	-	-	-	-	-	1,768,941	18,919,814
DFA Emerging Markets (DFCEX)	4,460,822	-	-	-	-	-	350,799	4,811,621
EuroPacific Growth Fund (RERGX)	18,450,505	-	-	-	-	-	1,914,011	20,364,516
<b>Total Fixed Income</b>	<b>92,296,371</b>	<b>-1,750,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6,130,763</b>	<b>96,677,135</b>
Boyd Watterson Fixed	46,985,431	-1,750,000	-	-	-	-	3,026,091	48,261,523
PNC Fixed	25,131,517	-	-	-	-	-	1,722,296	26,853,814
Vanguard Core Bond Fund (VCOBX)	20,179,423	-	-	-	-	-	1,382,376	21,561,798
<b>Private Real Estate</b>	<b>19,023,403</b>	<b>1,666,667</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-283,396</b>	<b>20,406,674</b>
Boyd Watterson GSA Fund	12,905,410	-	-	-	-	-	-283,396	12,622,014
Bentall GreenOak US Core Plus RE	6,117,993	1,666,667	-	-	-	-	-	7,784,660
<b>Private Equity</b>	<b>21,354,702</b>	<b>97,953</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>21,452,655</b>
Ironsides Direct Investment Fund V	10,465,041	-	-	-	-	-	-	10,465,041
PA Co-Investment Fund III	6,383,035	-652,047	-	-	-	-	-	5,730,988
Adams Street Co-Investment Fund V	2,975,709	750,000	-	-	-	-	-	3,725,709
Hamilton Lane Secondary Fund VI	1,530,917	-	-	-	-	-	-	1,530,917
<b>Private Debt</b>	<b>8,134,952</b>	<b>-40,747</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>8,094,205</b>
Ironsides Opportunities Fund	2,009,614	-40,747	-	-	-	-	-	1,968,867
PA Credit Strategies Fund	6,125,338	-	-	-	-	-	-	6,125,338
<b>Cash</b>	<b>166,380</b>	<b>2,549,442</b>	<b>3,893,552</b>	<b>-5,460,834</b>	<b>-78,075</b>	<b>-84,622</b>	<b>29,180</b>	<b>1,015,022</b>
Cash Account	166,380	2,549,442	3,893,552	-5,460,834	-78,075	-84,622	29,180	1,015,022



Financial Reconciliation								
	Market Value 01/01/2023	Net Transfers	Contributions	Distributions	Management Fees	Other Expenses	Return On Investment	Market Value 12/31/2023
<b>Total Fund</b>	<b>285,172,494</b>	<b>-</b>	<b>13,204,917</b>	<b>-23,117,282</b>	<b>-469,029</b>	<b>-252,325</b>	<b>35,974,637</b>	<b>310,513,412</b>
<b>Domestic Large Cap Equity</b>	<b>70,280,543</b>	<b>-7,563,950</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16,020,466</b>	<b>78,737,059</b>
Vanguard S&P 500 Index Fund (VINIX)	31,824,022	-4,040,635	-	-	-	-	7,993,740	35,777,127
Vanguard Russell 1000 Growth Index (VRGWX)	14,259,327	-1,666,667	-	-	-	-	5,852,074	18,444,733
DFA Large Value Equity (DFLVX)	12,669,538	-	-	-	-	-	1,453,019	14,122,557
Vanguard Russell 1000 Value Index (VRVIX)	7,569,545	-1,750,000	-	-	-	-	693,110	6,512,656
Vesper Capital Mgmt (UTRN)	3,958,111	-106,648	-	-	-	-	28,523	3,879,986
<b>Domestic Small Cap Equity</b>	<b>42,617,837</b>	<b>-9,500,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6,916,875</b>	<b>40,034,711</b>
Allspring Global Small Value Eq.	23,468,455	-7,500,000	-	-	-	-	3,553,430	19,521,885
Emerald Small Growth Equity	19,149,381	-2,000,000	-	-	-	-	3,363,445	20,512,826
<b>International Equity</b>	<b>38,738,368</b>	<b>-1,000,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>6,357,583</b>	<b>44,095,951</b>
DFA International Equity (DFIEX)	17,023,164	-1,000,000	-	-	-	-	2,896,650	18,919,814
DFA Emerging Markets (DFCEX)	4,167,693	-	-	-	-	-	643,928	4,811,621
EuroPacific Growth Fund (RERGX)	17,547,511	-	-	-	-	-	2,817,005	20,364,516
<b>Total Fixed Income</b>	<b>78,034,368</b>	<b>13,856,109</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4,786,658</b>	<b>96,677,135</b>
Boyd Watterson Fixed	34,787,597	11,000,000	-	-	-	-	2,473,925	48,261,523
PNC Fixed	22,391,930	3,000,000	-	-	-	-	1,461,884	26,853,814
Vanguard S-T Invst Grade Bond Fund (VFSIX)	20,854,841	-21,143,891	-	-	-	-	289,051	-
Vanguard Core Bond Fund (VCOBX)	-	21,000,000	-	-	-	-	561,798	21,561,798
<b>Private Real Estate</b>	<b>28,450,669</b>	<b>-7,457,919</b>	<b>-</b>	<b>-</b>	<b>-58,116</b>	<b>-</b>	<b>-527,960</b>	<b>20,406,674</b>
Bentall GreenOak/MEPT Real Estate	11,350,655	-11,069,031	-	-	-23,849	-	-257,775	-
Boyd Watterson GSA Fund	13,030,448	-	-	-	-	-	-408,434	12,622,014
Bentall GreenOak US Core Plus RE	4,069,566	3,611,112	-	-	-34,267	-	138,249	7,784,660
<b>Private Equity</b>	<b>16,820,728</b>	<b>2,711,489</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,920,439</b>	<b>21,452,655</b>
Ironsides Direct Investment Fund V	9,240,148	605,745	-	-	-	-	619,149	10,465,041
PA Co-Investment Fund III	6,995,010	-1,632,074	-	-	-	-	368,052	5,730,988
Adams Street Co-Investment Fund V	585,570	2,750,000	-	-	-	-	390,139	3,725,709
Hamilton Lane Secondary Fund VI	-	987,818	-	-	-	-	543,099	1,530,917
<b>Private Debt</b>	<b>8,976,700</b>	<b>-1,263,837</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>381,342</b>	<b>8,094,205</b>
Ironsides Opportunities Fund	3,070,761	-1,263,837	-	-	-	-	161,943	1,968,867
PA Credit Strategies Fund	5,905,939	-	-	-	-	-	219,399	6,125,338
<b>Cash</b>	<b>1,253,282</b>	<b>10,218,109</b>	<b>13,204,917</b>	<b>-23,117,282</b>	<b>-410,913</b>	<b>-252,325</b>	<b>119,234</b>	<b>1,015,022</b>
Cash Account	1,253,282	10,218,109	13,204,917	-23,117,282	-410,913	-252,325	119,234	1,015,022





Asset Allocation & Performance	Allocation		Performance(%)								
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	7 YR	Inception	Inception Date	
<b>Total Fund (Gross)</b>	<b>310,513,412</b>	<b>100.0</b>	<b>7.88 (64)</b>	<b>12.84 (59)</b>	<b>12.84 (59)</b>	<b>4.18 (33)</b>	<b>8.50 (57)</b>	<b>7.21 (64)</b>	<b>6.93 (18)</b>	<b>Jan-1998</b>	
Total Fund Policy Index			9.15	13.02	13.02	3.48	7.88	6.51	6.24		
All Public DB Plans Median			8.31	13.34	13.34	3.65	8.67	7.53	6.35		
<b>Total Fund (Net)</b>	<b>310,513,412</b>	<b>100.0</b>	<b>7.85</b>	<b>12.67</b>	<b>12.67</b>	<b>4.00</b>	<b>8.27</b>	<b>6.93</b>	<b>6.40</b>	<b>Oct-2003</b>	
Total Fund Policy Index			9.15	13.02	13.02	3.48	7.88	6.51	6.76		
<b>Total Equity</b>	<b>162,867,721</b>	<b>52.5</b>	<b>11.58</b>	<b>20.76</b>	<b>20.76</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3.24</b>	<b>Apr-2022</b>	
<b>Domestic Large Cap Equity</b>	<b>78,737,059</b>	<b>25.4</b>	<b>11.35</b>	<b>23.91</b>	<b>23.91</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3.91</b>	<b>Apr-2022</b>	
Vanguard S&P 500 Index Fund (VINIX)	35,777,127	11.5	11.68 (18)	26.24 (17)	26.24 (17)	9.96 (9)	15.66 (6)	13.38 (5)	13.01 (4)	Jul-2013	
S&P 500 Index			11.69	26.29	26.29	10.00	15.69	13.42	13.04		
IM S&P 500 Index (MF) Median			11.61	25.96	25.96	9.67	15.34	13.05	12.64		
Vanguard Russell 1000 Growth Index (VRGWX)	18,444,733	5.9	14.20 (46)	42.65 (37)	42.65 (37)	8.81 (12)	19.43 (8)	17.61 (10)	15.98 (8)	Jul-2013	
Russell 1000 Growth Index			14.16	42.68	42.68	8.86	19.50	17.68	16.05		
IM U.S. Large Cap Growth Equity (MF) Median			14.07	40.78	40.78	5.70	16.40	15.32	14.08		
DFA Large Value Equity (DFLVX)	14,122,557	4.5	9.06 (70)	11.47 (57)	11.47 (57)	10.39 (42)	10.90 (70)	8.45 (75)	7.62 (43)	May-2006	
Russell 1000 Value Index			9.50	11.46	11.46	8.86	10.91	8.32	7.23		
IM U.S. Large Cap Value Equity (MF) Median			9.61	12.63	12.63	9.59	11.83	9.33	7.35		
Vanguard Russell 1000 Value Index (VRVIX)	6,512,656	2.1	9.48 (55)	11.42 (57)	11.42 (57)	-	-	-	7.44 (79)	Mar-2021	
Russell 1000 Value Index			9.50	11.46	11.46	-	-	-	7.51		
IM U.S. Large Cap Value Equity (MF) Median			9.61	12.63	12.63	-	-	-	8.95		
Vesper Capital Mgmt (UTRN)	3,879,986	1.2	6.36 (98)	0.73 (100)	0.73 (100)	1.42 (100)	-	-	4.73 (99)	Nov-2020	
S&P 500 Index			11.69	26.29	26.29	10.00	-	-	14.46		
IM U.S. Large Cap Core Equity (SA+CF+MF) Median			11.66	24.60	24.60	8.87	-	-	13.35		
<b>Domestic Small Cap Equity</b>	<b>40,034,711</b>	<b>12.9</b>	<b>13.73</b>	<b>18.89</b>	<b>18.89</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2.75</b>	<b>Apr-2022</b>	
Allspring Global Small Value Eq.	19,521,885	6.3	12.52 (60)	20.80 (27)	20.80 (27)	11.11 (58)	12.67 (53)	8.55 (45)	9.49 (40)	Dec-2004	
Russell 2000 Value Index			15.26	14.65	14.65	7.94	10.00	6.10	7.06		
IM U.S. Small Cap Value Equity (SA+CF+MF) Median			13.23	17.78	17.78	12.01	12.82	8.30	9.21		
Emerald Small Growth Equity	20,512,826	6.6	14.91 (8)	19.35 (36)	19.35 (36)	-1.35 (50)	11.89 (52)	10.53 (56)	10.84 (61)	Oct-1998	
Russell 2000 Growth Index			12.75	18.66	18.66	-3.50	9.22	8.08	7.58		
IM U.S. Small Cap Growth Equity (SA+CF+MF) Median			11.58	17.88	17.88	-1.37	11.90	11.35	11.49		

See the disclosure page at the end of the report.



	Allocation		Performance(%)								Inception Date
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	7 YR	Inception		
<b>International Equity</b>	<b>44,095,951</b>	<b>14.2</b>	<b>10.07</b>	<b>16.57</b>	<b>16.57</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2.26</b>	<b>Apr-2022</b>	
DFA International Equity (DFIEX)	18,919,814	6.1	10.31 (42)	17.49 (45)	17.49 (45)	5.00 (12)	8.69 (13)	-	4.15 (31)	Dec-2017	
MSCI EAFE Value Index (Net)			8.22	18.95	18.95	7.59	7.08	-	3.30		
IM International Multi-Cap Core Equity (MF) Median			9.98	17.14	17.14	2.96	7.46	-	3.66		
DFA Emerging Markets (DFCEX)	4,811,621	1.5	7.86 (45)	15.45 (25)	15.45 (25)	0.71 (18)	6.18 (23)	-	2.85 (-)	Dec-2017	
MSCI Emerging Markets (Net) Index			7.86	9.83	9.83	-5.08	3.68	-	0.97		
IM Emerging Markets Equity (SA+CF+MF) Median			7.61	10.57	10.57	-5.90	3.96	-	-		
EuroPacific Growth Fund (RERGX)	20,364,516	6.6	10.37 (59)	16.05 (37)	16.05 (37)	-2.66 (69)	8.03 (62)	7.35 (48)	6.06 (36)	Nov-2015	
MSCI AC World ex USA Growth (Net)			11.12	14.03	14.03	-2.67	7.49	7.14	5.79		
IM International Large Cap Growth Equity (MF) Median			10.83	15.54	15.54	0.33	8.40	7.28	5.62		
<b>Total Fixed Income</b>	<b>96,677,135</b>	<b>31.1</b>	<b>6.77</b>	<b>5.64</b>	<b>5.64</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.64</b>	<b>Apr-2022</b>	
Boyd Watterson Fixed	48,261,523	15.5	6.69 (75)	6.04 (67)	6.04 (67)	-1.37 (15)	2.19 (36)	2.05 (46)	4.05 (81)	Oct-1998	
Boyd Watterson Fixed Policy			6.82	5.53	5.53	-1.54	1.64	1.60	-		
IM U.S. Broad Market Fixed Income (SA+CF) Median			6.93	6.37	6.37	-2.79	1.85	1.96	4.42		
PNC Fixed	26,853,814	8.6	6.85 (57)	6.23 (58)	6.23 (58)	-1.71 (19)	1.84 (51)	1.77 (69)	2.92 (94)	Jul-2008	
PNC Fixed Policy			6.82	5.53	5.53	-1.54	1.64	1.60	2.63		
IM U.S. Broad Market Fixed Income (SA+CF) Median			6.93	6.37	6.37	-2.79	1.85	1.96	3.74		
Vanguard Core Bond Fund (VCOBX)	21,561,798	6.9	6.85 (60)	-	-	-	-	-	2.65 (66)	Feb-2023	
Blmbg. U.S. Aggregate Index			6.82	-	-	-	-	-	2.38		
IM U.S. Broad Market Core Fixed Income (MF) Median			6.93	-	-	-	-	-	2.90		
<b>Total Alternatives</b>	<b>49,953,534</b>	<b>16.1</b>									
<b>Private Real Estate</b>	<b>20,406,674</b>	<b>6.6</b>	<b>-1.37</b>	<b>-2.06</b>	<b>-2.06</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.39</b>	<b>Apr-2022</b>	
Boyd Watterson GSA Fund	12,622,014	4.1	-2.20 (35)	-3.13 (11)	-3.13 (11)	3.05 (77)	5.10 (29)	6.26 (20)	6.88 (-)	Feb-2016	
NCREIF Property Index			-3.02	-7.94	-7.94	4.57	4.33	5.04	5.46		
IM U.S. Private Real Estate (SA+CF) Median			-4.20	-10.48	-10.48	5.00	4.66	5.76	-		
Bentall GreenOak US Core Plus RE	7,784,660	2.5	0.00 (12)	3.15 (8)	3.15 (8)	-	-	-	-	Nov-2022	
NCREIF Property Index			-3.02	-7.94	-7.94	-	-	-	-9.65		
IM U.S. Private Real Estate (SA+CF) Median			-4.20	-10.48	-10.48	-	-	-	-		

	Allocation		Performance(%)							
	Market Value \$	%	QTR	YTD	1 YR	3 YR	5 YR	7 YR	Inception	Inception Date
<b>Private Equity</b>	<b>21,452,655</b>	<b>6.9</b>								
Ironsides Direct Investment Fund V	10,465,041	3.4								
PA Co-Investment Fund III	5,730,988	1.8								
Adams Street Co-Investment Fund V	3,725,709	1.2								
Hamilton Lane Secondary Fund VI	1,530,917	0.5								
<b>Private Debt</b>	<b>8,094,205</b>	<b>2.6</b>								
Ironsides Opportunities Fund	1,968,867	0.6								
PA Credit Strategies Fund	6,125,338	2.0								
<b>Cash</b>	<b>1,015,022</b>	<b>0.3</b>								
Cash Account	1,015,022	0.3								

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Comparative Performance

Total Fund

As of December 31, 2023

Comparative Performance																				
	2023		2022		2021		2020		2019		2018		2017		2016		2015		2014	
<b>Total Fund (Gross)</b>	<b>12.84</b>	<b>(59)</b>	<b>-11.56</b>	<b>(22)</b>	<b>13.31</b>	<b>(59)</b>	<b>12.18</b>	<b>(64)</b>	<b>18.55</b>	<b>(71)</b>	<b>-5.13</b>	<b>(69)</b>	<b>14.12</b>	<b>(71)</b>	<b>8.40</b>	<b>(20)</b>	<b>0.36</b>	<b>(36)</b>	<b>6.45</b>	<b>(47)</b>
Total Fund Policy Index	13.02		-12.15		11.61		12.26		17.45		-3.89		10.71		8.86		1.22		7.13	
All Public DB Plans Median	13.34		-13.87		13.79		13.40		19.92		-4.50		15.24		6.97		-0.18		6.31	
<b>Total Fund (Net)</b>	<b>12.67</b>		<b>-11.71</b>		<b>13.09</b>		<b>11.89</b>		<b>18.18</b>		<b>-5.52</b>		<b>13.72</b>		<b>7.99</b>		<b>-0.03</b>		<b>6.02</b>	
Total Fund Policy Index	13.02		-12.15		11.61		12.26		17.45		-3.89		10.71		8.86		1.22		7.13	
<b>Total Equity</b>	<b>20.76</b>																			
<b>Domestic Large Cap Equity</b>	<b>23.91</b>																			
Vanguard S&P 500 Index Fund (VINIX)	26.24	(17)	-18.14	(12)	28.67	(7)	18.39	(13)	31.47	(4)	-4.42	(15)	21.80	(4)	11.93	(6)	1.34	(11)	13.65	(2)
S&P 500 Index	26.29		-18.11		28.71		18.40		31.49		-4.38		21.83		11.96		1.38		13.69	
IM S&P 500 Index (MF) Median	25.96		-18.36		28.25		18.05		31.08		-4.66		21.37		11.55		0.97		13.18	
Vanguard Russell 1000 Growth Index (VRGWX)	42.65	(37)	-29.17	(28)	27.52	(18)	38.38	(35)	36.30	(21)	-1.56	(55)	30.13	(40)	7.03	(10)	5.56	(51)	12.98	(25)
Russell 1000 Growth Index	42.68		-29.14		27.60		38.49		36.39		-1.51		30.21		7.08		5.67		13.05	
IM U.S. Large Cap Growth Equity (MF) Median	40.78		-31.30		22.39		35.62		33.26		-1.22		29.28		2.21		5.61		10.49	
DFA Large Value Equity (DFLVX)	11.47	(57)	-5.78	(48)	28.07	(22)	-0.60	(91)	25.49	(65)	-11.61	(87)	18.97	(25)	18.89	(9)	-3.49	(62)	10.05	(67)
Russell 1000 Value Index	11.46		-7.54		25.16		2.80		26.54		-8.27		13.66		17.34		-3.83		13.45	
IM U.S. Large Cap Value Equity (MF) Median	12.63		-6.10		25.96		3.82		26.50		-8.61		16.95		13.85		-3.00		10.82	
Vanguard Russell 1000 Value Index (VRVIX)	11.42	(57)	-7.62	(67)																
Russell 1000 Value Index	11.46		-7.54		25.16		2.80		26.54		-8.27		13.66		17.34		-3.83		13.45	
IM U.S. Large Cap Value Equity (MF) Median	12.63		-6.10		25.96		3.82		26.50		-8.61		16.95		13.85		-3.00		10.82	
Vesper Capital Mgmt (UTRN)	0.73	(100)	-20.37	(79)	30.04	(15)														
S&P 500 Index	26.29		-18.11		28.71		18.40		31.49		-4.38		21.83		11.96		1.38		13.69	
IM U.S. Large Cap Core Equity (SA+CF+MF) Median	24.60		-18.25		26.92		18.04		30.11		-5.50		21.50		9.73		0.70		11.78	
<b>Domestic Small Cap Equity</b>	<b>18.89</b>																			
Allspring Global Small Value Eq.	20.80	(27)	-12.53	(80)	29.83	(62)	2.24	(69)	29.50	(11)	-12.84	(34)	12.21	(36)	30.62	(32)	-3.36	(33)	8.76	(12)
Russell 2000 Value Index	14.65		-14.48		28.27		4.63		22.39		-12.86		7.84		31.74		-7.47		4.22	
IM U.S. Small Cap Value Equity (SA+CF+MF) Median	17.78		-10.36		32.52		4.79		23.26		-14.65		10.28		27.74		-5.24		5.11	
Emerald Small Growth Equity	19.35	(36)	-23.91	(33)	5.74	(74)	39.16	(50)	31.23	(41)	-10.67	(83)	28.70	(20)	10.07	(58)	4.58	(9)	7.55	(18)
Russell 2000 Growth Index	18.66		-26.36		2.83		34.63		28.48		-9.31		22.17		11.32		-1.38		5.60	
IM U.S. Small Cap Growth Equity (SA+CF+MF) Median	17.88		-26.82		11.71		38.95		29.00		-4.28		22.32		11.18		-1.02		4.22	

See the disclosure page at the end of this report.



Comparative Performance

Total Fund

As of December 31, 2023

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
<b>International Equity</b>	<b>16.57</b>									
DFA International Equity (DFIEX)	17.49 (45)	-13.48 (21)	13.87 (9)	7.72 (55)	21.66 (41)	-17.40 (83)				
MSCI EAFE Value Index (Net)	18.95	-5.58	10.89	-2.63	16.09	-14.78	21.44	5.02	-5.68	-5.39
IM International Multi-Cap Core Equity (MF) Median	17.14	-15.12	10.46	7.96	21.25	-15.14	25.23	1.25	-0.89	-4.98
DFA Emerging Markets (DFCEX)	15.45 (25)	-16.40 (19)	5.83 (18)	13.86 (70)	16.04 (77)	-15.25 (40)				
MSCI Emerging Markets (Net) Index	9.83	-20.09	-2.54	18.31	18.42	-14.57	37.28	11.19	-14.92	-2.19
IM Emerging Markets Equity (SA+CF+MF) Median	10.57	-22.49	-1.95	17.99	20.50	-16.45	35.98	7.17	-13.17	-2.65
EuroPacific Growth Fund (RERGX)	16.05 (37)	-22.72 (60)	2.84 (86)	25.27 (17)	27.38 (55)	-14.87 (53)	31.14 (29)	1.06 (21)		
MSCI AC World ex USA Growth (Net)	14.03	-23.05	5.09	22.20	27.34	-14.43	32.01	0.12	-1.25	-2.65
IM International Large Cap Growth Equity (MF) Median	15.54	-20.24	8.88	20.00	27.50	-14.67	28.61	-1.94	0.25	-4.47
<b>Total Fixed Income</b>	<b>5.64</b>									
Boyd Watterson Fixed	6.04 (67)	-9.17 (7)	-0.40 (38)	6.86 (91)	8.69 (84)	-0.03 (52)	3.45 (91)	2.22 (96)	0.92 (30)	3.47 (97)
Boyd Watterson Fixed Policy	5.53	-8.24	-1.44	6.43	6.80	0.88	2.14	2.08	1.07	3.13
IM U.S. Broad Market Fixed Income (SA+CF) Median	6.37	-12.92	-0.75	8.74	9.49	-0.01	4.33	3.71	0.63	6.14
PNC Fixed	6.23 (58)	-9.36 (7)	-1.38 (75)	7.53 (85)	7.29 (95)	0.78 (10)	2.41 (99)	2.11 (97)	0.66 (50)	2.99 (99)
PNC Fixed Policy	5.53	-8.24	-1.44	6.43	6.80	0.88	2.14	2.08	1.07	3.13
IM U.S. Broad Market Fixed Income (SA+CF) Median	6.37	-12.92	-0.75	8.74	9.49	-0.01	4.33	3.71	0.63	6.14
Vanguard S-T Inv't Grade Bond Fund (VFSIX)		-5.72 (94)	-0.30 (75)	5.28 (5)	5.87 (6)	1.02 (65)	2.16 (20)	2.85 (17)	1.18 (4)	1.89 (4)
Blmbg. 1-3 Year Gov/Credit	4.61	-3.69	-0.47	3.33	4.03	1.60	0.84	1.28	0.65	0.77
IM U.S. Short Term Investment Grade (MF) Median	5.67	-3.79	0.02	3.02	4.12	1.24	1.45	1.68	0.27	0.67
Vanguard Core Bond Fund (VCOBX)										
Blmbg. U.S. Aggregate Index	5.53	-13.01	-1.55	7.51	8.72	0.01	3.54	2.65	0.55	5.97
IM U.S. Broad Market Core Fixed Income (MF) Median	5.77	-13.66	-1.33	8.16	8.76	-0.62	3.60	2.90	0.04	5.55
<b>Private Real Estate</b>	<b>-2.06</b>									
Bentall GreenOak/MEPT Real Estate		8.74 (28)	20.81 (72)	1.37 (59)	4.55 (78)	8.18 (55)	6.48 (80)	8.97 (70)	13.01 (77)	13.22 (60)
NCREIF Property Index	-7.94	5.52	17.70	1.60	6.42	6.72	6.96	7.97	13.33	11.82
IM U.S. Private Real Estate (SA+CF) Median	-10.48	7.14	23.30	1.57	7.01	8.35	8.06	9.63	15.33	13.66
Boyd Watterson GSA Fund	-3.13 (11)	4.58 (73)	8.04 (97)	6.97 (6)	9.53 (18)	9.60 (23)	8.87 (35)			
NCREIF Property Index	-7.94	5.52	17.70	1.60	6.42	6.72	6.96	7.97	13.33	11.82
IM U.S. Private Real Estate (SA+CF) Median	-10.48	7.14	23.30	1.57	7.01	8.35	8.06	9.63	15.33	13.66
Bentall GreenOak US Core Plus RE	3.15 (8)									
NCREIF Property Index	-7.94	5.52	17.70	1.60	6.42	6.72	6.96	7.97	13.33	11.82
IM U.S. Private Real Estate (SA+CF) Median	-10.48	7.14	23.30	1.57	7.01	8.35	8.06	9.63	15.33	13.66

See the disclosure page at the end of this report.



As of December 31, 2023

## Private Equity Summary of Partnership

Partnerships	Valuation Date	Vintage Year	Investment Strategy	Capital Commitment \$	Drawn Down \$	Market Value \$	Distributed \$	IRR (%)	TVPI Multiple
<b>Private Equity Funds</b>									
Ironsides Direct Investment Fund V	12/31/2023	2018	Buyouts	6,000,000	7,292,877	10,465,041	2,196,167	16.0	1.7
PA Co-Investment Fund III	12/31/2023	2019	Buyouts	6,000,000	5,511,784	5,730,988	4,844,365	19.3	1.9
Adams Street Co-Investment Fund V	12/31/2023	2022	Co-Investment	10,000,000	3,262,945	3,725,709	-	20.5	1.1
Hamilton Lane Secondary Fund VI	12/31/2023	2022	Secondaries	10,000,000	990,445	1,530,917	2,627	90.9	1.5
<b>Private Debt Funds</b>									
Ironsides Opportunities Fund	12/31/2023	2018	Buyout - Mid	4,000,000	2,814,610	1,968,867	2,284,899	11.8	1.5
PA Credit Strategies Fund	12/31/2023	2015	Credit	4,000,000	4,000,000	6,125,338	-	8.7	1.5



**Comparative Performance - IRR**  
**Private Investments**  
As of December 31, 2023

Comparative Performance - IRR									
	QTR	YTD	1 YR	2 YR	3 YR	4 YR	5 YR	Inception	Inception Date
<b>Private Equity</b>									
Ironsides Direct Investment Fund V	0.00	6.53	6.53	4.61	8.20	16.83	16.92	16.02	11/09/2018
PA Co-Investment Fund III	0.00	5.60	5.60	7.76	19.90	23.49	20.94	19.29	11/05/2018
Adams Street Co-Investment Fund V	0.00	17.50	17.50	N/A	N/A	N/A	N/A	20.55	10/28/2022
Hamilton Lane Secondary Fund VI	0.00	90.92	90.92	N/A	N/A	N/A	N/A	90.92	01/03/2023
<b>Private Debt</b>									
Ironsides Opportunities Fund	0.00	7.54	7.54	9.03	10.67	11.68	12.04	11.83	12/31/2018
PA Credit Strategies Fund	0.00	3.71	3.71	4.77	9.33	8.65	8.82	8.69	11/21/2018





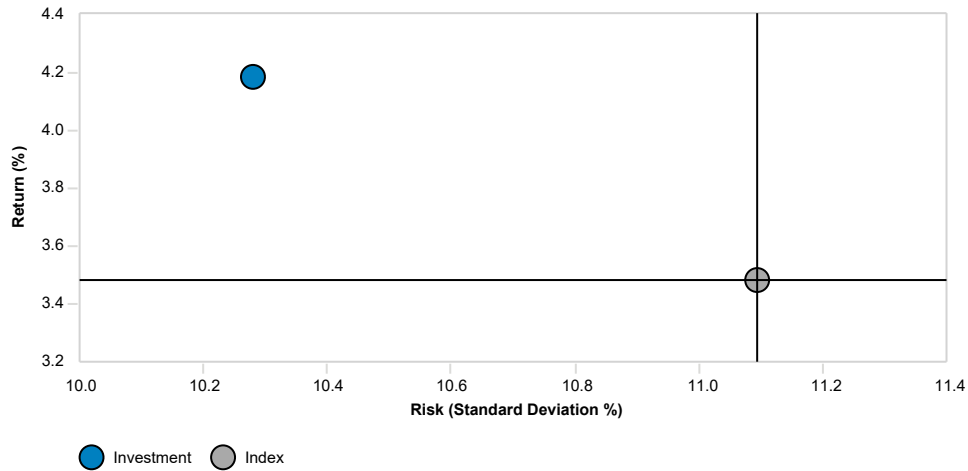
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	4.18	10.28	0.24	97.66	8	92.71	4
Index	3.48	11.10	0.17	100.00	7	100.00	5

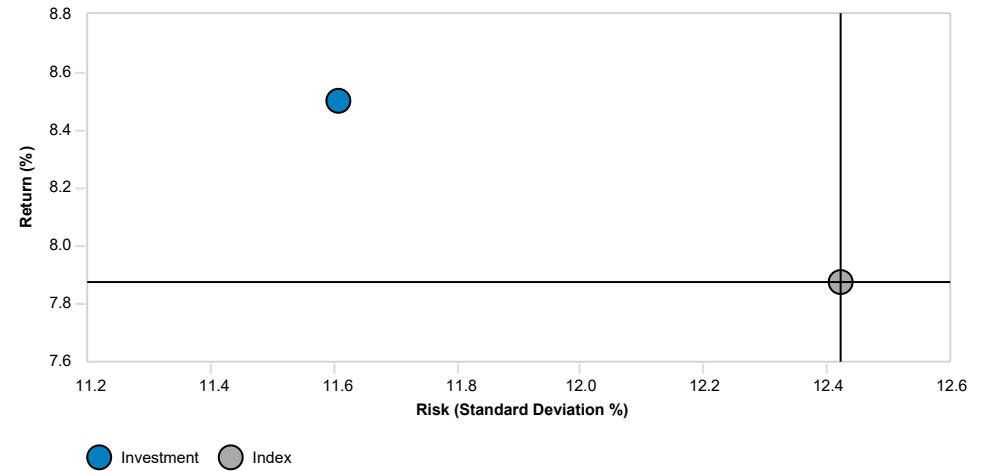
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	8.50	11.61	0.60	98.55	15	93.85	5
Index	7.88	12.42	0.52	100.00	14	100.00	6

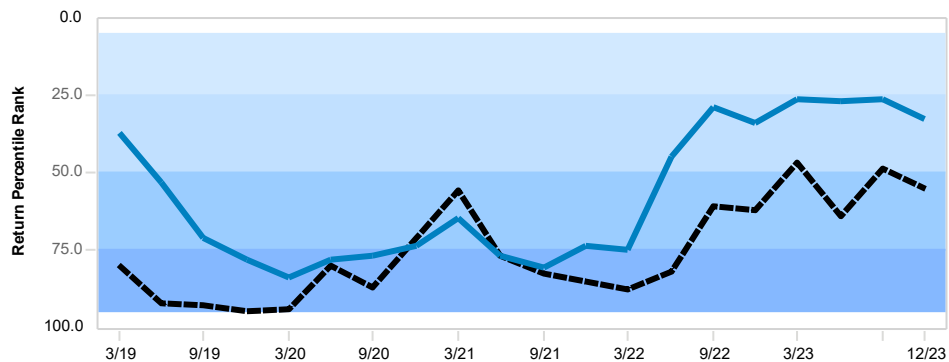
**Risk and Return 3 Years**



**Risk and Return 5 Years**

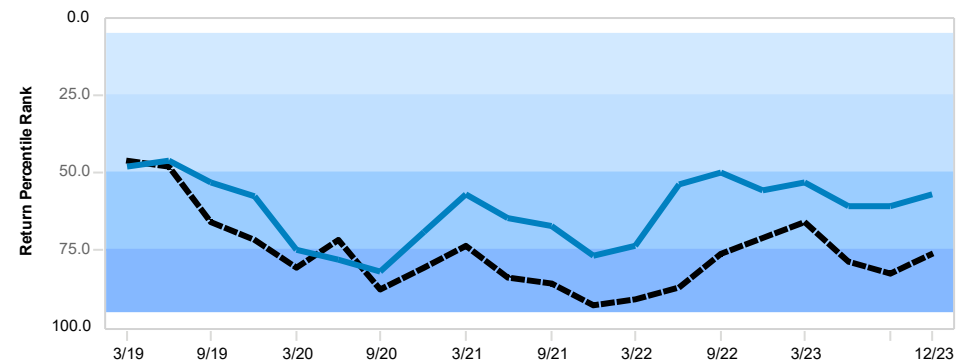


**3 Year Rolling Percentile Rank All Public DB Plans**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	8 (40%)	6 (30%)	6 (30%)
Index	20	0 (0%)	2 (10%)	6 (30%)	12 (60%)

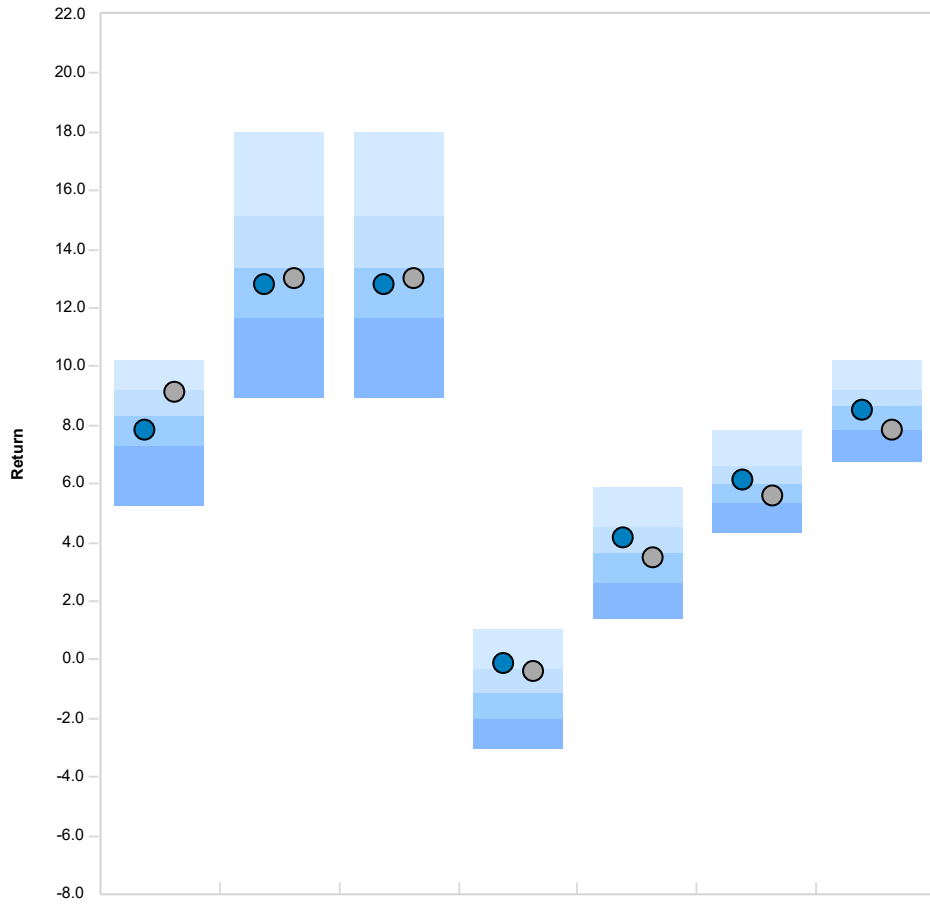
**5 Year Rolling Percentile Rank All Public DB Plans**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	3 (15%)	14 (70%)	3 (15%)
Index	20	0 (0%)	2 (10%)	6 (30%)	12 (60%)

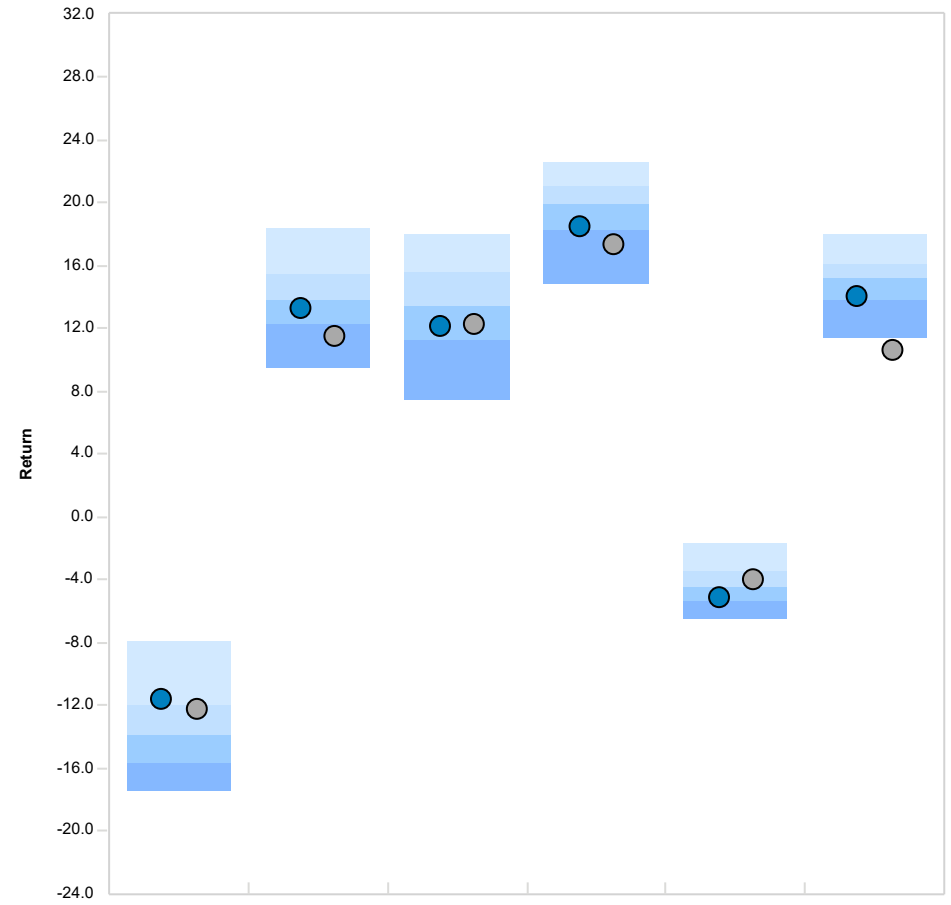


**Plan Sponsor Peer Group Analysis vs. All Public DB Plans**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	7.88 (64)	12.84 (59)	12.84 (59)	-0.10 (21)	4.18 (33)	6.13 (45)	8.50 (57)
● Index	9.15 (28)	13.02 (57)	13.02 (57)	-0.36 (26)	3.48 (55)	5.61 (67)	7.88 (76)
Median	8.31	13.34	13.34	-1.11	3.65	6.02	8.67

**Plan Sponsor Peer Group Analysis vs. All Public DB Plans**



	2022	2021	2020	2019	2018	2017
● Investment	-11.56 (22)	13.31 (59)	12.18 (64)	18.55 (71)	-5.13 (69)	14.12 (71)
● Index	-12.15 (29)	11.61 (84)	12.26 (64)	17.45 (83)	-3.89 (33)	10.71 (97)
Median	-13.87	13.79	13.40	19.92	-4.50	15.24

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
<b>Investment</b>	<b>-2.80 (46)</b>	<b>3.17 (59)</b>	<b>4.31 (51)</b>	<b>5.31 (63)</b>	<b>-3.84 (28)</b>	<b>-8.75 (18)</b>
Index	-3.42 (78)	3.02 (65)	4.07 (62)	5.41 (60)	-3.34 (14)	-9.83 (31)
Median	-2.91	3.33	4.31	5.67	-4.31	-10.65



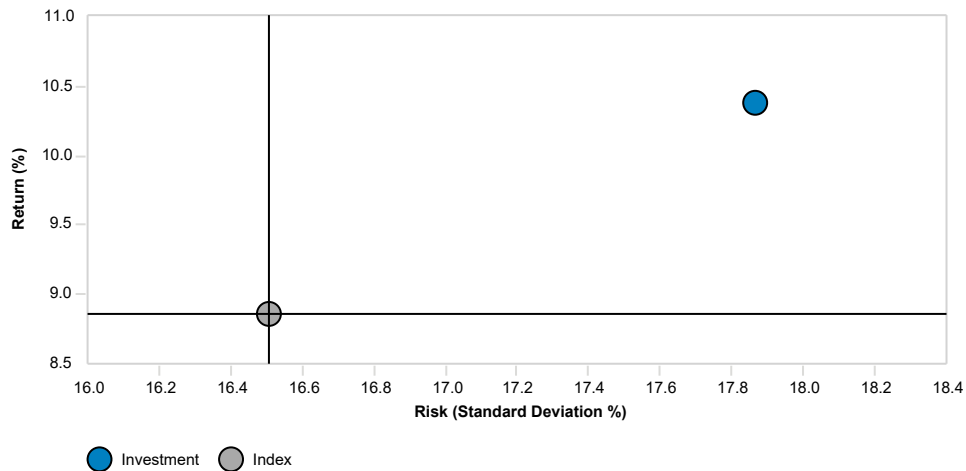
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	10.39	17.87	0.52	107.14	7	102.53	5
Index	8.86	16.51	0.47	100.00	7	100.00	5

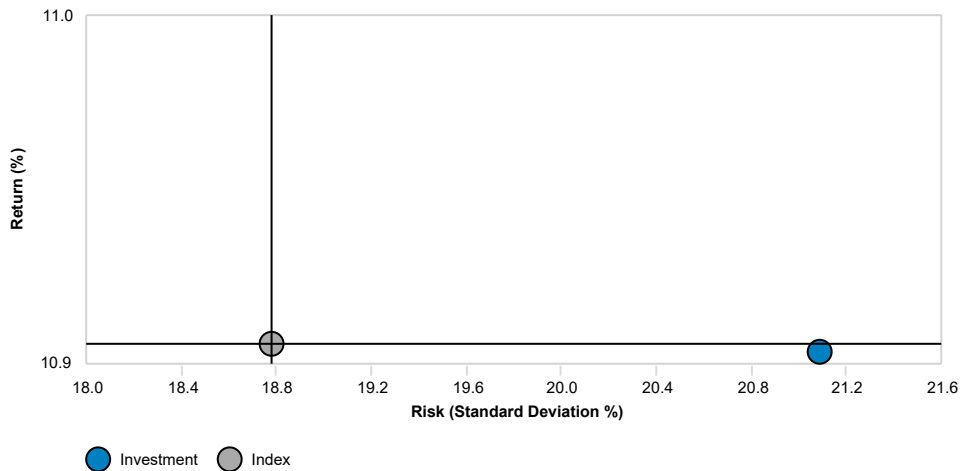
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	10.90	21.09	0.51	107.50	14	109.62	6
Index	10.91	18.78	0.55	100.00	14	100.00	6

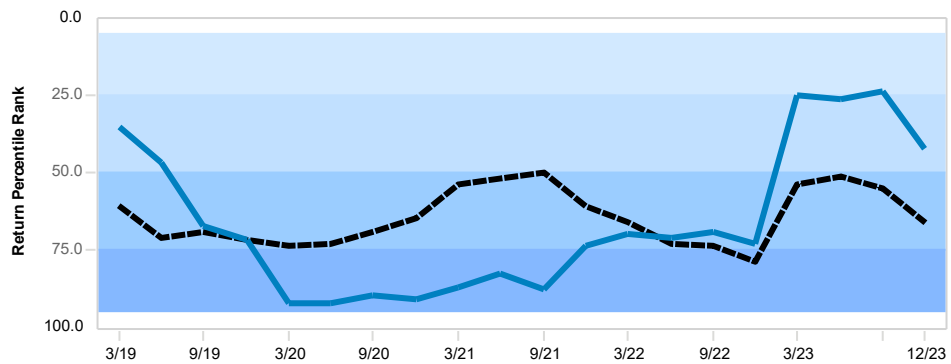
**Risk and Return 3 Years**



**Risk and Return 5 Years**

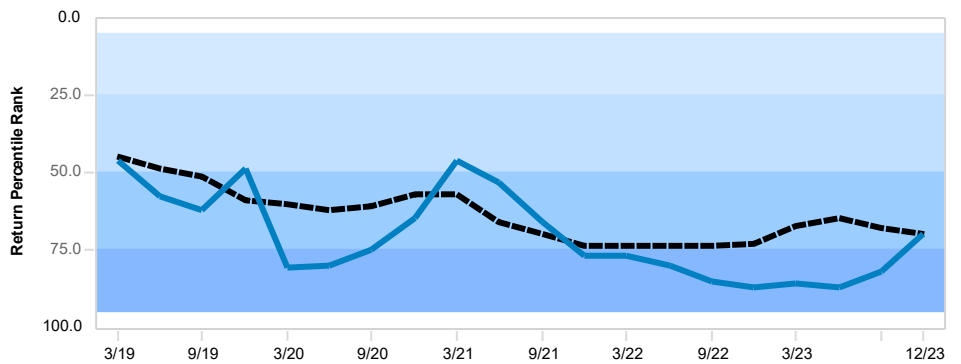


**3 Year Rolling Percentile Rank IM U.S. Large Cap Value Equity (MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	2 (10%)	4 (20%)	7 (35%)	7 (35%)
Index	20	0 (0%)	1 (5%)	18 (90%)	1 (5%)

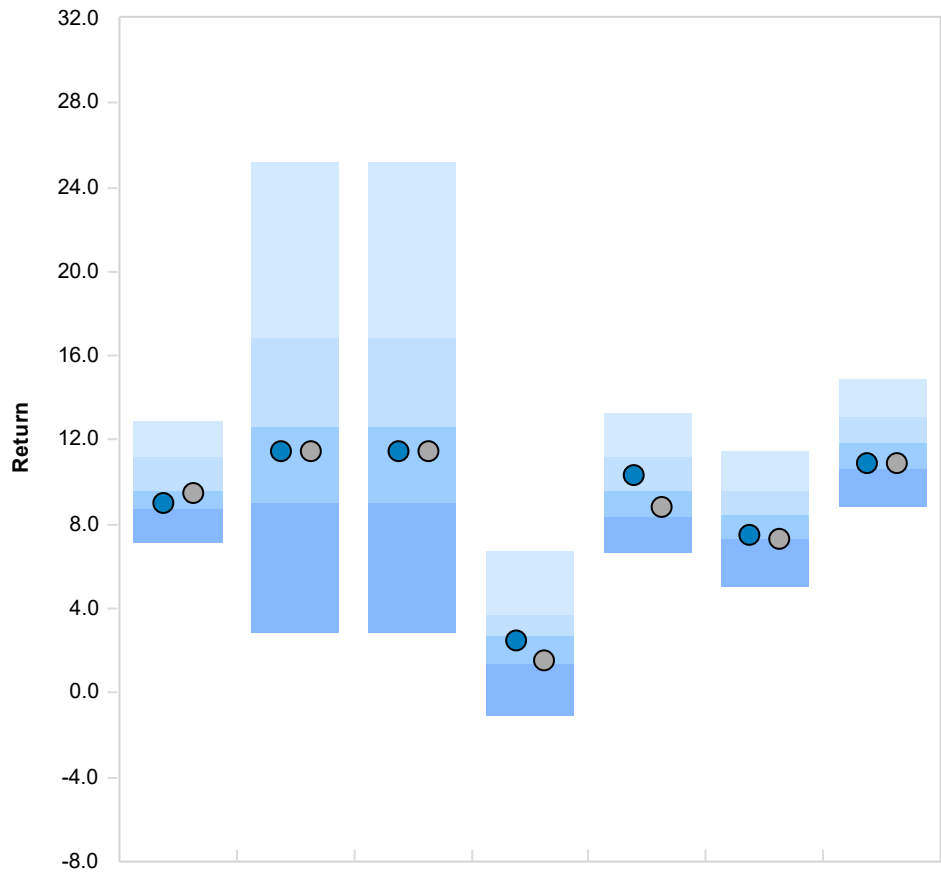
**5 Year Rolling Percentile Rank IM U.S. Large Cap Value Equity (MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	3 (15%)	7 (35%)	10 (50%)
Index	20	0 (0%)	2 (10%)	18 (90%)	0 (0%)

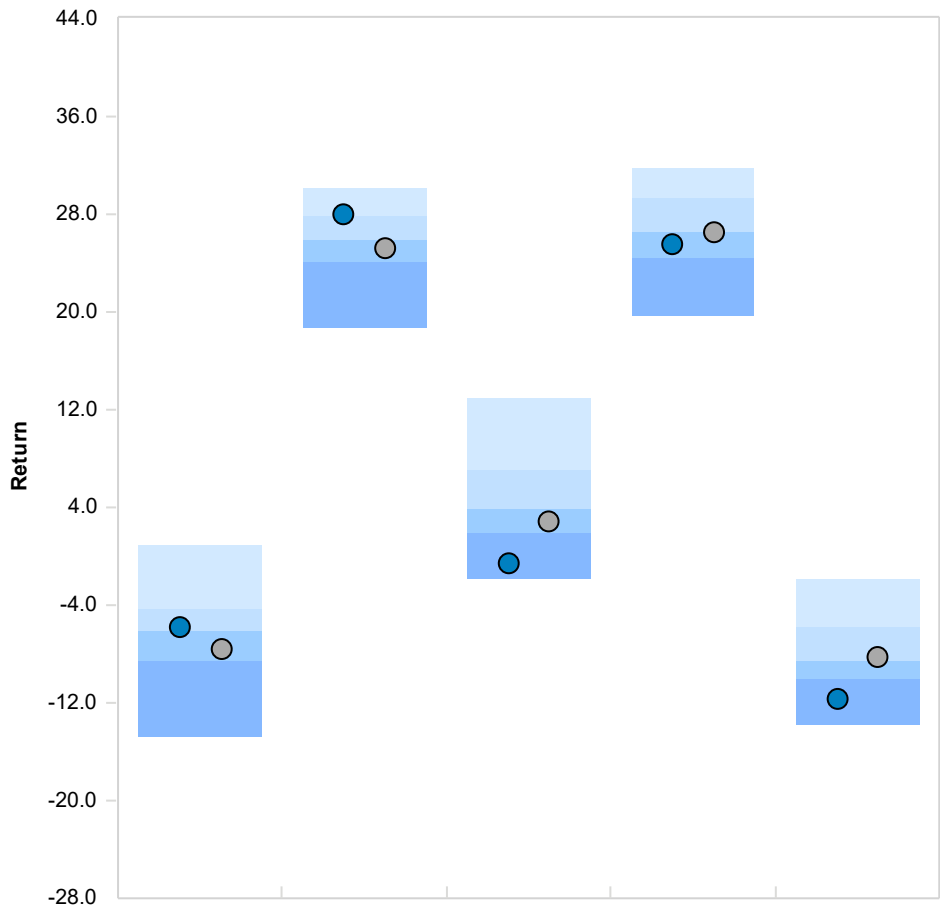


**Peer Group Analysis - IM U.S. Large Cap Value Equity (MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	9.06 (70)	11.47 (57)	11.47 (57)	2.48 (55)	10.39 (42)	7.53 (71)	10.90 (70)
● Index	9.50 (55)	11.46 (57)	11.46 (57)	1.52 (72)	8.86 (66)	7.31 (76)	10.91 (70)
Median	9.61	12.63	12.63	2.66	9.59	8.41	11.83

**Peer Group Analysis - IM U.S. Large Cap Value Equity (MF)**



	2022	2021	2020	2019	2018
● Investment	-5.78 (48)	28.07 (22)	-0.60 (91)	25.49 (65)	-11.61 (87)
● Index	-7.54 (66)	25.16 (63)	2.80 (61)	26.54 (50)	-8.27 (45)
Median	-6.10	25.96	3.82	26.50	-8.61

**Comparative Performance**

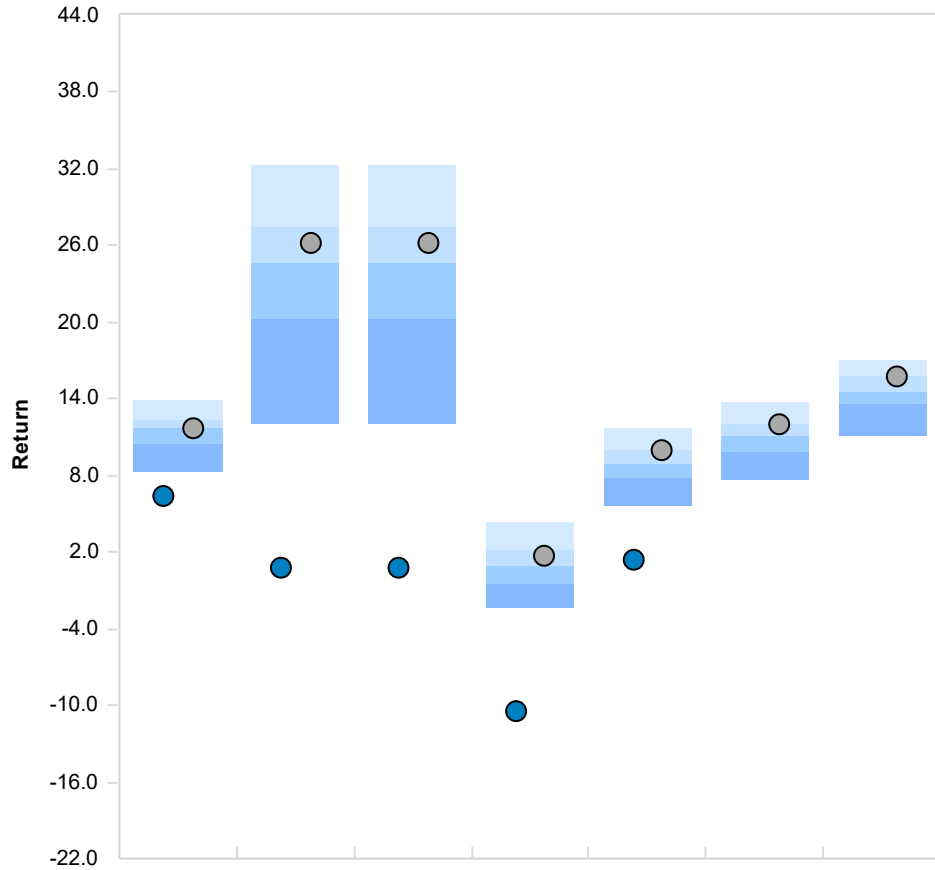
	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-1.39 (19)	3.18 (78)	0.46 (45)	14.05 (27)	-5.65 (53)	-12.13 (62)
Index	-3.16 (69)	4.07 (56)	1.01 (33)	12.42 (59)	-5.62 (52)	-12.21 (63)
Median	-2.36	4.40	0.15	12.88	-5.57	-11.35



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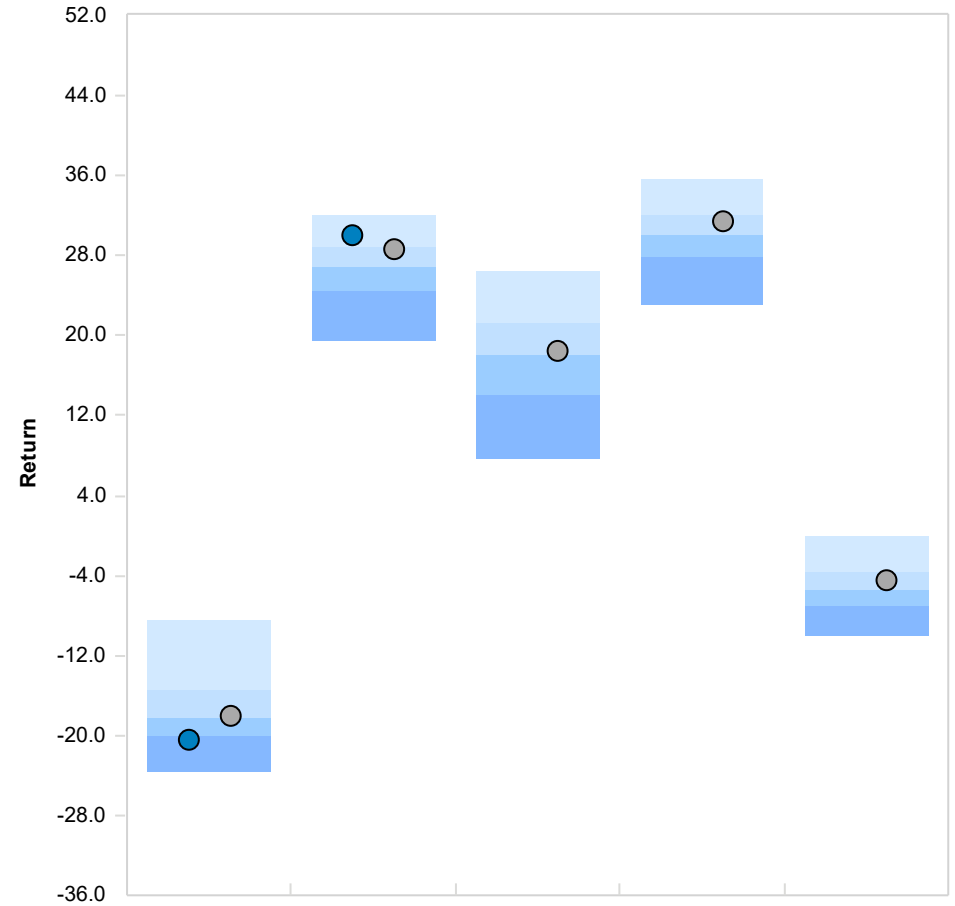


**Peer Group Analysis - IM U.S. Large Cap Core Equity (SA+CF+MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	6.36 (98)	0.73 (100)	0.73 (100)	-10.44 (100)	1.42 (100)	N/A	N/A
● Index	11.69 (49)	26.29 (35)	26.29 (35)	1.69 (34)	10.00 (26)	12.04 (26)	15.69 (25)
Median	11.66	24.60	24.60	0.95	8.87	11.02	14.57

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



	2022	2021	2020	2019	2018
● Investment	-20.37 (79)	30.04 (15)	N/A	N/A	N/A
● Index	-18.11 (49)	28.71 (27)	18.40 (48)	31.49 (34)	-4.38 (32)
Median	-18.25	26.92	18.04	30.11	-5.50

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-6.55 (100)	0.71 (100)	0.63 (96)	8.07 (46)	-8.60 (100)	-8.63 (3)
Index	-3.27 (58)	8.74 (31)	7.50 (29)	7.56 (57)	-4.88 (43)	-16.10 (61)
Median	-3.14	8.13	6.51	7.84	-5.12	-15.68



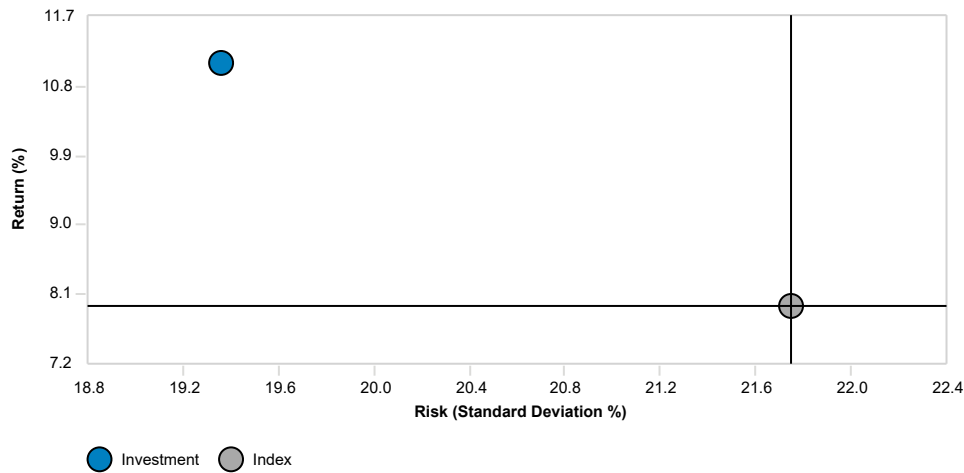
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	11.11	19.36	0.53	92.68	7	81.24	5
Index	7.94	21.75	0.36	100.00	6	100.00	6

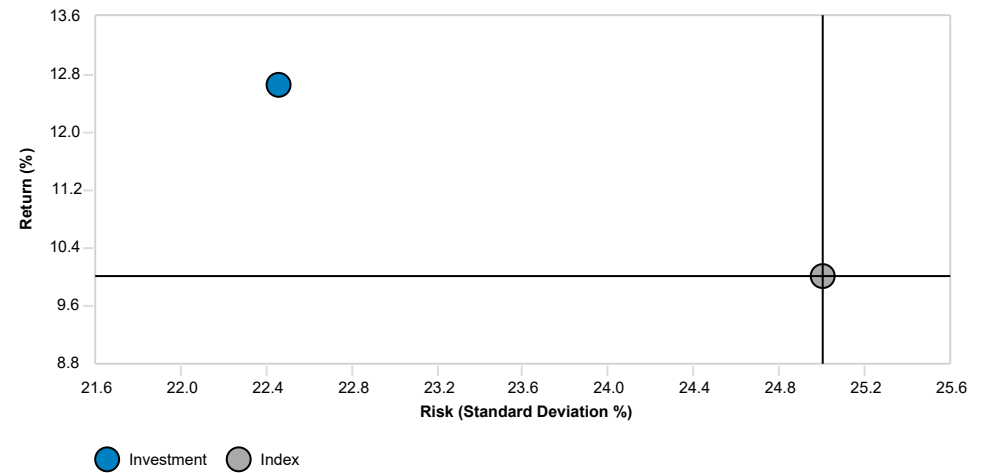
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	12.67	22.46	0.56	93.34	14	84.12	6
Index	10.00	25.01	0.43	100.00	12	100.00	8

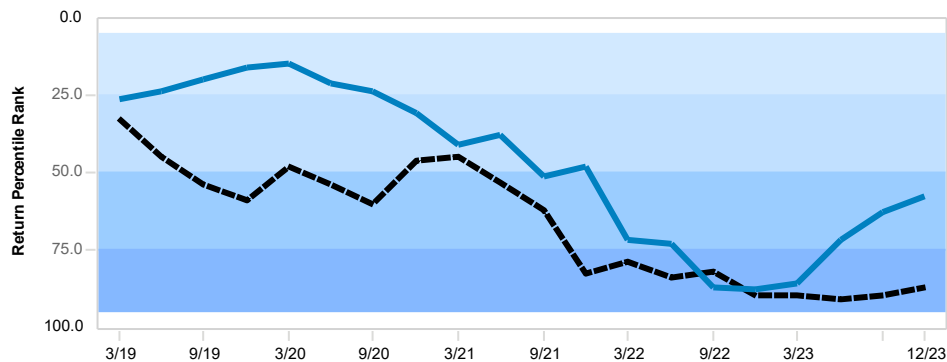
Risk and Return 3 Years



Risk and Return 5 Years

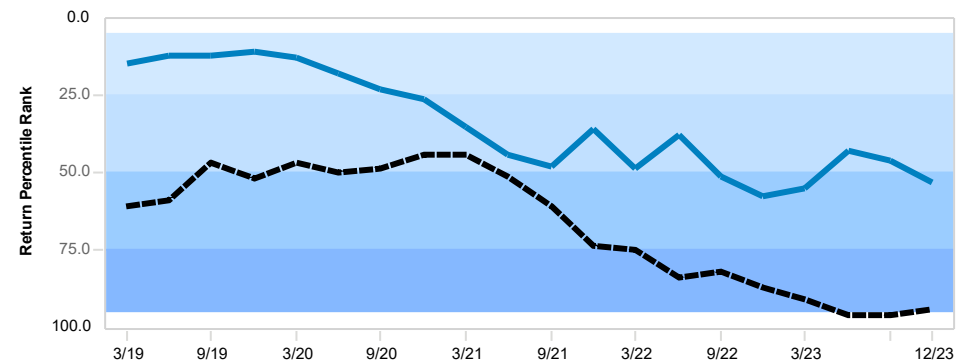


3 Year Rolling Percentile Rank IM U.S. Small Cap Value Equity (SA+CF+MF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	6 (30%)	5 (25%)	6 (30%)	3 (15%)
Index	20	0 (0%)	5 (25%)	6 (30%)	9 (45%)

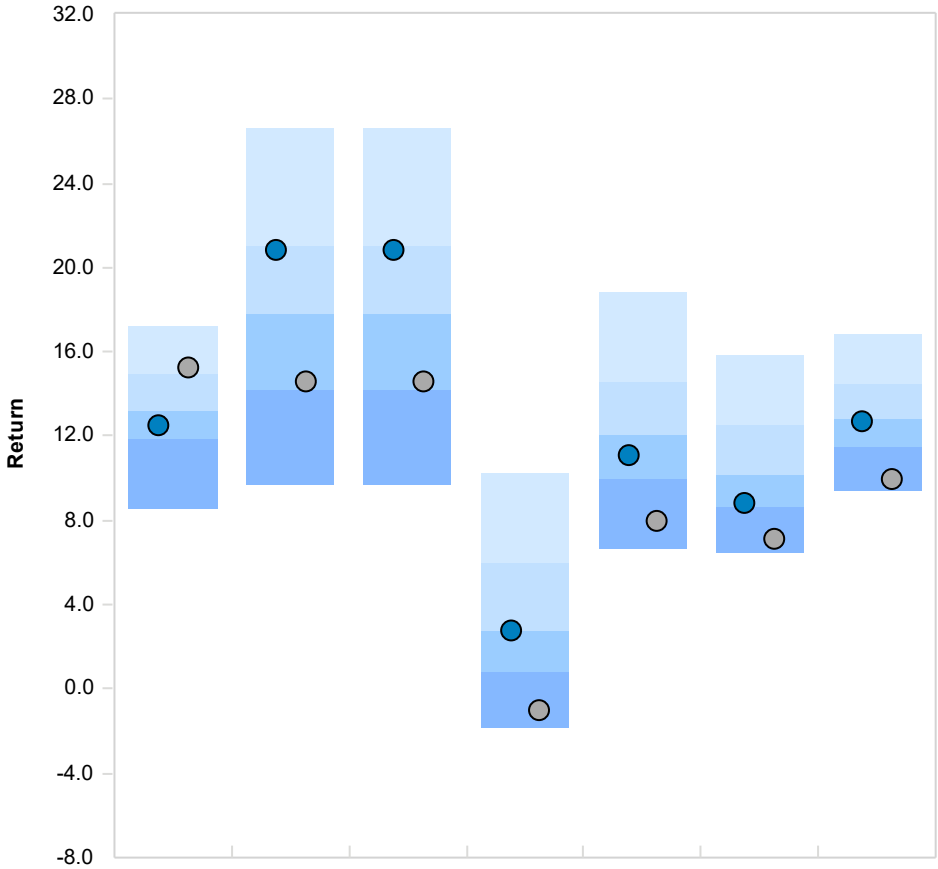
5 Year Rolling Percentile Rank IM U.S. Small Cap Value Equity (SA+CF+MF)



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

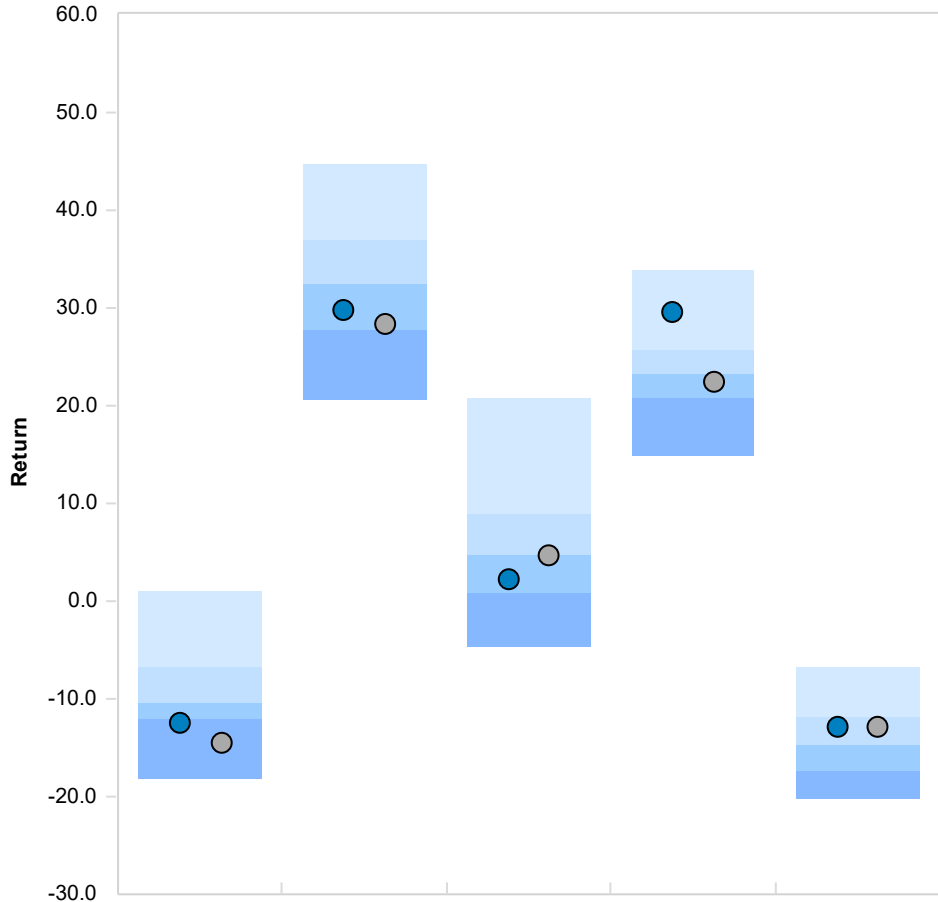


**Peer Group Analysis - IM U.S. Small Cap Value Equity (SA+CF+MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	12.52 (60)	20.80 (27)	20.80 (27)	2.79 (50)	11.11 (58)	8.82 (71)	12.67 (53)
● Index	15.26 (21)	14.65 (74)	14.65 (74)	-0.98 (92)	7.94 (87)	7.10 (93)	10.00 (94)
Median	13.21	17.78	17.78	2.77	12.01	10.14	12.82

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



	2022	2021	2020	2019	2018
● Investment	-12.53 (80)	29.83 (62)	2.24 (69)	29.50 (11)	-12.84 (34)
● Index	-14.48 (90)	28.27 (72)	4.63 (52)	22.39 (62)	-12.86 (34)
Median	-10.36	32.52	4.79	23.26	-14.65

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-2.17 (56)	5.47 (26)	4.04 (18)	12.01 (45)	-8.24 (95)	-11.59 (20)
Index	-2.96 (62)	3.18 (68)	-0.66 (86)	8.42 (90)	-4.61 (47)	-15.28 (83)
Median	-1.96	4.05	1.56	11.75	-4.87	-13.57





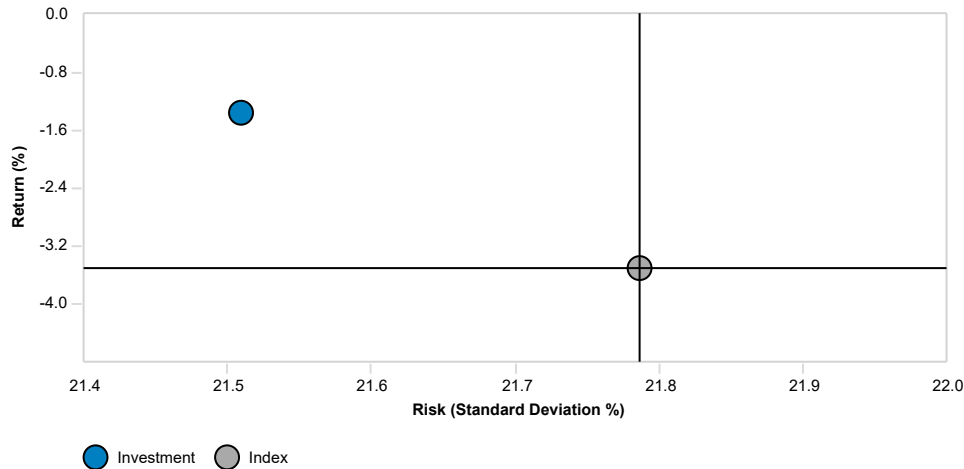
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-1.35	21.51	-0.05	103.90	8	96.81	4
Index	-3.50	21.79	-0.15	100.00	8	100.00	4

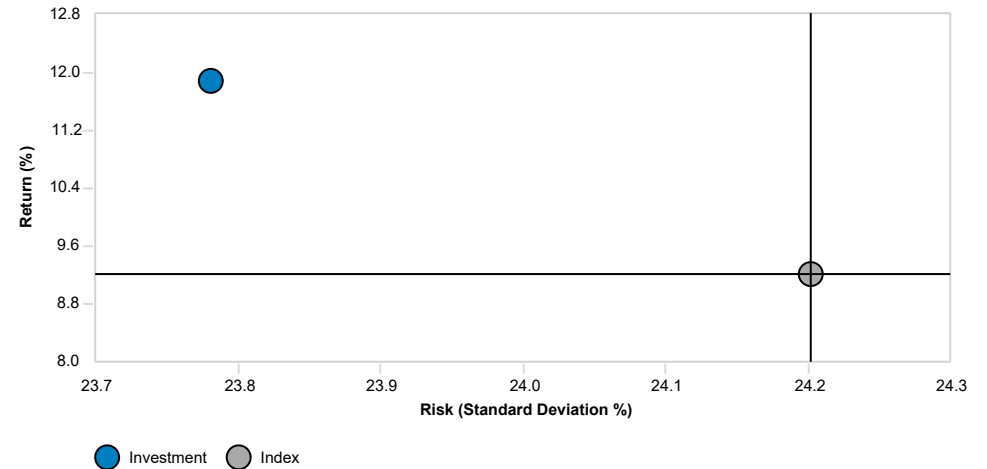
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	11.89	23.78	0.51	103.62	14	96.63	6
Index	9.22	24.20	0.41	100.00	14	100.00	6

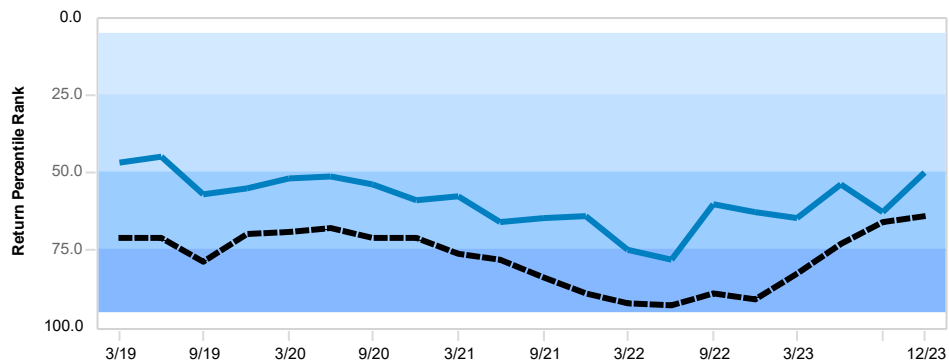
Risk and Return 3 Years



Risk and Return 5 Years

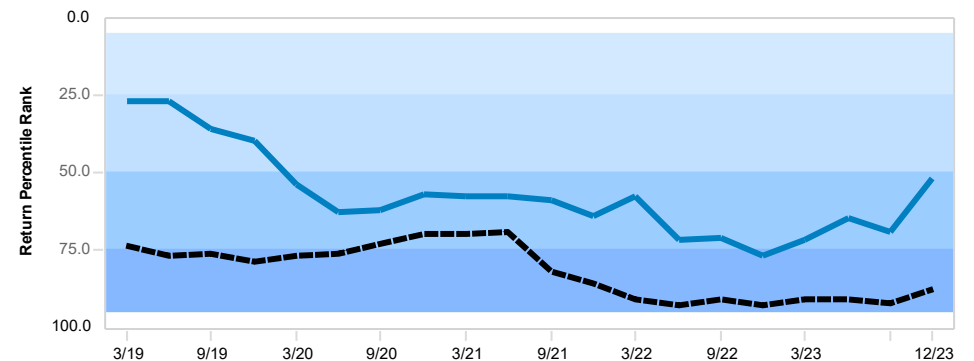


3 Year Rolling Percentile Rank IM U.S. Small Cap Growth Equity (SA+CF+MF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	3 (15%)	16 (80%)	1 (5%)
Index	20	0 (0%)	0 (0%)	10 (50%)	10 (50%)

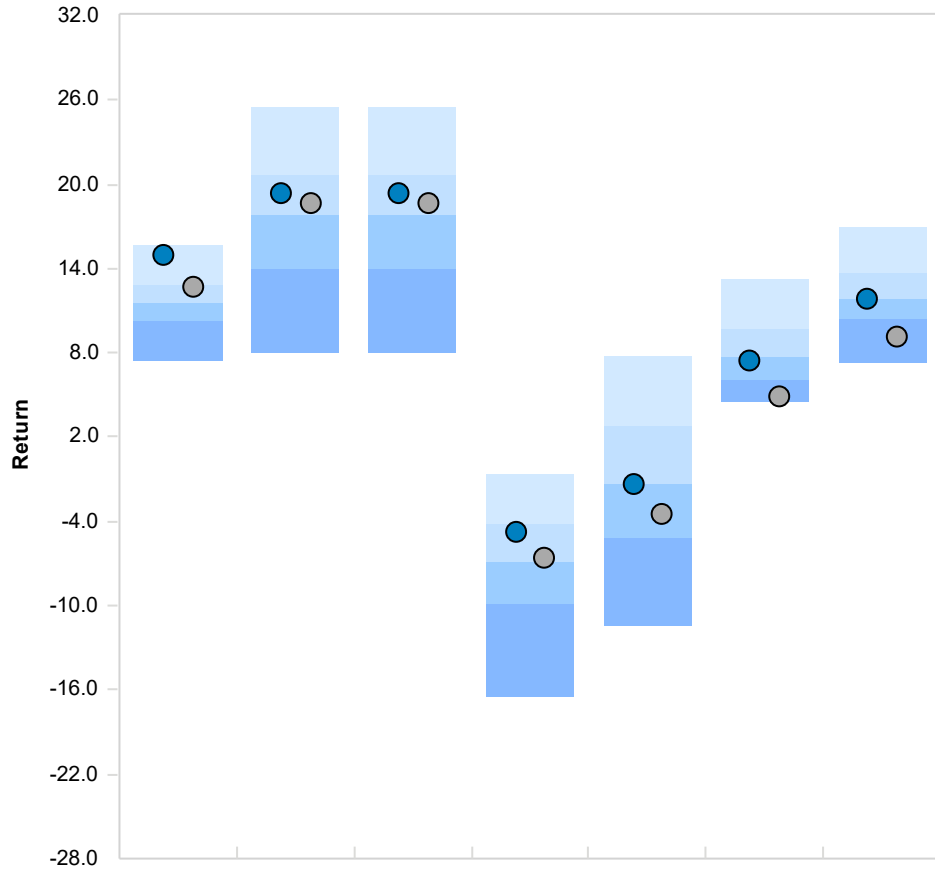
5 Year Rolling Percentile Rank IM U.S. Small Cap Growth Equity (SA+CF+MF)



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

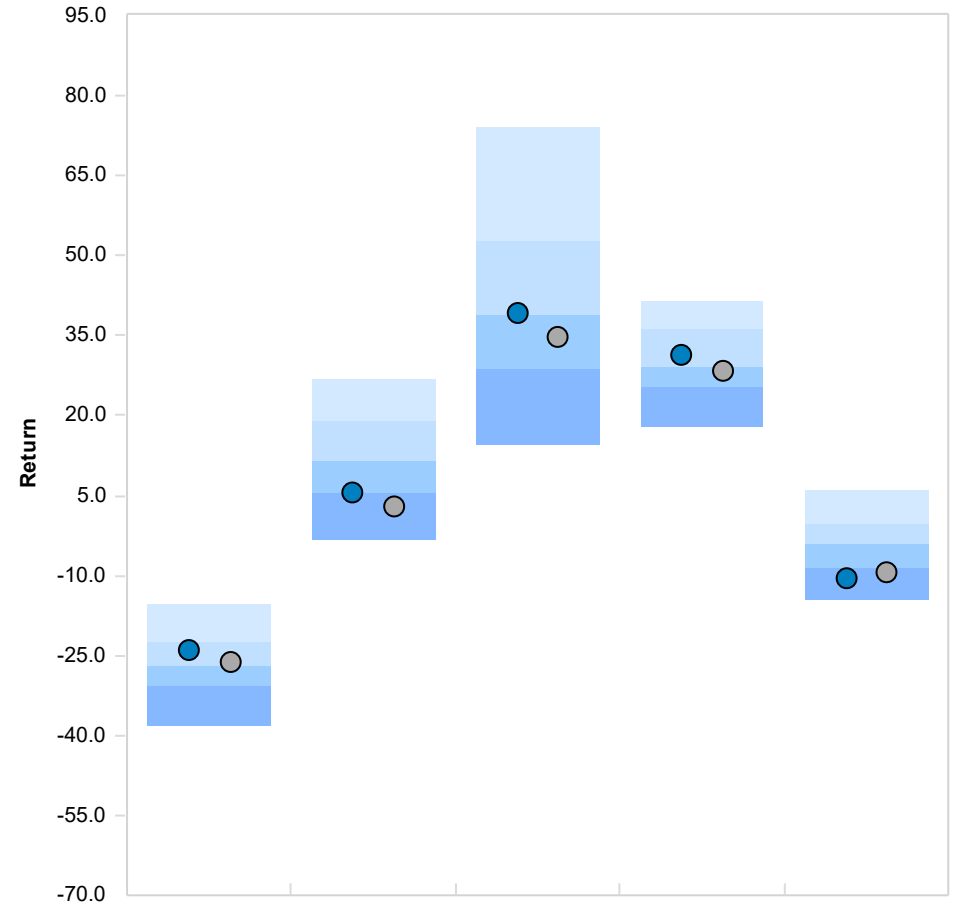


**Peer Group Analysis - IM U.S. Small Cap Growth Equity (SA+CF+MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	14.91 (8)	19.35 (36)	19.35 (36)	-4.71 (30)	-1.35 (50)	7.51 (55)	11.89 (52)
● Index	12.75 (28)	18.66 (45)	18.66 (45)	-6.52 (47)	-3.50 (64)	4.88 (86)	9.22 (88)
Median	11.58	17.88	17.88	-6.92	-1.37	7.75	11.90

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



	2022	2021	2020	2019	2018
● Investment	-23.91 (33)	5.74 (74)	39.16 (50)	31.23 (41)	-10.67 (83)
● Index	-26.36 (47)	2.83 (84)	34.63 (59)	28.48 (53)	-9.31 (78)
Median	-26.82	11.71	38.95	29.00	-4.28

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-8.50 (85)	8.85 (7)	4.28 (80)	6.57 (30)	0.01 (35)	-20.10 (62)
Index	-7.32 (72)	7.05 (22)	6.07 (61)	4.13 (60)	0.24 (32)	-19.25 (53)
Median	-6.10	5.37	6.72	4.73	-1.06	-18.96



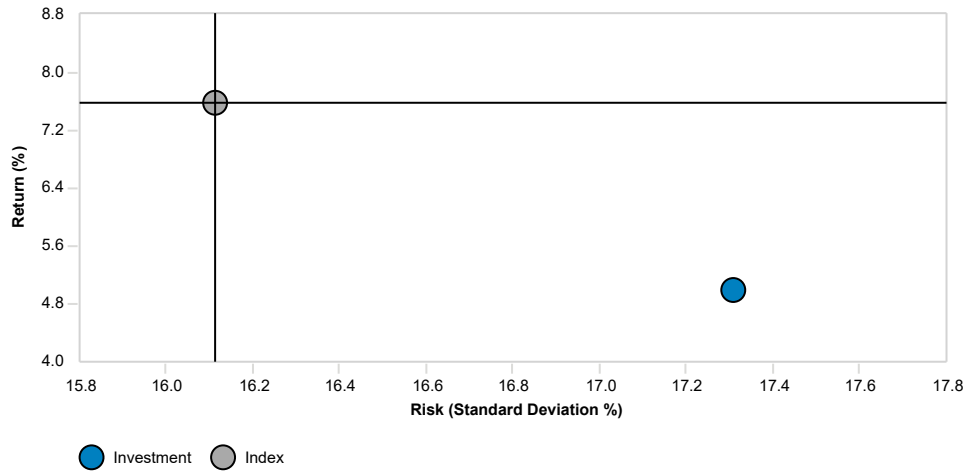
Historical Statistics 3 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	5.00	17.31	0.25	95.90	7	106.26	5
Index	7.59	16.11	0.41	100.00	9	100.00	3

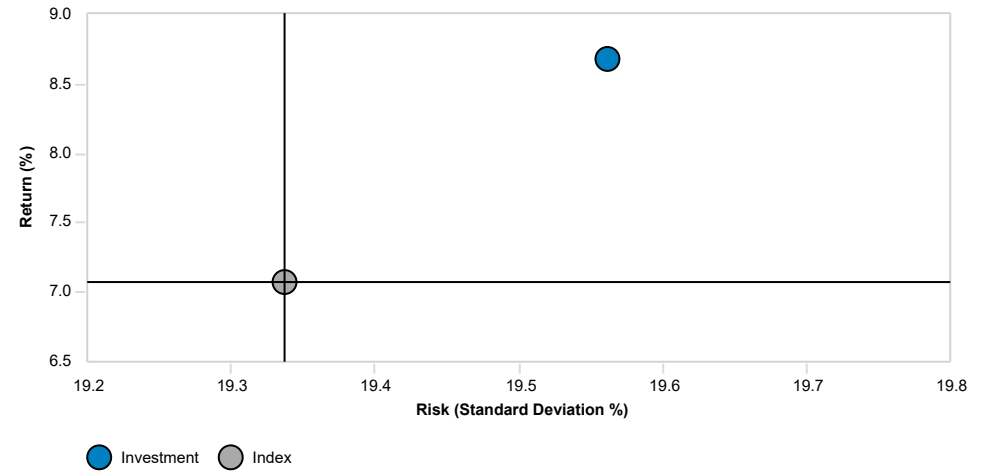
Historical Statistics 5 Years

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	8.69	19.56	0.43	103.79	13	98.05	7
Index	7.08	19.34	0.36	100.00	15	100.00	5

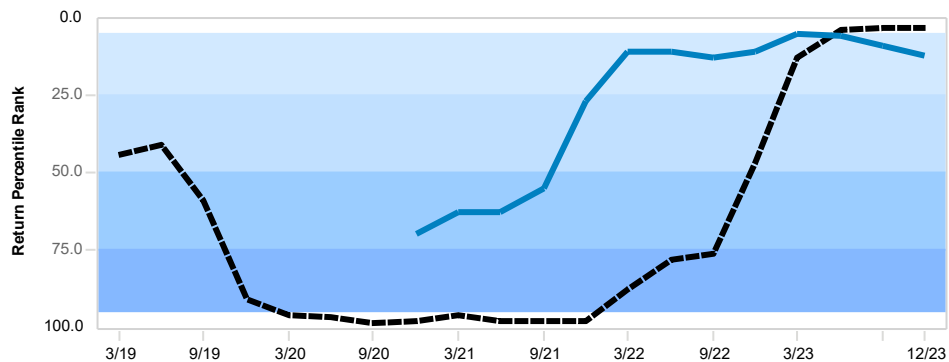
Risk and Return 3 Years



Risk and Return 5 Years

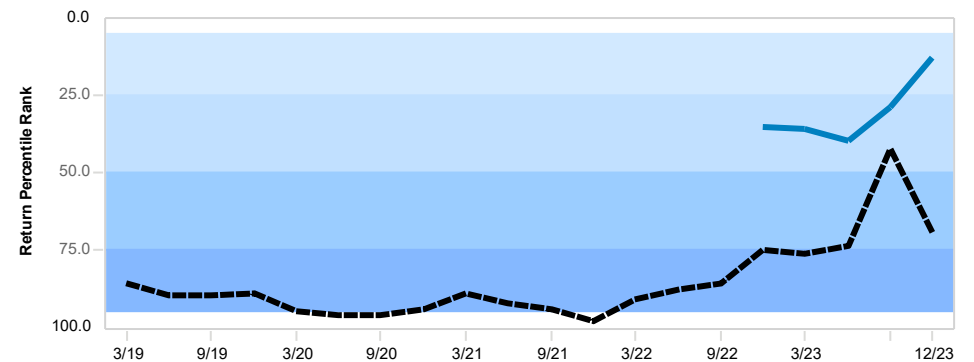


3 Year Rolling Percentile Rank IM International Multi-Cap Core Equity (MF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	8 (62%)	1 (8%)	4 (31%)	0 (0%)
Index	20	4 (20%)	3 (15%)	1 (5%)	12 (60%)

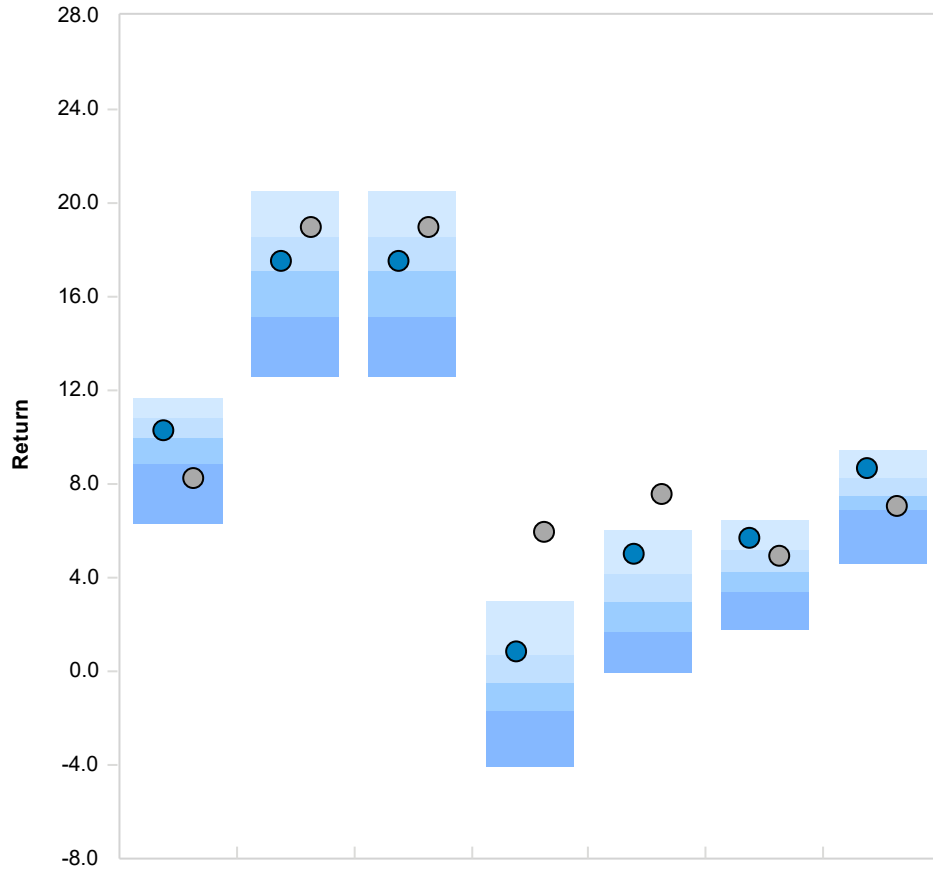
5 Year Rolling Percentile Rank IM International Multi-Cap Core Equity (MF)



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	5	1 (20%)	4 (80%)	0 (0%)	0 (0%)
Index	20	0 (0%)	1 (5%)	3 (15%)	16 (80%)

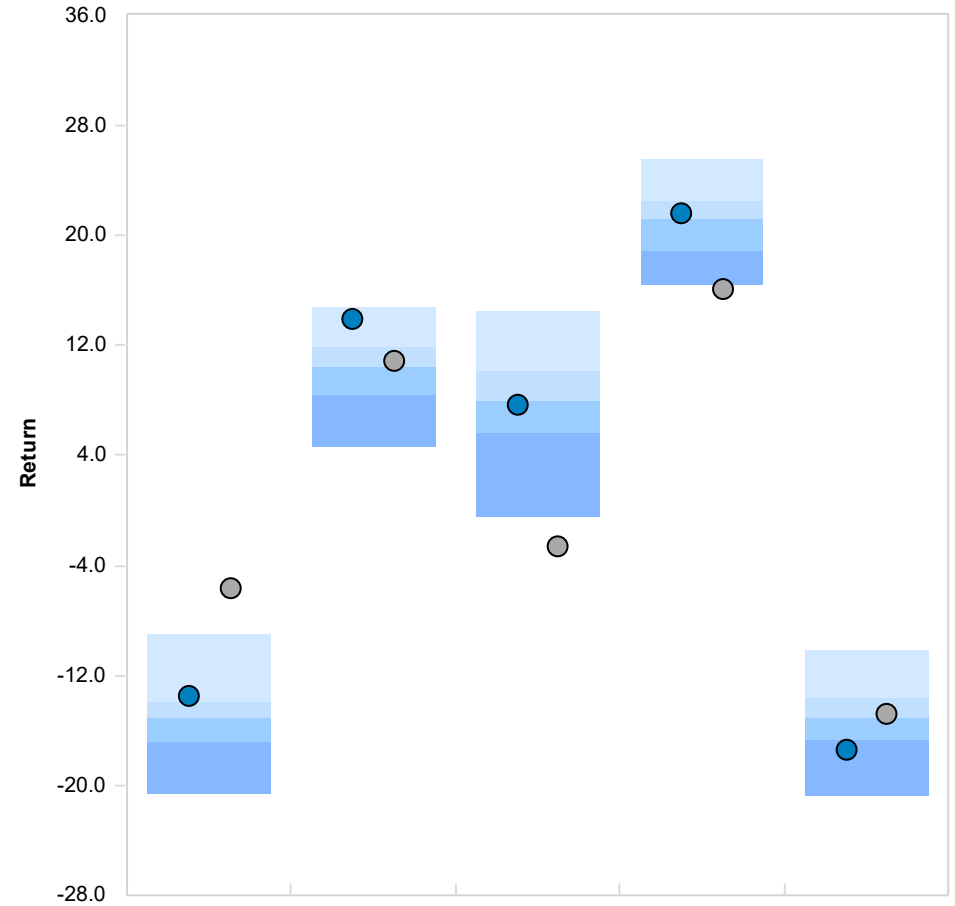


**Peer Group Analysis - IM International Multi-Cap Core Equity (MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	10.31 (42)	17.49 (45)	17.49 (45)	0.82 (21)	5.00 (12)	5.67 (13)	8.69 (13)
● Index	8.22 (86)	18.95 (22)	18.95 (22)	5.98 (2)	7.59 (3)	4.94 (36)	7.08 (69)
Median	9.98	17.14	17.14	-0.54	2.94	4.22	7.46

**Peer Group Analysis - IM International Multi-Cap Core Equity (MF)**



	2022	2021	2020	2019	2018
● Investment	-13.48 (21)	13.87 (9)	7.72 (55)	21.66 (41)	-17.40 (83)
● Index	-5.58 (2)	10.89 (45)	-2.63 (99)	16.09 (96)	-14.78 (47)
Median	-15.12	10.46	7.96	21.25	-15.14

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-2.94 (21)	2.07 (84)	7.51 (63)	17.63 (29)	-10.45 (53)	-13.59 (58)
Index	0.59 (1)	3.15 (38)	5.93 (93)	19.64 (5)	-10.20 (39)	-12.41 (22)
Median	-4.13	2.95	7.84	16.91	-10.43	-13.29



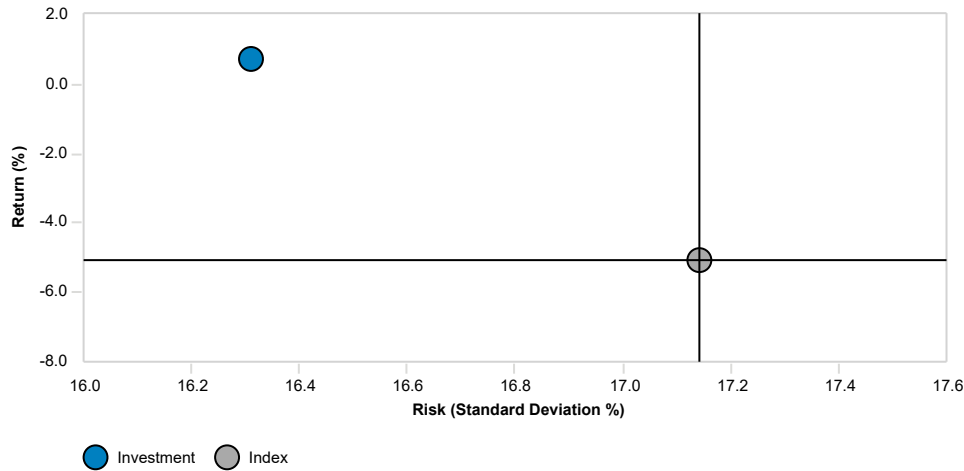
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	0.71	16.31	-0.01	103.33	7	79.47	5
Index	-5.08	17.14	-0.35	100.00	6	100.00	6

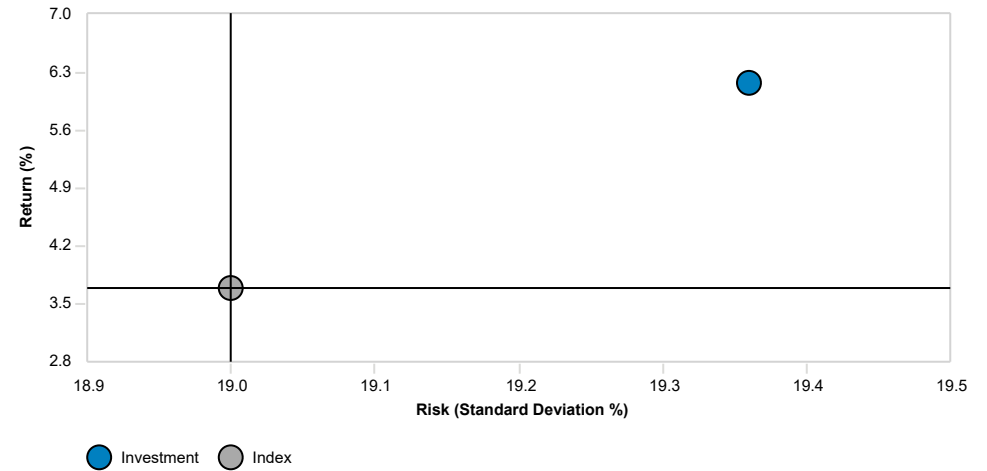
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	6.18	19.36	0.31	101.13	13	90.56	7
Index	3.68	19.00	0.19	100.00	12	100.00	8

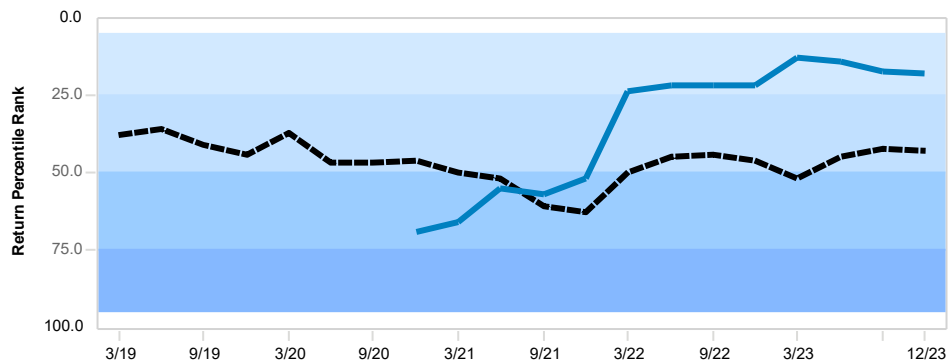
**Risk and Return 3 Years**



**Risk and Return 5 Years**

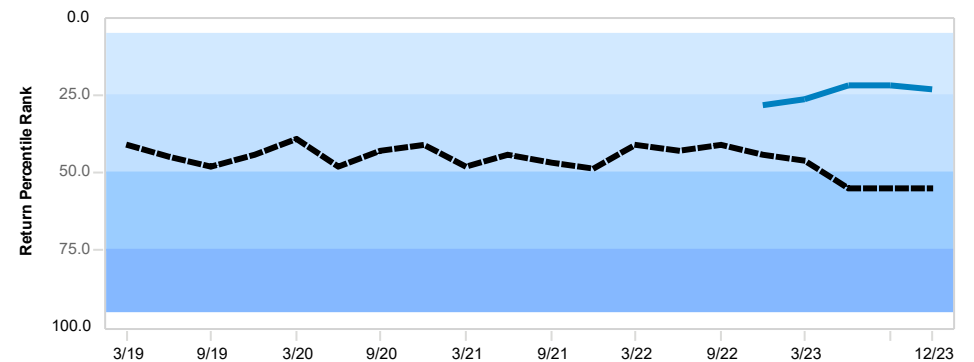


**3 Year Rolling Percentile Rank IM Emerging Markets Equity (SA+CF+MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	8 (62%)	0 (0%)	5 (38%)	0 (0%)
Index	20	0 (0%)	16 (80%)	4 (20%)	0 (0%)

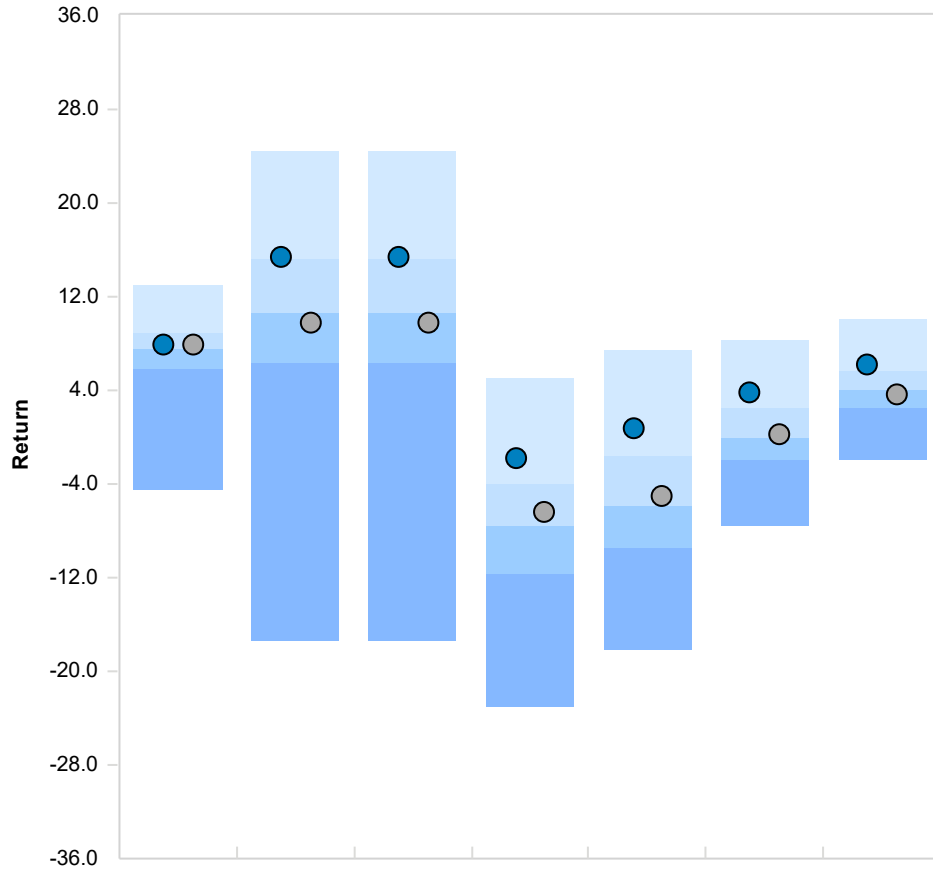
**5 Year Rolling Percentile Rank IM Emerging Markets Equity (SA+CF+MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	5	3 (60%)	2 (40%)	0 (0%)	0 (0%)
Index	20	0 (0%)	17 (85%)	3 (15%)	0 (0%)

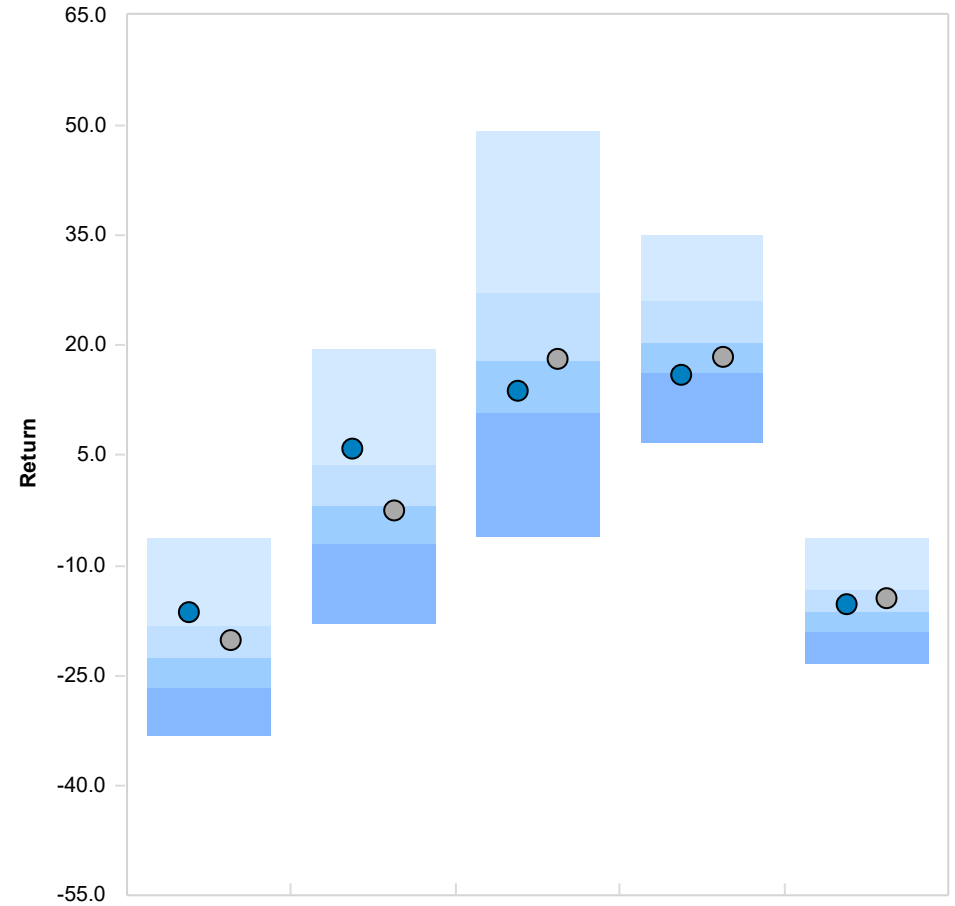


**Peer Group Analysis - IM Emerging Markets Equity (SA+CF+MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	7.86 (45)	15.45 (25)	15.45 (25)	-1.76 (17)	0.71 (18)	3.85 (20)	6.18 (23)
● Index	7.86 (45)	9.83 (55)	9.83 (55)	-6.32 (40)	-5.08 (43)	0.30 (47)	3.68 (55)
Median	7.61	10.57	10.57	-7.59	-5.90	-0.07	3.96

**Peer Group Analysis - IM Emerging Markets Equity (SA+CF+MF)**



	2022	2021	2020	2019	2018
● Investment	-16.40 (19)	5.83 (18)	13.86 (70)	16.04 (77)	-15.25 (40)
● Index	-20.09 (33)	-2.54 (54)	18.31 (49)	18.42 (63)	-14.57 (32)
Median	-22.49	-1.95	17.99	20.50	-16.45

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-1.52 (19)	2.93 (31)	5.59 (32)	10.54 (40)	-10.90 (46)	-11.79 (52)
Index	-2.93 (33)	0.90 (65)	3.96 (66)	9.70 (54)	-11.57 (56)	-11.45 (45)
Median	-3.85	1.61	4.84	9.92	-11.20	-11.71



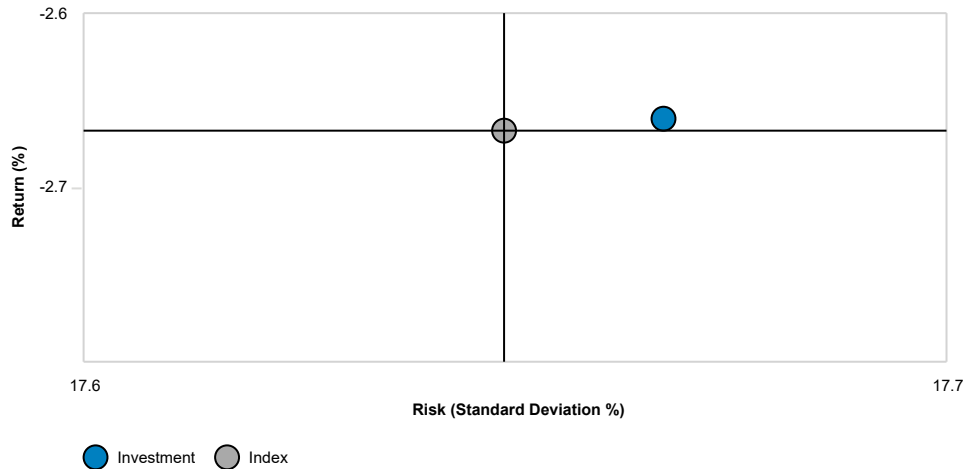
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-2.66	17.67	-0.19	98.90	5	98.91	7
Index	-2.67	17.65	-0.19	100.00	6	100.00	6

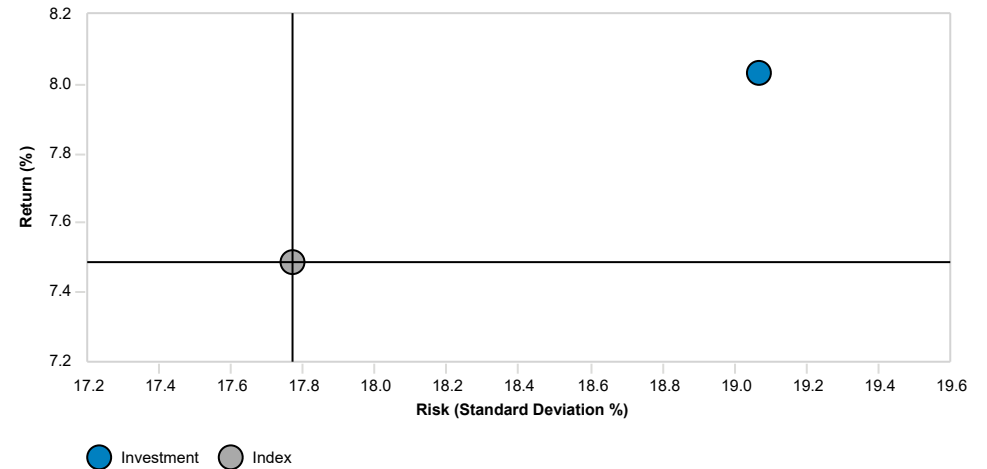
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	8.03	19.07	0.40	106.33	11	105.39	9
Index	7.49	17.77	0.39	100.00	12	100.00	8

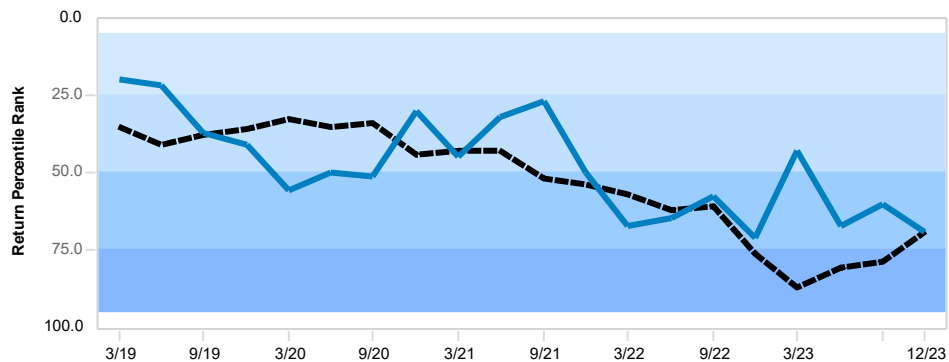
**Risk and Return 3 Years**



**Risk and Return 5 Years**

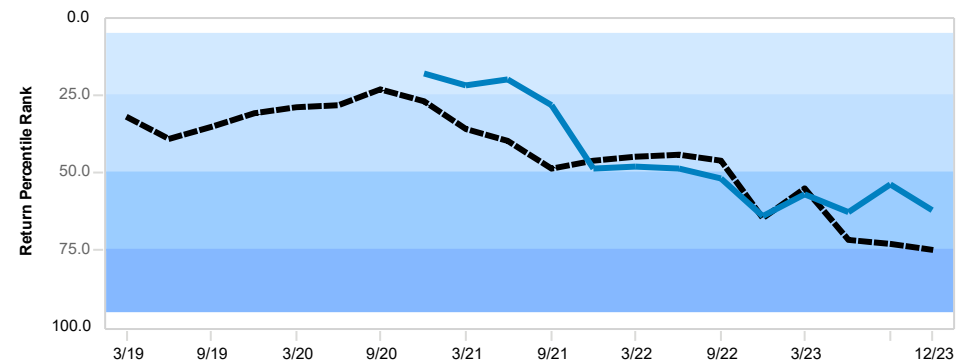


**3 Year Rolling Percentile Rank IM International Large Cap Growth Equity (MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	2 (10%)	9 (45%)	9 (45%)	0 (0%)
Index	20	0 (0%)	10 (50%)	6 (30%)	4 (20%)

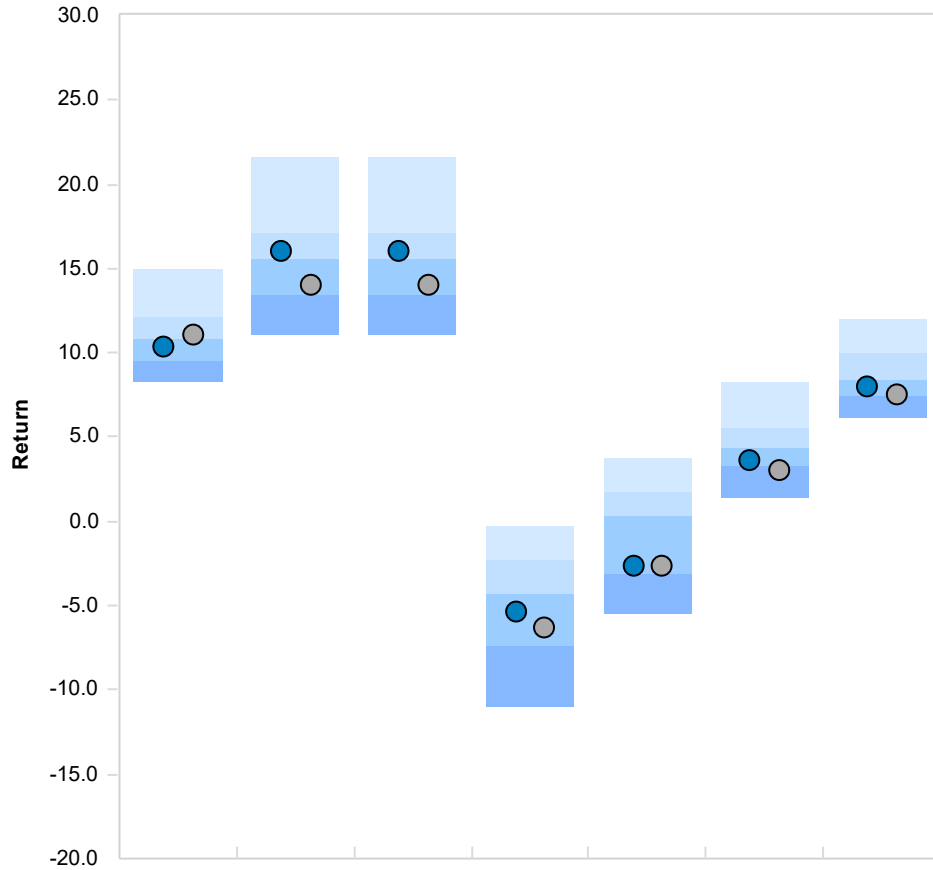
**5 Year Rolling Percentile Rank IM International Large Cap Growth Equity (MF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	13	3 (23%)	4 (31%)	6 (46%)	0 (0%)
Index	20	1 (5%)	14 (70%)	5 (25%)	0 (0%)

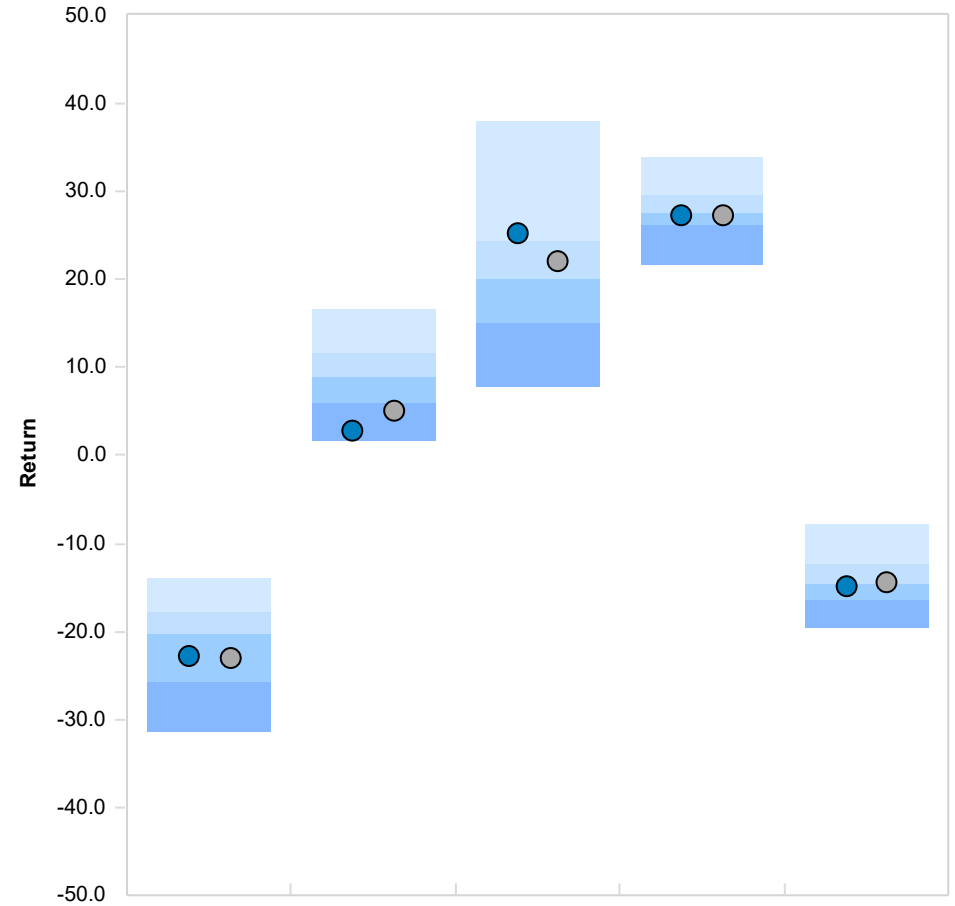


Peer Group Analysis - IM International Large Cap Growth Equity (MF)



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	10.37 (59)	16.05 (37)	16.05 (37)	-5.30 (61)	-2.66 (69)	3.68 (67)	8.03 (62)
● Index	11.12 (42)	14.03 (73)	14.03 (73)	-6.33 (71)	-2.67 (69)	3.03 (79)	7.49 (75)
Median	10.83	15.54	15.54	-4.28	0.33	4.37	8.40

Peer Group Analysis - IM International Large Cap Growth Equity (MF)



	2022	2021	2020	2019	2018
● Investment	-22.72 (60)	2.84 (86)	25.27 (17)	27.38 (55)	-14.87 (53)
● Index	-23.05 (65)	5.09 (79)	22.20 (41)	27.34 (56)	-14.43 (47)
Median	-20.24	8.88	20.00	27.50	-14.67

Comparative Performance

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-6.33 (33)	2.16 (63)	9.87 (42)	13.78 (65)	-9.33 (39)	-14.65 (49)
Index	-7.31 (55)	1.94 (74)	8.59 (64)	12.89 (80)	-9.37 (41)	-15.71 (66)
Median	-7.10	2.45	9.63	14.64	-9.57	-14.68





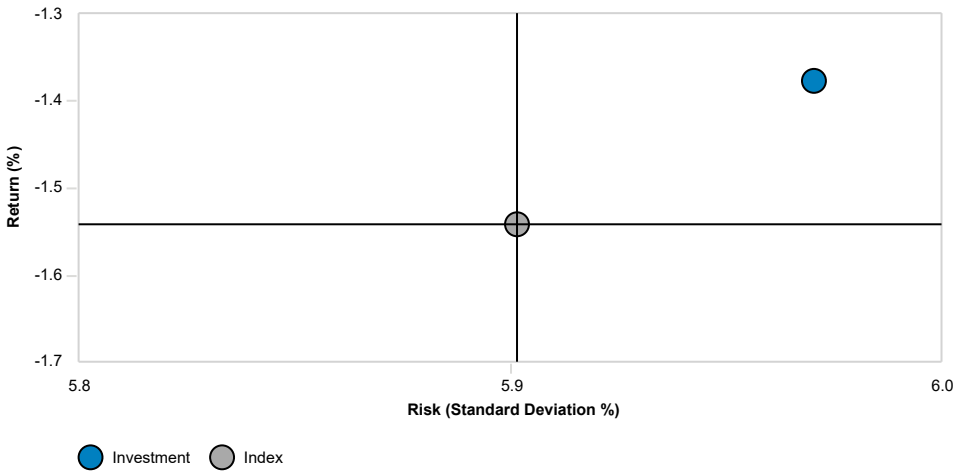
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-1.37	5.97	-0.57	99.88	5	97.82	7
Index	-1.54	5.90	-0.61	100.00	5	100.00	7

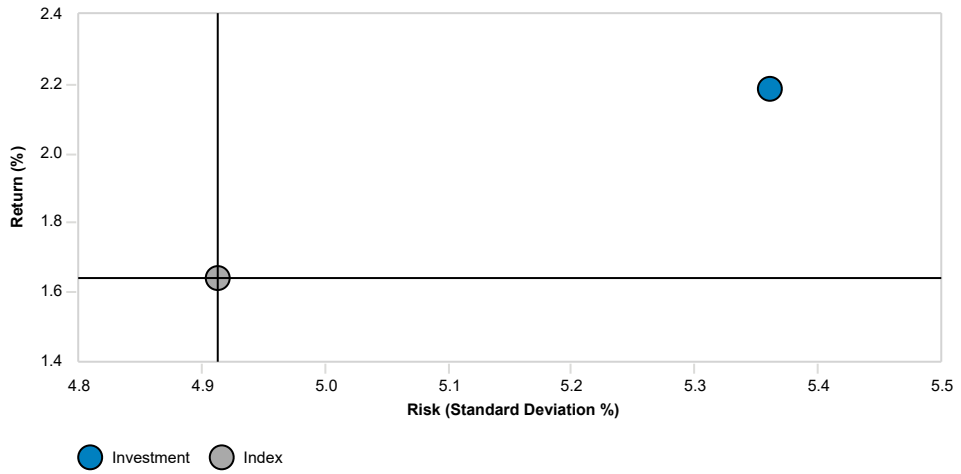
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	2.19	5.36	0.08	112.62	12	106.29	8
Index	1.64	4.91	-0.02	100.00	13	100.00	7

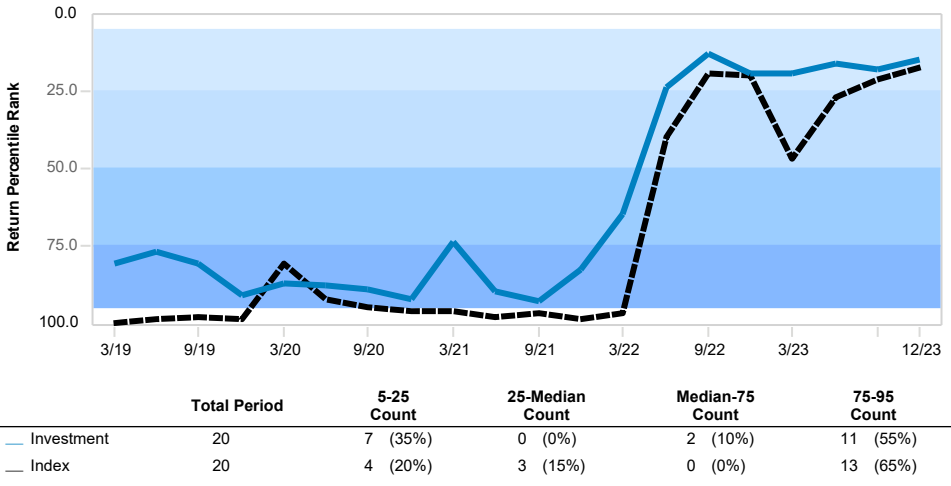
**Risk and Return 3 Years**



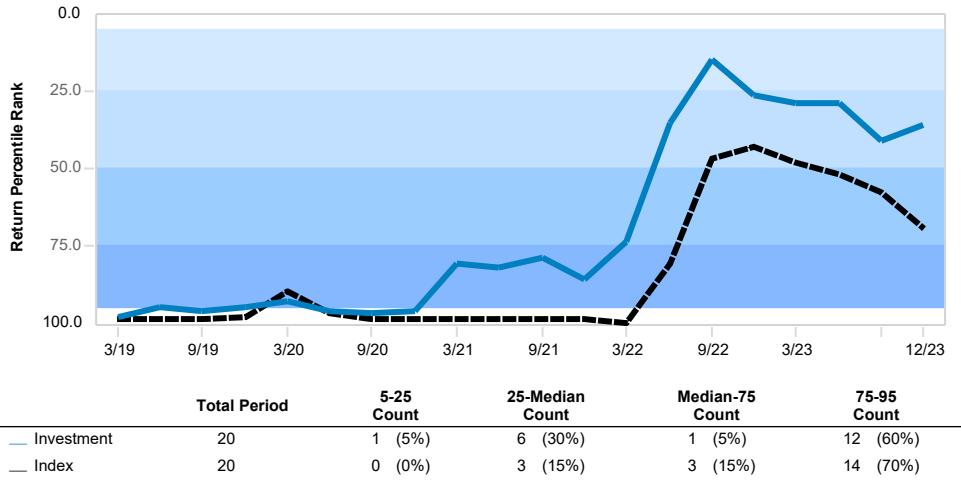
**Risk and Return 5 Years**



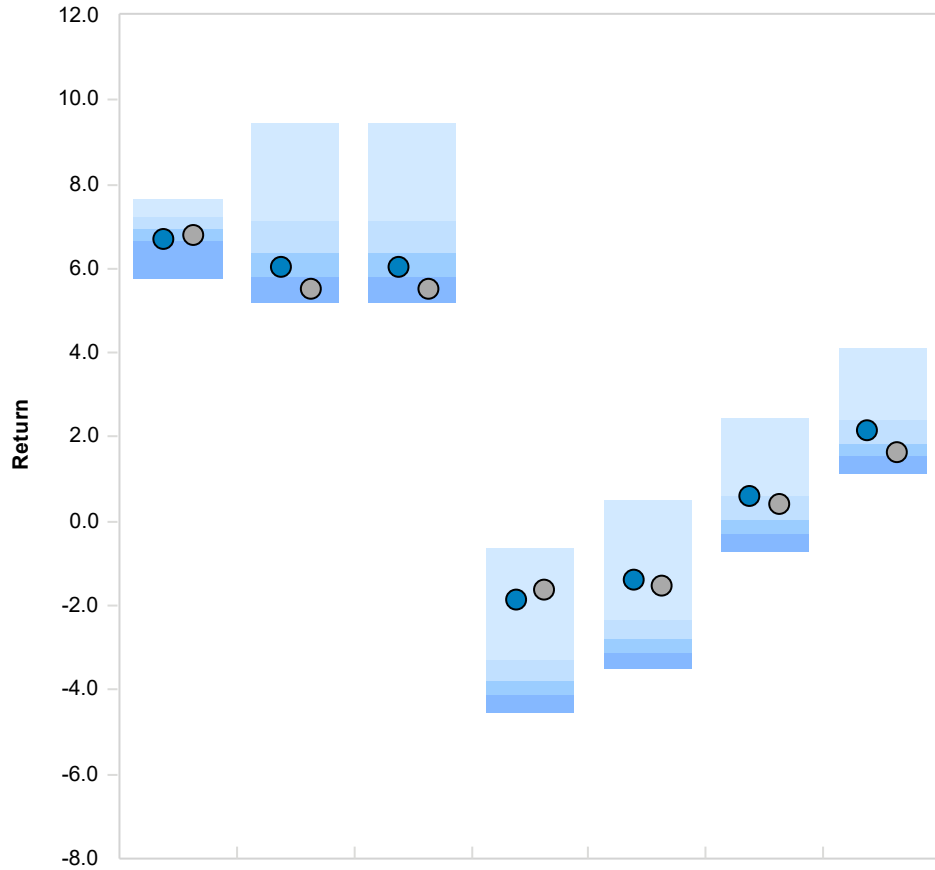
**3 Year Rolling Percentile Rank IM U.S. Broad Market Fixed Income (SA+CF)**



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

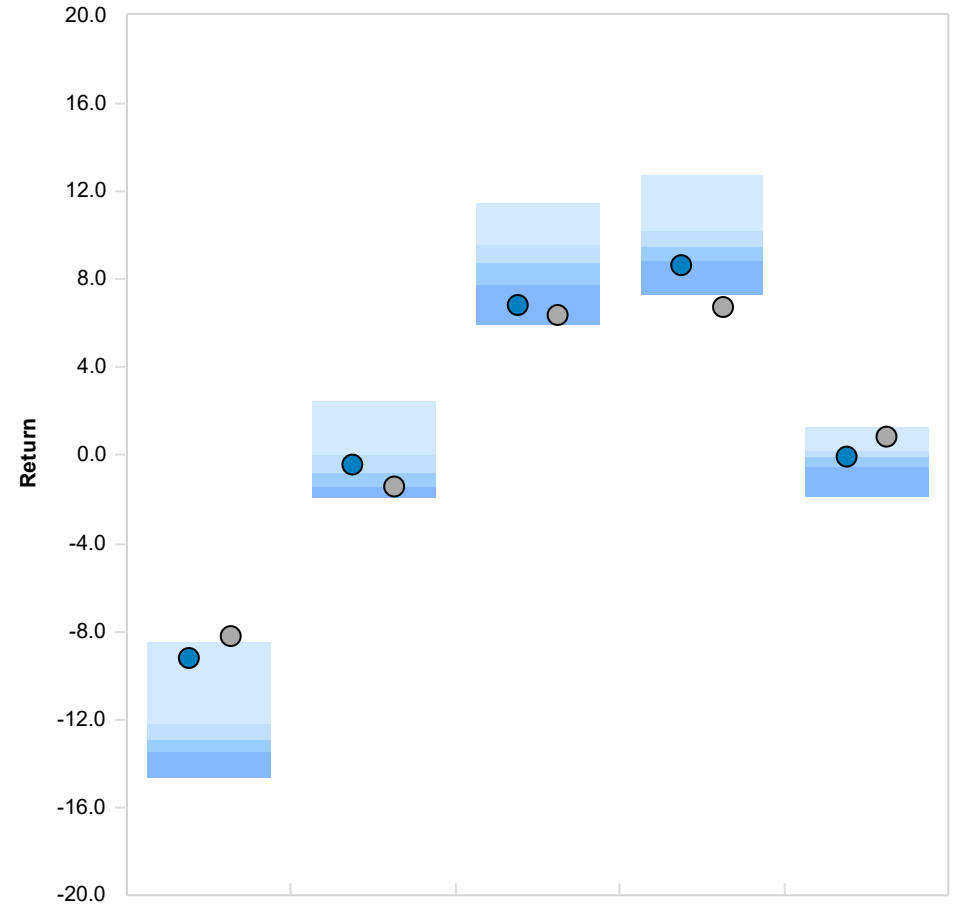


**Peer Group Analysis - IM U.S. Broad Market Fixed Income (SA+CF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	6.69 (75)	6.04 (67)	6.04 (67)	-1.86 (11)	-1.37 (15)	0.62 (25)	2.19 (36)
● Index	6.82 (61)	5.53 (89)	5.53 (89)	-1.59 (8)	-1.54 (17)	0.39 (31)	1.64 (69)
Median	6.93	6.37	6.37	-3.81	-2.79	0.03	1.85

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



	2022	2021	2020	2019	2018
● Investment	-9.17 (7)	-0.40 (38)	6.86 (91)	8.69 (84)	-0.03 (52)
● Index	-8.24 (5)	-1.44 (76)	6.43 (93)	6.80 (98)	0.88 (9)
Median	-12.92	-0.75	8.74	9.49	-0.01

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-3.40 (86)	-0.15 (18)	3.05 (67)	0.46 (100)	-2.27 (6)	-3.22 (5)
Index	-3.23 (77)	-0.84 (83)	2.96 (75)	1.54 (85)	-3.06 (10)	-2.37 (3)
Median	-3.01	-0.58	3.16	1.90	-4.47	-5.00



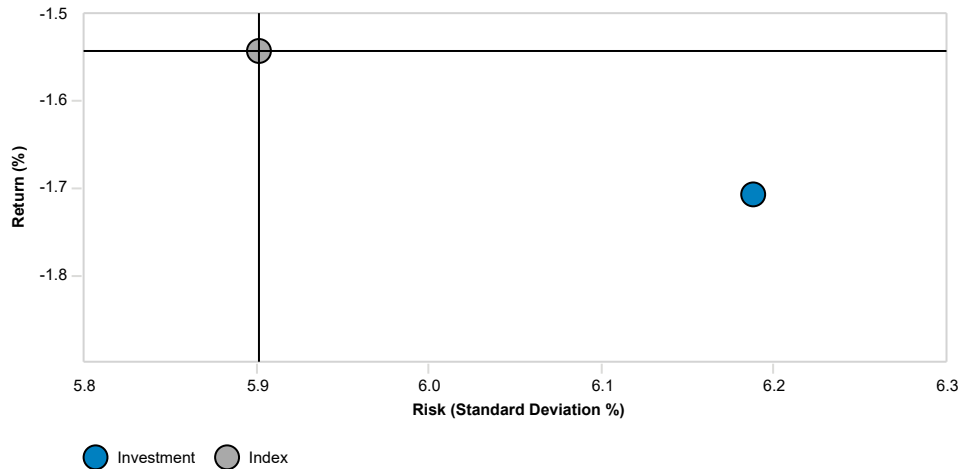
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	-1.71	6.19	-0.60	105.18	4	106.13	8
Index	-1.54	5.90	-0.61	100.00	5	100.00	7

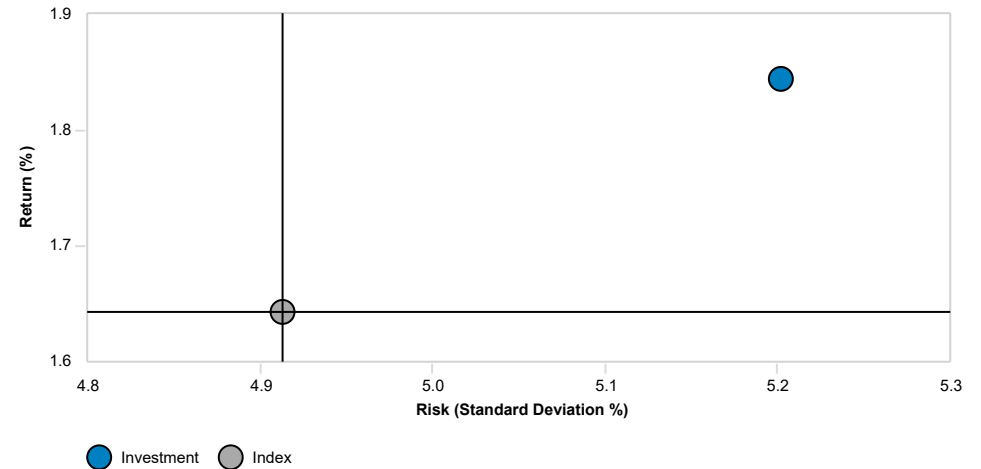
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	1.84	5.20	0.02	108.05	12	106.72	8
Index	1.64	4.91	-0.02	100.00	13	100.00	7

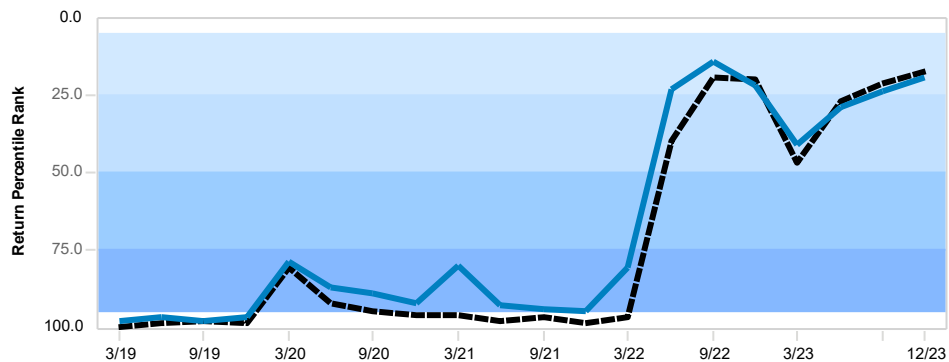
**Risk and Return 3 Years**



**Risk and Return 5 Years**

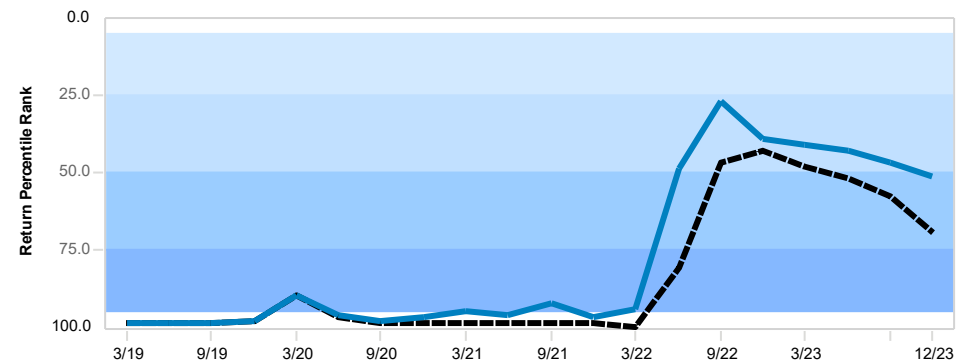


**3 Year Rolling Percentile Rank IM U.S. Broad Market Fixed Income (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	5 (25%)	2 (10%)	0 (0%)	13 (65%)
Index	20	4 (20%)	3 (15%)	0 (0%)	13 (65%)

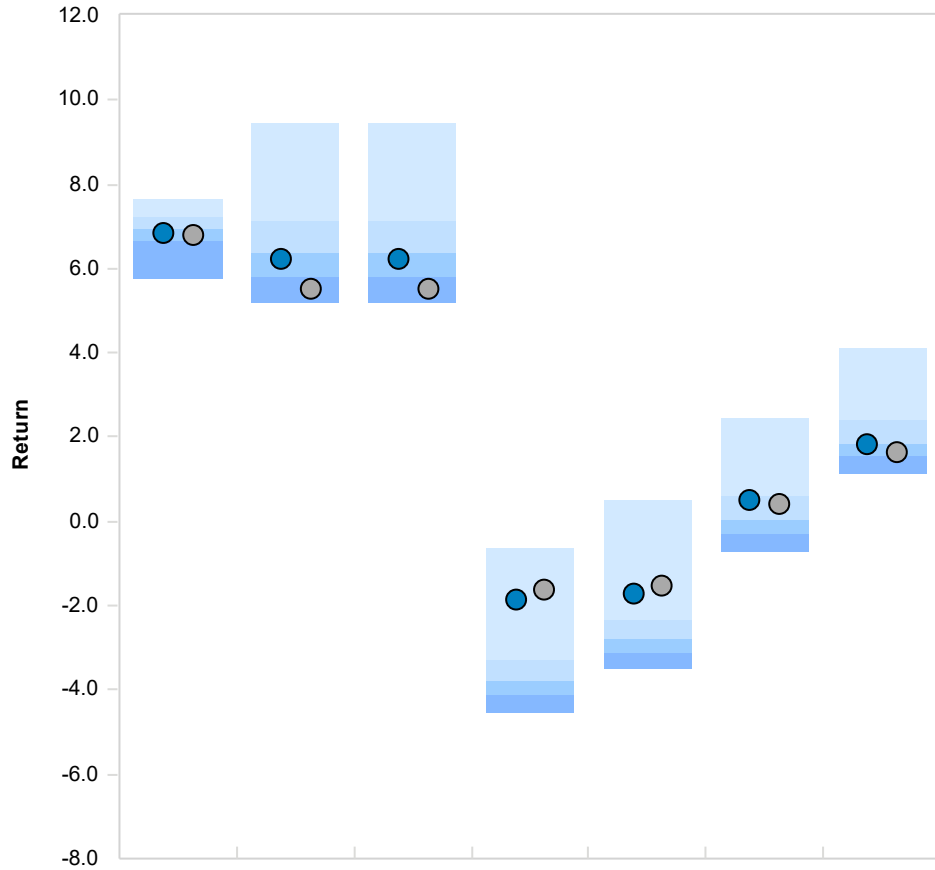
**5 Year Rolling Percentile Rank IM U.S. Broad Market Fixed Income (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	0 (0%)	6 (30%)	1 (5%)	13 (65%)
Index	20	0 (0%)	3 (15%)	3 (15%)	14 (70%)

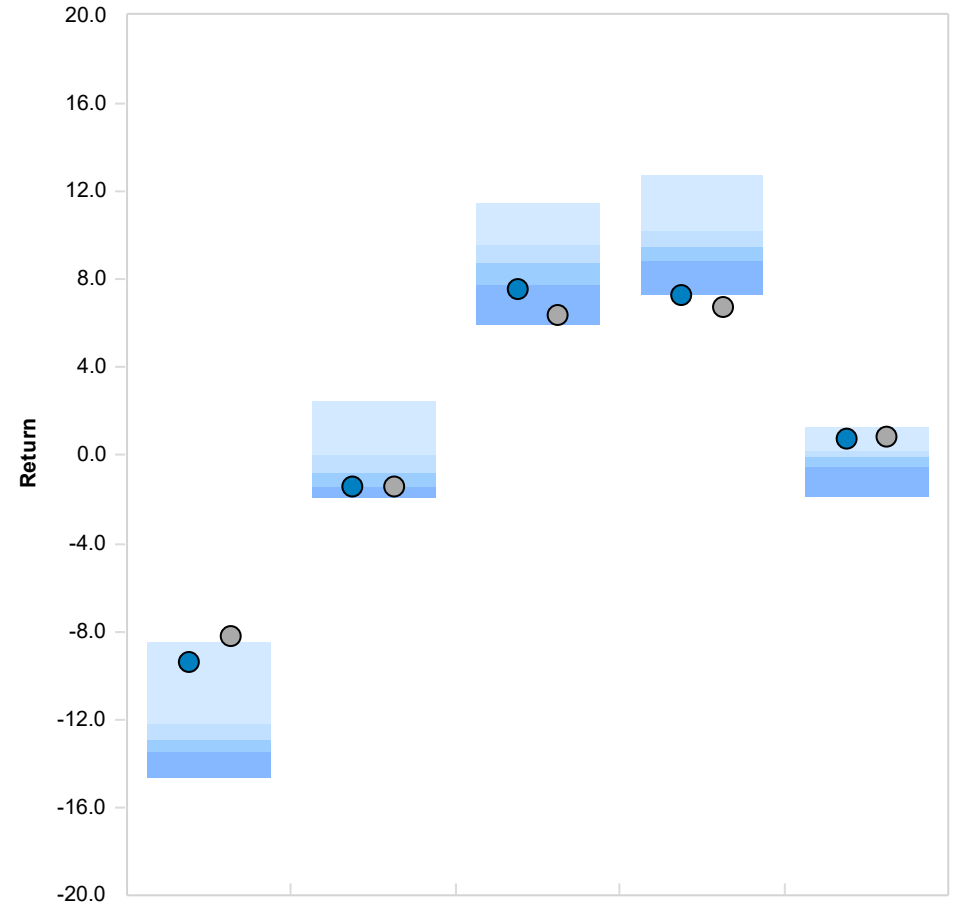


Peer Group Analysis - IM U.S. Broad Market Fixed Income (SA+CF)



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	6.85 (57)	6.23 (58)	6.23 (58)	-1.87 (11)	-1.71 (19)	0.53 (27)	1.84 (51)
● Index	6.82 (61)	5.53 (89)	5.53 (89)	-1.59 (8)	-1.54 (17)	0.39 (31)	1.64 (69)
Median	6.93	6.37	6.37	-3.81	-2.79	0.03	1.85

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



	2022	2021	2020	2019	2018
● Investment	-9.36 (7)	-1.38 (75)	7.53 (85)	7.29 (95)	0.78 (10)
● Index	-8.24 (5)	-1.44 (76)	6.43 (93)	6.80 (98)	0.88 (9)
Median	-12.92	-0.75	8.74	9.49	-0.01

Comparative Performance

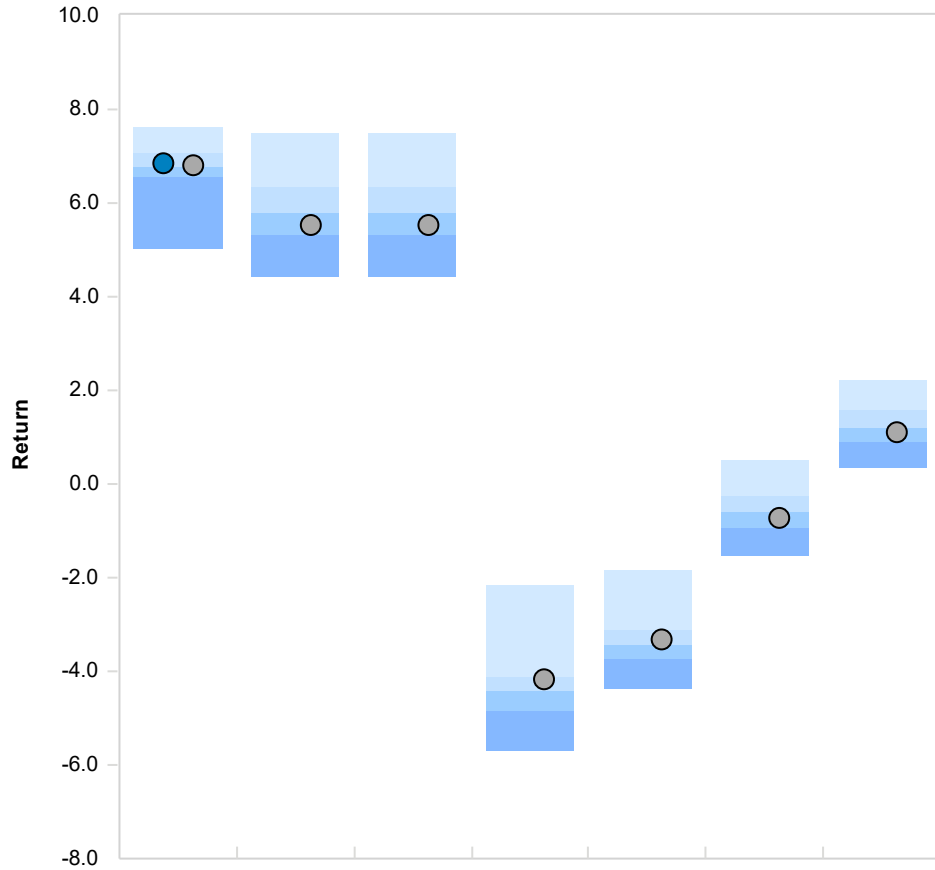
	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-3.20 (71)	-0.67 (59)	3.40 (25)	0.24 (100)	-2.95 (9)	-2.43 (3)
Index	-3.23 (77)	-0.84 (83)	2.96 (75)	1.54 (85)	-3.06 (10)	-2.37 (3)
Median	-3.01	-0.58	3.16	1.90	-4.47	-5.00



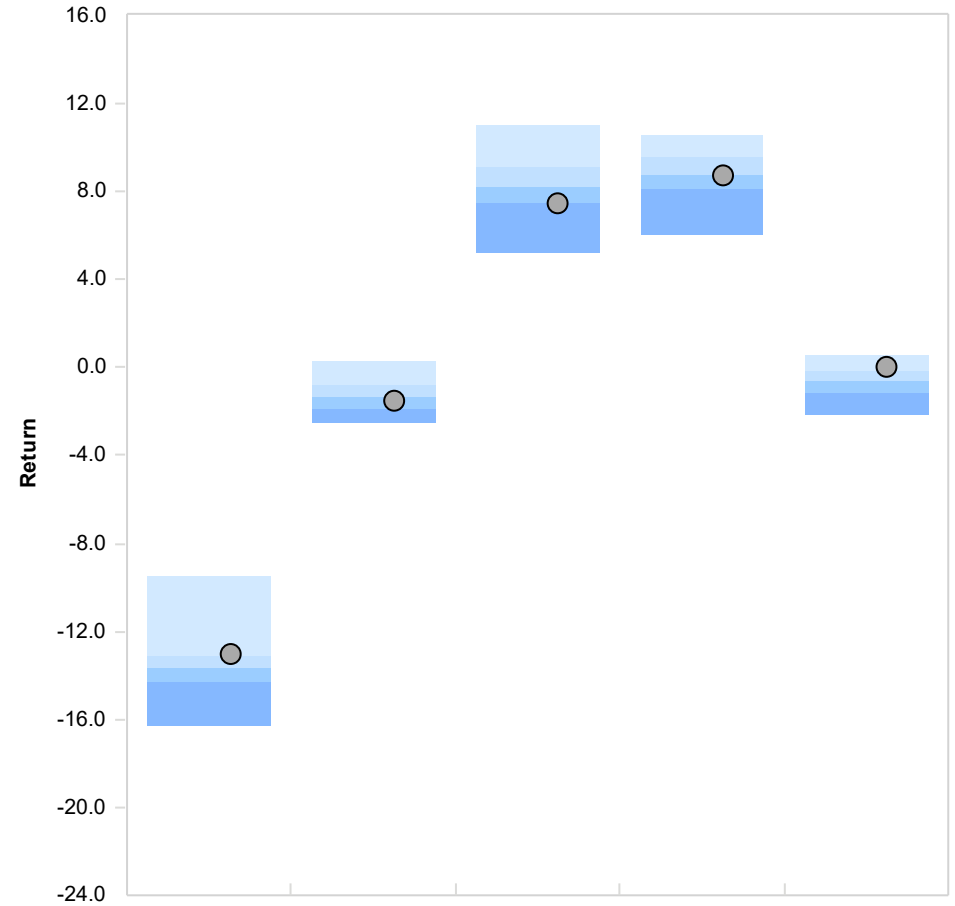
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**Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (MF)**



**Peer Group Analysis - IM U.S. Broad Market Core Fixed Income (MF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
Investment	6.85 (43)	N/A	N/A	N/A	N/A	N/A	N/A
Index	6.82 (46)	5.53 (65)	5.53 (65)	-4.19 (32)	-3.31 (38)	-0.72 (59)	1.10 (58)
Median	6.77	5.77	5.77	-4.43	-3.44	-0.60	1.19

	2022	2021	2020	2019	2018
Investment	N/A	N/A	N/A	N/A	N/A
Index	-13.01 (22)	-1.55 (60)	7.51 (73)	8.72 (53)	0.01 (18)
Median	-13.66	-1.33	8.16	8.76	-0.62

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-2.93 (30)	-0.84 (53)	N/A	N/A	N/A	N/A
Index	-3.23 (70)	-0.84 (55)	2.96 (69)	1.87 (35)	-4.75 (61)	-4.69 (16)
Median	-3.08	-0.81	3.14	1.71	-4.67	-5.35



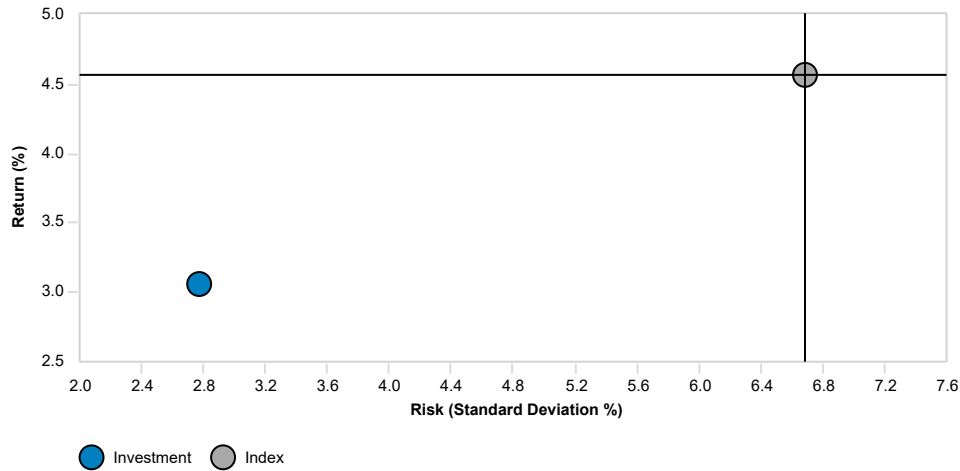
**Historical Statistics 3 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	3.05	2.78	0.24	47.14	9	25.65	3
Index	4.57	6.68	0.33	100.00	7	100.00	5

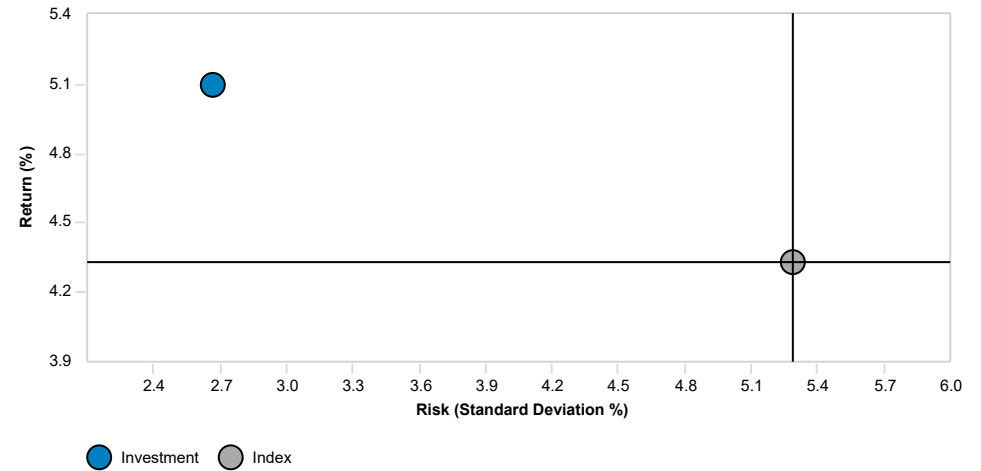
**Historical Statistics 5 Years**

	Return	Standard Deviation	Sharpe Ratio	Up Market Capture	Up Quarters	Down Market Capture	Down Quarters
Investment	5.10	2.67	0.93	75.01	17	6.48	3
Index	4.33	5.28	0.42	100.00	14	100.00	6

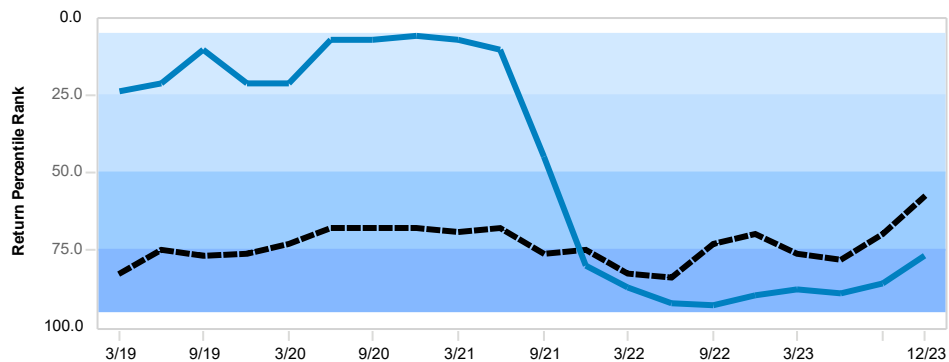
**Risk and Return 3 Years**



**Risk and Return 5 Years**

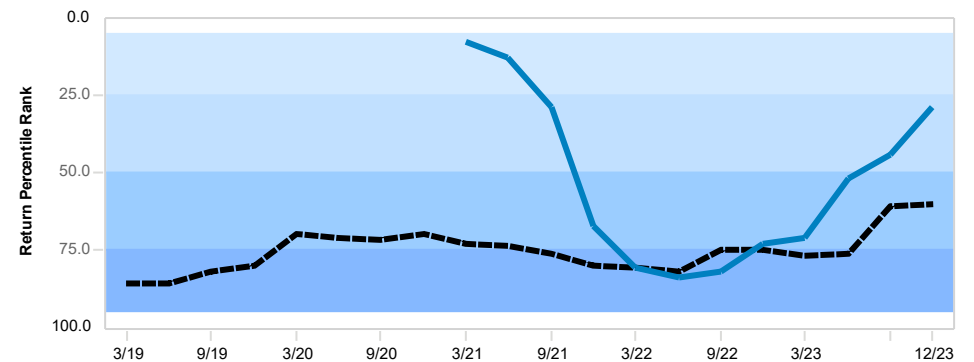


**3 Year Rolling Percentile Rank IM U.S. Private Real Estate (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	20	10 (50%)	1 (5%)	0 (0%)	9 (45%)
Index	20	0 (0%)	0 (0%)	12 (60%)	8 (40%)

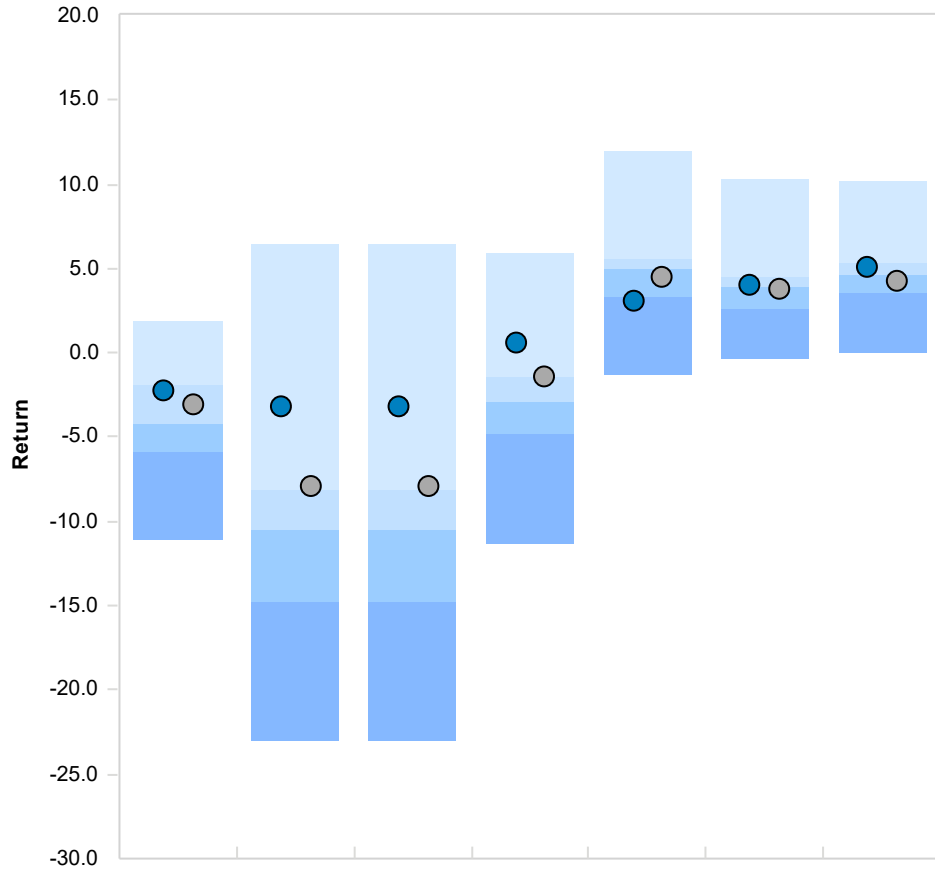
**5 Year Rolling Percentile Rank IM U.S. Private Real Estate (SA+CF)**



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
Investment	12	2 (17%)	3 (25%)	4 (33%)	3 (25%)
Index	20	0 (0%)	0 (0%)	10 (50%)	10 (50%)

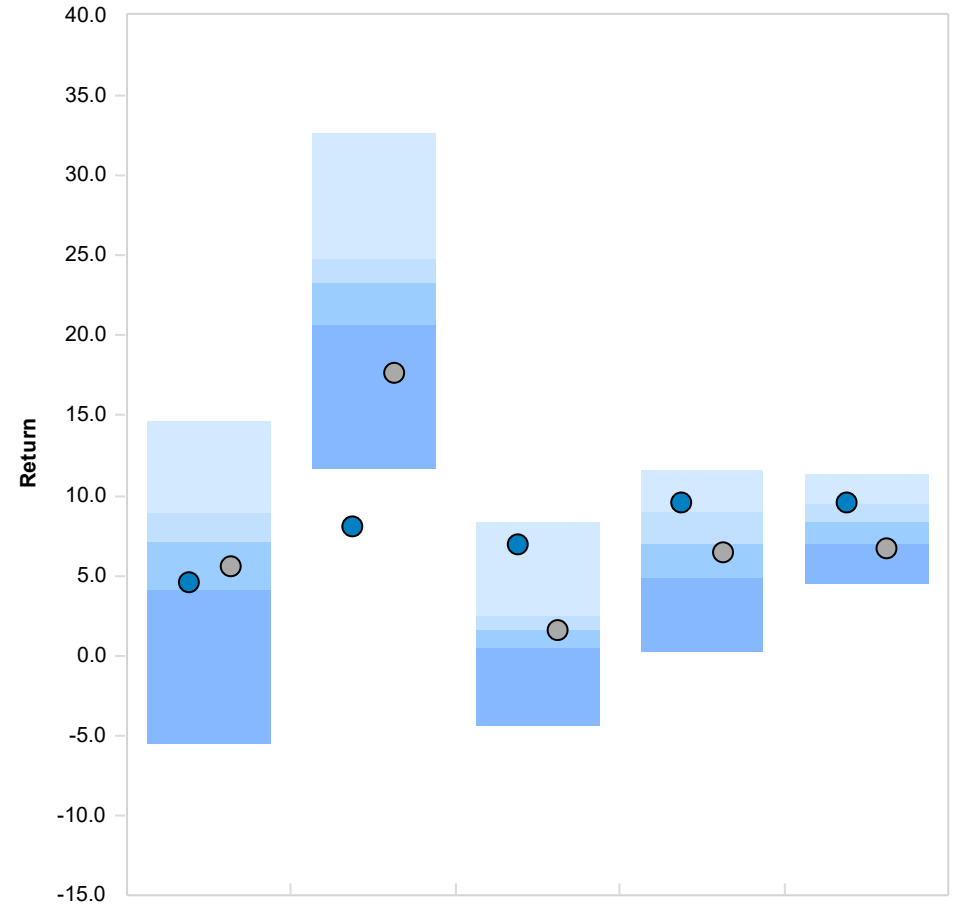


**Peer Group Analysis - IM U.S. Private Real Estate (SA+CF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	-2.20 (35)	-3.13 (11)	-3.13 (11)	0.65 (13)	3.05 (77)	4.02 (48)	5.10 (29)
● Index	-3.02 (43)	-7.94 (25)	-7.94 (25)	-1.44 (26)	4.57 (58)	3.82 (56)	4.33 (60)
Median	-4.20	-10.48	-10.48	-2.89	5.00	3.96	4.66

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



	2022	2021	2020	2019	2018
● Investment	4.58 (73)	8.04 (97)	6.97 (6)	9.53 (18)	9.60 (23)
● Index	5.52 (61)	17.70 (85)	1.60 (47)	6.42 (64)	6.72 (81)
Median	7.14	23.30	1.57	7.01	8.35

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	-0.85 (14)	0.50 (8)	-0.60 (12)	0.16 (8)	1.38 (32)	1.33 (89)
Index	-1.37 (20)	-1.98 (50)	-1.81 (25)	-3.50 (25)	0.57 (54)	3.23 (68)
Median	-2.72	-1.98	-2.91	-4.97	0.60	4.33

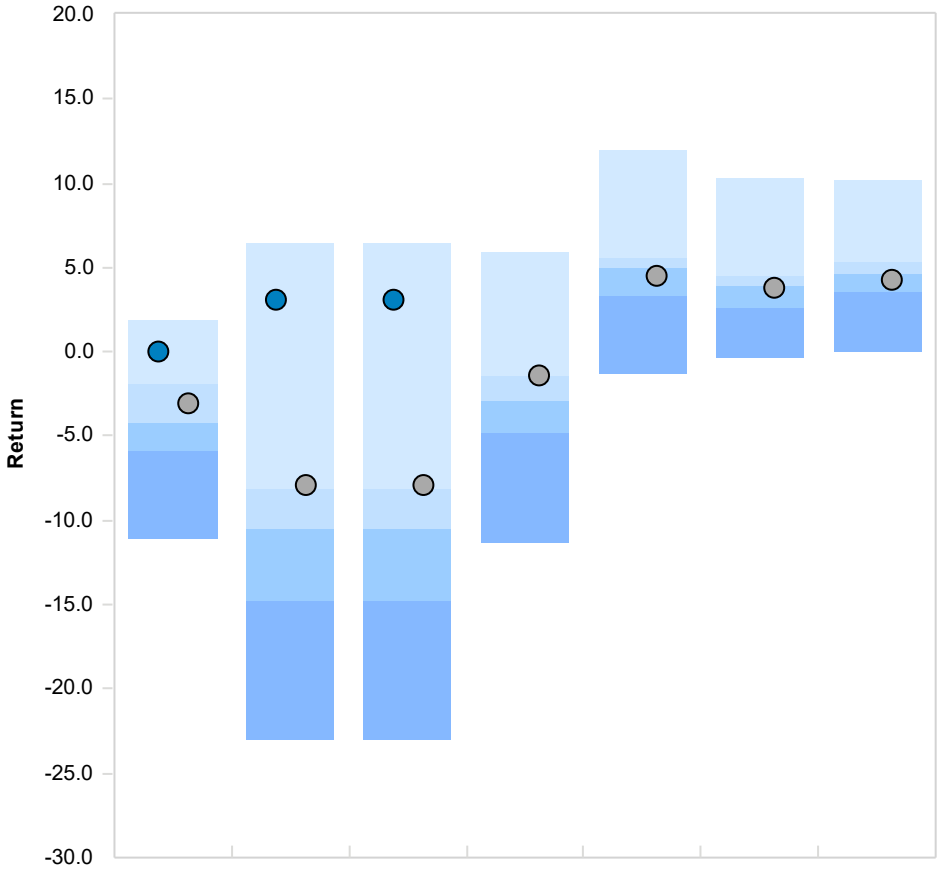




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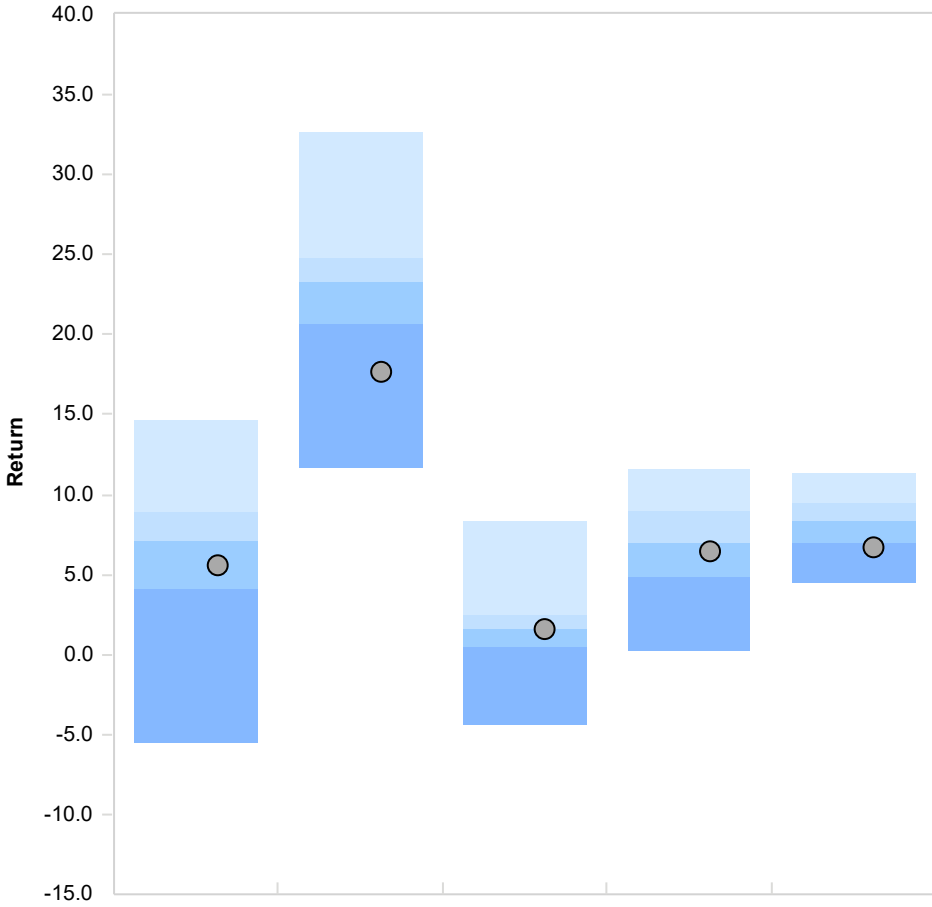


**Peer Group Analysis - IM U.S. Open End Private Real Estate (SA+CF)**



	QTR	FYTD	1 YR	2 YR	3 YR	4 YR	5 YR
● Investment	0.00 (12)	3.15 (8)	3.15 (8)	N/A	N/A	N/A	N/A
● Index	-3.02 (43)	-7.94 (25)	-7.94 (25)	-1.44 (26)	4.57 (58)	3.82 (56)	4.33 (60)
Median	-4.20	-10.48	-10.48	-2.89	5.00	3.96	4.66

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



	2022	2021	2020	2019	2018
● Investment	N/A	N/A	N/A	N/A	N/A
● Index	5.52 (61)	17.70 (85)	1.60 (47)	6.42 (64)	6.72 (81)
Median	7.14	23.30	1.57	7.01	8.35

**Comparative Performance**

	1 Qtr Ending Sep-2023	1 Qtr Ending Jun-2023	1 Qtr Ending Mar-2023	1 Qtr Ending Dec-2022	1 Qtr Ending Sep-2022	1 Qtr Ending Jun-2022
Investment	0.53 (8)	1.54 (7)	1.06 (6)	N/A	N/A	N/A
Index	-1.37 (20)	-1.98 (50)	-1.81 (25)	-3.50 (25)	0.57 (54)	3.23 (68)
Median	-2.72	-1.98	-2.91	-4.97	0.60	4.33



Erie County Employees Retirement Plan

Fee Analysis

As of December 31, 2023

	Estimated Annual Fee (%)	Market Value (\$)	Estimated Annual Fee (\$)	Fee Schedule
<b>Total Fund</b>	<b>0.39</b>	<b>310,513,412</b>	<b>1,205,620</b>	
<b>Domestic Large Cap Equity</b>	<b>0.11</b>	<b>78,737,059</b>	<b>90,162</b>	
Vanguard S&P 500 Index Fund (VINIX)	0.04	35,777,127	12,522	0.04 % of Assets
Vanguard Russell 1000 Growth Index (VRGWX)	0.07	18,444,733	12,911	0.07 % of Assets
DFA Large Value Equity (DFLVX)	0.22	14,122,557	31,070	0.22 % of Assets
Vanguard Russell 1000 Value Index (VRVIX)	0.07	6,512,656	4,559	0.07 % of Assets
Vesper Capital Mgmt (UTRN)	0.75	3,879,986	29,100	0.75 % of Assets
<b>Domestic Small Cap Equity</b>	<b>0.56</b>	<b>40,034,711</b>	<b>223,686</b>	
Allspring Global Small Value Eq.	0.50	19,521,885	97,609	0.50 % of Assets
Emerald Small Growth Equity	0.61	20,512,826	126,077	0.75 % of First \$2 M 0.60 % Thereafter
<b>International Equity</b>	<b>0.36</b>	<b>44,095,951</b>	<b>157,850</b>	
DFA International Equity (DFIEX)	0.24	18,919,814	45,408	0.24 % of Assets
DFA Emerging Markets (DFCEX)	0.39	4,811,621	18,765	0.39 % of Assets
EuroPacific Growth Fund (RERGX)	0.46	20,364,516	93,677	0.46 % of Assets
<b>Total Fixed Income</b>	<b>0.21</b>	<b>96,677,135</b>	<b>207,754</b>	
Boyd Watterson Fixed	0.23	48,261,523	111,002	0.23 % of Assets
PNC Fixed	0.28	26,853,814	75,191	0.28 % of Assets
Vanguard Core Bond Fund (VCOBX)	0.10	21,561,798	21,562	0.10 % of Assets
<b>Private Real Estate</b>	<b>1.15</b>	<b>20,406,674</b>	<b>235,622</b>	
Boyd Watterson GSA Fund	1.25	12,622,014	157,775	1.25 % of Assets
Bentall GreenOak US Core Plus RE	1.00	7,784,660	77,847	1.00 % of Assets
<b>Private Equity</b>	<b>1.00</b>	<b>21,452,655</b>	<b>214,527</b>	
Ironsides Direct Investment Fund V	1.00	10,465,041	104,650	1.00 % of Assets
PA Co-Investment Fund III	1.00	5,730,988	57,310	1.00 % of Assets
Adams Street Co-Investment Fund V	1.00	3,725,709	37,257	1.00 % of Assets
Hamilton Lane Secondary Fund VI	1.00	1,530,917	15,309	1.00 % of Assets
<b>Private Debt</b>	<b>0.94</b>	<b>8,094,205</b>	<b>76,020</b>	
Ironsides Opportunities Fund	0.75	1,968,867	14,767	0.75 % of Assets
PA Credit Strategies Fund	1.00	6,125,338	61,253	1.00 % of Assets
<b>Cash</b>		<b>1,015,022</b>	<b>-</b>	
Cash Account		1,015,022	-	

See the disclosure page at the end of this report.

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.



**Historical Hybrid Composition**  
**Total Fund Policy Index**  
As of December 31, 2023

**Historical Hybrid Composition**

Allocation Mandate	Weight (%)
<b>Dec-1997</b>	
Bloomberg Intermediate US Govt/Credit Idx	40.00
MSCI EAFE (Net) Index	10.00
Russell 3000 Index	50.00
<b>Mar-1998</b>	
Russell 3000 Index	50.00
MSCI EAFE (Net) Index	10.00
Bloomberg Intermediate US Govt/Credit Idx	40.00
<b>Mar-2005</b>	
Russell 3000 Index	50.00
MSCI EAFE (Net) Index	10.00
Bloomberg Intermediate US Govt/Credit Idx	37.00
Blmbg. U.S. Corp High Yield	3.00
<b>Mar-2007</b>	
Russell 3000 Index	50.00
MSCI EAFE (Net) Index	10.00
Bloomberg Intermediate US Govt/Credit Idx	30.00
Blmbg. U.S. Gov't/Credit	10.00
<b>Dec-2010</b>	
Russell 3000 Index	45.00
MSCI EAFE (Net) Index	10.00
Bloomberg Intermediate US Govt/Credit Idx	38.00
NCREIF Property Index	7.00
<b>Dec-2015</b>	
MSCI EAFE (Net) Index	10.00
Bloomberg Intermediate US Govt/Credit Idx	37.00
NCREIF Property Index	7.00
Russell 2000 Index	15.00
Russell 1000 Index	12.00
S&P 500 Index	13.00
Alerian MLP Index	6.00

Allocation Mandate	Weight (%)
<b>Mar-2019</b>	
MSCI EAFE (Net) Index	13.00
Bloomberg Intermediate US Govt/Credit Idx	29.00
NCREIF Property Index	6.00
Russell 2000 Index	12.00
Russell 1000 Index	25.00
Alerian MLP Index	4.00
Credit Suisse Leveraged Loan Index	2.00
Russell Microcap + 3%	4.00
Bloomberg 1-5 Year Gov/Credit Idx	5.00
<b>Mar-2021</b>	
MSCI EAFE (Net) Index	13.00
Bloomberg Intermediate US Govt/Credit Idx	29.00
NCREIF Property Index	8.00
Russell 2000 Index	15.00
Russell 1000 Index	22.00
Credit Suisse Leveraged Loan Index	3.00
Russell Microcap + 3%	5.00
Bloomberg 1-5 Year Gov/Credit Idx	5.00
<b>Jan-2023</b>	
MSCI EAFE (Net) Index	13.00
Blmbg. U.S. Aggregate Index	34.00
NCREIF Property Index	8.00
Russell 2000 Index	15.00
Russell 1000 Index	22.00
Credit Suisse Leveraged Loan Index	3.00
Russell Microcap + 3%	5.00



Returns prior to 1/1/2023 are from the prior consultant.

Returns for periods greater than one year are annualized.

Manager fees associated with money market or cash accounts are not tracked.

<b>Active Return</b>	- Arithmetic difference between the manager's performance and the designated benchmark return over a specified time period.
<b>Alpha</b>	- 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.
<b>Beta</b>	- A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of the portfolio's systematic risk.
<b>Consistency</b>	- 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.
<b>Distributed to Paid In (DPI)</b>	- 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.
<b>Down Market Capture</b>	- The ratio of average portfolio performance over the designated benchmark during periods of negative returns. A lower value indicates better product performance
<b>Downside Risk</b>	- 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.
<b>Excess Return</b>	- Arithmetic difference between the manager's performance and the risk-free return over a specified time period.
<b>Excess Risk</b>	- A measure of the standard deviation of a portfolio's performance relative to the risk free return.
<b>Information Ratio</b>	- 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.
<b>Public Market Equivalent (PME)</b>	- 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.
<b>R-Squared</b>	- 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.
<b>Return</b>	- Compounded rate of return for the period.
<b>Sharpe Ratio</b>	- 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.
<b>Standard Deviation</b>	- 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.
<b>Total Value to Paid In (TVPI)</b>	- 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
<b>Tracking Error</b>	- This is a measure of the standard deviation of a portfolio's returns in relation to the performance of its designated market benchmark.
<b>Treynor Ratio</b>	- 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.
<b>Up Market Capture</b>	- 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.

This performance report is based on data obtained by the client's custodian(s), investment fund administrator, or other sources believed to be reliable. While these sources are believed to be reliable, the data providers are responsible for the accuracy and completeness of their statements. Clients are encouraged to compare the records of their custodian(s) to ensure this report fairly and accurately reflects their various asset positions.

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*Methodology for this Award: For the 2022 Greenwich Quality Award for Overall U.S. Investment Consulting – Midsize Consultants – Between February and November 2022, Coalition Greenwich conducted interviews with 727 individuals from 590 of the largest tax-exempt funds in the United States. These U.S.-based institutional investors are corporate and union funds, public funds, and endowment and foundation funds, with either pension or investment pool assets greater than \$150 million. Study participants were asked to provide quantitative and qualitative evaluations of their asset management and investment consulting providers, including qualitative assessments of those firms soliciting their business and detailed information on important market trends.*



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