

**PUBLIC SCHOOL FUND INVESTMENT BOARD**

**MEETING AGENDA, MARCH 28, 2024**

**VIDEO CONFERENCE VIA ZOOM LINK:**

Join Zoom Meeting

<https://us02web.zoom.us/j/86474463379?pwd=K2pIM3RMN3pGM2NNUW92VEJEMTcwdz09>

Meeting ID: 864 7446 3379

Passcode: YQu0u7

**Public School Fund Investment Board Members**

Dave Young	- Colorado State Treasurer – Board Chair
Peter Calamari	- Platte River Equity
Jerome DeHerrera, Esq.	- Achieve Law Group
Wendy Dominguez	- Innovest Portfolio Solutions
Christine Scanlan	- State Land Board Commissioners

- |       |   |                                     |
|-------|---|-------------------------------------|
| I.    | Call to Order   | D. Young Noon                       |
| II.   | Roll Call   | E. Rothaus 12:02 (2 min)            |
| III.  | Introduction of Legal Counsel, Peter Baumann              | P. Baumann 12:04 (3 min)            |
| IV.   | Approval of Minutes from November 13, 2024 Board Meeting  | D. Young 12:07 (3 min)              |
| V.    | Market Update (Qtr. 4 – Ending December 31, 2023)         | Callan 12:10 (10 min)               |
| VI.   | Performance Report (FY Qtr. 1 – Ending December 31, 2023) | Callan 12:20 (15 min)               |
| VII.  | Cash Deployment Update and Allocation Discussion          | Callan 12:35 (5 min)                |
| VIII. | Fund Manager Presentation: Parametric                     | Dan Ryan, Parametric 12:40 (20 min) |
| IX.   | Other Business  | 1:00 (10 min), E. Rothaus/Callan    |
|       | a. 2024 Legislative Update                                |                                     |
|       | b. Impact Investing Update                                |                                     |
|       | c. Treasury Portfolio Rebalancing                         |                                     |
|       | d. 2024 Planning  |                                     |
| X.    | Public Comment  | 1:10 (2 min)                        |
| XI.   | Board Adjournment   | 1:12                                |

**Future Meeting Dates:**

May 13, 2024

Noon



Public School Fund Investment Board Meeting  
Meeting Minutes November 13, 2023  
Held Via Zoom

**Board Members in Attendance:**

Dave Young  
Peter Calamari - Excused  
Wendy Dominguez  
Christine Scanlan  
Jerome DeHerrera

**12:02 – 12:03 PM Welcome, Roll Call**

**12:03 – 12:05 PM Meeting minutes from the August 14, 2023 Board Meeting**

Ms. Scanlon made a motion to approve the August 14, 2023 meeting minutes. Ms. Dominguez seconded the motion.

- Dave Young – Yes
- Peter Calamari – Excused
- Jerome DeHerrera – Yes
- Wendy Dominguez – Yes
- Christine Scanlan – Yes

The October 14<sup>th</sup> meeting minutes will be reviewed and approved at a future meeting.

**12:05 – 12:09 PM Conflict of Interest Policy**

Grant Sullivan representing the Attorney General's Office presented the State's conflict of interest policy. He will send the policy to all the Board members, and they will respond with any conflicts and their acknowledgment of the policy.

Mr. Sullivan has been appointed as a judge to the Colorado Court of Appeals, and this is his last meeting with the Board. Mr. Sullivan thanked everyone for their support.

**12:09 – 12:10 PM Short Duration Portfolio Manager Contract Update - Janus**

Sarah Zimbelman, Portfolio Administrator and Mr. Sullivan have been working on contract negotiations with Janus. The draft has been sent to Eric Rothaus, Deputy State Treasurer, at the Treasury and Callan for review. The current contract expires on December 9, 2023, and the new contract must be signed before that.

**12:10 – 12:13 PM Vote one-year extension: Parametric Contact**

This will be Parametric's first extension on their current contract. Callan supports the extension.

Mr. DeHerrera made a motion to approve a one-year contract extension for Parametric. Ms. Dominguez seconded the motion.

- Dave Young – Yes
- Peter Calamari – Excused
- Jerome DeHerrera – Yes
- Wendy Dominguez – Yes
- Christine Scanlan – Yes

### **12:13 – 12:21 PM Proposed RFP Process and Core Bond Portfolio RFP Update**

The most RFP had 30-35 participants, and Callan would like to be more prepared for the future RFPs. Callan proposes that instead of sending out RFPs, the board should utilize Callan's database as part of a new RFP process. The State and Callan would give a public notice of the posting. Callan would charge a fee for this process. Callan and the State will review the State's RFP requirements and return to the Board in the future with the results of that analysis and a possible proposal.

### **12:21 – 12:38 PM Market Update**

Callan presented the update for Quarter 3 updates – Ending September 30, 2023

### **12:38 – 12:44 PM Performance Report**

Janet Becker-Wold from Callan presented the Fiscal Year Quarter 1 updates – Ending September 30, 2023

### **12:44 – 12:47 PM Cash Deployment Update and Allocation Discussion**

Alex Browning from Callan presented the asset allocation and cash deployment update. Callan shared its rebalancing recommendation. Since the rebalancing recommendation is within the agreed upon range, the Board is not required to take formal action through a motion.

### **12:47 – 12:51 PM Fee Review**

As part of Callan's services to the Board, it annually reviews investment manager fees for the Board's portfolio. Ms. Becker-Wold explained the process of this review and what fees the Board is paying.

### **12:51 – 12:54 PM Unrealized Gain/Loss**

Mr. Rothaus presented the unrealized gain/loss document provided to the Board.

### **12:54 – 1:14 PM Fund Manager Presentation: Mackay Shields**

Presentation by Joseph Maietta from Mackay Shields

### **1:14 – 1:34 PM Fund Manager Presentation: Spectrum Preferred Securities**

Presentation by Steven Somonson from Spectrum Preferred Securities

### **1:34 – 1:57 PM Other Business**

- Proposed IPS Change  
The Investments team at the Treasury suggested potential changes to the Investment Policy Statement. Callan and the Treasury will have the goal of offering proposed changes to the Board in a redlined document at a future board meeting.

- 2024 Legislative Update  
The session starts in January and there are discussions regarding the \$21 million allocation to the State Education Fund.
- Follow up Conversation on Impact Investing  
Mary Wickersham provided an update on the conversations and activities she has had related to impact investing since the previous meeting. Representative Bird is interested in sponsoring a JBC bill regarding this issue but there is no draft available yet.
- 2024 Planning  
The next meetings will be on February 26 and May 13, 2024 at noon

**1:57 – 1:59 PM Public comments**

- Written Comments
  - o There were no written comments.
- Verbal Comments
  - o There were no verbal comments.

**The meeting was adjourned at 2:00 pm.**

**Next Meeting**

- February 26, 2024 at Noon

December 31, 2023

**CO Public School Permanent Fund**



**Investment Measurement Service  
Quarterly Review**

---

## Table of Contents

### December 31, 2023

---

<b>Capital Markets Research</b>	<b>1</b>
<b>Actual vs. Target Asset Allocation</b>	<b>17</b>
<b>Equity</b>	
Total Equity	27
Domestic Equity	29
International Equity	33
<b>Fixed Income</b>	
Total Fixed Income	38
<b>Market Duration</b>	
Colorado Treasurer's Portfolio	43
<b>Short Duration</b>	
Janus Henderson Short Duration	48
<b>High Income Strategies</b>	
High Income Strategies	54
<b>High Yield Fixed Income</b>	
Mackay Shield US High Yield	57
<b>Preferred Securities</b>	
Principal Preferred Securities	62
<b>Research &amp; Education</b>	<b>67</b>
<b>Disclosures</b>	<b>69</b>



## Economy Becomes Even More Surprising

### ECONOMY

**2** Last year was supposed to feature the recession caused by the Fed's dedication to fighting inflation; instead, the economy grew 2.5% for the year. While the rate of overall growth slowed in 4Q, the economy seemed to get stronger by the quarter in 2023.

## Broad Rally for Bonds Across the World

### FIXED INCOME

**8** Driven by falling rates and strong risk-on sentiment, the Agg returned 6.8%, the highest quarterly return since 2Q89. The 10-year U.S. Treasury yield closed the year at 3.88%. Global bonds saw broad-based gains across countries and developed markets topped the U.S.

## Net IRR of Nearly 9% Over Three Years

### PRIVATE CREDIT

**12** Given its high returns, private credit remained in high demand across Callan's investor base. Private credit assets under management stood at over \$1.5 trillion at the end of 2023, with Preqin forecasting the asset class will grow to over \$2.5 trillion by 2028.

## Increases in 2023 but Inflation Tops Worries

### INSTITUTIONAL INVESTORS

**4** Robust equity returns led all institutional investor types to show gains for 2023, a stark reversal from the double-digit losses of 2022. But over the last year, all investors lagged a 60% stocks/40% bonds benchmark by a significant amount, likely due to those same equity gains.

## Private RE Falls but REITs Outpace Stocks

### REAL ESTATE/REAL ASSETS

**10** The NCREIF Property Index fell 3.0% during 4Q23. The NCREIF Open-End Diversified Core Equity (ODCE) Index fell 4.8% during 4Q. The FTSE EPRA Nareit Developed REIT Index rose 15.6% during 4Q23. The FTSE Nareit Equity REITs Index increased 16.2%.

## Gains Spurred by Stocks and Bonds

### HEDGE FUNDS/MACs

**13** Most hedge fund managers showed gains in 4Q23. Equity hedge strategies were the best performing. Relative value strategies generated positive performance as well, while event-driven strategies also ended on a strong note. Multi-asset class (MAC) strategies also gained.

## Dovish Policy Drives Widespread Gains

### EQUITY

**6** U.S. equity markets rebounded in the last two months of the year as the impact of possible rate cuts in 2024 started to get priced in. Dovish signaling from central banks and dropping yields led to a broad market rally in 4Q23 for global ex-U.S. markets as well.

## Big Slowdown After Frenzy of 2021

### PRIVATE EQUITY

**11** Both new investment activity and exit activity slowed markedly in 2023. Public equity's strong recovery in 2023 has left private equity in its wake. Private equity only saw about a fifth of the gains of the public markets over the last year, on a PME basis.

## 2.9% Drop After Three Quarters of Gains

### DEFINED CONTRIBUTION

**15** Despite the loss, the Callan DC Index™ saw a trailing one-year gain of 13.8%. The Age 45 Target Date Fund (analogous to the 2045 vintage) fell 3.6%. Balances within the DC Index fell by 3.2% after a 4.3% increase in the previous quarter, driven by investment losses.

## Broad Market Quarterly Returns

**U.S. Equity**  
Russell 3000



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



**U.S. Fixed Income**  
Bloomberg Agg



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



Sources: Bloomberg, FTSE Russell, MSCI



# The Economy Is More Surprising by the Quarter

ECONOMY | Jay Kloepfer

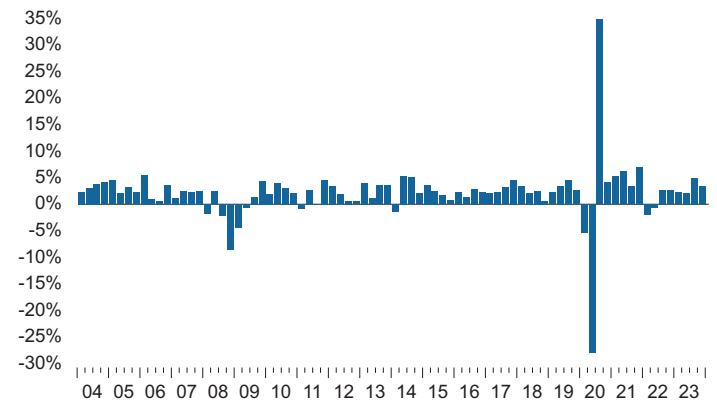
The U.S. economy grew by 3.3% in 4Q23, once again surprising to the upside. If you asked anyone who has to indulge in the hubris of forecasting the economy, all of 2023 has been a surprise. Last year was supposed to feature the recession caused by the Fed's dedication to fighting inflation by raising interest rates; instead, the economy grew 2.5% for the year, up from the 1.9% rate in 2022. The job market has generated 5.4 million new jobs since the end of 2019, before the start of the pandemic. Real wages and real income growth turned positive in mid-2023 as inflation subsided but demand for workers remained. Workers feel confident in the tight labor market, and this confidence is driving consumer spending. Consumption expenditures accounted for half of GDP growth in 3Q and almost 60% in 4Q. The economy seemed to get stronger by the quarter in 2023.

So why no recession? Underneath the mayhem that defined both 2022 and 2023—geopolitical uncertainty, spiking inflation, rising interest rates, and the volatility in the equity market—the U.S. and global economies remain in remarkably good shape. The U.S. economy weathered the rate hikes in 2022 and 2023 particularly well. The first reason is stimulus and lots of it, around the globe, which translated into pent-up demand. Second, the very tight labor market in the U.S. gives workers and their families confidence to spend. Third, despite the housing market taking a big hit as mortgage rates shot up, housing has not dragged down the economy as in rate hike episodes of yore. In addition, we do not have a mortgage crisis similar to the one that struck in 2008-09 and nearly took down the banking system.

However, we do have a commercial real estate tsunami working through offices in central business districts and retail trade, which will reshape the physical as well as business landscape of many communities in the U.S. Finally, we do have a housing shortage around the U.S. that may have long-term generational consequences for homeownership, wealth creation, and financial security for younger people.

## Quarterly Real GDP Growth

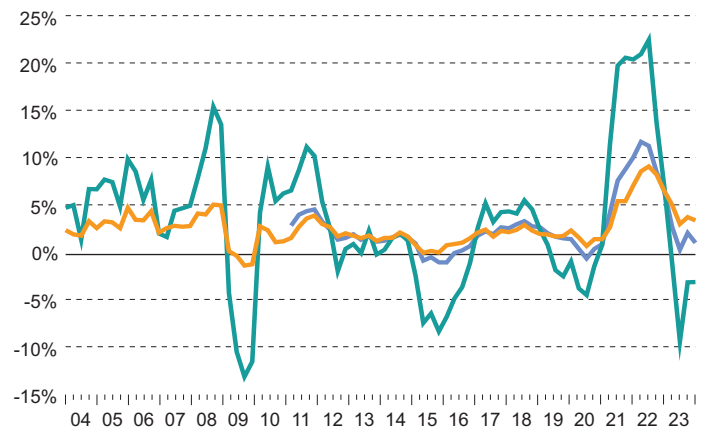
(20 Years)



Source: Bureau of Economic Analysis

## Inflation Year-Over-Year

● CPI (All Urban Consumers) ● PPI (All Commodities) ● PPI (Final Demand)



Source: Bureau of Labor Statistics

Inflation shot up to 9% in mid 2022, but the rate of price increases began to ebb in the second half of 2022 and declined steadily to 3% by the end of 3Q23. Unfortunately, headline inflation ticked back up to 3.5% by the end of the year, so we are not out of the inflation woods yet. Even as the rate of price increases comes down, prices are now “permanently” higher unless we see deflation. The level of the CPI-U index is up 10% since the start of 2022.

One key factor keeping inflation from falling back toward the Federal Reserve's goal of 2% is the labor market. We ended 2023 with labor markets not only tight but tightening. Initial unemployment claims (measured on a weekly basis)—one of our few leading indicators—began climbing in 2Q, and by early spring weekly claims had surpassed the average set in 2019 of 218,000. As claims rose to 250,000 by August, the data appeared to show that interest rate hikes were finally starting to bite. Then initial claims fell back sharply and we ended the year at 203,000. Continuing unemployment claims also began to rise from a very low level starting in 4Q22 and ended the year about 9% higher than the pre-pandemic level. So initial claims show workers holding onto jobs, but the continuing claims show workers have a bit more trouble finding jobs once laid off. However, the unemployment rate remains low at 3.7%. The tightness in the labor market is inconsistent with the Fed's goal of achieving its 2% inflation target. As continuing claims rose in 2023, bond markets read the data as the first sign of easing in the labor market, but the robust end-of-the-year GDP report, the lower initial claims, and the strong December job market report suggest labor market tightness is not yet easing.

The remarkable GDP growth is fueling continued demand for workers, and with inflation falling while wages are rising, workers saw real incomes (wages and salaries net of inflation) grow in each of the last three quarters of 2023, with a sharp gain of 2.5% in real disposable (after-tax) income in 4Q. Average hourly earnings growth slowed from 5% (annual growth) in 2022 to 4% by December 2023, but as inflation fell real wage growth finally turned positive starting in May, and this real growth carried through December (wage growth is exceeding inflation).

The upshot: it may take longer than many believed to unravel the current growth momentum in the U.S. economy. The Fed had stated

### The Long-Term View

Index	4Q23	Periods Ended 12/31/23			
		1 Yr	5 Yrs	10 Yrs	25 Yrs
<b>U.S. Equity</b>					
Russell 3000	12.1	26.0	15.2	11.5	7.7
S&P 500	11.7	26.3	15.7	12.0	7.6
Russell 2000	14.0	16.9	10.0	7.2	7.9
<b>Global ex-U.S. Equity</b>					
MSCI EAFE	10.4	18.2	8.2	4.3	4.4
MSCI ACWI ex USA	9.8	15.6	7.1	3.8	--
MSCI Emerging Markets	7.9	9.8	3.7	2.7	--
MSCI ACWI ex USA Small Cap	10.1	15.7	7.9	4.9	7.3
<b>Fixed Income</b>					
Bloomberg Agg	6.8	5.5	1.1	1.8	3.9
90-Day T-Bill	1.4	5.0	1.9	1.3	1.9
Bloomberg Long G/C	13.2	7.1	1.1	3.2	5.2
Bloomberg GI Agg ex US	9.2	5.7	-1.6	-0.8	2.2
<b>Real Estate</b>					
NCREIF Property	-3.0	-7.9	4.3	6.8	8.0
FTSE Nareit Equity	16.2	13.7	7.4	7.6	9.3
<b>Alternatives</b>					
HFRI Fund Weighted	4.2	8.1	7.1	4.6	6.3
Cambridge PE*	-0.4	4.2	14.6	14.3	13.9
Bloomberg Commodity	-4.6	-7.9	7.2	-1.1	2.8
Gold Spot Price	11.0	13.4	10.1	5.6	8.2
<b>Inflation – CPI-U</b>	-0.3	3.4	4.1	2.8	2.5

\*Data for most recent period lags. Data as of 3Q23.

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

earlier in 2023 a belief that rates would remain elevated, based on its economic expectation of “stronger for longer.” After the Fed reversed course in the November and December FOMC meetings, signaling rate cuts were likely in 2024, the economy reverted to stronger for longer on its own.

### Recent Quarterly Economic Indicators

	4Q23	3Q23	2Q23	1Q23	4Q22	3Q22
Employment Cost: Total Compensation Growth	4.2%	4.3%	4.5%	4.8%	5.1%	5.0%
Nonfarm Business: Productivity Growth	3.2%	4.9%	3.6%	-0.8%	1.6%	0.4%
GDP Growth	3.3%	4.9%	2.1%	2.2%	2.6%	2.7%
Manufacturing Capacity Utilization	77.1%	77.7%	78.0%	78.2%	78.5%	79.4%
Consumer Sentiment Index (1966=100)	64.9	69.6	62.3	64.6	58.8	56.1

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

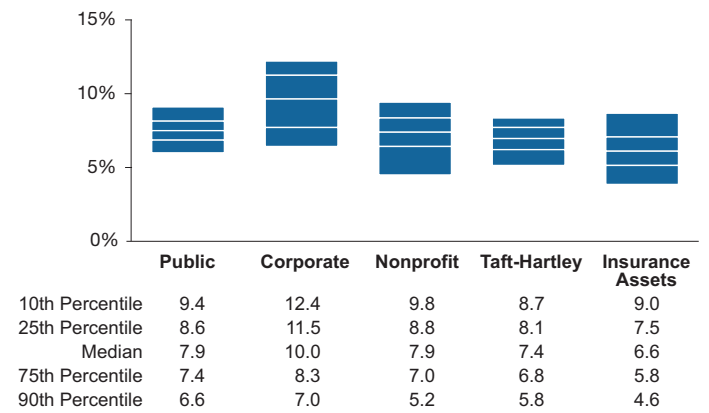
# Gains in 2023 but Inflation Tops Worries

## INSTITUTIONAL INVESTORS

- The 2023 equity market was up 24%, led by seven securities nicknamed “The Magnificent Seven.”
- Other 493 securities gained 12% in 2023.
- These robust equity returns led all institutional investor types to show gains for 2023, a stark reversal from the double-digit losses of 2022.
- Nonprofits showed the best returns, while corporate defined benefit (DB) plans and Taft-Hartley plans brought up the rear.
- But over the last year, all investors lagged a 60%/40% stocks/40% bonds benchmark by a significant amount.
- Remarkable U.S. equity gains likely played a big role in that gap.
- As has been the case for years, institutional investors continued to show 20-year returns close to but still below the 60%/40% benchmark.

- *Recession:* There is no shortage of worries that could cause one: interest rate hikes, global armed conflicts, U.S.-China conflict, the U.S. presidential election ....
- *Equity valuations:* The Magnificent Seven and index concentration worried some clients, while stock prices in light of higher interest rates were also a concern.

Quarterly Returns, Callan Database Groups (12/31/23)



Source: Callan

### All Investor Types

- The major macroeconomic issues investors are discussing include:
  - *Interest rates:* As has been true for much of the past year, worries about inflation and the future direction of interest rates were pervasive.

### Callan Database Median and Index Returns\* for Periods Ended 12/31/23

Database Group	Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Public Database	7.9	13.0	4.3	9.0	6.9	7.2
Corporate Database	10.0	11.8	-0.1	6.6	5.7	6.6
Nonprofit Database	7.9	13.5	4.3	8.7	6.5	7.0
Taft-Hartley Database	7.4	11.9	4.5	8.6	6.9	6.8
Insurance Assets Database	6.6	9.7	1.5	5.1	4.1	4.9
All Institutional Investors	8.1	12.6	3.7	8.3	6.5	6.9
Large (>\$1 billion)	7.5	11.7	4.6	8.6	6.9	7.2
Medium (\$100mm - \$1bn)	8.2	12.8	3.8	8.4	6.5	7.0
Small (<\$100 million)	8.3	13.1	3.4	8.2	6.2	6.5
60% S&P 500/40% Bloomberg Agg	9.7	17.7	4.7	10.1	8.1	7.4

\*Returns less than one year are not annualized.

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

**Public DB Plans**

- The average or median discount rate, according to the most recent NASRA survey, remains at 7.00%.
- A 7.00% return expectation can be hit with almost 50% in fixed income.
- Plans have increased their exposure to both fixed income and/or alternatives.
- Given this rate, investors are weighing how or whether to adjust allocations based on Callan’s 2024-2033 Capital Markets Assumptions.
- The rise in fixed income expectations in particular has made estimated return-on-asset assumptions much easier to hit.
- But if plans increase their discount rates, the higher funded status could lead to increased pressure to improve benefits.

**Corporate DB Plans**

- Liabilities decreased as rates rose.
- Interest rate hedging continues to work.
- Plans that were hedged were insulated from changes to interest rates in 2023.
- Some plans focused on total return “won” for a second year in a row as rising rates decreased the liability, resulting in an increased funded ratio.
- As closed plans’ liabilities shorten, interest in intermediate fixed income continues.

- Many plans’ improved funded status has led some to further implement de-risking glidepaths.
- Higher fixed income assumptions have led clients to weigh changing allocations to the asset class, but in different ways. Some are looking at long duration bonds, others at whether to add to their fixed income allocations or stay pat.

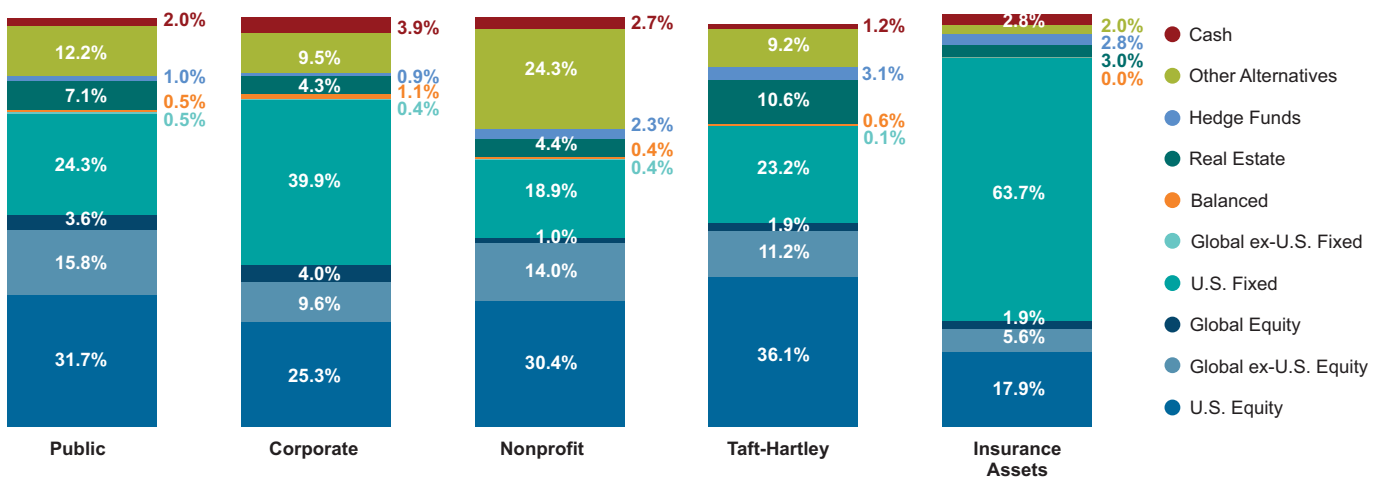
**Nonprofits**

- These investors are still focused on total return.
- Interest in private credit remains strong.
- Inflation concerns continue to affect real returns.
- Strong economies can lead to strong fundraising efforts, which can help dampen return volatility.

**Defined Contribution (DC) Plans**

- These are the significant new issues:
  - SECURE 2.0 and its postponement
  - Retirement income and how the maturing demographics of participants, higher rates, and rollovers can affect the different types of retirement income solutions plans can choose.
- The gap in returns between money market and stable value funds was a new source of concern for some plans.

**Average Asset Allocation, Callan Database Groups**



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

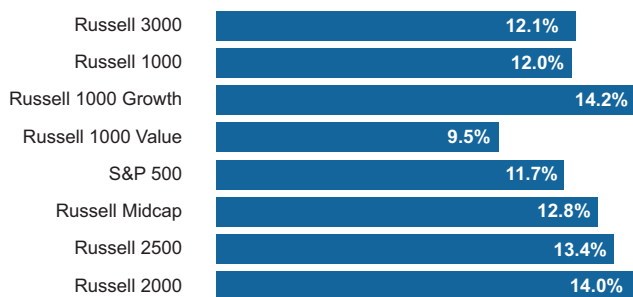
# Equity

## U.S. Equities

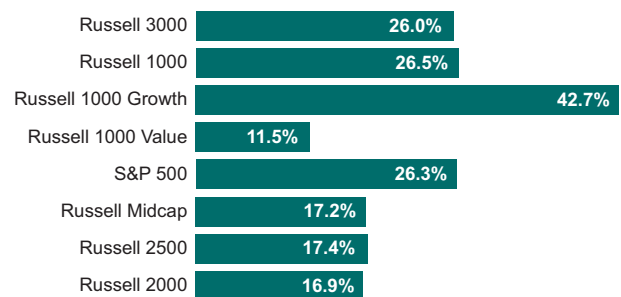
### End-of-the-year rally

- U.S. equity markets rebounded in the last two months of the year as the impact of possible rate cuts in 2024 started to get priced in.
- The S&P 500 Index approached a record high as the year closed. Of note, 2023 was the first year since 2012 that the S&P failed to reach a high-water mark. That said, the index was up an impressive 11.7% in 4Q and 26.3% for the year.
- The tech sector was the clear winner for the quarter and the year (+17.2%; +57.8%) while Energy (-6.9%; -1.3%) was the only sector to register both a 4Q and 2023 decline.
- 2023 saw the narrowest breadth of leadership (“the Magnificent Seven”) since 1987, with just 27% of stocks outperforming the S&P 500. Historically, such concentrated leadership has not been the sign of a healthy market.
- Fourth quarter and 2023 returns for the bunch were impressive: Alphabet: +6.8%, +58.8%; Amazon: +19.5%, +80.9%; Apple: +12.6%, +49.0%; Meta: +17.9%, +194.1%; Microsoft: +19.3%, +58.2%; NVIDIA: +13.9%, +239.0%; Tesla: -0.7%, +101.7%.
- The index would have been up only about 10% for the year without these stocks, and the equal-weighted S&P 500 returned 11.9% in 4Q and 13.9% in 2023.
- However, gains started broadening out in the last two months of the year with the equal-weighted S&P index outperforming the capitalization-weighted version.
- Smaller cap stocks also outperformed their large cap counterparts in 4Q23, further proof of the broadening out of returns.
- For the full year, large cap stocks outperformed small cap stocks by almost 10 percentage points.
- Growth vs. value performance was mixed across market capitalization during the quarter. Within large cap, growth outperformed value, while the opposite was true within small cap.

### U.S. Equity: Quarterly Returns (12/31/23)

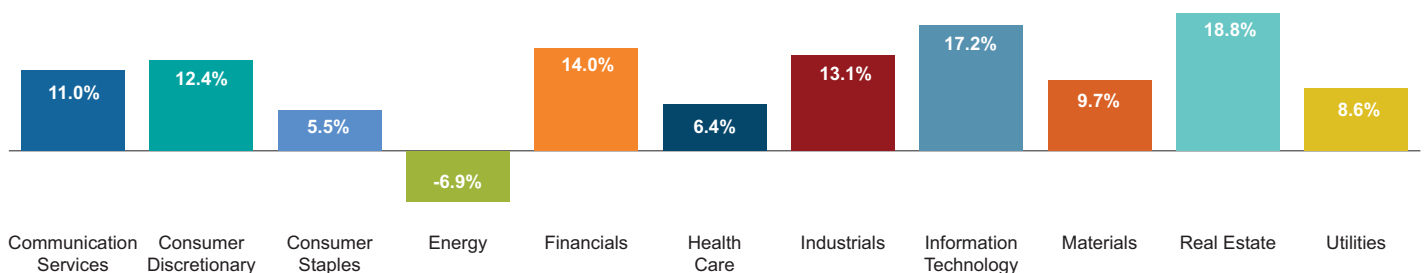


### U.S. Equity: One-Year Returns (12/31/23)



Sources: FTSE Russell and S&P Dow Jones Indices

### Quarterly Performance of Industry Sectors (12/31/23)



Source: S&P Dow Jones Indices

## Global Equities: Global markets in the black for 4Q

### Broad market

- Dovish signaling from central banks and dropping yields led to a broad market rally in 4Q23.
- Global ex-U.S. small caps reclaimed some of their lagging performance in 4Q but ended the year as the worst-performing broad-based index, albeit up over 12%. Elevated borrowing costs and the persistent risk of a recession have kept investors away.
- Japan's low rates have benefited exporters, and the threat of being delisted spurred a stock buy-back spree. Coupled with an increased focus on governance, this spurred Japan to a multi-decade high.

### Emerging markets

- Emerging markets underperformed developed markets.
- India's rally couldn't overcome China's weakness, whose economic growth was near the government's target, but investor concerns around stimulus and a surprisingly sluggish reopening drove stocks lower.

### Growth vs. value

- Energy, a volatile area in the market, pulled back value's rally after having a strong 3Q. Global ex-U.S. growth rallied on lowering yields but couldn't overcome earlier underperformance and ended the year behind its value peers in both emerging and developed markets.

### U.S. dollar vs. other currencies

- The U.S. dollar weakened in 4Q as investors believed that U.S. interest rates would fall faster than much of the developed world.

### China: Danger or opportunity?

#### Long-term growth potential

- China has the second-largest GDP and the world's largest population of consumers.

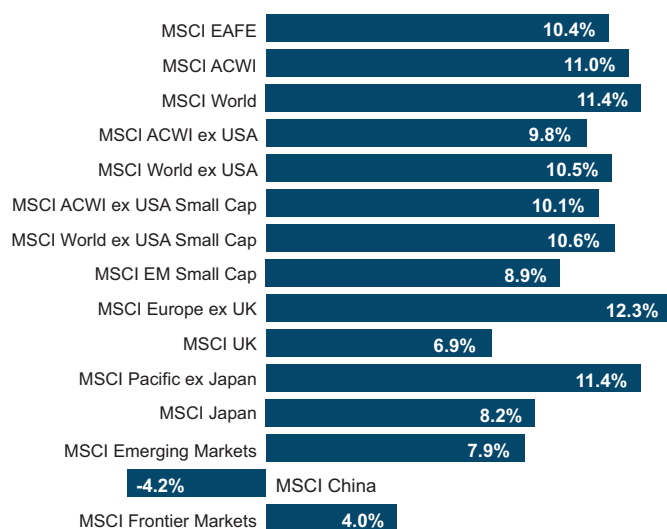
#### Valuation

- Valuations remain attractive on a forward P/E basis.

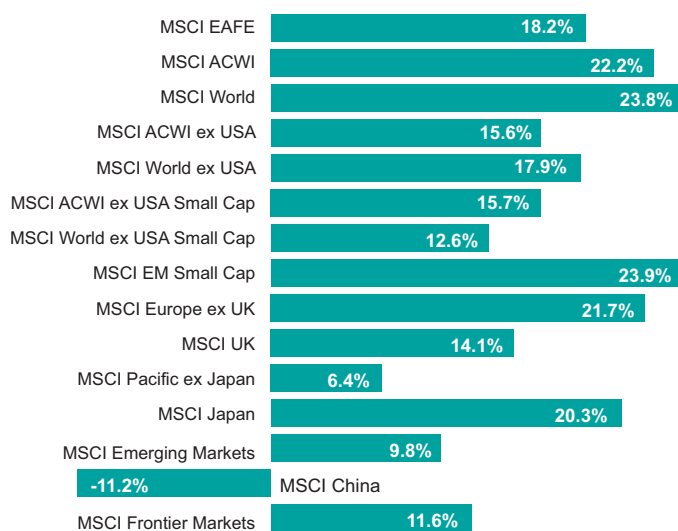
### Structural challenges

- Inbound foreign direct investment (FDI) for China went negative for the first time as local markets remained weak and geopolitical tensions persisted.
- China is run by an authoritarian regime that may act against investors' best interests.

### Global ex-U.S. Equity: Quarterly Returns (U.S. Dollar, 12/31/23)



### Global ex-U.S. Equity: One-Year Returns (U.S. Dollar, 12/31/23)



Source: MSCI

# Fixed Income

## U.S. Fixed Income

### Strong returns at end of year

- Driven by falling rates and strong risk-on sentiment, the Agg returned 6.8%, the highest quarterly return since 2Q89 (when the 90-day T-bill was over 8% and inflation hit 14% earlier in the decade)!
- 10-year U.S. Treasury yield closed the year at 3.88%
- A round trip from December 2022, masking significant volatility during the year
- High was 4.98% in October and low was 3.30% in April
- Corporates and mortgages outperformed Treasuries for the quarter and year.
- High yield corporates soared as defaults remained low and the economy resilient.

### U.S. Treasury yield curve remained inverted, but less so

- 106 bps as of 6/30; 44 bps as of 9/30; 35 bps as of 12/31

### Fed kept Fed Funds rate on hold and softened language

- Pivoted from “higher for longer” to projected rate cuts in 2024
- Inflation over past six months below Fed’s 2% target
- Core PCE Price Index was 1.9% annualized in November.
- Markets expect six rate cuts in 2024 versus three in the Fed’s Summary of Economic Projections.

### Valuations

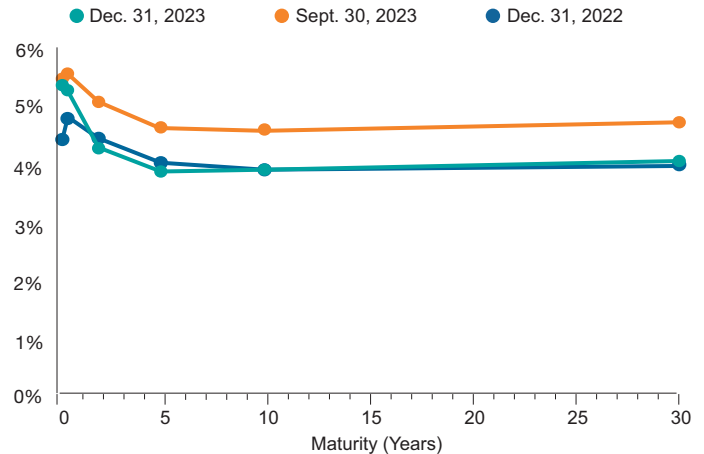
- Investment grade and high yield corporate spreads now below 10-year averages

## Municipal Bonds

### Gains in 4Q and a superb November

- November was the best month since August 1982.
- Helped by falling yields, muted issuance, and strong demand
- Reversed the -1.4% year-to-date return as of 9/30

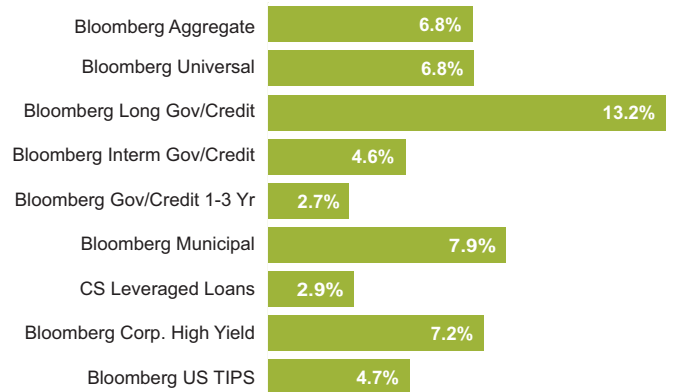
## U.S. Treasury Yield Curves



Source: Bloomberg

## U.S. Fixed Income: Quarterly Returns

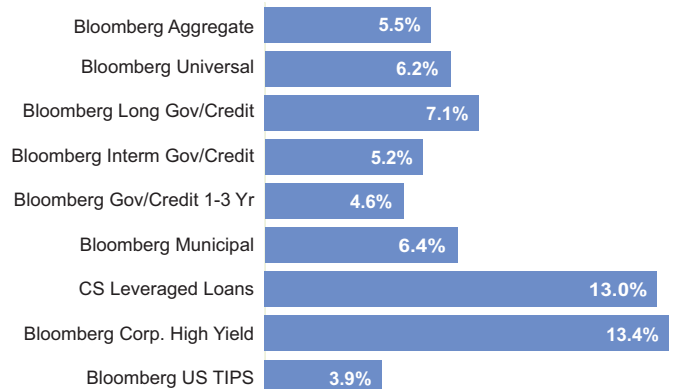
(12/31/23)



Sources: Bloomberg and Credit Suisse

## U.S. Fixed Income: One-Year Returns

(12/31/23)



## FIXED INCOME (Continued)

### BBBs performed best for quarter and year

- AAA: +8.4%; +5.8%
- AA: +7.6%; +5.9%
- A: +8.0%; +7.3%
- BBB: +9.2%; +8.9%

### Valuations

- Credit spreads close to historical averages
- Mortgage spreads widened on interest rate volatility and slowing prepayments.

### Valuations vs. U.S. Treasuries richened

- 10-year AAA Muni/10-year U.S. Treasury yield ratio 59%, down from 75% as of 9/30
- Well below 10-year median of 87%
- After-tax yields remain attractive at 5.4% (source: Morgan Stanley).

### Fundamentals for state, local governments remain sound

- Upgrades exceeded downgrades in 2023.

### Global Fixed Income

#### Falling rates bolstered 4Q returns globally

- Central banks seen as moving closer to cutting rates as inflation moderated
- Gains were broad-based across countries with the U.S. lagging other developed markets in unhedged terms.
- Emerging markets also posted strong results with gains across most countries.

#### U.S. dollar weakened

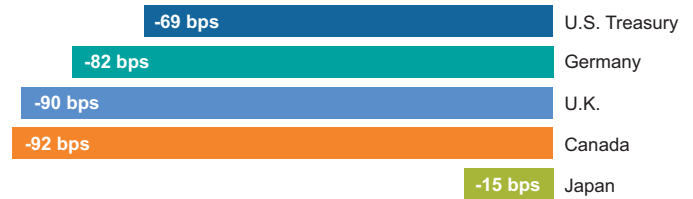
- Major currencies rose compared to the dollar in 4Q.

#### Emerging markets also posted strong results

- Gains across most countries

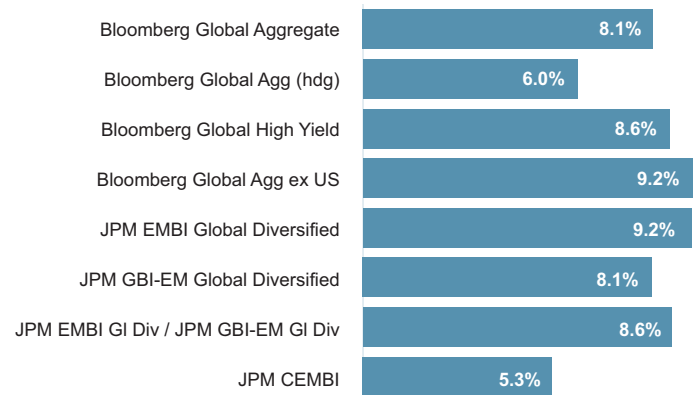
### Change in 10-Year Global Government Bond Yields

3Q23 to 4Q23



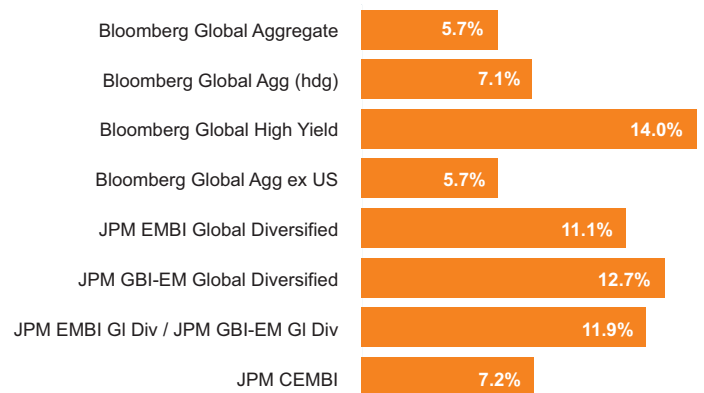
Source: Bloomberg

### Global Fixed Income: Quarterly Returns (12/31/23)



Sources: Bloomberg and JPMorgan Chase

### Global Fixed Income: One-Year Returns (12/31/23)



Sources: Bloomberg and JPMorgan Chase



# Private RE Falls but REITs Outpace Stocks

REAL ESTATE/REAL ASSETS | Munir Iman

## Private RE valuations reflect higher rates

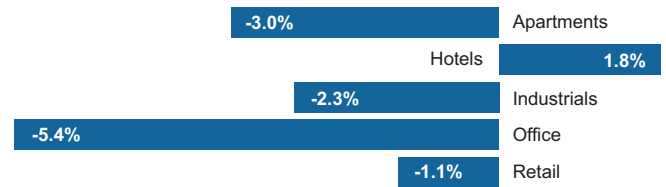
- The NCREIF Property Index, a measure of U.S. institutional real estate assets, fell 3.0% during 4Q23. The income return was 1.1% while the appreciation return was –4.1%.
- Hotels, which represent a small portion of the index, led property sector performance with a gain of 1.8%.
- Office finished last with a loss of 5.4%.
- Regionally, the South led with a loss of 1.9%, while the West was the worst performer with a drop of 3.7%.
- The NCREIF Open-End Diversified Core Equity (ODCE) Index, representing equity ownership positions in U.S. core real estate, fell 4.8% during 4Q, with an income return of 1.0% and an appreciation return of -5.8%.

## REITs outperform equities

- The FTSE EPRA Nareit Developed REIT Index, a measure of global real estate securities, rose 15.6% during 4Q23.
- U.S. REITs, as measured by the FTSE Nareit Equity REITs Index, increased 16.2%.
- The FTSE EPRA Nareit Asia Index (USD), representing the Asia/Pacific region, gained 8.6%.
- European REITs, as measured by the FTSE EPRA Nareit Europe Index (USD), jumped 26.8%.
- U.S. REITs outperformed the S&P 500 (11.7%). They also topped Asia REITs but underperformed Europe.

## Sector Quarterly Returns by Property Type

(12/31/23)



Source: NCREIF

- The outperformance in the U.S. was driven by dampening inflation, coupled with a more dovish Federal Reserve sentiment sparking a rally to close the year.
- The office sector outperformed, coming off its lows.
- Gaming, residential, health care, and data center lagged, impacted by interest rate challenges and prior strong performances.
- The FTSE EPRA Nareit Developed Asia Index (USD) rose 8.6% during the quarter. China's economic outlook remains uncertain, exacerbated by geopolitical tensions and underwhelming stimulus.
- The FTSE EPRA Nareit Developed Europe Index (USD) increased by 26.8% during the quarter.
- Europe was the top-performing region, driven by meaningful currency tailwinds. Expectations of a dovish central bank were driven by weakening economic data.

## Callan Database Median and Index Returns\* for Periods Ended 12/31/23

Private Real Assets	Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	15 Years
<b>Real Estate ODCE Style</b>	<b>-0.4</b>	<b>-10.0</b>	<b>-10.0</b>	<b>4.9</b>	<b>4.7</b>	<b>7.0</b>	<b>5.2</b>
NFI-ODCE (value-weighted, net)	-5.0	-12.7	-12.7	4.0	3.3	6.3	5.1
NCREIF Property	-3.0	-7.9	-7.9	4.6	4.3	6.8	6.4
NCREIF Farmland	2.3	5.0	5.0	7.4	6.0	7.3	9.4
NCREIF Timberland	4.3	9.5	9.5	10.5	6.6	5.8	4.7
<b>Public Real Estate</b>							
<b>Global Real Estate Style</b>	<b>15.4</b>	<b>12.2</b>	<b>12.2</b>	<b>2.6</b>	<b>5.6</b>	<b>6.0</b>	<b>9.3</b>
FTSE EPRA Nareit Developed	11.3	2.2	2.2	3.5	5.9	6.0	8.6
<b>Global ex-U.S. Real Estate Style</b>	<b>15.4</b>	<b>9.0</b>	<b>9.0</b>	<b>-3.7</b>	<b>3.2</b>	<b>4.8</b>	<b>8.6</b>
FTSE EPRA Nareit Dev ex US	14.9	6.3	6.3	-4.5	-0.5	1.0	5.6
<b>U.S. REIT Style</b>	<b>16.5</b>	<b>14.0</b>	<b>14.0</b>	<b>6.8</b>	<b>8.8</b>	<b>8.6</b>	<b>11.6</b>
FTSE EPRA Nareit Equity REITs	16.2	13.7	13.7	7.2	7.4	7.6	10.5

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

# Big Slowdown After Frenzy of 2021

PRIVATE EQUITY | Ashley Kahn

Both new investment activity and exit activity slowed markedly in 2023, following rising interest rates, declines in the public markets, and continued price uncertainty.

**Fundraising** ► Fundraising declined back closer to historical levels in 2022 after its frenzied peak in 2021. So far, 2023 has been another down year, with LPs being more selective with their commitments.

**Buyouts** ► There was a significant decline in deal activity this year after the highs of 2021-2022, caused by high interest rates, a wide bid-ask spread, and lingering effects from the slowdown in the public markets. There was also greater difficulty in obtaining financing this year, particularly for mega buyout deals, which has brought down leverage ratios across the industry.

Buyout valuations are finally starting to normalize in 2023 after their peak in 2021. Buyout valuations are sensitive to changes in interest rates—as the cost of borrowing rises, it is harder to justify high valuations.

**Venture Capital and Growth Equity** ► There was a substantial decline in venture capital and growth equity activity in 2023, following the crazed highs of 2021 and early 2022. Valuations, likewise, have reverted back to historical levels, particularly at the late stage.

## Private Equity Performance (%) (Pooled Horizon IRRs through 9/30/23\*)

Strategy	Quarter	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
All Venture	-2.4	-8.9	14.8	17.2	17.2	13.4	12.5	20.4
Growth Equity	-0.6	0.8	12.3	14.8	14.3	13.1	13.8	14.3
All Buyouts	0.1	10.2	16.8	15.0	14.6	12.4	14.6	12.8
Mezzanine	1.8	13.0	13.5	11.0	11.1	10.7	11.1	9.9
Credit Opportunities	1.2	8.2	11.1	7.1	7.5	10.1	9.3	9.6
Control Distressed	0.4	5.6	19.4	13.6	11.7	11.5	11.6	11.4
<b>All Private Equity</b>	<b>-0.4</b>	<b>4.2</b>	<b>15.4</b>	<b>14.8</b>	<b>14.3</b>	<b>12.5</b>	<b>13.6</b>	<b>13.0</b>
S&P 500	11.7	26.3	10.0	15.7	12.0	14.0	9.7	7.6
Russell 3000	12.1	26.0	8.5	15.2	11.5	13.8	9.7	7.7

Note: Private equity returns are net of fees. Sources: Refinitiv/Cambridge and S&P Dow Jones Indices  
\*Most recent data available at time of publication

**Exits** ► Exits have declined dramatically after hitting all-time records in 2021. Only 8% of total private equity AUM generated liquidity in 2023 (the lowest level ever)—lower even than the depths of the Global Financial Crisis.

With the IPO window still closed and increasing antitrust sentiment, it is unclear whether exit activity will rebound in 2024. IPO exits in 2023 were at just 15% of pre-pandemic levels.

**Returns** ► Public equity's strong recovery in 2023 (led by the "Magnificent 7" technology stocks) has left private equity in its wake. Private equity only saw about a fifth of the gains of the public markets over the last year, on a PME basis.

## Funds Closed 1/1/23 to 12/31/23

Strategy	No. of Funds	Amt (\$mm)	Share
Venture Capital	1,584	199,090	21%
Growth Equity	139	103,324	11%
Buyouts	515	471,684	50%
Mezzanine Debt	24	36,050	4%
Distressed/Special Credit	42	46,018	5%
Energy	6	3,296	0%
Secondary and Other	137	74,616	8%
Fund-of-funds	25	5,567	1%
<b>Totals</b>	<b>1,472</b>	<b>552,402</b>	<b>100%</b>

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

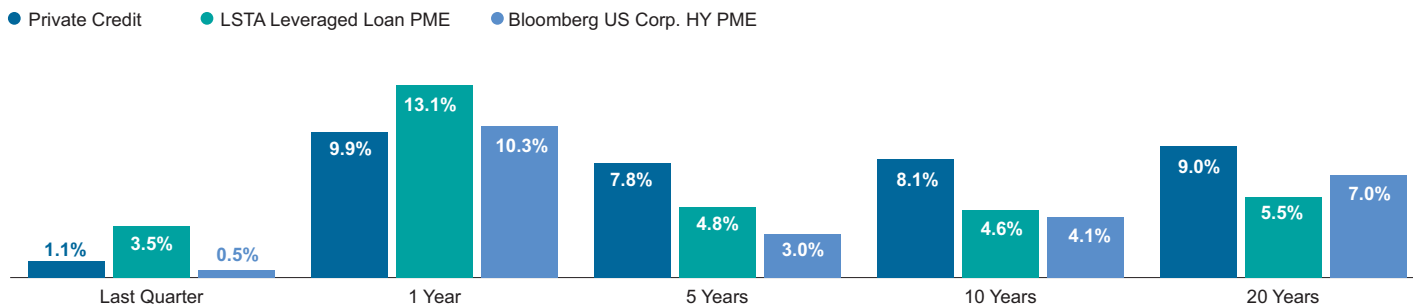
Note: Transaction count and dollar volume figures across all private equity measures are preliminary figures and are subject to update in subsequent versions of the *Capital Markets Review* and other Callan publications.

# Net IRR of Nearly 9% Over Three Years

PRIVATE CREDIT | Catherine Beard

- Private credit performance varies across sub-asset class and underlying return drivers. Over the past three years the asset class has generated a net IRR of nearly 9%. Higher-risk strategies have performed better than lower-risk strategies.
- Private credit remained in high demand across Callan’s investor base, and a number of large defined benefit plans are looking to increase their existing private credit allocations from 2%–3% to 5%–10%.
- While we always work to build out diversified client portfolios, we think there is particularly interesting relative value in upper middle market sponsor-backed lending and asset-based lending.
- We are seeing an uptick in stress for some individual names in direct lending portfolios due to a combination of input cost inflation and increased interest expense.
- Private credit AUM stood at over \$1.5 trillion at the end of 2023, with Preqin forecasting the asset class will grow to over \$2.5 trillion by 2028 at a 11.13% CAGR from 2023 to 2028.
- Direct lending is expected to grow steadily through 2028 as investors increase their private credit allocations. Distressed exposure will grow a bit more slowly with other strategies such as opportunistic, special situations, and other niche diversifiers growing more quickly.

## Private Credit Performance (%) (Pooled Horizon IRRs through 9/30/23\*)



## Private Credit Performance (%) (Pooled Horizon IRRs by Strategy through 9/30/23\*)

Strategy	Quarter	1 Year	5 Years	10 Years	20 Years
Senior Debt	0.1	11.4	5.9	6.6	6.8
Mezzanine	1.8	13.0	11.0	11.1	10.5
Credit Opportunities	1.2	8.2	7.1	7.6	8.9

Source: LSEG/Cambridge

\*Most recent data available at time of publication

# Gains in 4Q23 Spurred by Rising Stocks and Bonds

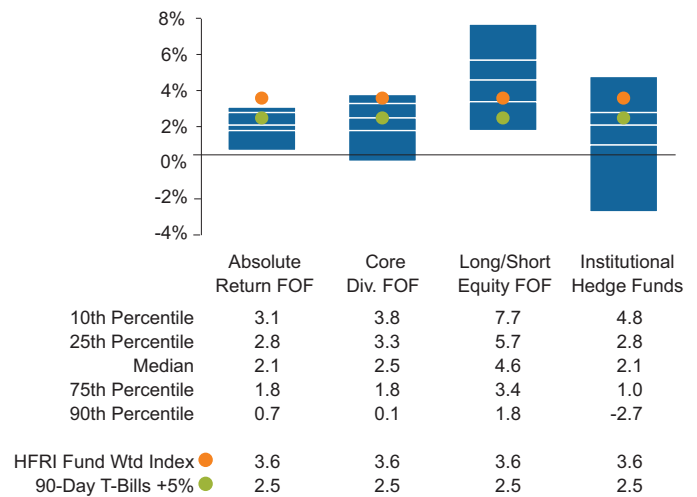
HEDGE FUNDS/MACs | Joe McGuane

Equity markets ended the final quarter of 2023 with double-digit gains and, by the time the year ended, recouped all of 2022's losses. This surge was marked by rising expectations that the Federal Reserve was done hiking interest rates and would begin easing monetary policy in the new year. The yield on the U.S. 10-year Treasury declined sharply to end December at 3.9%, the same level where it began the year. Credit in general had a positive quarter, driven by lower rates and tighter spreads. Investment grade outperformed high yield, as both indices ended the quarter positive.

Hedge funds ended the year on a strong note. Equity hedge strategies were the best performing, as those with higher net long exposure performed better, along with strategies focused on health care and technology, media, and telecommunications (TMT). Relative value strategies generated positive performance during the quarter, driven by fundamental and systematic equity relative value strategies. Event-driven strategies

## Hedge Fund Style Group Returns

(12/31/23)



Sources: Callan, Credit Suisse, Federal Reserve

## Callan Peer Group Median and Index Returns\* for Periods Ended 12/31/23

Hedge Fund Universe	Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years
Callan Institutional Hedge Fund Peer Group	2.1	7.5	7.5	5.6	7.1	5.8
Callan Fund-of-Funds Peer Group	2.9	6.9	6.9	4.0	5.6	4.2
Callan Absolute Return FOF Style	2.1	5.7	5.7	5.5	5.3	4.3
Callan Core Diversified FOF Style	2.5	6.8	6.8	3.7	5.7	3.6
Callan Long/Short Equity FOF Style	4.6	9.0	9.0	-0.2	6.1	5.2
HFRI Fund Weighted Index	3.6	7.6	7.6	4.3	7.0	4.5
HFRI Fixed Convertible Arbitrage	1.4	4.8	4.8	3.8	6.8	4.8
HFRI Distressed/Restructuring	3.2	6.7	6.7	5.7	6.3	4.0
HFRI Emerging Markets	4.2	8.1	8.1	0.1	4.8	3.1
HFRI Equity Market Neutral	1.4	5.6	5.6	4.6	3.2	2.9
HFRI Event-Driven	5.4	10.4	10.4	5.7	6.8	4.6
HFRI Relative Value	2.6	7.0	7.0	4.6	4.9	4.0
HFRI Macro	-1.1	-0.6	-0.6	5.3	5.5	3.1
HFRI Equity Hedge	5.6	10.5	10.5	3.5	8.3	5.2
HFRI Multi-Strategy	4.6	9.8	9.8	1.8	4.5	2.9
HFRI Merger Arbitrage	4.3	5.8	5.8	6.4	6.2	4.7
90-Day T-Bill + 5%	2.5	10.0	10.0	7.2	6.9	6.3

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

also ended on a strong note, as interest rate volatility provided trading opportunities when credit spreads tightened going into year-end. Macro strategies ended the quarter slightly negative, as losses from short positions in U.S. equities and developed market rates were offset by long technology equities and long front-end rates positions.

Serving as a proxy for large, broadly diversified hedge funds with low-beta exposure to equity markets, the median Callan Institutional Hedge Fund Peer Group rose 2.1%. Within this style group of 50 peers, the average hedged credit manager gained 2.6%, driven by actively trading around interest rate volatility. The median Callan Institutional hedged rates manager rose 2.3%, largely driven by relative value fixed income trades. Meanwhile, the average hedged equity manager added 2.2%, as sector-focused managers were able to profit from the broad market rally.

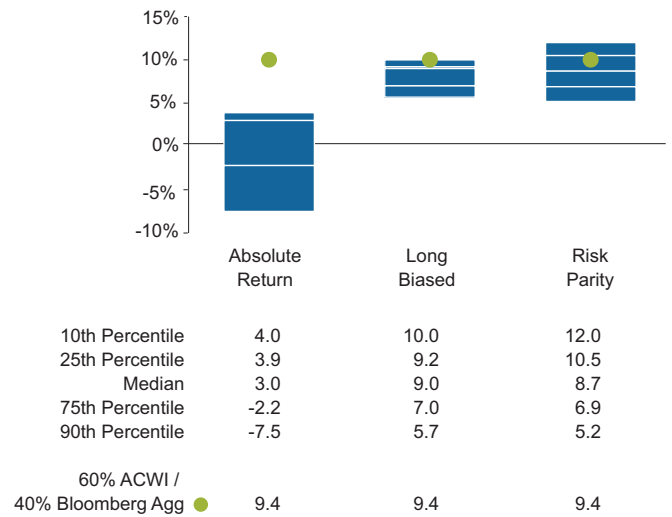
Within the HFRI indices, the best-performing strategy last quarter was equity hedge (5.6%), as health care-, financial-, and technology-focused strategies drove performance during the final quarter of the year. Macro strategies fell 1.1%, as short equity positions offset gains from front end interest rate trading.

Across the Callan Hedge FOF database, the median Callan Long-Short Equity FOF gained 4.6%, as sector-focused strategies drove performance during the quarter. The median Callan Core Diversified FOF rose 2.5%, boosted by equity and event-driven strategies. The Callan Absolute Return FOF ended 2.1% higher, as lower equity beta strategies were behind this move higher.

Within Callan's database of liquid alternative solutions, the Callan MAC Long Biased manager rose 9.0%, as the broad-based equity rally moved performance higher. The Callan MAC Risk Parity peer group rose 8.7%, as equities and fixed income drove performance. The Callan MAC Absolute Return peer group rose, as broad markets had a strong end of the year.

## MAC Style Group Returns

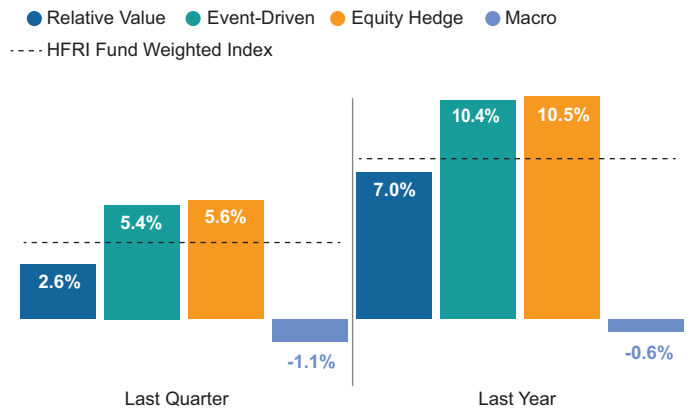
(12/31/23)



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

## HFRI Hedge Fund-Weighted Strategy Returns

(12/31/23)



Source: HFRI

# Index Drops by 2.9% After Three Quarters of Gains

DEFINED CONTRIBUTION | [Scotty Lee](#)

## Performance: Index Dips after Third Straight Quarterly Gain

- The Callan DC Index™ lost 2.9% in 3Q23, which brought the Index’s trailing one-year gain to 13.8%. The Age 45 Target Date Fund (analogous to the 2045 vintage) had a lower quarterly return (-3.6%).

## Growth sources: Investment Losses Lead to Fall in Balances

- Balances within the DC Index fell by 3.2% after a 4.3% increase in the previous quarter. Investment losses (-2.9%) were the primary driver.

## Turnover: Net Transfers Decrease

- Turnover (i.e., net transfer activity levels within DC plans) in the DC Index decreased to 0.26% from the previous quarter’s measure of 0.33%. Despite the decrease, the Index’s historical average (0.55%) remained steady.

## Net cash flow analysis: Stable Value Declines Sharply

- Automatic features and their appeal to “do-it-for-me” investors typically result in target date funds (TDFs) receiving the largest net inflows in the DC Index, which was the case in 3Q23 as the asset allocation funds garnered 87.2% of quarterly net flows. Stable value (-56.2%) saw relatively large outflows for the fourth straight quarter.

## Equity allocation: Exposure Declines

- The Index’s overall allocation to equity (71.5%) fell slightly from the previous quarter’s level (71.8%). The current equity allocation continues to sit above the Index’s historical average (68.4%).

## Asset allocation: Fixed Income, TDFs See Gains

- U.S. fixed income (5.5%) and target date funds (34.1%) were among the asset classes with the largest percentage increases in allocation, while U.S small/mid cap equity (7.4%) had the largest decrease in allocation from the previous quarter due to net outflows.

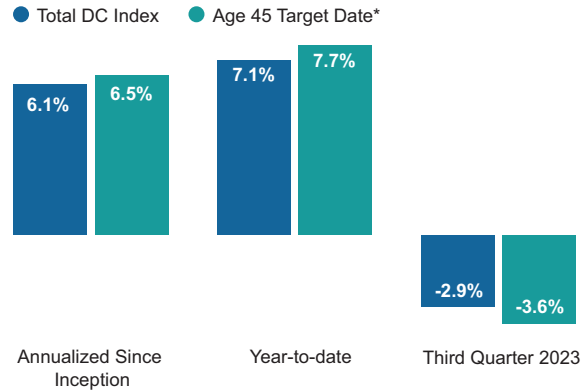
## Prevalence: Money Market Up, Stable Value Down

- The prevalence of money market funds (54.1%) rose by 1.5% accompanied by a decrease in the prevalence of stable value funds (70.1%) by 0.8%.

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

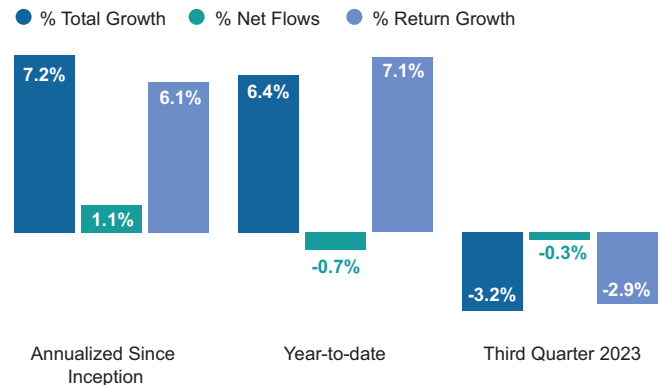
## Investment Performance

(9/30/23)



## Growth Sources

(9/30/23)



## Net Cash Flow Analysis (3Q23)

(Top Two and Bottom Two Asset Gatherers)

Asset Class	Flows as % of Total Net Flows
Target Date Funds	87.2%
Global ex-U.S. Equity	5.3%
U.S. Small/Mid Cap	-13.3%
Stable Value	-56.2%
<b>Total Turnover**</b>	<b>0.3%</b>

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

Source: Callan DC Index

Note: DC Index inception date is January 2006.

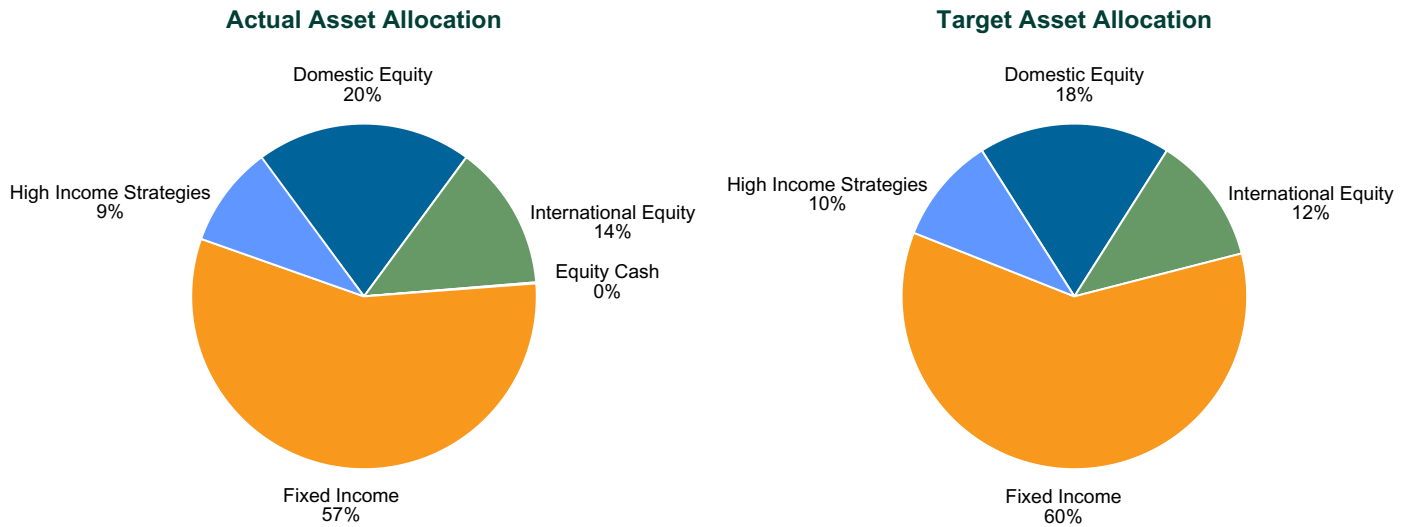
\* The Age 45 Fund transitioned from the average 2035 TDF to the 2040 TDF in June 2018.

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

Actual vs. Target  
Asset Allocation

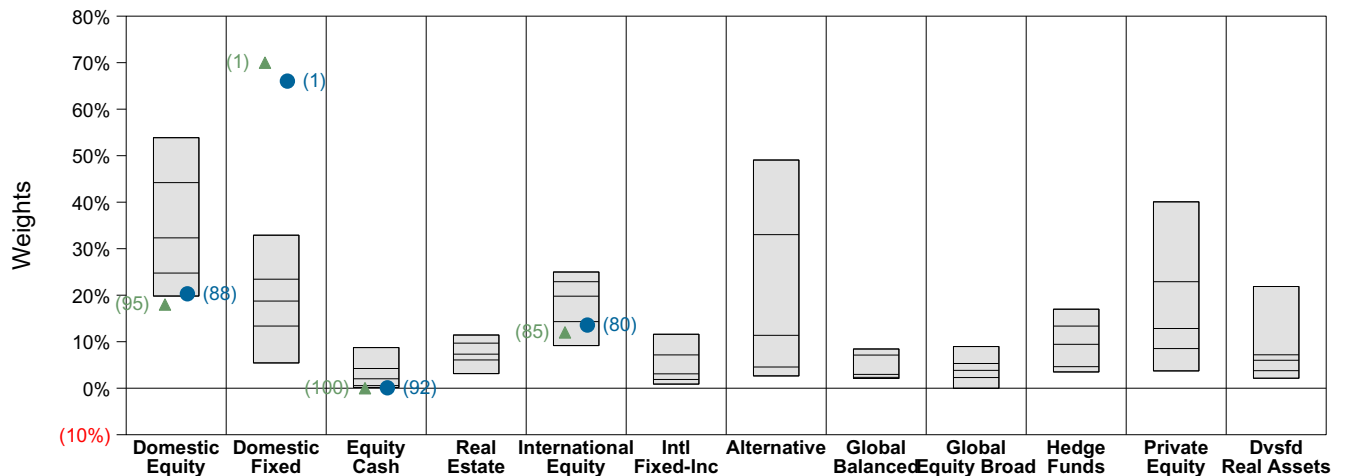
## Actual vs Target Asset Allocation As of December 31, 2023

The top left chart shows the Fund's asset allocation as of December 31, 2023. The top right chart shows the Fund's target asset allocation as outlined in the investment policy statement. The bottom chart ranks the fund's asset allocation and the target allocation versus the Callan Endow/Foundation - Mid (100M-1B).



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Domestic Equity	304,162	20.3%	18.0%	2.3%	34,470
International Equity	203,446	13.6%	12.0%	1.6%	23,651
Equity Cash	1,321	0.1%	0.0%	0.1%	1,321
Fixed Income	847,714	56.6%	60.0%	(3.4%)	(51,259)
High Income Strategies	141,646	9.5%	10.0%	(0.5%)	(8,183)
Total	1,498,289	100.0%	100.0%		

### Asset Class Weights vs Callan Endow/Foundation - Mid (100M-1B)



	Domestic Equity	Domestic Fixed	Equity Cash	Real Estate	International Equity	Intl Fixed-Inc	Alternative	Global Balanced	Global Equity Broad	Hedge Funds	Private Equity	Dvsfd Real Assets
10th Percentile	53.87	32.90	8.74	11.44	24.99	11.60	49.06	8.43	8.96	16.99	40.07	21.87
25th Percentile	44.21	23.44	4.24	9.69	22.90	7.16	33.02	7.13	5.32	13.36	22.90	7.18
Median	32.33	18.74	2.03	7.32	19.79	3.09	11.37	2.97	3.84	9.44	12.84	6.01
75th Percentile	24.76	13.37	0.56	6.08	14.32	1.88	4.56	2.33	2.29	4.63	8.53	3.77
90th Percentile	19.82	5.43	0.16	3.14	9.17	0.88	2.64	2.09	0.00	3.50	3.72	2.14
<b>Fund</b> ●	20.30	66.03	0.09	-	13.58	-	-	-	-	-	-	-
<b>Target</b> ▲	18.00	70.00	0.00	-	12.00	-	-	-	-	-	-	-
% Group Invested	95.16%	93.55%	82.26%	50.00%	88.71%	11.29%	69.35%	9.68%	9.68%	27.42%	38.71%	22.58%

\* Current Quarter Target = 52.5% Blmbg:Aggregate, 18.0% Russell 3000 Index, 12.0% MSCI ACWI xUS (Net), 8.5% Blmbg HY Corp, 7.5% Blmbg Gov/Cred 1-3 Yr and 1.5% ICE All US Cap Secs.



## Investment Manager Asset Allocation

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

### Asset Distribution Across Investment Managers

	December 31, 2023		Net New Inv.	Inv. Return	September 30, 2023	
	Market Value	Weight			Market Value	Weight
<b>Total Equity (1)</b>	<b>\$508,057,742</b>	<b>33.91%</b>	<b>\$14,290,282</b>	<b>\$50,748,086</b>	<b>\$443,019,374</b>	<b>32.86%</b>
<b>Domestic Equity</b>	<b>\$304,162,159</b>	<b>20.30%</b>	<b>\$6,590,931</b>	<b>\$32,393,218</b>	<b>\$265,178,009</b>	<b>19.67%</b>
iShares S&P 1500 ETF	304,162,159	20.30%	6,590,931	32,393,218	265,178,009	19.67%
<b>International Equity</b>	<b>\$203,445,792</b>	<b>13.58%</b>	<b>\$7,944,855</b>	<b>\$18,345,777</b>	<b>\$177,155,160</b>	<b>13.14%</b>
iShares MSCI Emerging ETF	55,242,262	3.69%	2,679,817	4,143,332	48,419,113	3.59%
iShares MSCI Canada ETF	20,234,559	1.35%	650,349	1,988,399	17,595,811	1.31%
iShares Core MSCI EAFE ETF	127,968,972	8.54%	4,614,689	12,214,047	111,140,236	8.24%
Equity Cash	449,791	0.03%	(245,504)	9,091	686,204	0.05%
<b>Total Fixed Income</b>	<b>\$847,714,015</b>	<b>56.58%</b>	<b>\$25,973,751</b>	<b>\$47,205,417</b>	<b>\$774,534,847</b>	<b>57.46%</b>
<b>Market Duration</b>	<b>\$738,319,236</b>	<b>49.28%</b>	<b>\$24,809,917</b>	<b>\$43,786,447</b>	<b>\$669,722,872</b>	<b>49.68%</b>
Colorado Treasurer's Portfolio	738,319,236	49.28%	24,809,917	43,786,447	669,722,872	49.68%
<b>Short Duration</b>	<b>\$109,394,779</b>	<b>7.30%</b>	<b>\$1,163,834</b>	<b>\$3,418,970</b>	<b>\$104,811,975</b>	<b>7.78%</b>
Janus Henderson (2)	109,394,779	7.30%	1,163,834	3,418,970	104,811,975	7.78%
<b>High Income Strategies</b>	<b>\$141,646,216</b>	<b>9.45%</b>	<b>\$3,572,187</b>	<b>\$8,005,214</b>	<b>\$130,068,815</b>	<b>9.65%</b>
<b>High Yield Fixed Income</b>	<b>\$120,239,453</b>	<b>8.03%</b>	<b>\$1,983,791</b>	<b>\$6,943,370</b>	<b>\$111,312,291</b>	<b>8.26%</b>
Mackay Shield US High Yield (3)	120,239,453	8.03%	1,983,791	6,943,370	111,312,291	8.26%
<b>Preferred Securities</b>	<b>\$21,406,763</b>	<b>1.43%</b>	<b>\$1,588,396</b>	<b>\$1,061,843</b>	<b>\$18,756,524</b>	<b>1.39%</b>
Principal Preferred Securities (3)	21,406,763	1.43%	1,588,396	1,061,843	18,756,524	1.39%
<b>Cash Available For Investing</b>	<b>\$871,195</b>	<b>0.06%</b>	<b>\$369,787</b>	<b>\$85,398</b>	<b>\$416,010</b>	<b>0.03%</b>
<b>Total Fund</b>	<b>\$1,498,289,168</b>	<b>100.0%</b>	<b>\$44,206,007</b>	<b>\$106,044,115</b>	<b>\$1,348,039,046</b>	<b>100.0%</b>

(1) Funded in December 2017.

(2) Funded in November 2018.

(3) Funded in July 2020.

## Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods ended December 31, 2023. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

### Returns for Periods Ended December 31, 2023

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>Total Equity</b>	<b>11.41%</b>	<b>22.08%</b>	<b>5.97%</b>	<b>12.01%</b>	<b>-</b>
60% Russell 3000/40% ACWI ex US	11.14%	21.77%	5.77%	11.93%	8.43%
<b>Domestic Equity</b>	<b>12.23%</b>	<b>26.15%</b>	<b>8.55%</b>	<b>15.09%</b>	<b>-</b>
Russell 3000 Index	12.07%	25.96%	8.54%	15.16%	11.48%
<b>International Equity</b>	<b>10.21%</b>	<b>16.05%</b>	<b>1.97%</b>	<b>7.43%</b>	<b>-</b>
MSCI ACWI ex US	9.75%	15.62%	1.55%	7.08%	3.83%
<b>Total Fixed Income</b>	<b>6.05%</b>	<b>5.80%</b>	<b>(2.76%)</b>	<b>1.32%</b>	<b>2.18%</b>
Total Fixed Income Benchmark (1)	6.30%	5.43%	(2.90%)	1.20%	1.60%
<b>Market Duration</b>	<b>6.49%</b>	<b>5.77%</b>	<b>(3.28%)</b>	<b>1.10%</b>	<b>2.09%</b>
Colorado Treasurer's Portfolio (2)	6.49%	5.77%	(3.28%)	1.10%	2.09%
PSPF Custom Benchmark (3)	6.82%	5.53%	(3.31%)	1.10%	1.55%
<b>Short Duration</b>	<b>3.25%</b>	<b>6.03%</b>	<b>0.84%</b>	<b>2.37%</b>	<b>-</b>
Janus Henderson Short Duration	3.25%	6.03%	0.84%	2.37%	-
Blmbg Gov/Cred 1-3 Yr	2.69%	4.61%	0.09%	1.51%	1.27%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.89%	5.24%	0.51%	1.98%	1.67%
<b>High Income Strategies</b>	<b>6.14%</b>	<b>11.41%</b>	<b>2.65%</b>	<b>-</b>	<b>-</b>
High Income Strategies Benchmark (5)	7.06%	12.82%	1.50%	5.20%	4.63%
<b>High Yield Fixed Income</b>	<b>6.23%</b>	<b>12.13%</b>	<b>3.09%</b>	<b>-</b>	<b>-</b>
Mackay Shield US High Yield	6.23%	12.13%	3.09%	-	-
Blmbg High Yield	7.16%	13.44%	1.98%	5.37%	4.60%
<b>Preferred Securities</b>	<b>5.66%</b>	<b>7.36%</b>	<b>0.14%</b>	<b>-</b>	<b>-</b>
Principal Preferred Securities	5.66%	7.36%	0.14%	-	-
ICE BofA US All Cap Secs	6.46%	9.29%	(1.27%)	4.17%	4.73%
<b>Total Fund w/o CAI (6)</b>	<b>7.84%</b>	<b>11.32%</b>	<b>0.10%</b>	<b>4.19%</b>	<b>3.37%</b>
Total Fund Benchmark (6)	7.83%	10.93%	(0.22%)	4.17%	2.91%

(1) Current quarter's Total Fixed Income Benchmark consists of 87.5% Bloomberg U.S. Aggregate and 12.5% Bloomberg Gov/Credit 1-3 Yrs.

(2) Includes cash returns starting July 2017.

(3) The PSPF Fixed Income Portfolio Custom Benchmark consisted of 37% U.S. Treasury 1-10 Year Index, 34% Mortgages 0-10 Year WAL Index, 19% AAA U.S. Agencies 1-10 Year Index and 10% U.S. Corporates AAA Rated 1-10 Years Index through March 31, 2017, 100% Bloomberg U.S. Aggregate, thereafter.

(4) Benchmark consists of 85% Bloomberg 1-3 Year Government/Credit Index and 15% BofAML 1-3 Year BB US Cash Pay High Yield Index.

(5) Benchmark consists of 85% Blmbg High Yield Index and 15% ICE BofA US All Cap Secs Index.

(6) Current quarter's Total Fund Benchmark consists of 18% Russell 3000, 12% MSCI ACWI ex US, 52.5% Bloomberg U.S. Aggregate, 7.5% Bloomberg Gov/Credit 1-3 Yrs, 8.5% Bloomberg US High Yield and 1.5% ICE BofA U.S. All Capital Securities Index. See pg. 22 for full benchmark history.

The Total Fund return calculations do not include Cash Available for Investing.

\*All composites and manager returns are shown gross-of-fees.

## Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods ended June 30. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	6/2023- 12/2023	FY 2023	FY 2022	FY 2021	FY 2020
<b>Total Equity</b>	<b>7.33%</b>	<b>16.33%</b>	<b>(15.85%)</b>	<b>41.59%</b>	<b>1.82%</b>
60% Russell 3000/40% ACWI ex US	7.30%	16.57%	(16.06%)	40.77%	1.90%
<b>Domestic Equity</b>	<b>8.56%</b>	<b>18.83%</b>	<b>(13.95%)</b>	<b>44.30%</b>	<b>6.40%</b>
Russell 3000 Index	8.43%	18.95%	(13.87%)	44.16%	6.53%
<b>International Equity</b>	<b>5.50%</b>	<b>12.28%</b>	<b>(18.97%)</b>	<b>37.78%</b>	<b>(4.71%)</b>
MSCI ACWI ex US	5.61%	12.72%	(19.42%)	35.72%	(4.80%)
<b>Total Fixed Income</b>	<b>3.38%</b>	<b>(0.04%)</b>	<b>(9.76%)</b>	<b>(0.27%)</b>	<b>8.79%</b>
Total Fixed Income Benchmark (1)	3.39%	(0.75%)	(9.46%)	(0.26%)	8.28%
<b>Market Duration</b>	<b>3.33%</b>	<b>(0.53%)</b>	<b>(10.55%)</b>	<b>(0.55%)</b>	<b>9.26%</b>
Colorado Treasurer's Portfolio (2)	3.33%	(0.53%)	(10.55%)	(0.55%)	9.26%
PSPF Custom Benchmark (3)	3.37%	(0.94%)	(10.29%)	(0.33%)	8.74%
<b>Short Duration</b>	<b>3.70%</b>	<b>2.92%</b>	<b>(4.33%)</b>	<b>2.33%</b>	<b>4.41%</b>
Janus Henderson Short Duration	3.70%	2.92%	(4.33%)	2.33%	4.41%
Blmbg Gov/Cred 1-3 Yr	3.44%	0.52%	(3.56%)	0.44%	4.20%
85% 1-3YR G/C; 15% 1-3YR BB (4)	3.69%	1.49%	(3.83%)	1.70%	3.94%
<b>High Income Strategies</b>	<b>6.70%</b>	<b>8.18%</b>	<b>(9.38%)</b>	-	-
High Income Strategies Benchmark (5)	7.44%	7.93%	(12.89%)	15.13%	0.46%
<b>High Yield Fixed Income</b>	<b>6.64%</b>	<b>9.23%</b>	<b>(9.09%)</b>	-	-
Mackay Shield US High Yield	6.64%	9.23%	(9.09%)	-	-
Blmbg High Yield	7.66%	9.06%	(12.81%)	15.37%	0.03%
<b>Preferred Securities</b>	<b>7.10%</b>	<b>2.29%</b>	<b>(11.11%)</b>	-	-
Principal Preferred Securities	7.10%	2.29%	(11.11%)	-	-
ICE BofA US All Cap Secs	6.25%	1.66%	(13.33%)	13.67%	2.86%
<b>Total Fund w/o CAI (6)</b>	<b>5.02%</b>	<b>5.66%</b>	<b>(11.58%)</b>	<b>8.30%</b>	<b>7.37%</b>
Total Fund Benchmark (6)	4.98%	5.18%	(11.64%)	7.98%	7.87%

(1) Current quarter's Total Fixed Income Benchmark consists of 87.5% Bloomberg U.S. Aggregate and 12.5% Bloomberg Gov/Credit 1-3 Yrs.

(2) Includes cash returns starting July 2017.

(3) The PSPF Fixed Income Portfolio Custom Benchmark consisted of 37% U.S. Treasury 1-10 Year Index, 34% Mortgages 0-10 Year WAL Index, 19% AAA U.S. Agencies 1-10 Year Index and 10% U.S. Corporates AAA Rated 1-10 Years Index through March 31, 2017, 100% Bloomberg U.S. Aggregate, thereafter.

(4) Benchmark consists of 85% Bloomberg 1-3 Year Government/Credit Index and 15% BofAML 1-3 Year BB US Cash Pay High Yield Index.

(5) Benchmark consists of 85% Blmbg High Yield Index and 15% ICE BofA US All Cap Secs Index.

(6) Current quarter's Total Fund Benchmark consists of 18% Russell 3000, 12% MSCI ACWI ex US, 52.5% Bloomberg U.S. Aggregate, 7.5% Bloomberg Gov/Credit 1-3 Yrs, 8.5% Bloomberg US High Yield and 1.5% ICE BofA U.S. All Capital Securities Index. See pg. 22 for full benchmark history.

The Total Fund return calculations do not include Cash Available for Investing.

\*All composites and manager returns are shown gross-of-fees.

## Total Fund Benchmark Definition

Inception to Dec 31, 2017		
Market Duration	PFSF Fixed Income Benchmark	100%

January 1st, 2018 - December 31th, 2018		
US Equity	Russell 3000 Index	12.00%
International Equity	MSCI ACWI ex US	8.00%
Market Duration	Bloomberg Barclays Aggregate	72.00%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	8.00%

January 1st, 2019 - September 30th, 2020		
US Equity	Russell 3000 Index	12.00%
International Equity	MSCI ACWI ex US	8.00%
Market Duration	Bloomberg Barclays Aggregate	72.00%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	8.00%

October 1st, 2020 - March 31st, 2021		
US Equity	Russell 3000 Index	12.00%
International Equity	MSCI ACWI ex US	8.00%
Market Duration	Bloomberg Barclays Aggregate	67.50%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	7.50%
High Yield	Bloomberg Barclays US High Yield	4.25%
Preferred Securities	ICE BofA U.S. All Capital Securities Index	0.75%

April 1st, 2021 - June 30th, 2021		
US Equity	Russell 3000 Index	14.70%
International Equity	MSCI ACWI ex US	9.80%
Market Duration	Bloomberg Barclays Aggregate	61.50%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	7.50%
High Yield	Bloomberg Barclays US High Yield	5.50%
Preferred Securities	ICE BofA U.S. All Capital Securities Index	1.00%

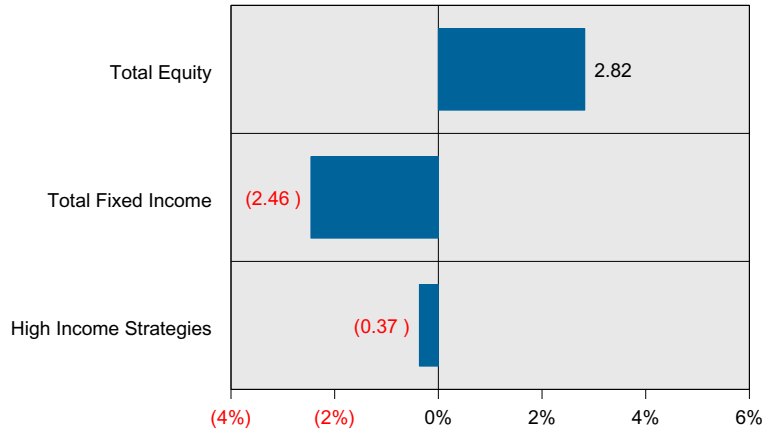
July 1st, 2021 - September 30, 2021		
US Equity	Russell 3000 Index	16.35%
International Equity	MSCI ACWI ex US	10.90%
Market Duration	Bloomberg Barclays Aggregate	57.00%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	7.50%
High Yield	Bloomberg Barclays US High Yield	7.00%
Preferred Securities	ICE BofA U.S. All Capital Securities Index	1.25%

October 1st, 2021 - Current		
US Equity	Russell 3000 Index	18.00%
International Equity	MSCI ACWI ex US	12.00%
Market Duration	Bloomberg Barclays Aggregate	52.50%
Short Duration	Bloomberg Barclays Gov/Cred 1-3 Yr	7.50%
High Yield	Bloomberg Barclays US High Yield	8.50%
Preferred Securities	ICE BofA U.S. All Capital Securities Index	1.50%

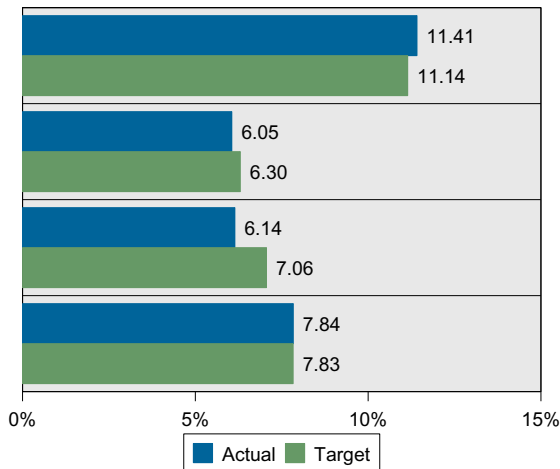
## Quarterly Total Fund Relative Attribution - December 31, 2023

The following analysis approaches Total Fund Attribution from the perspective of relative return. Relative return attribution separates and quantifies the sources of total fund excess return relative to its target. This excess return is separated into two relative attribution effects: Asset Allocation Effect and Manager Selection Effect. The Asset Allocation Effect represents the excess return due to the actual total fund asset allocation differing from the target asset allocation. Manager Selection Effect represents the total fund impact of the individual managers excess returns relative to their benchmarks.

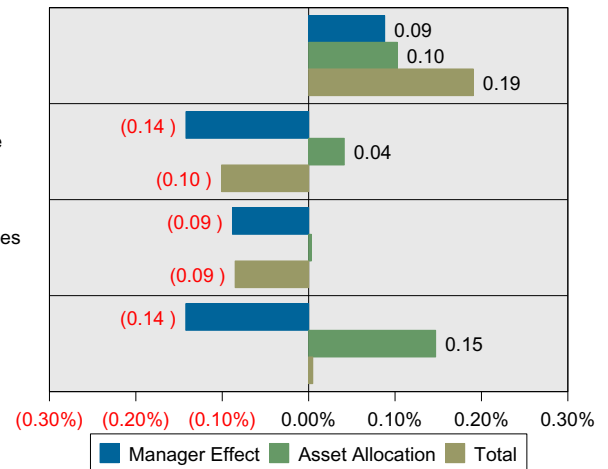
### Asset Class Under or Overweighting



### Actual vs Target Returns



### Relative Attribution by Asset Class



### Relative Attribution Effects for Quarter ended December 31, 2023

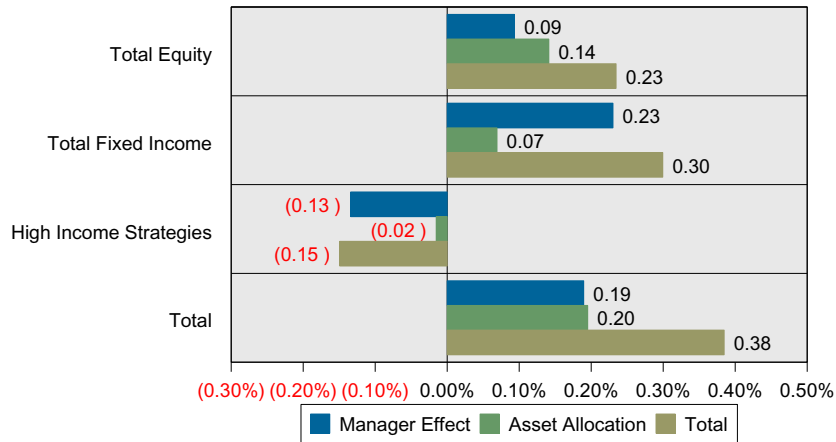
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	33%	30%	11.41%	11.14%	0.09%	0.10%	0.19%
Total Fixed Income	58%	60%	6.05%	6.30%	(0.14)%	0.04%	(0.10)%
High Income Strategies	10%	10%	6.14%	7.06%	(0.09)%	0.00%	(0.09)%
<b>Total</b>			<b>7.84%</b>	<b>7.83%</b>	<b>(0.14)%</b>	<b>0.15%</b>	<b>0.00%</b>

\* Current Quarter Target = 52.5% Blmbg:Aggregate, 18.0% Russell 3000 Index, 12.0% MSCI ACWI xUS (Net), 8.5% Blmbg HY Corp, 7.5% Blmbg Gov/Cred 1-3 Yr and 1.5% ICE All US Cap Secs.

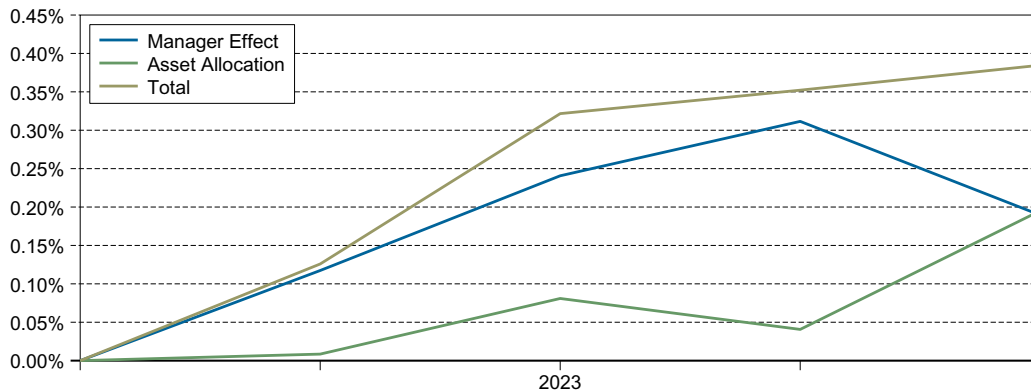
## Cumulative Total Fund Relative Attribution - December 31, 2023

The charts below accumulate the Total Fund Attribution Analysis (shown earlier) over multiple periods to examine the cumulative sources of excess total fund performance relative to target. These cumulative results quantify the longer-term sources of total fund excess return relative to target by asset class. These relative attribution effects separate the cumulative sources of total fund excess return into Asset Allocation Effect and Manager Selection Effect.

### One Year Relative Attribution Effects



### Cumulative Relative Attribution Effects



### One Year Relative Attribution Effects

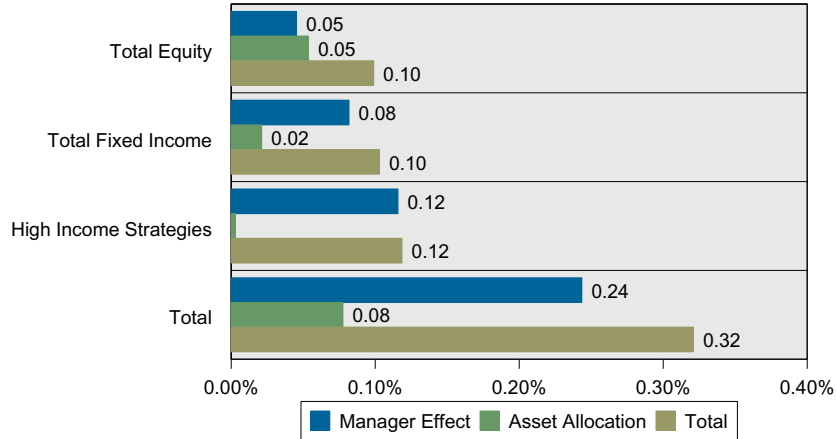
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	32%	30%	22.08%	21.77%	0.09%	0.14%	0.23%
Total Fixed Income	59%	60%	5.80%	5.43%	0.23%	0.07%	0.30%
High Income Strategies	10%	10%	11.41%	12.82%	(0.13%)	(0.02%)	(0.15%)
<b>Total</b>			<b>11.32%</b>	<b>10.93%</b>	<b>+ 0.19%</b>	<b>+ 0.20%</b>	<b>0.38%</b>

\* Current Quarter Target = 52.5% Blmbg:Aggregate, 18.0% Russell 3000 Index, 12.0% MSCI ACWI xUS (Net), 8.5% Blmbg HY Corp, 7.5% Blmbg Gov/Cred 1-3 Yr and 1.5% ICE All US Cap Secs.

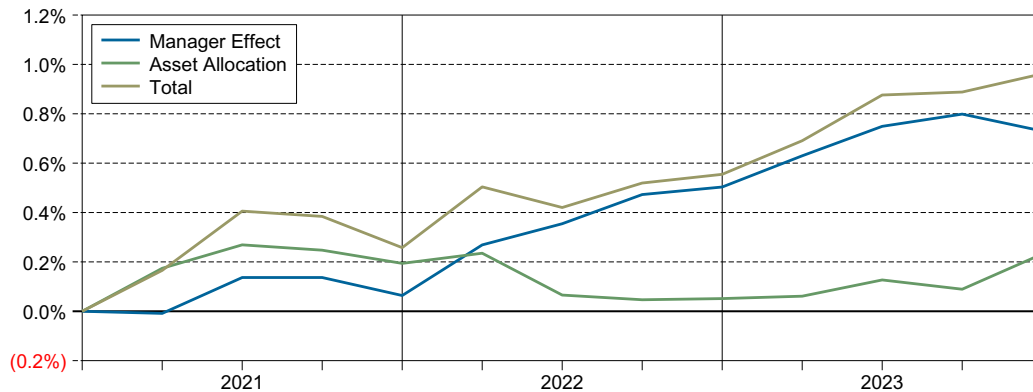
## Cumulative Total Fund Relative Attribution - December 31, 2023

The charts below accumulate the Total Fund Attribution Analysis (shown earlier) over multiple periods to examine the cumulative sources of excess total fund performance relative to target. These cumulative results quantify the longer-term sources of total fund excess return relative to target by asset class. These relative attribution effects separate the cumulative sources of total fund excess return into Asset Allocation Effect and Manager Selection Effect.

### Three Year Annualized Relative Attribution Effects



### Cumulative Relative Attribution Effects



### Three Year Annualized Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	29%	28%	5.97%	5.77%	0.05%	0.05%	0.10%
Total Fixed Income	61%	62%	(2.76%)	(2.90%)	0.08%	0.02%	0.10%
High Income Strategies	9%	9%	2.65%	1.50%	0.12%	0.00%	0.12%
<b>Total</b>					<b>0.10%</b>	<b>(0.22%)</b>	<b>0.32%</b>

\* Current Quarter Target = 52.5% Blmbg:Aggregate, 18.0% Russell 3000 Index, 12.0% MSCI ACWI xUS (Net), 8.5% Blmbg HY Corp, 7.5% Blmbg Gov/Cred 1-3 Yr and 1.5% ICE All US Cap Secs.





# Total Equity

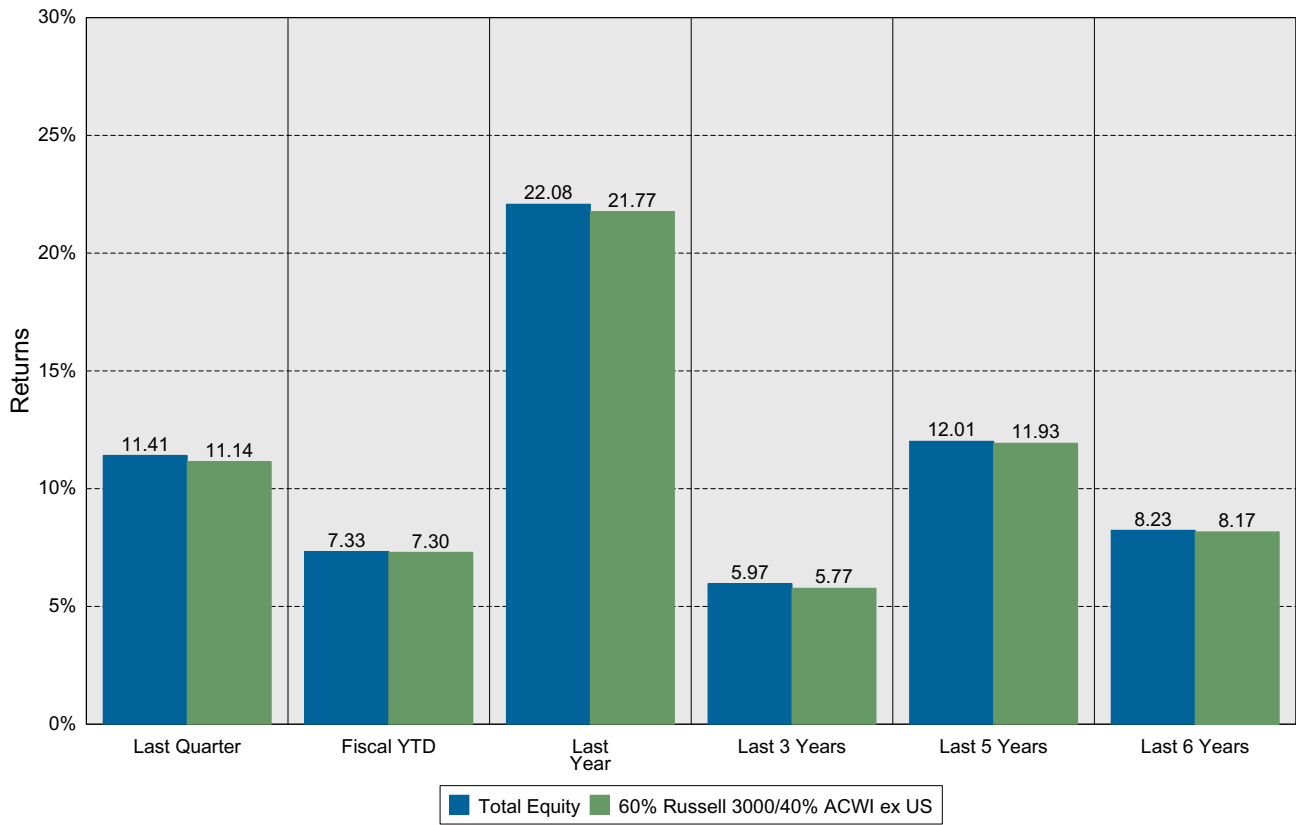
## Period Ended December 31, 2023

### Inception Date

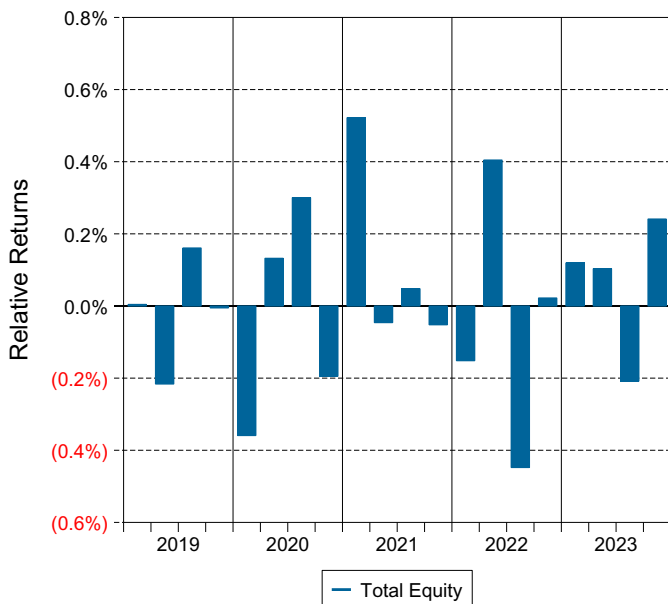
Parametric was funded December 12th, 2017.

### Quarterly Summary and Highlights

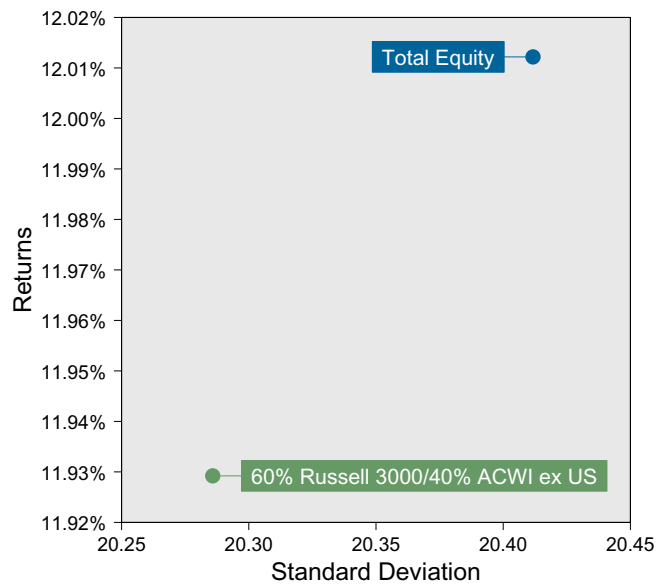
- Total Equity's portfolio outperformed the 60% Russell 3000/40% ACWI ex US by 0.27% for the quarter and outperformed the 60% Russell 3000/40% ACWI ex US for the year by 0.31%.



**Relative Returns vs  
60% Russell 3000/40% ACWI ex US**



**Annualized Five Year Risk vs Return**

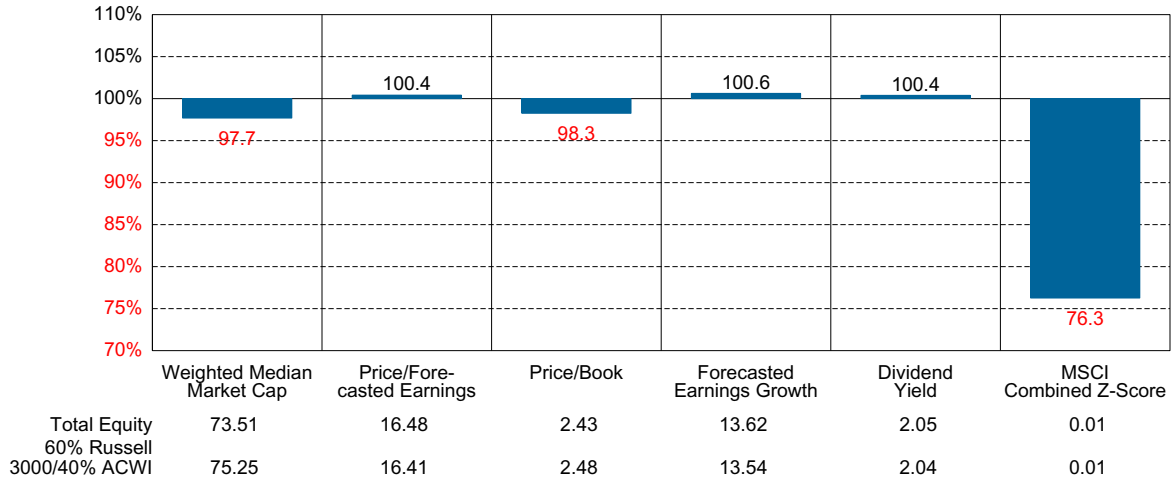


# Total Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

This graph compares the manager's portfolio characteristics relative to the benchmark's portfolio characteristics.

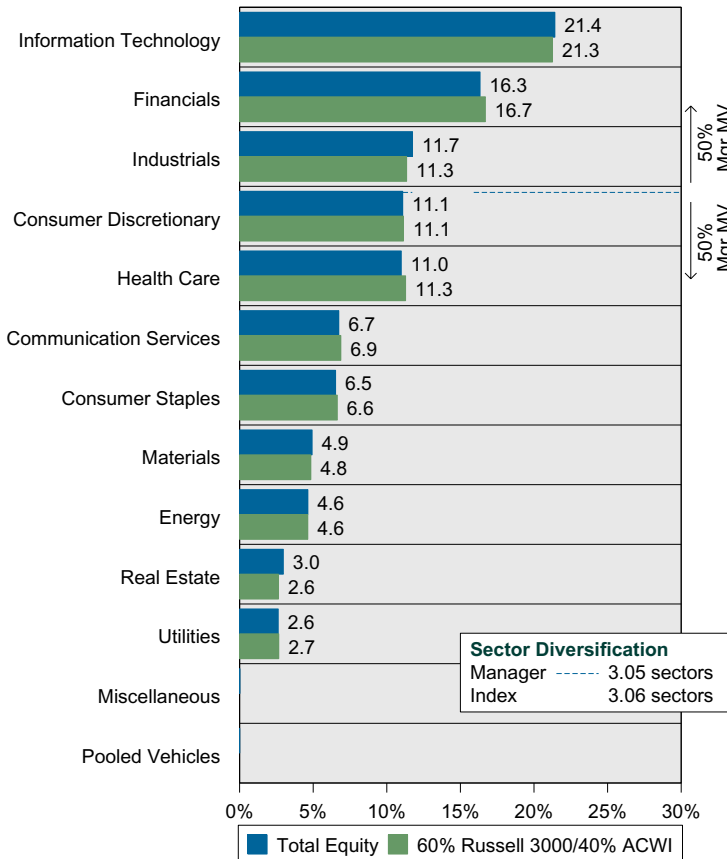
### Portfolio Characteristics Relative to 60% Russell 3000/40% ACWI as of December 31, 2023



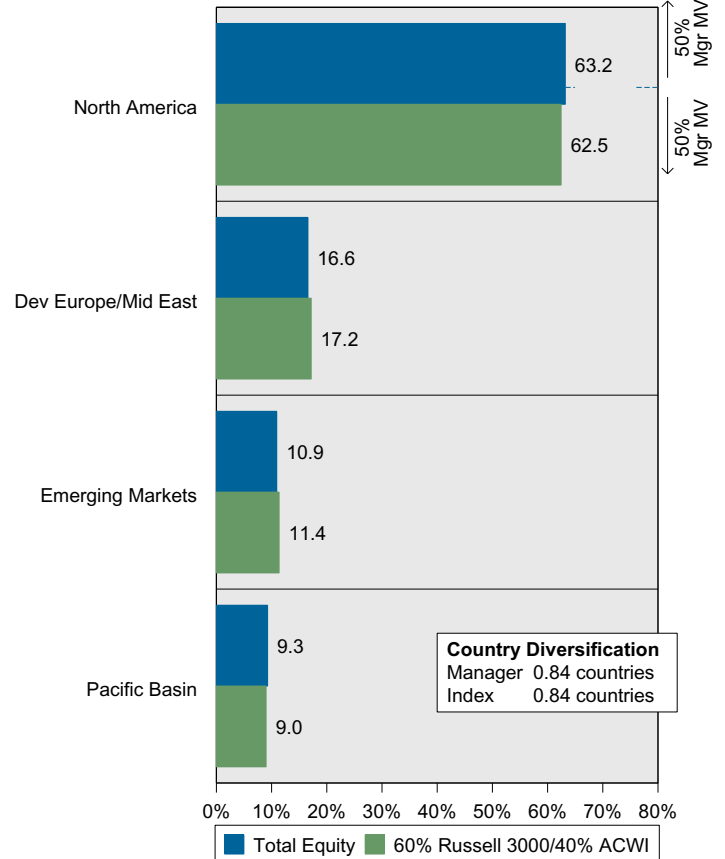
## Sector Weights

The graph below contrasts the manager's sector weights for the most recent quarter with those of the benchmark. The regional allocation chart also compares the manager's geographical region weights with those of the benchmark.

### Sector Allocation December 31, 2023



### Regional Allocation December 31, 2023



# Domestic Equity

## Period Ended December 31, 2023

### Inception Date

Parametric was funded December 12th, 2017.

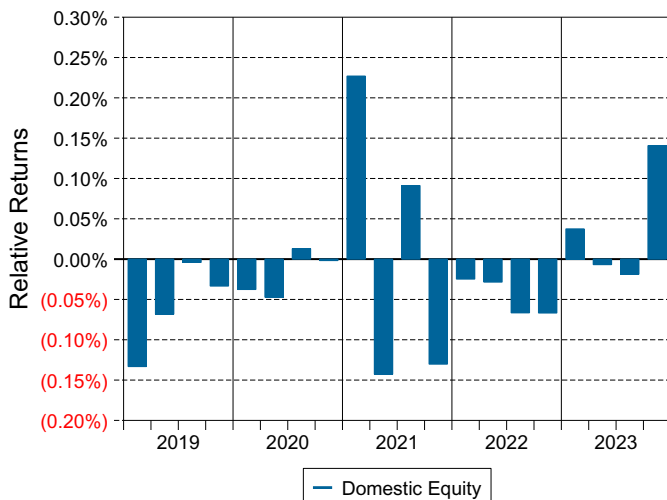
### Quarterly Summary and Highlights

- Domestic Equity's portfolio posted a 12.23% return for the quarter placing it in the 16 percentile of the EF- Domestic Equity group for the quarter and in the 12 percentile for the last year.
- Domestic Equity's portfolio outperformed the Russell 3000 Index by 0.16% for the quarter and outperformed the Russell 3000 Index for the year by 0.19%.

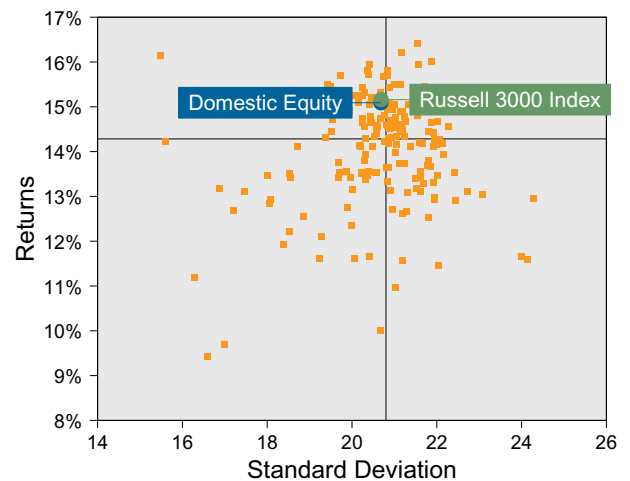
### Performance vs EF- Domestic Equity (Gross)



Relative Return vs Russell 3000 Index



EF- Domestic Equity (Gross)  
Annualized Five Year Risk vs Return

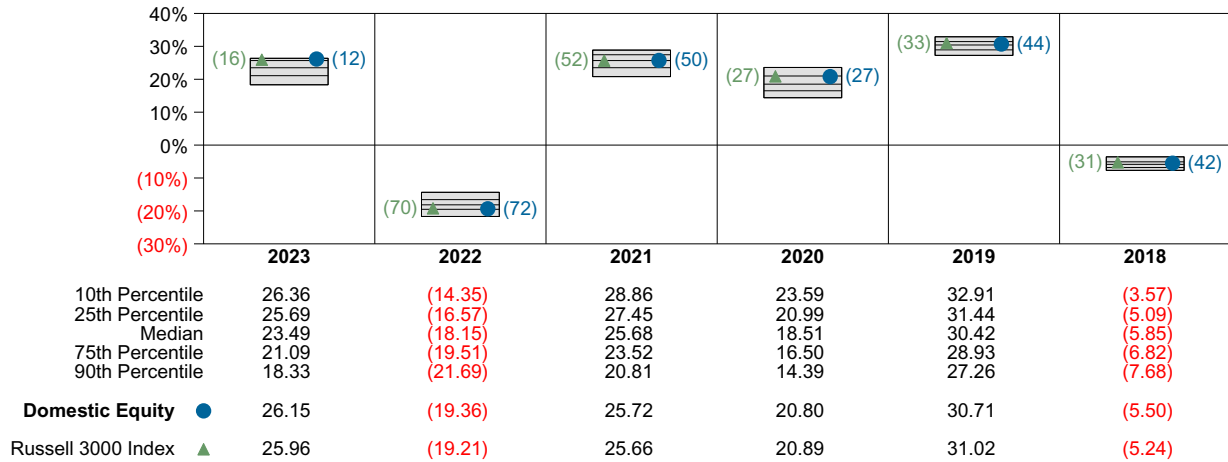


# Domestic Equity Return Analysis Summary

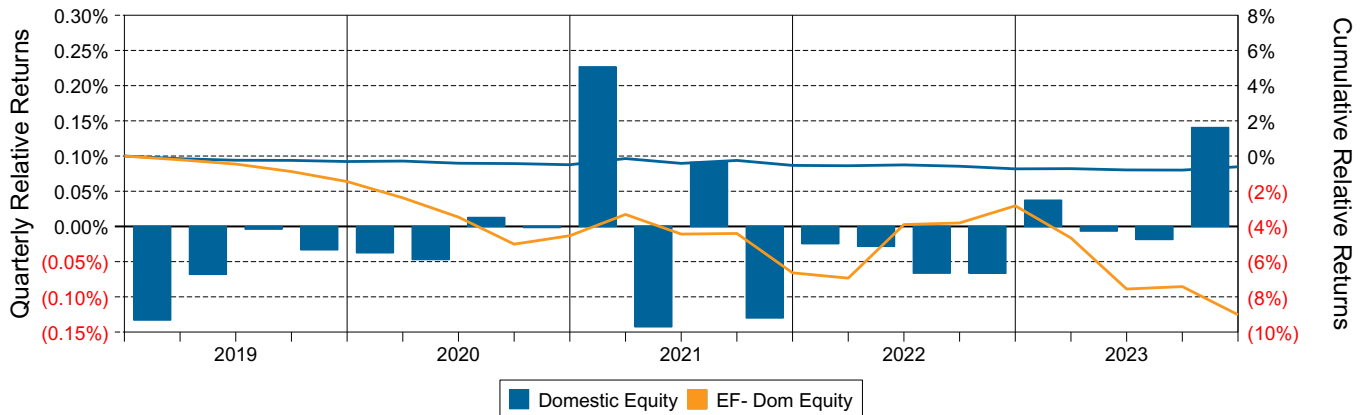
## Return Analysis

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

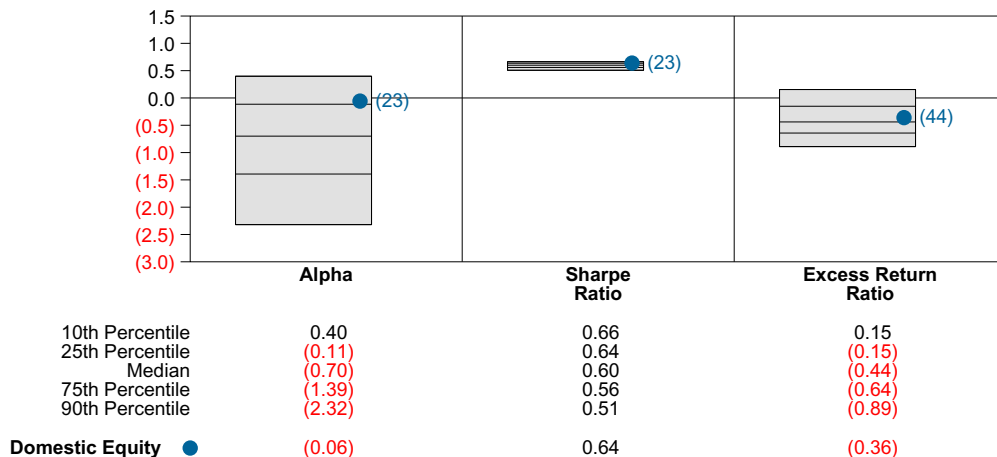
### Performance vs EF- Domestic Equity (Gross)



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



### Risk Adjusted Return Measures vs Russell 3000 Index Rankings Against EF- Domestic Equity (Gross) Five Years Ended December 31, 2023

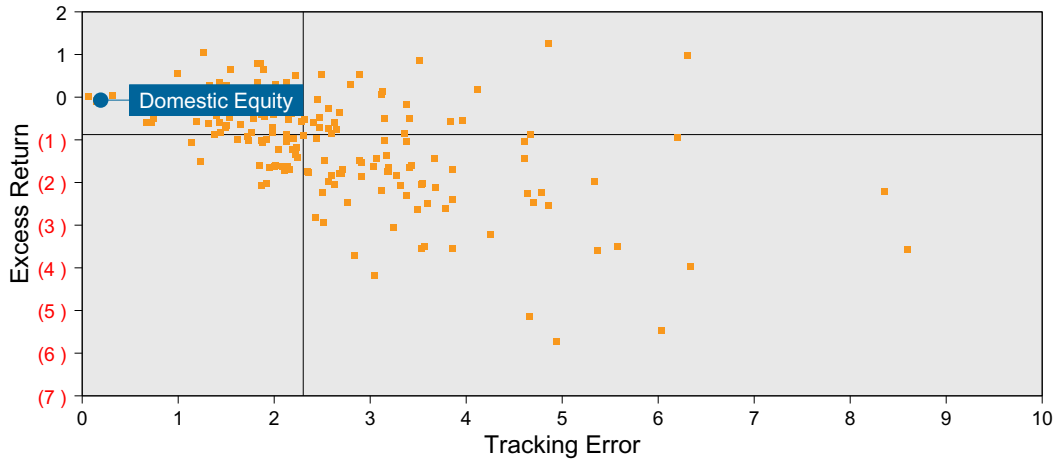


# Domestic Equity Risk Analysis Summary

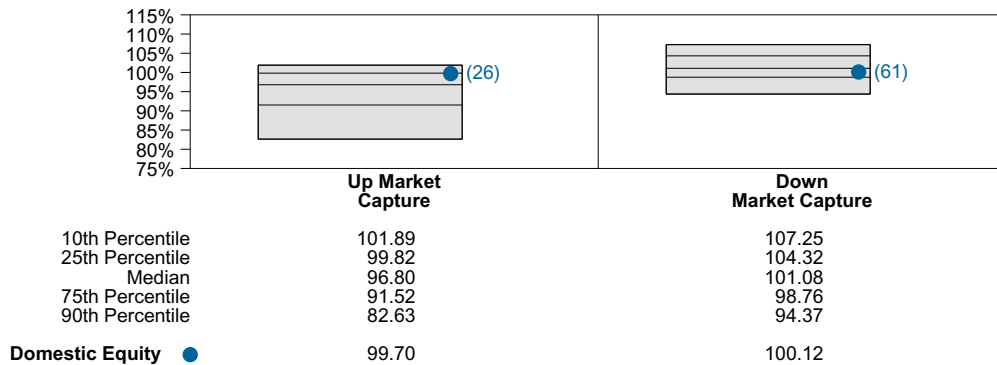
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows Up and Down Market Capture. The last two charts show the ranking of the manager's risk statistics versus the peer group.

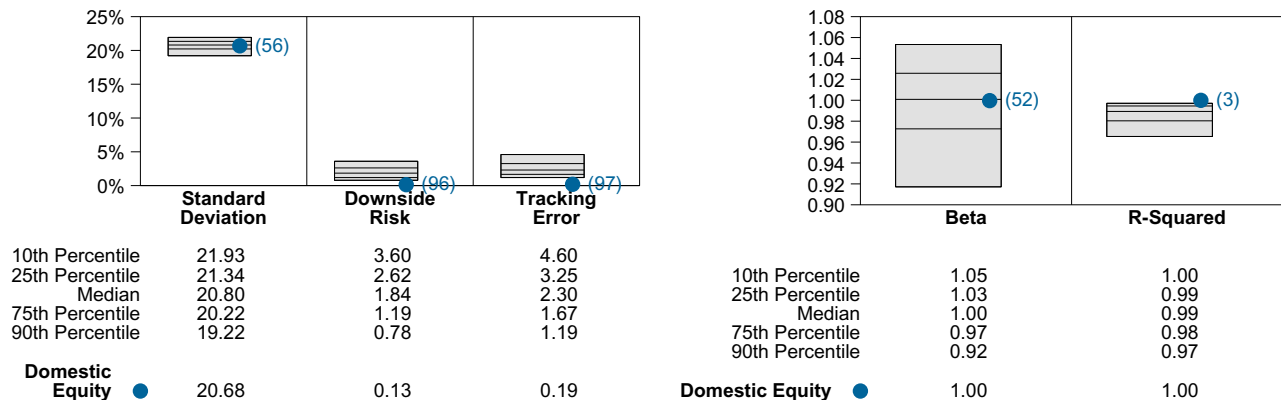
### Risk Analysis vs EF- Domestic Equity (Gross) Five Years Ended December 31, 2023



### Market Capture vs Russell 3000 Index Rankings Against EF- Domestic Equity (Gross) Five Years Ended December 31, 2023



### Risk Statistics Rankings vs Russell 3000 Index Rankings Against EF- Domestic Equity (Gross) Five Years Ended December 31, 2023

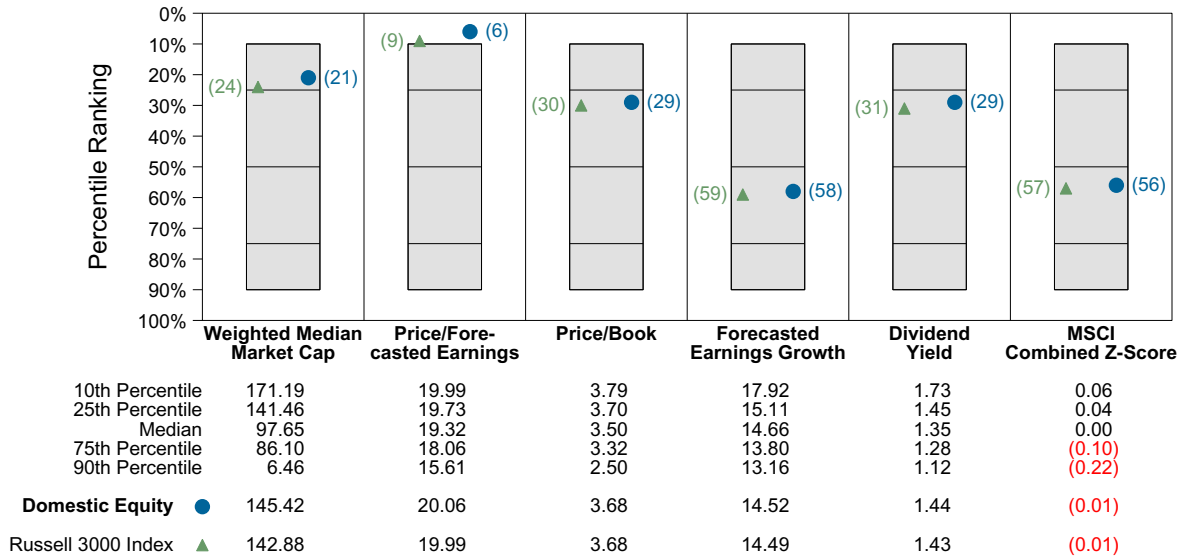


# Domestic Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

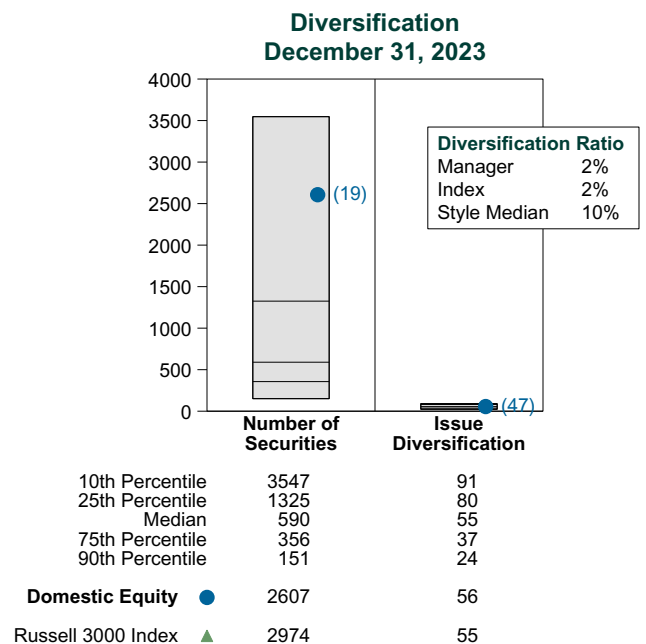
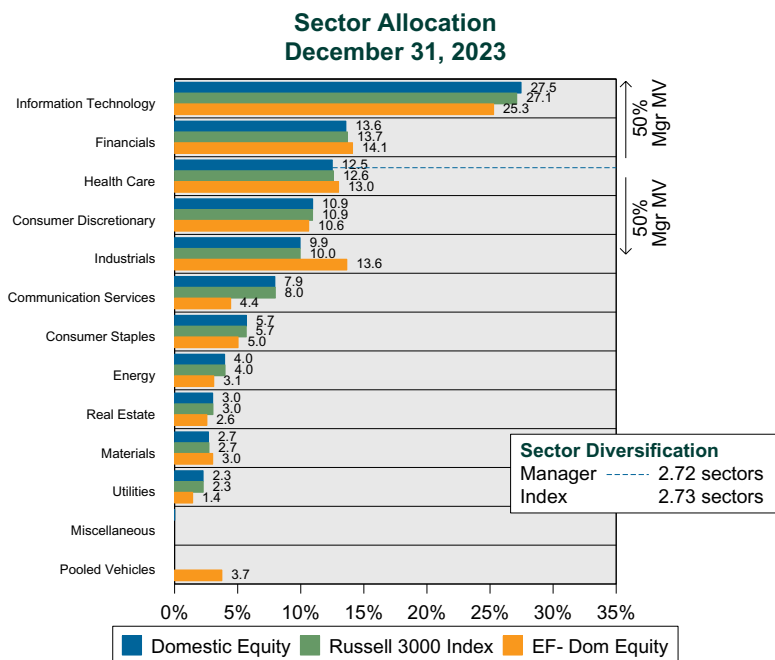
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against EF- Domestic Equity as of December 31, 2023



## Sector Weights

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



# International Equity

## Period Ended December 31, 2023

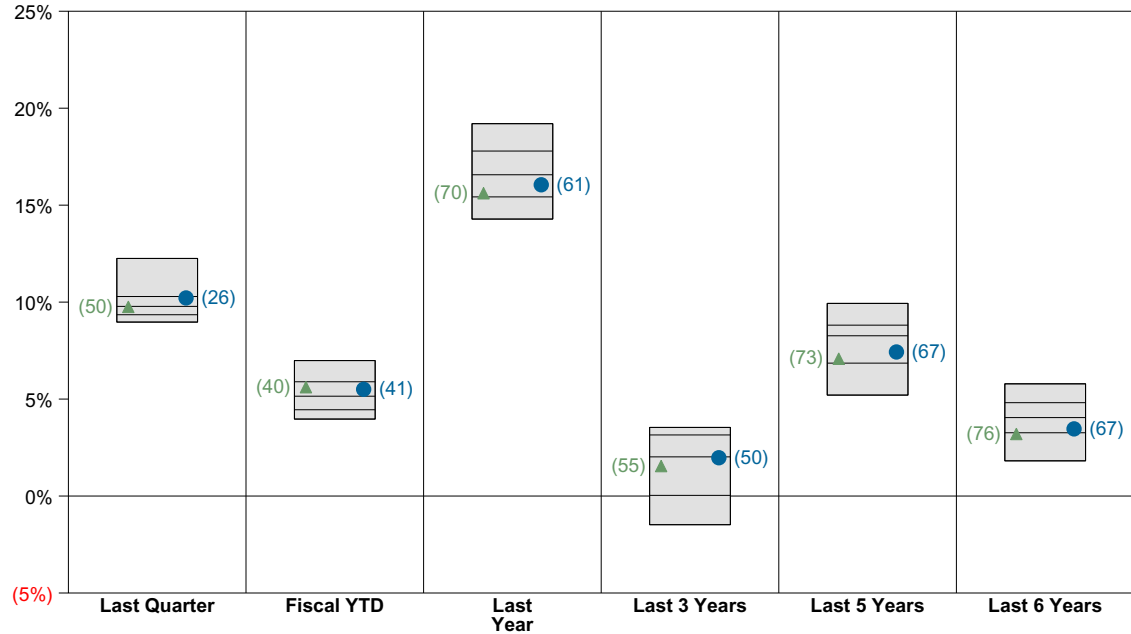
### Inception Date

Parametric was funded December 12th, 2017.

### Quarterly Summary and Highlights

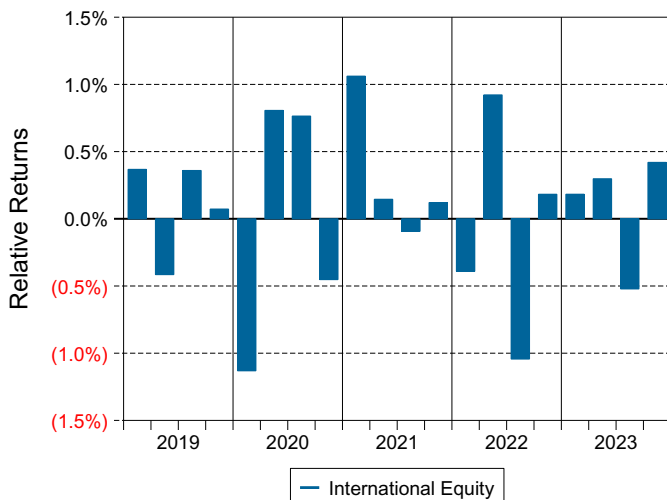
- International Equity's portfolio posted a 10.21% return for the quarter placing it in the 26 percentile of the EF-International Equity group for the quarter and in the 61 percentile for the last year.
- International Equity's portfolio outperformed the MSCI ACWI ex US by 0.46% for the quarter and outperformed the MSCI ACWI ex US for the year by 0.43%.

### Performance vs EF- International Equity (Gross)

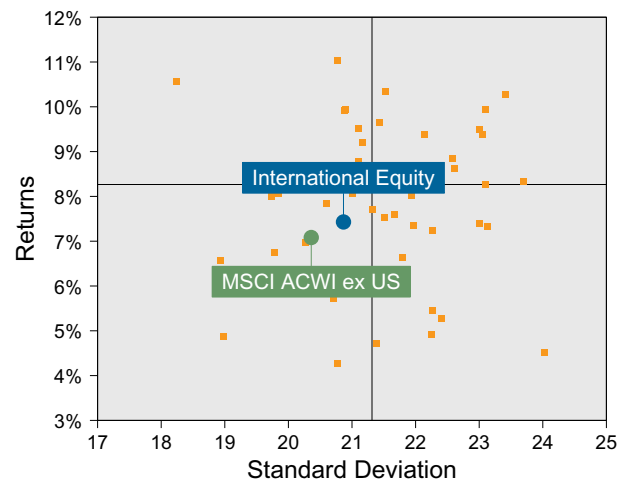


10th Percentile	12.25	6.99	19.20	3.54	9.93	5.79
25th Percentile	10.29	5.89	17.79	3.15	8.81	4.81
Median	9.78	5.15	16.57	2.02	8.27	4.05
75th Percentile	9.35	4.45	15.43	0.03	6.85	3.26
90th Percentile	8.97	3.97	14.28	(1.48)	5.21	1.81
<b>International Equity</b> ●	10.21	5.50	16.05	1.97	7.43	3.46
<b>MSCI ACWI ex US</b> ▲	9.75	5.61	15.62	1.55	7.08	3.20

### Relative Return vs MSCI ACWI ex US



### EF- International Equity (Gross) Annualized Five Year Risk vs Return

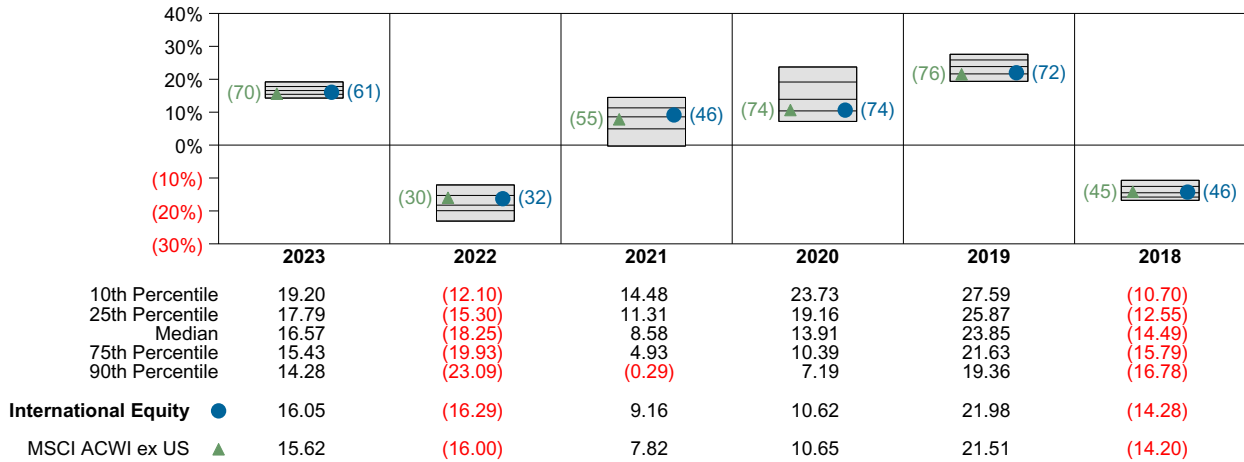


# International Equity Return Analysis Summary

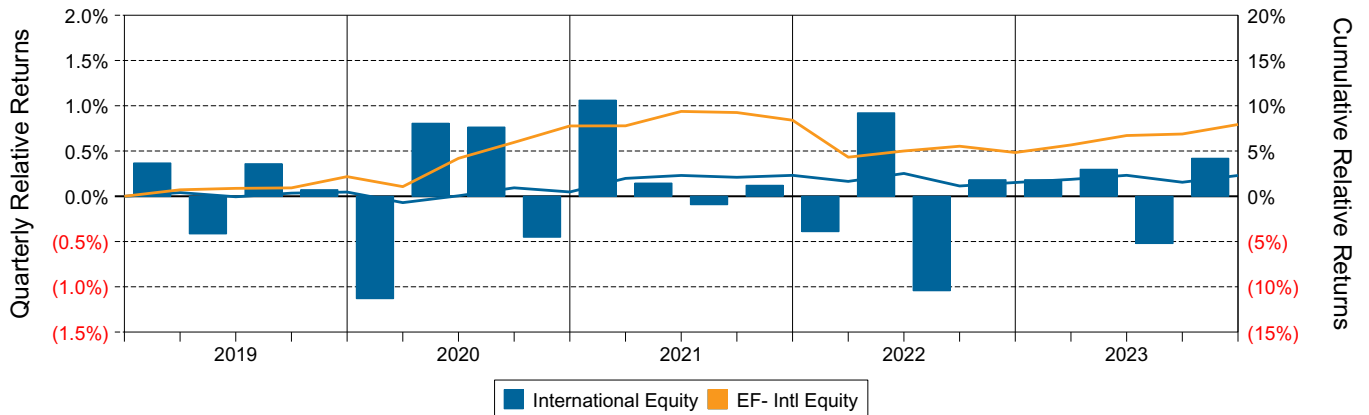
## Return Analysis

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

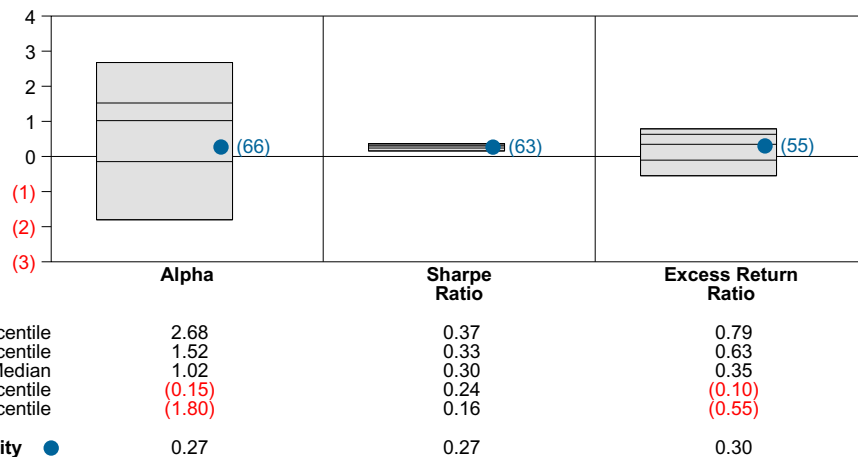
### Performance vs EF- International Equity (Gross)



### Cumulative and Quarterly Relative Returns vs MSCI ACWI ex US



### Risk Adjusted Return Measures vs MSCI ACWI ex US Rankings Against EF- International Equity (Gross) Five Years Ended December 31, 2023



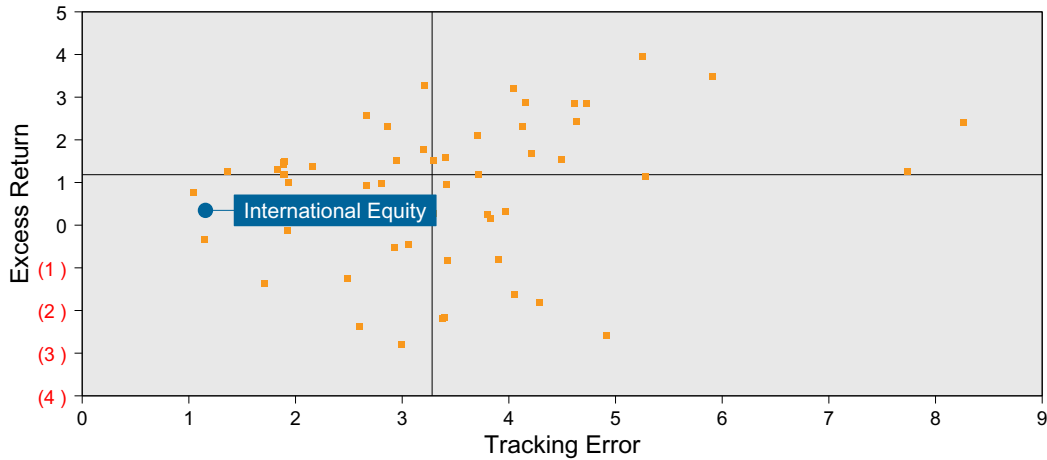


# International Equity Risk Analysis Summary

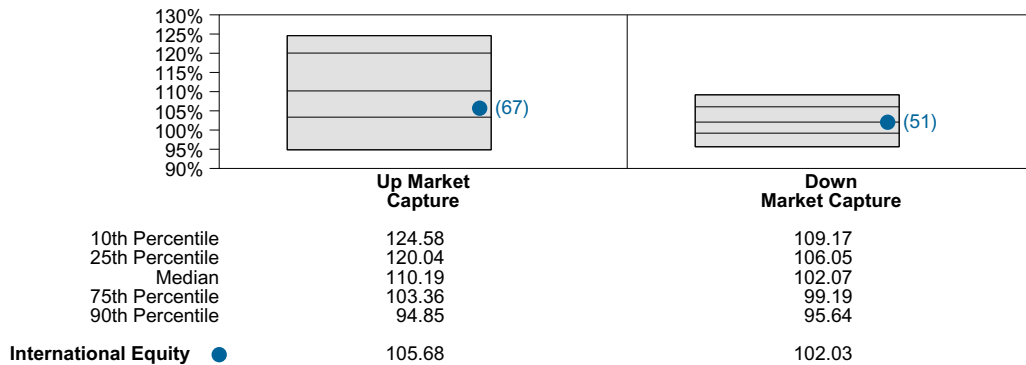
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows Up and Down Market Capture. The last two charts show the ranking of the manager's risk statistics versus the peer group.

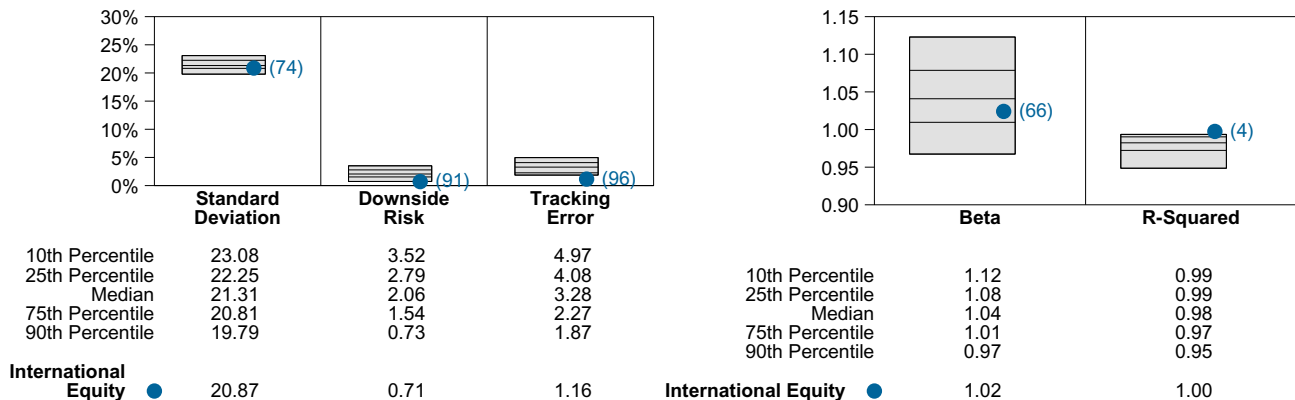
### Risk Analysis vs EF- International Equity (Gross) Five Years Ended December 31, 2023



### Market Capture vs MSCI ACWI ex US Rankings Against EF- International Equity (Gross) Five Years Ended December 31, 2023



### Risk Statistics Rankings vs MSCI ACWI ex US Rankings Against EF- International Equity (Gross) Five Years Ended December 31, 2023

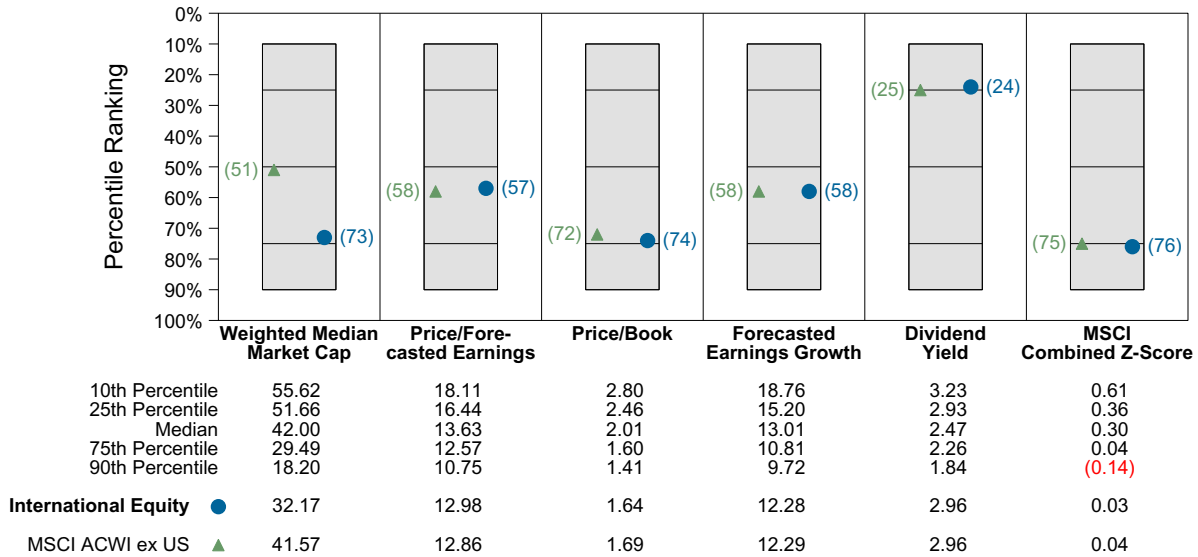


# International Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

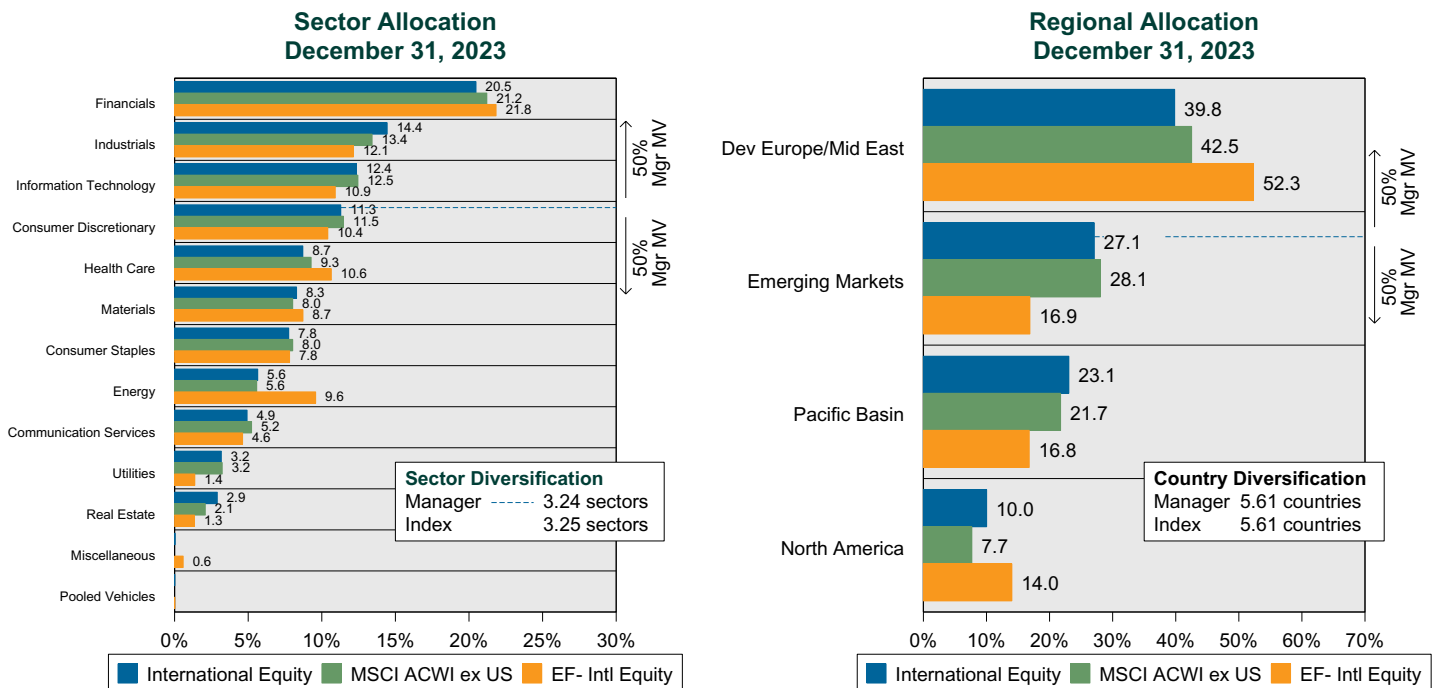
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against EF- International Equity as of December 31, 2023



## Sector Weights

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





# Total Fixed Income

## Period Ended December 31, 2023

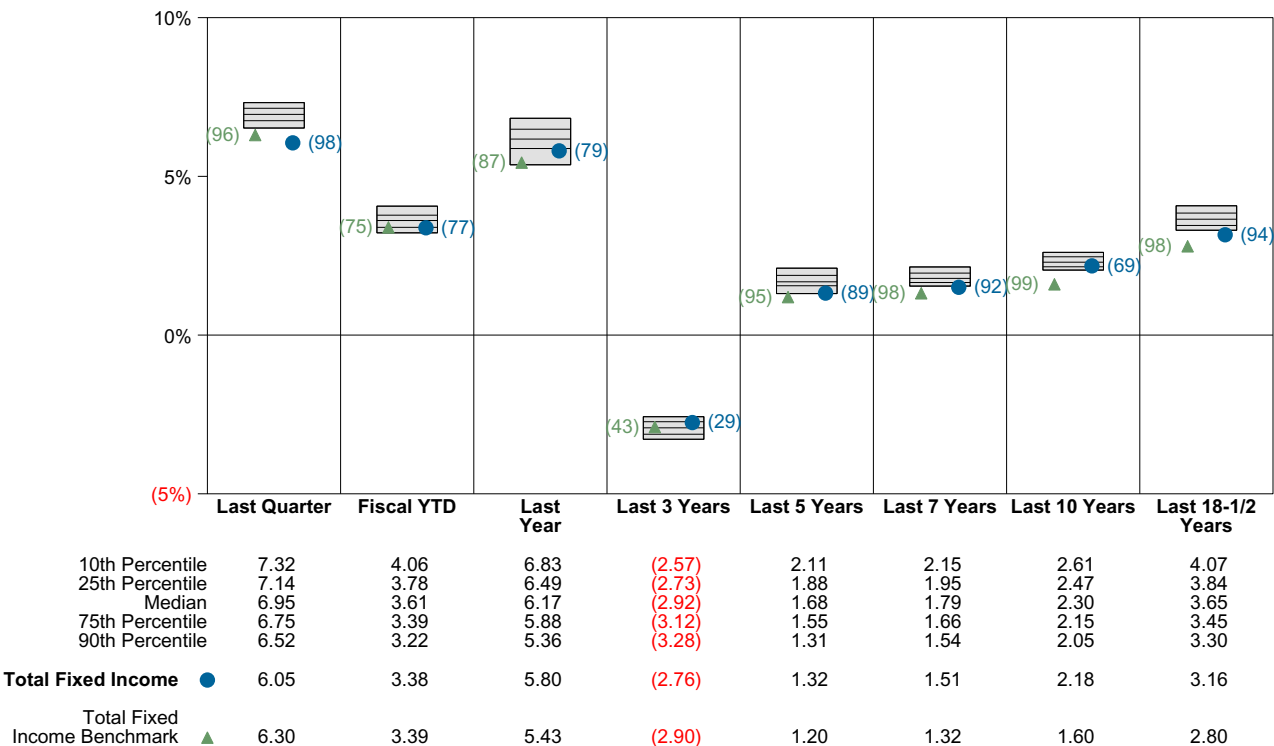
### Benchmark Definition

Total Fixed Income Benchmark consists of 100% PFSF Fixed Income Benchmark through December 31, 2018, 90% Bloomberg U.S. Aggregate and 10% Bloomberg Gov/Credit 1-3 Yrs through March 31, 2021, 89% Bloomberg U.S. Aggregate and 11% Bloomberg Gov/Credit 1-3 Yrs through June 30, 2021 and 87.5% Bloomberg U.S. Aggregate and 12.5% Bloomberg Gov/Credit 1-3 Yrs, thereafter.

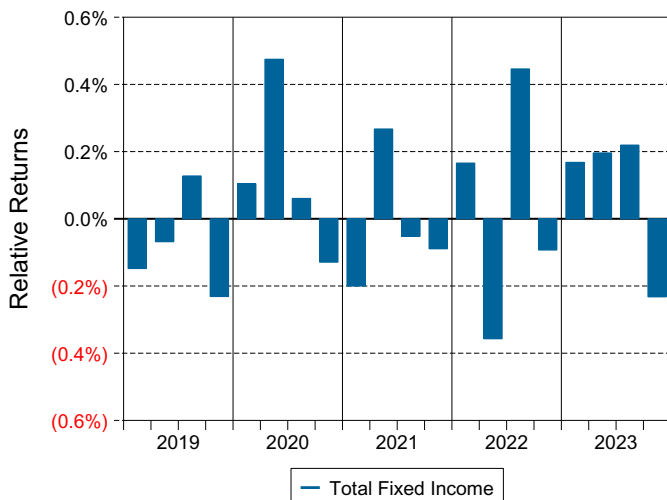
### Quarterly Summary and Highlights

- Total Fixed Income's portfolio posted a 6.05% return for the quarter placing it in the 98 percentile of the Callan Core Bond Fixed Income group for the quarter and in the 79 percentile for the last year.
- Total Fixed Income's portfolio underperformed the Total Fixed Income Benchmark by 0.25% for the quarter and outperformed the Total Fixed Income Benchmark for the year by 0.37%.

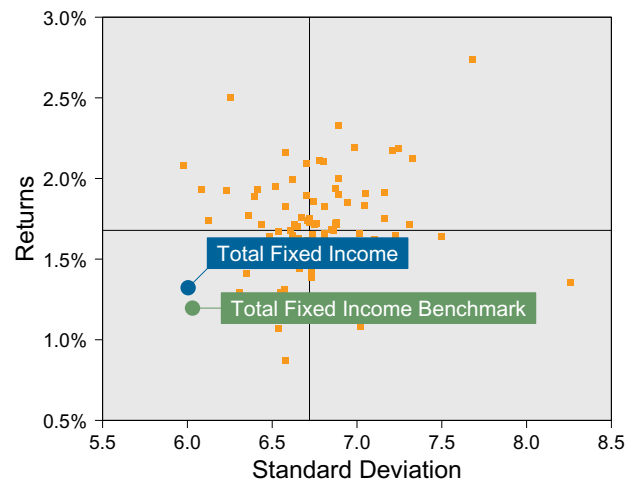
### Performance vs Callan Core Bond Fixed Income (Gross)



### Relative Returns vs Total Fixed Income Benchmark



### Callan Core Bond Fixed Income (Gross) Annualized Five Year Risk vs Return

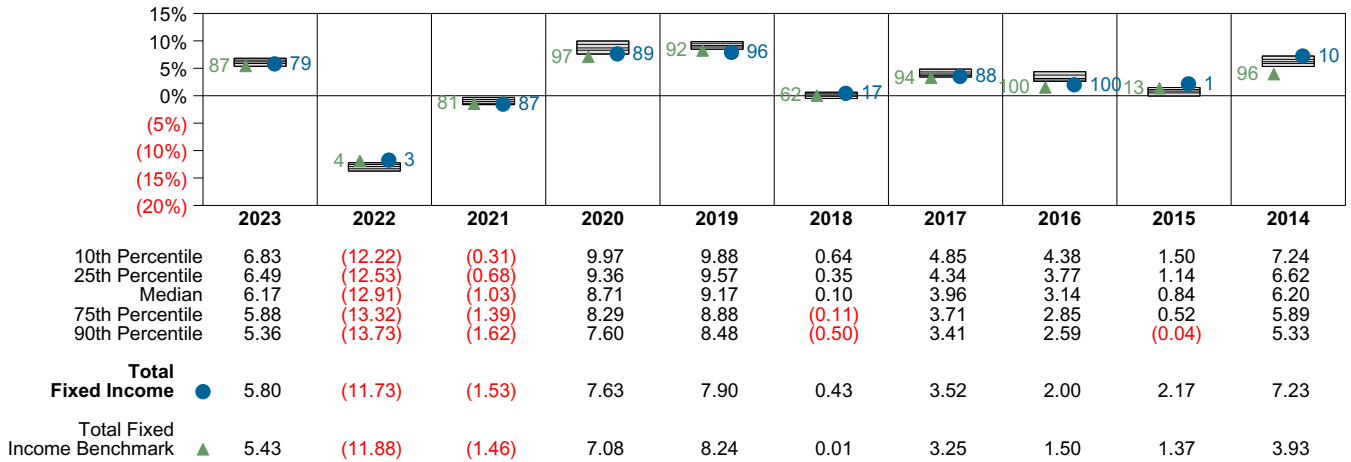


# Total Fixed Income Return Analysis Summary

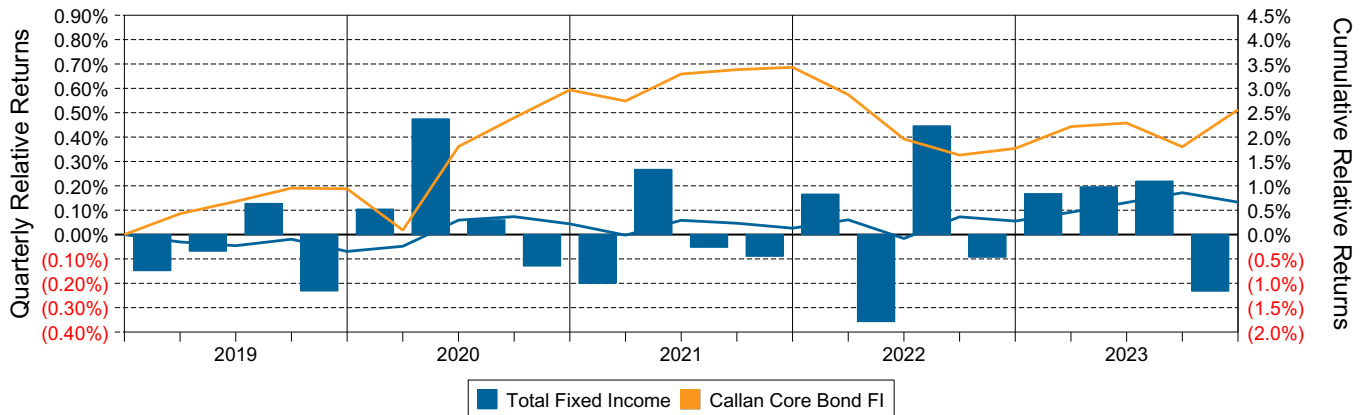
## Return Analysis

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

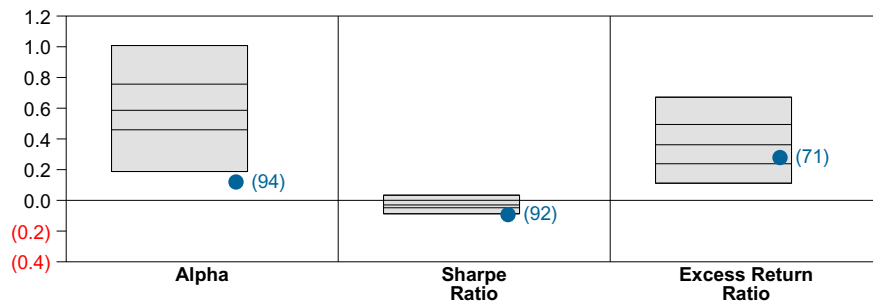
### Performance vs Callan Core Bond Fixed Income (Gross)



### Cumulative and Quarterly Relative Returns vs Total Fixed Income Benchmark



### Risk Adjusted Return Measures vs Total Fixed Income Benchmark Rankings Against Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023

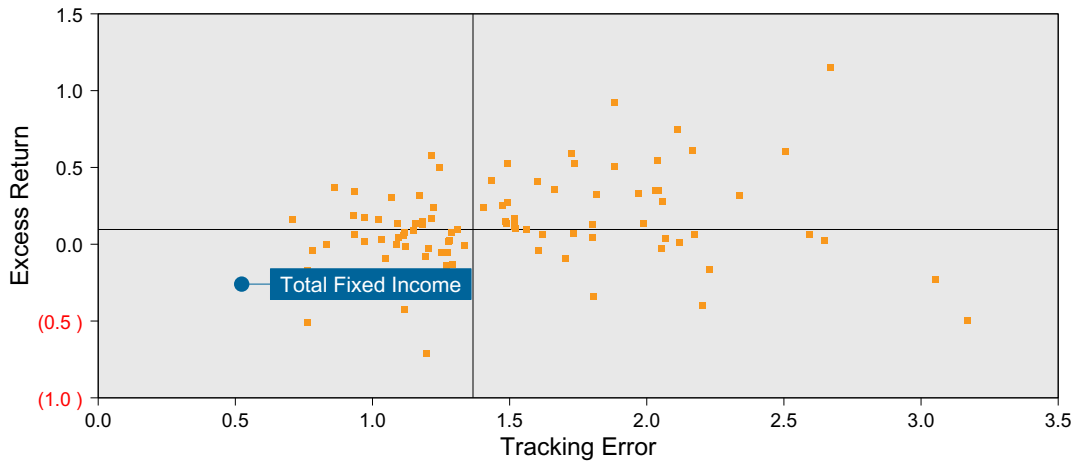


# Total Fixed Income Risk Analysis Summary

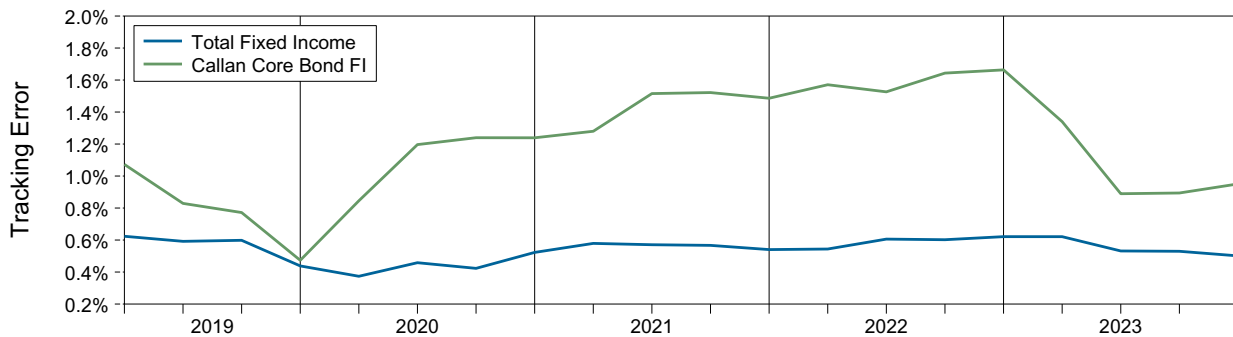
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows tracking error patterns versus the benchmark over time. The last two charts show the ranking of the manager's risk statistics versus the peer group.

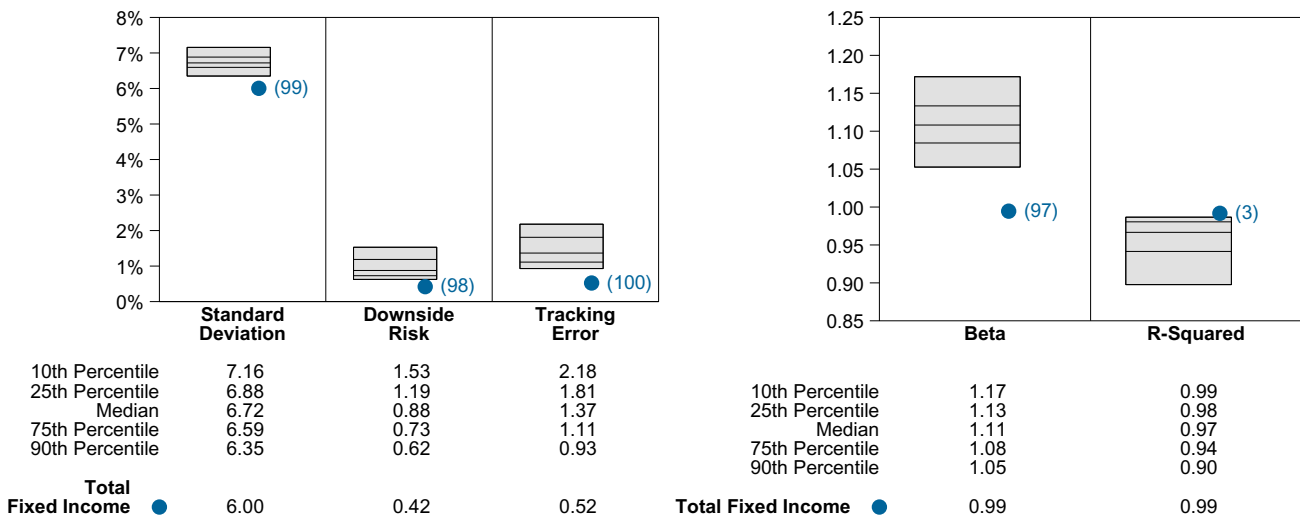
### Risk Analysis vs Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023



### Rolling 12 Quarter Tracking Error vs Total Fixed Income Benchmark



### Risk Statistics Rankings vs Total Fixed Income Benchmark Rankings Against Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023

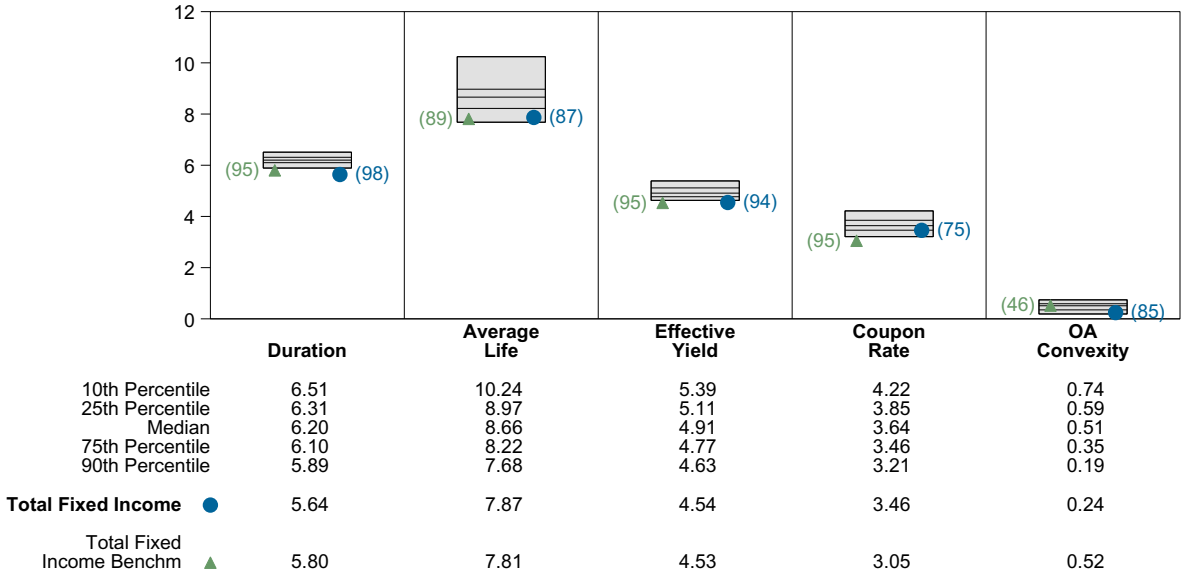


# Total Fixed Income Bond Characteristics Analysis Summary

## Portfolio Characteristics

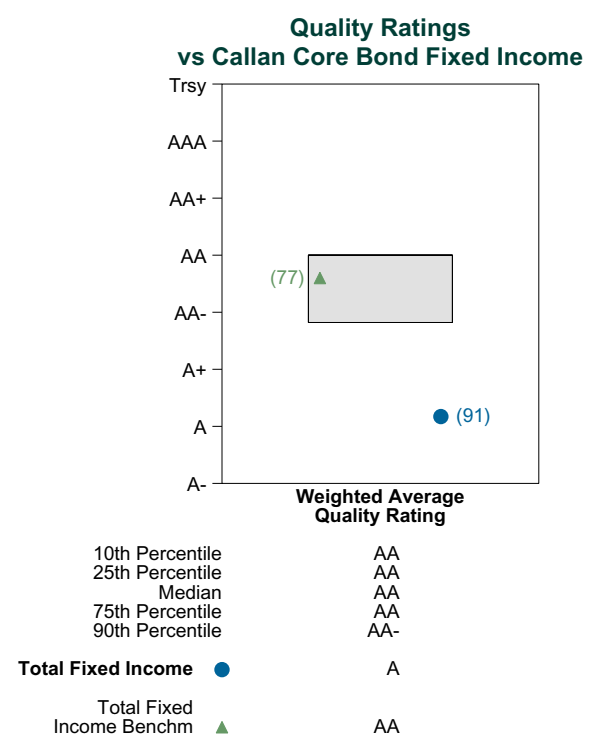
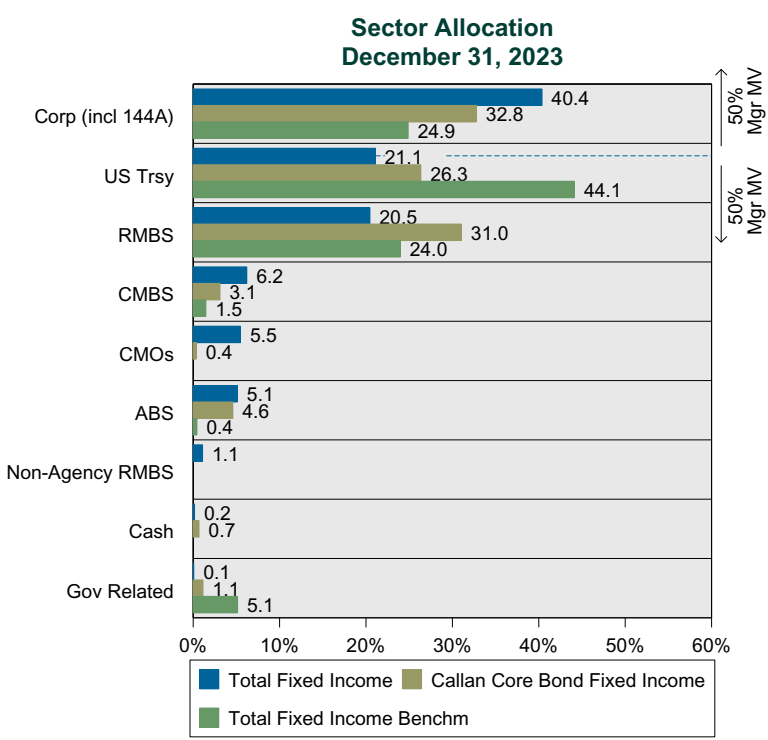
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Fixed Income Portfolio Characteristics Rankings Against Callan Core Bond Fixed Income as of December 31, 2023



## Sector Allocation and Quality Ratings

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

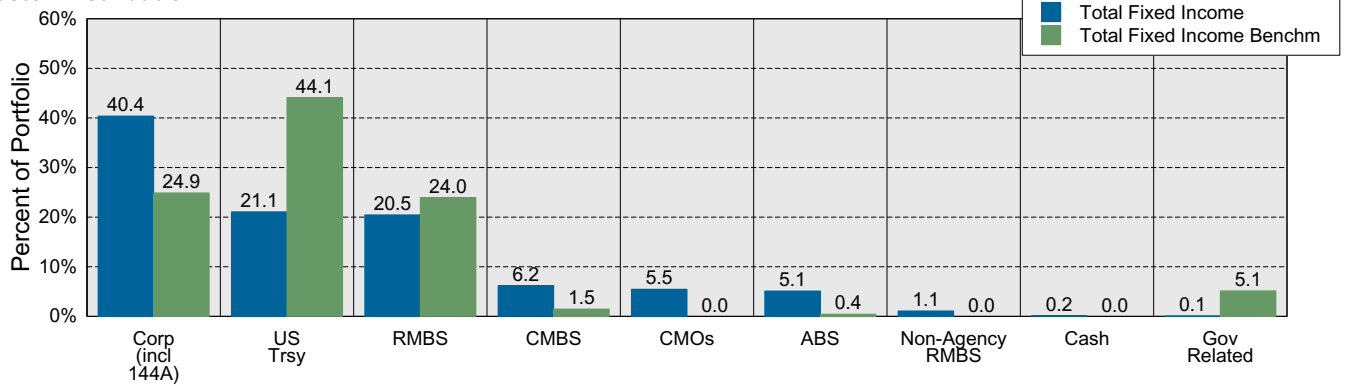


# Total Fixed Income Portfolio Characteristics Summary As of December 31, 2023

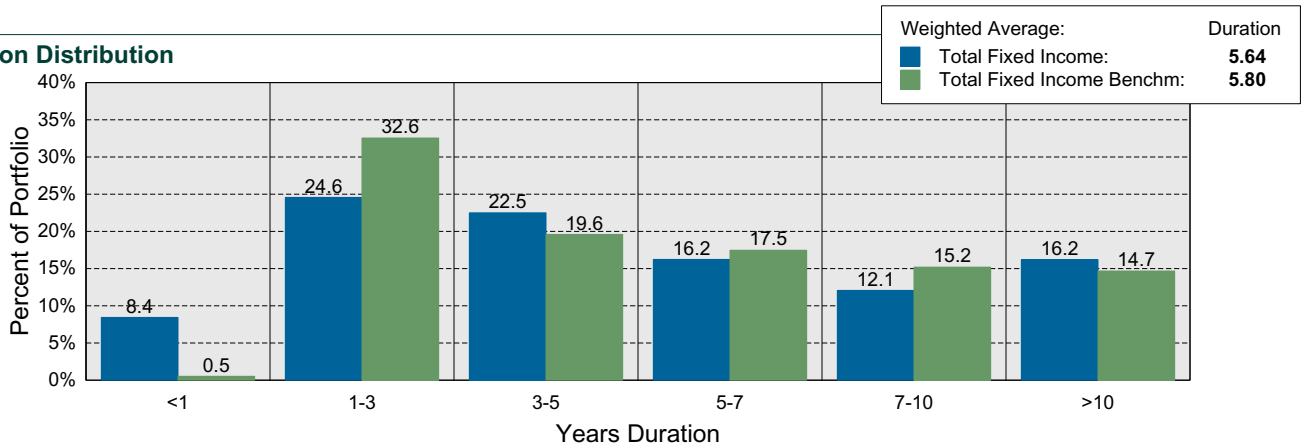
## Portfolio Structure Comparison

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

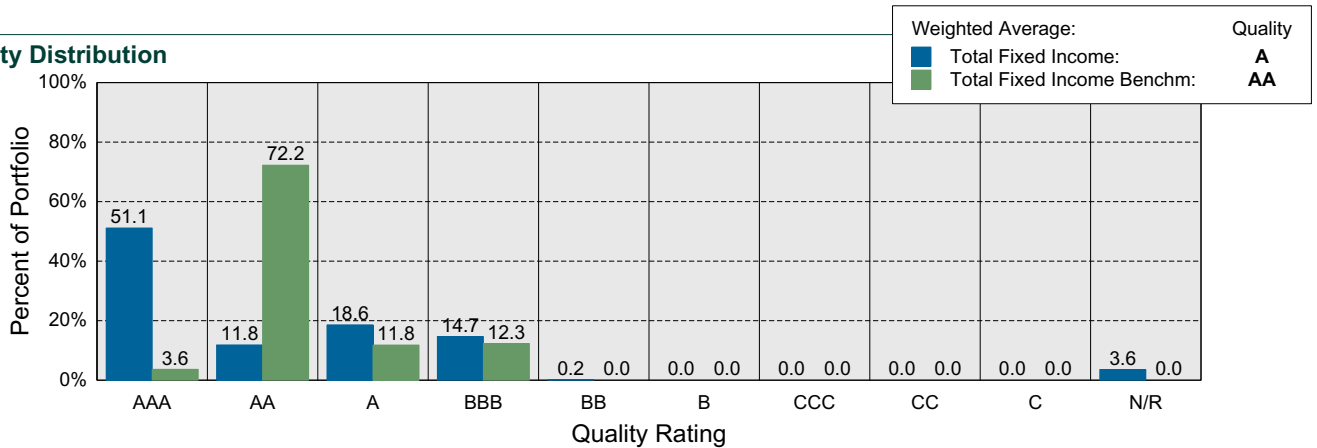
### Sector Distribution



### Duration Distribution



### Quality Distribution





# Colorado Treasurer's Portfolio

## Period Ended December 31, 2023

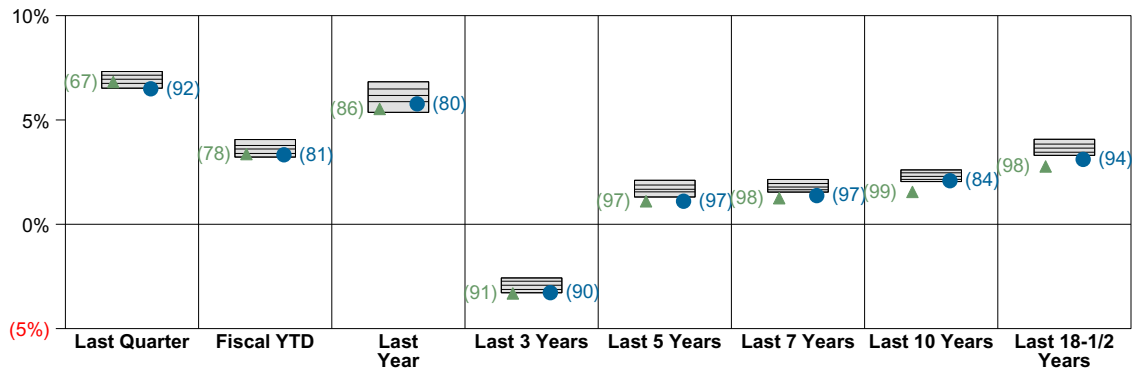
### Investment Philosophy

The Fixed Income Portfolio is managed by the Colorado State Treasury and was initially funded in 3Q 2005. The PSPF Custom Benchmark consisted of 37% U.S. Treasury 1-10 Year Index, 34% Mortgages 0-10 Year WAL Index, 19% AAA U.S. Agencies 1-10 Year Index and 10% U.S. Corporates AAA Rated 1-10 Years Index through March 31, 2017 and the Bloomberg U.S. Aggregate thereafter. It is important to note that the Fixed Income Portfolio has historically been managed under a buy and hold mandate for investment yield. The Callan Core Bond Fixed Income Manager Universe used to construct the floating bar chart exhibit below, representing 77 core fixed income managers and products, is largely composed of products following a total return mandate. The School Fund bond portfolio is subject to statutorily imposed net loss restrictions. As such, relative performance comparison of the Fixed Income Portfolio to this universe may not be entirely representative of relative performance.

### Quarterly Summary and Highlights

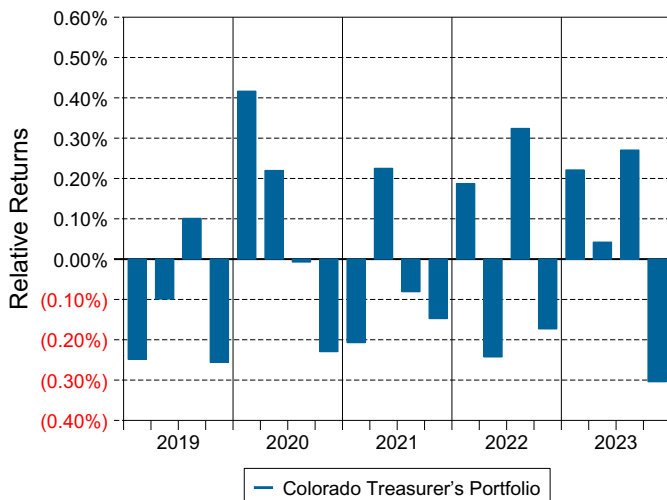
- Colorado Treasurer's Portfolio's portfolio posted a 6.49% return for the quarter placing it in the 92 percentile of the Callan Core Bond Fixed Income group for the quarter and in the 80 percentile for the last year.
- Colorado Treasurer's Portfolio's portfolio underperformed the PSPF Bond Custom Benchmark by 0.32% for the quarter and outperformed the PSPF Bond Custom Benchmark for the year by 0.24%.

### Performance vs Callan Core Bond Fixed Income (Gross)

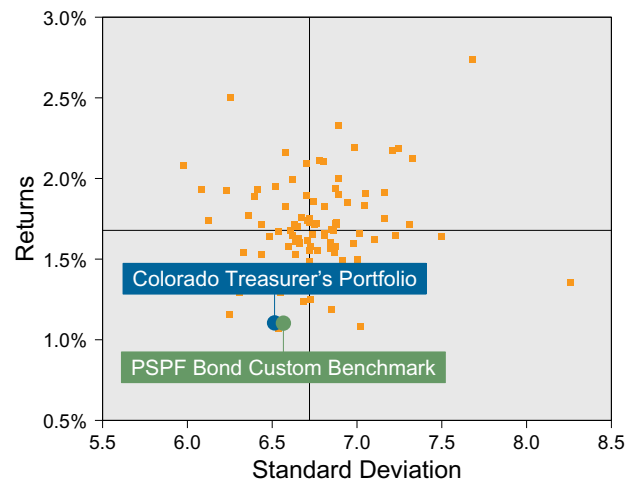


	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 18-1/2 Years
10th Percentile	7.32	4.06	6.83	(2.57)	2.11	2.15	2.61	4.07
25th Percentile	7.14	3.78	6.49	(2.73)	1.88	1.95	2.47	3.84
Median	6.95	3.61	6.17	(2.92)	1.68	1.79	2.30	3.65
75th Percentile	6.75	3.39	5.88	(3.12)	1.55	1.66	2.15	3.45
90th Percentile	6.52	3.22	5.36	(3.28)	1.31	1.54	2.05	3.30
<b>Colorado Treasurer's Portfolio</b>	<b>6.49</b>	<b>3.33</b>	<b>5.77</b>	<b>(3.28)</b>	<b>1.10</b>	<b>1.37</b>	<b>2.09</b>	<b>3.11</b>
<b>PSPF Bond Custom Benchmark</b>	<b>6.82</b>	<b>3.37</b>	<b>5.53</b>	<b>(3.31)</b>	<b>1.10</b>	<b>1.25</b>	<b>1.55</b>	<b>2.77</b>

### Relative Returns vs PSPF Bond Custom Benchmark



### Callan Core Bond Fixed Income (Gross) Annualized Five Year Risk vs Return

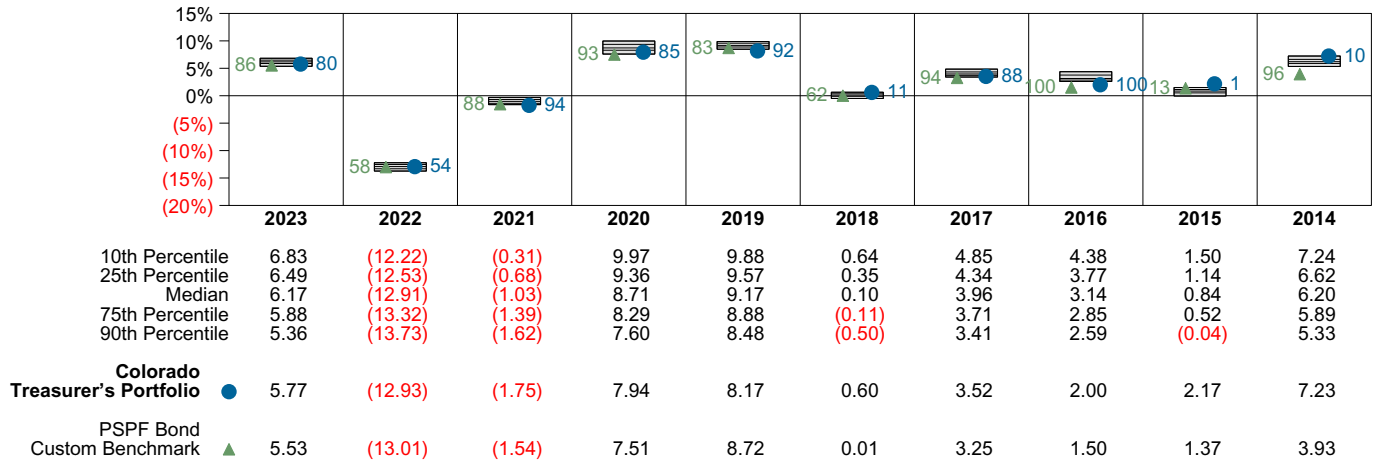


# Colorado Treasurer's Portfolio Return Analysis Summary

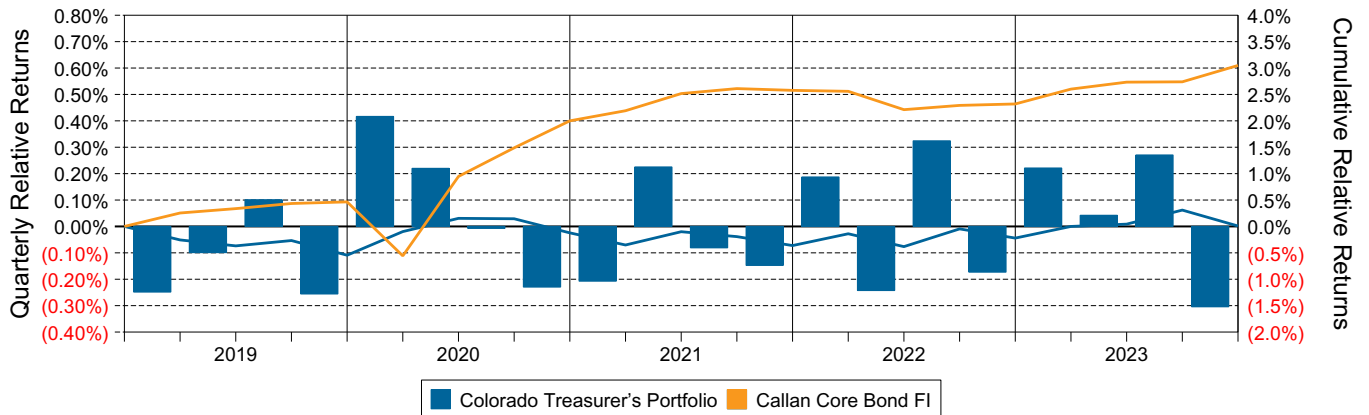
## Return Analysis

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

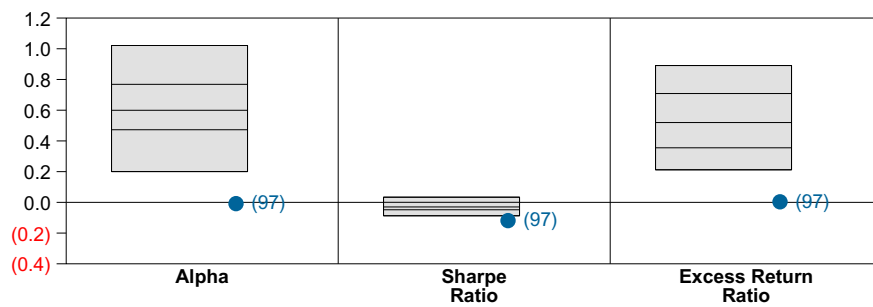
### Performance vs Callan Core Bond Fixed Income (Gross)



### Cumulative and Quarterly Relative Returns vs PSPF Bond Custom Benchmark



### Risk Adjusted Return Measures vs PSPF Bond Custom Benchmark Rankings Against Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023

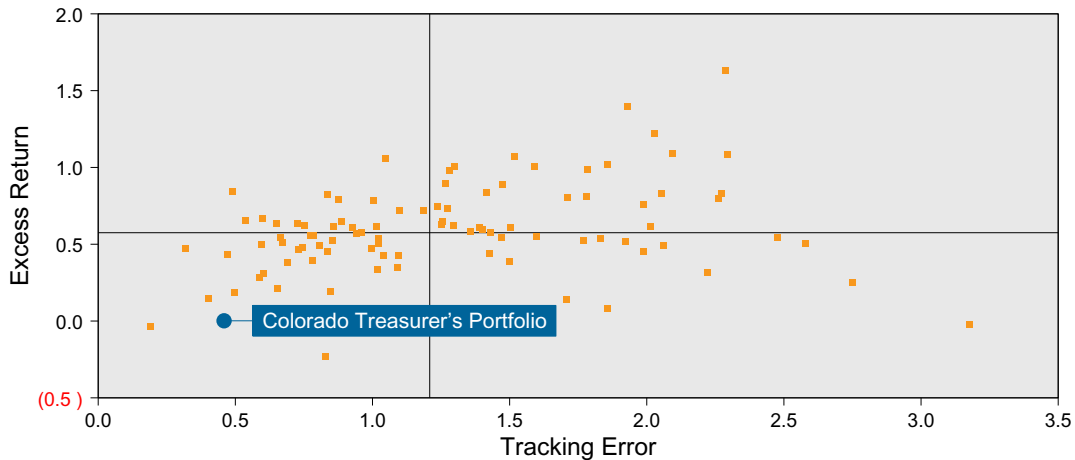


# Colorado Treasurer's Portfolio Risk Analysis Summary

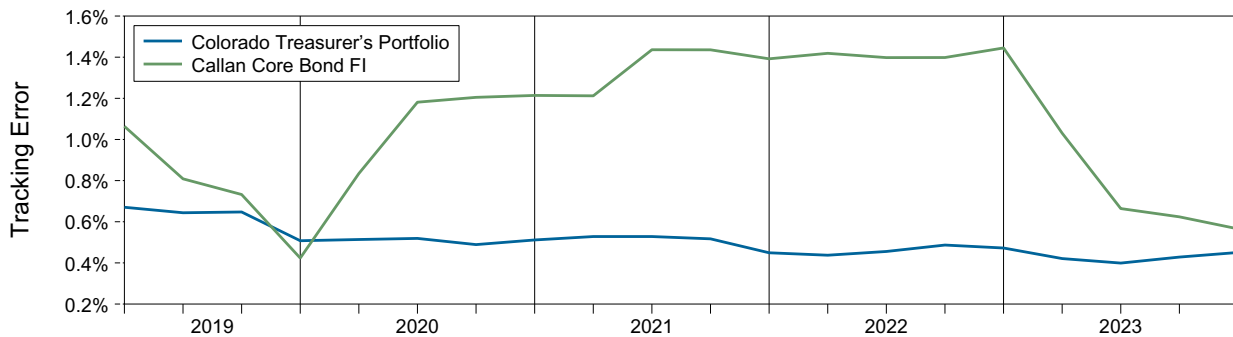
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows tracking error patterns versus the benchmark over time. The last two charts show the ranking of the manager's risk statistics versus the peer group.

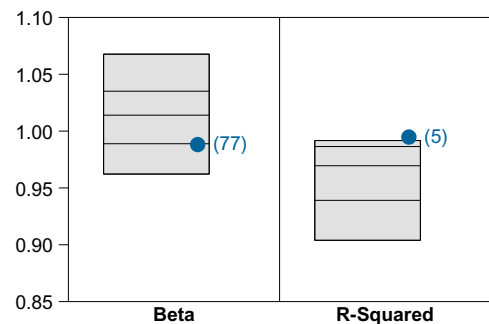
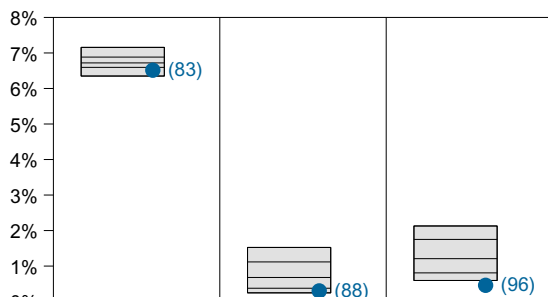
### Risk Analysis vs Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023



### Rolling 12 Quarter Tracking Error vs PSPF Bond Custom Benchmark



### Risk Statistics Rankings vs PSPF Bond Custom Benchmark Rankings Against Callan Core Bond Fixed Income (Gross) Five Years Ended December 31, 2023



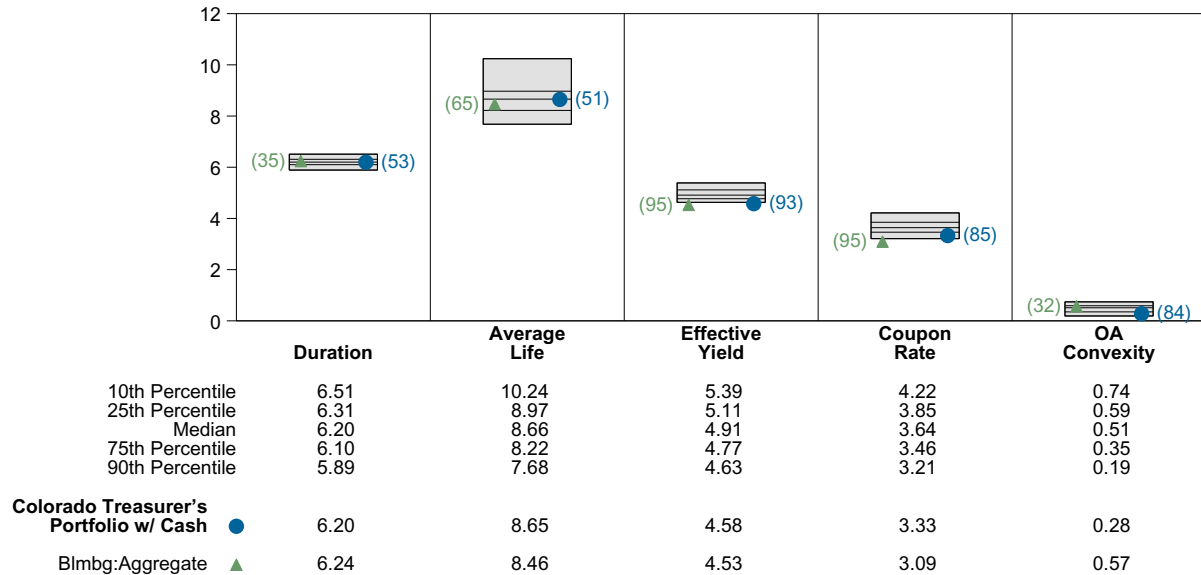
	Standard Deviation	Downside Risk	Tracking Error	Beta	R-Squared
10th Percentile	7.16	1.52	2.13	1.07	0.99
25th Percentile	6.88	1.12	1.75	1.04	0.99
Median	6.72	0.68	1.21	1.01	0.97
75th Percentile	6.59	0.38	0.81	0.99	0.94
90th Percentile	6.35	0.25	0.59	0.96	0.90
<b>Colorado Treasurer's Portfolio</b>	<b>6.51</b>	<b>0.30</b>	<b>0.46</b>	<b>0.99</b>	<b>0.99</b>

# Colorado Treasurer's Portfolio w/ Cash Bond Characteristics Analysis Summary

## Portfolio Characteristics

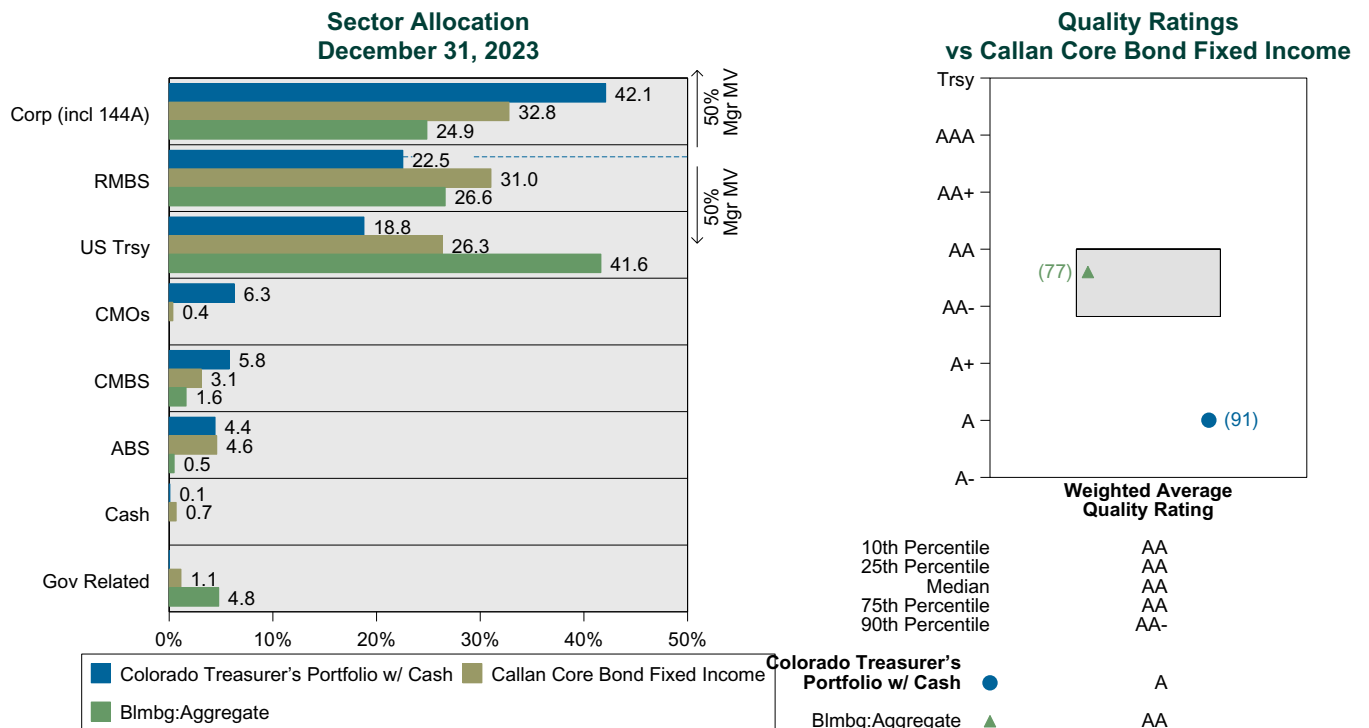
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan Core Bond Fixed Income as of December 31, 2023



## Sector Allocation and Quality Ratings

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

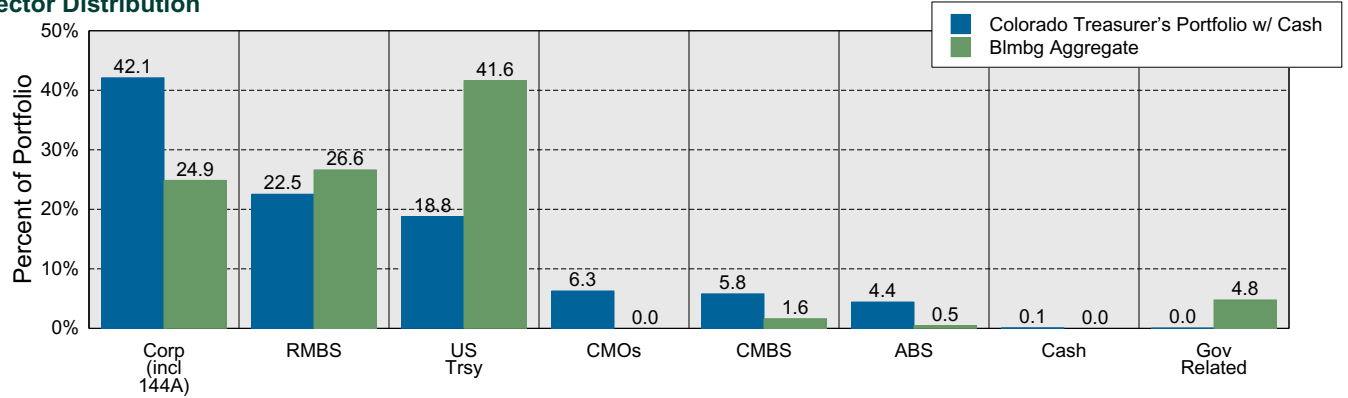


# Colorado Treasurer's Portfolio w/ Cash Portfolio Characteristics Summary As of December 31, 2023

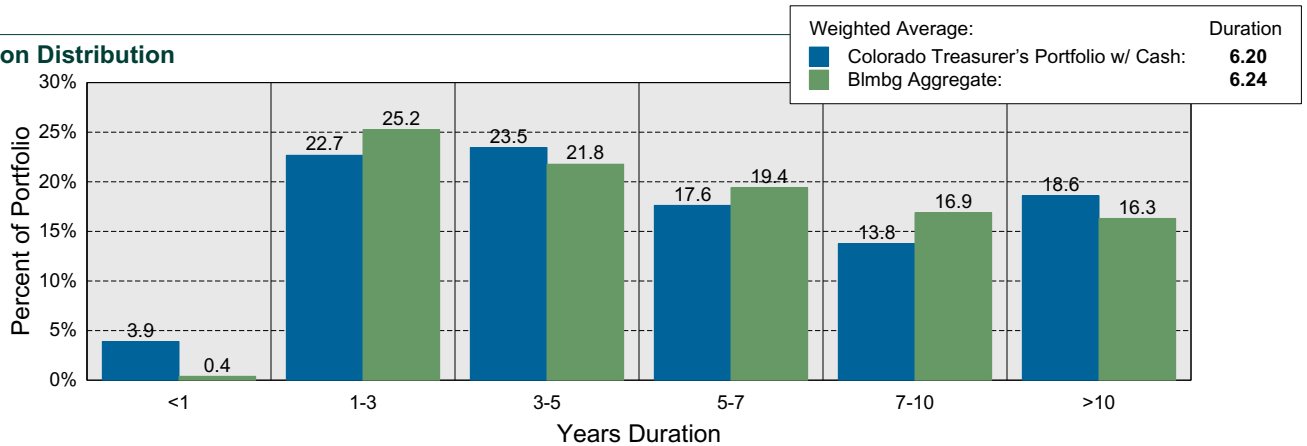
## Portfolio Structure Comparison

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

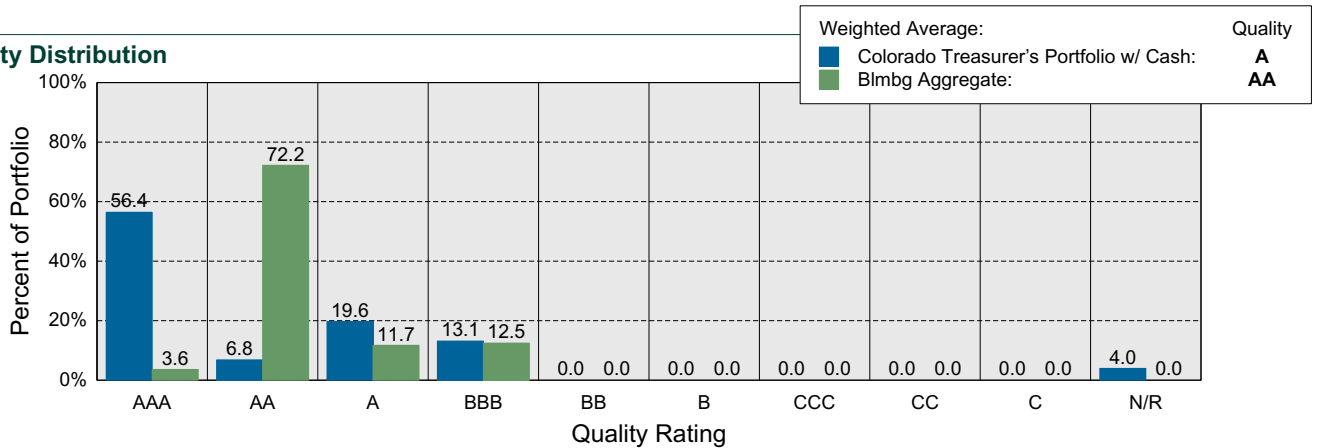
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Janus Henderson Short Duration Period Ended December 31, 2023

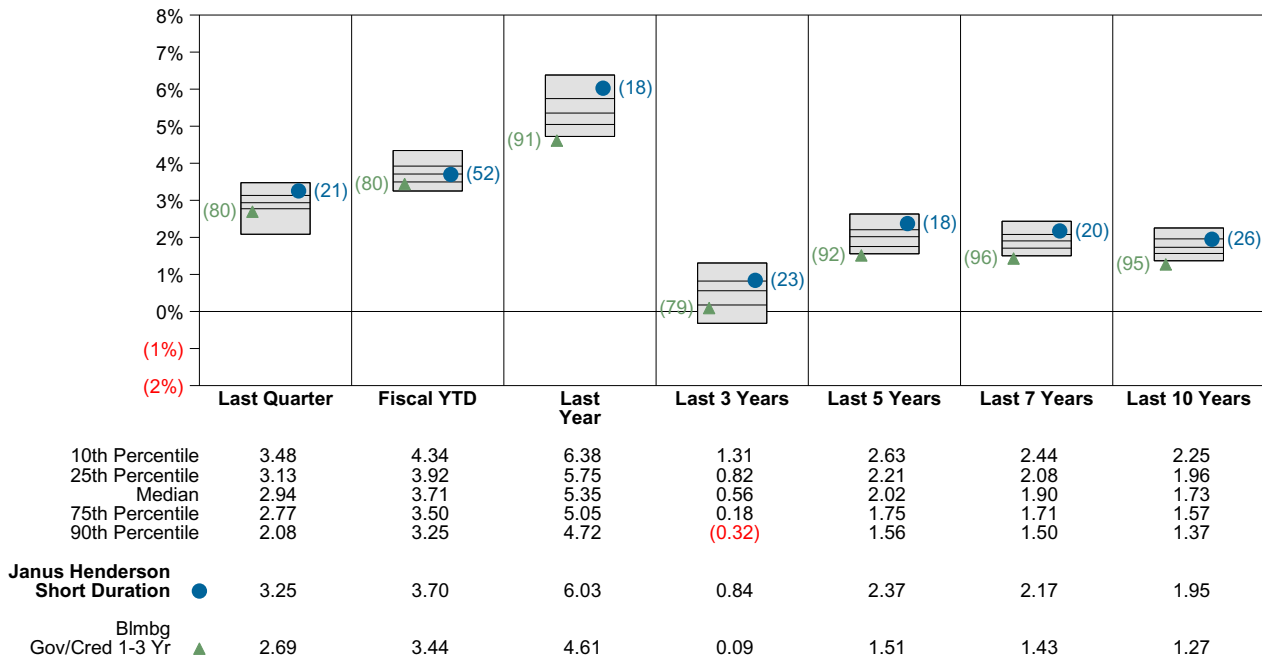
## Investment Philosophy

Janus Henderson believes a bottom-up, fundamentally driven investment process that focuses on credit-oriented investments can generate risk-adjusted outperformance over time. A comprehensive bottom-up view drives decision-making at a macro level, enabling them to make informed decisions about allocations to all sectors of the fixed income universe. The Short Duration Fixed Income strategy emphasizes risk-adjusted performance and capital preservation with value generated principally from prudent credit selection and credit sector positioning. The Janus Henderson short duration portfolio was funded November 9th, 2018. Prior returns represent the manager's composite returns.

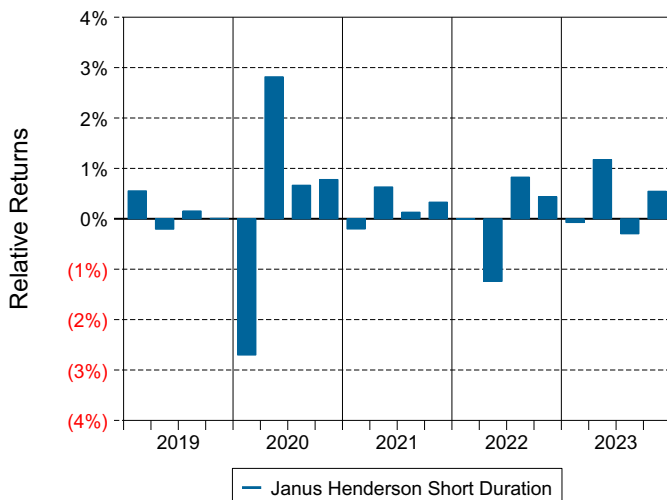
## Quarterly Summary and Highlights

- Janus Henderson Short Duration's portfolio posted a 3.25% return for the quarter placing it in the 21 percentile of the Callan Short Term Fixed Income group for the quarter and in the 18 percentile for the last year.
- Janus Henderson Short Duration's portfolio outperformed the Blmbg Gov/Cred 1-3 Yr by 0.56% for the quarter and outperformed the Blmbg Gov/Cred 1-3 Yr for the year by 1.41%.

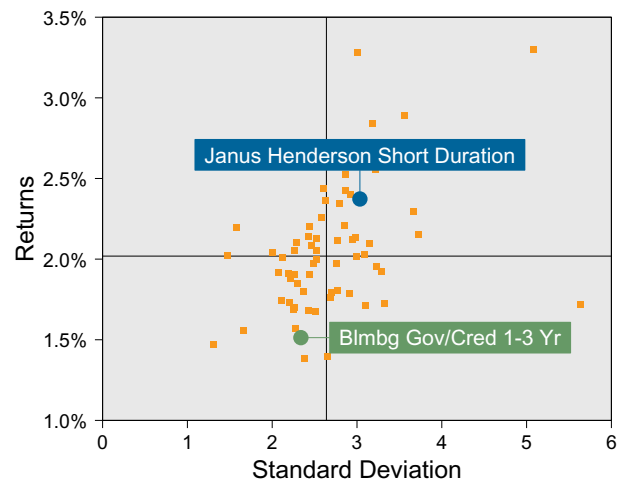
## Performance vs Callan Short Term Fixed Income (Gross)



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



## Callan Short Term Fixed Income (Gross) Annualized Five Year Risk vs Return

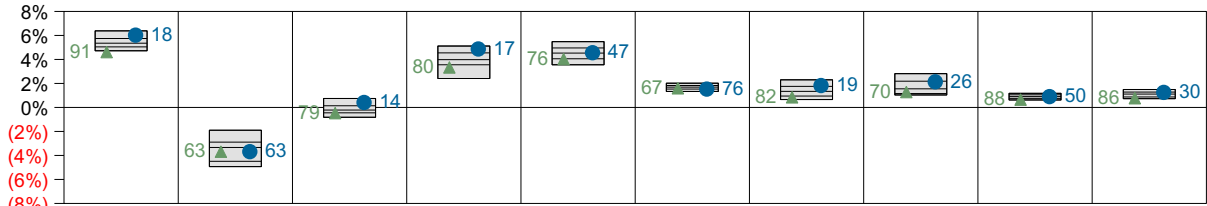


# Janus Henderson Short Duration Return Analysis Summary

## Return Analysis

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

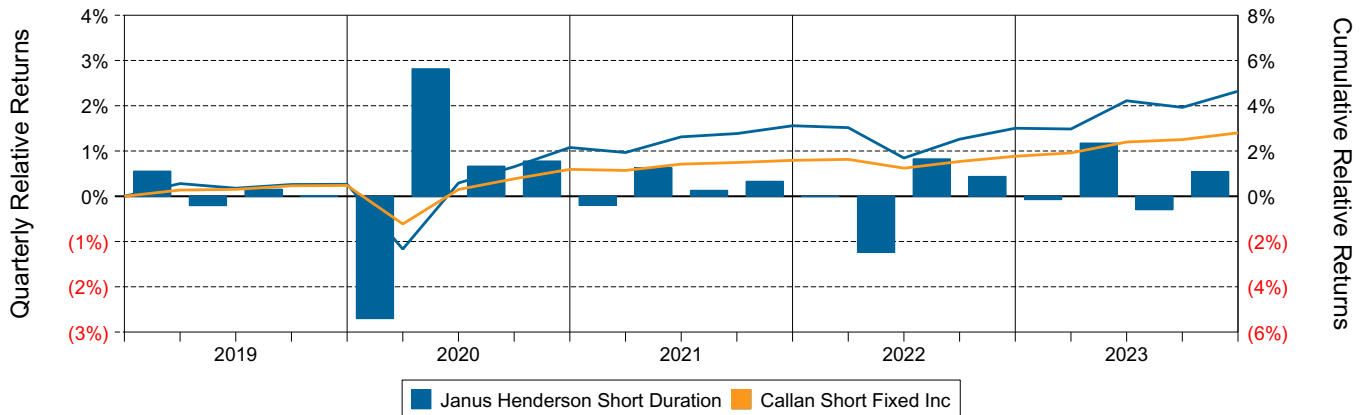
### Performance vs Callan Short Term Fixed Income (Gross)



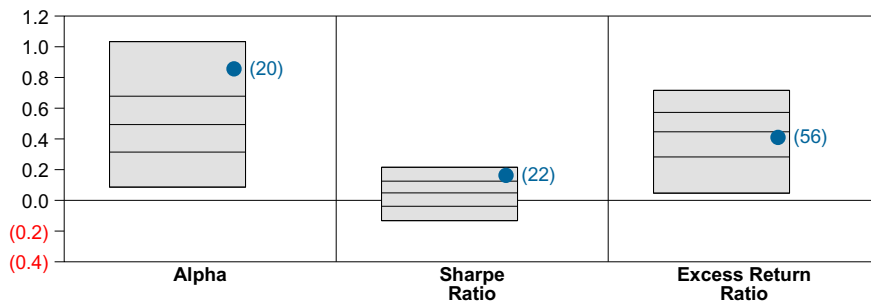
	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
10th Percentile	6.38	(1.90)	0.75	5.12	5.48	2.02	2.30	2.81	1.18	1.50
25th Percentile	5.75	(2.89)	0.14	4.55	4.96	1.83	1.76	2.19	1.05	1.28
Median	5.35	(3.34)	(0.22)	3.98	4.53	1.69	1.34	1.55	0.90	1.11
75th Percentile	5.05	(4.49)	(0.45)	3.56	4.06	1.53	0.95	1.16	0.76	0.87
90th Percentile	4.72	(4.93)	(0.82)	2.41	3.56	1.33	0.66	1.04	0.62	0.73

Janus Henderson Short Duration	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
●	6.03	(3.68)	0.41	4.87	4.56	1.53	1.82	2.13	0.90	1.25
Blmbg Gov/Cred 1-3 Yr	4.61	(3.69)	(0.47)	3.33	4.03	1.60	0.84	1.28	0.65	0.77
▲										

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



### Risk Adjusted Return Measures vs Blmbg Gov/Cred 1-3 Yr Rankings Against Callan Short Term Fixed Income (Gross) Five Years Ended December 31, 2023



	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	1.03	0.22	0.72
25th Percentile	0.68	0.13	0.57
Median	0.49	0.05	0.45
75th Percentile	0.31	(0.04)	0.28
90th Percentile	0.09	(0.13)	0.05

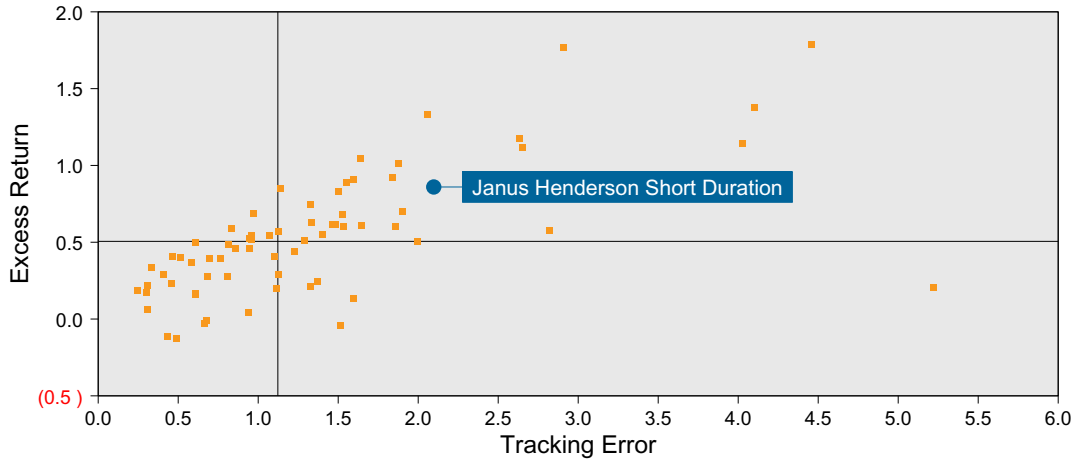
Janus Henderson Short Duration	●	0.86	0.16	0.41
--------------------------------	---	------	------	------

# Janus Henderson Short Duration Risk Analysis Summary

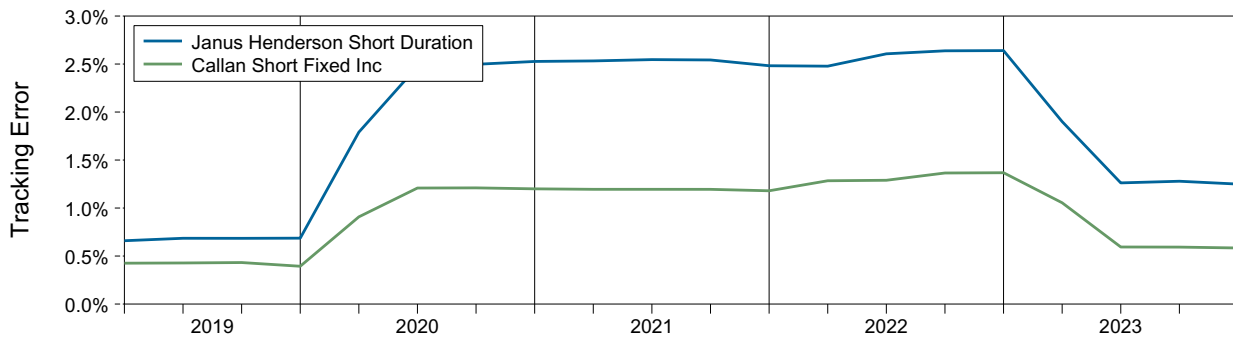
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows tracking error patterns versus the benchmark over time. The last two charts show the ranking of the manager's risk statistics versus the peer group.

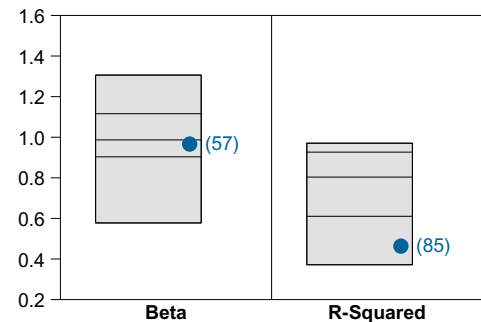
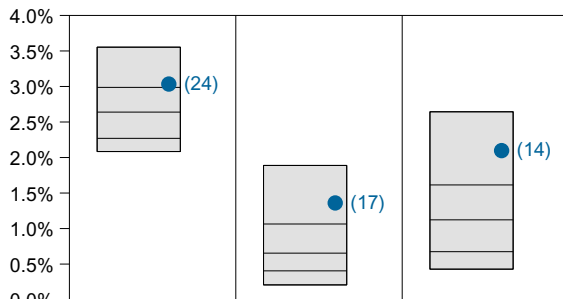
### Risk Analysis vs Callan Short Term Fixed Income (Gross) Five Years Ended December 31, 2023



### Rolling 12 Quarter Tracking Error vs Blmbg Gov/Cred 1-3 Yr



### Risk Statistics Rankings vs Blmbg Gov/Cred 1-3 Yr Rankings Against Callan Short Term Fixed Income (Gross) Five Years Ended December 31, 2023



	Standard Deviation	Downside Risk	Tracking Error	Beta	R-Squared
10th Percentile	3.55	1.89	2.64	1.31	0.97
25th Percentile	2.99	1.06	1.61	1.12	0.93
Median	2.64	0.65	1.12	0.99	0.80
75th Percentile	2.27	0.40	0.67	0.90	0.61
90th Percentile	2.08	0.21	0.43	0.58	0.37

Janus Henderson Short Duration ● 3.03 1.36 2.10

Janus Henderson Short Duration ● 0.97 0.46

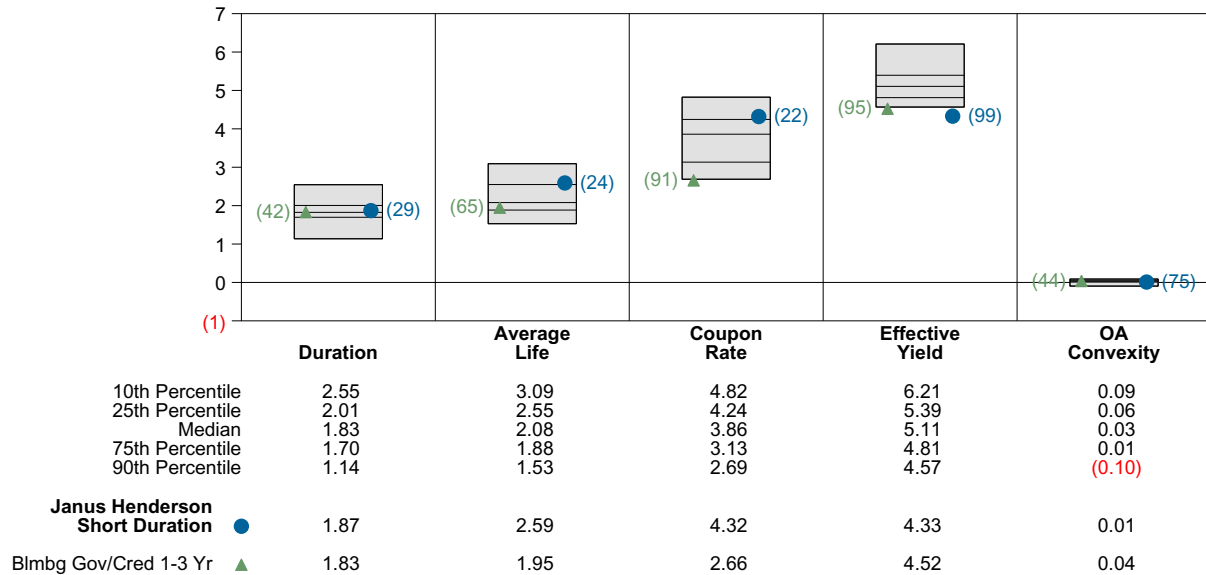


# Janus Henderson Short Duration Bond Characteristics Analysis Summary

## Portfolio Characteristics

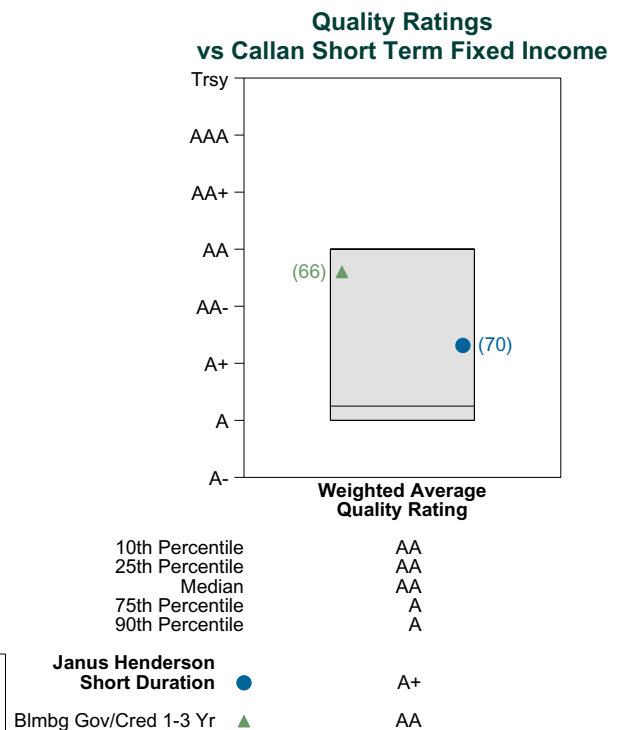
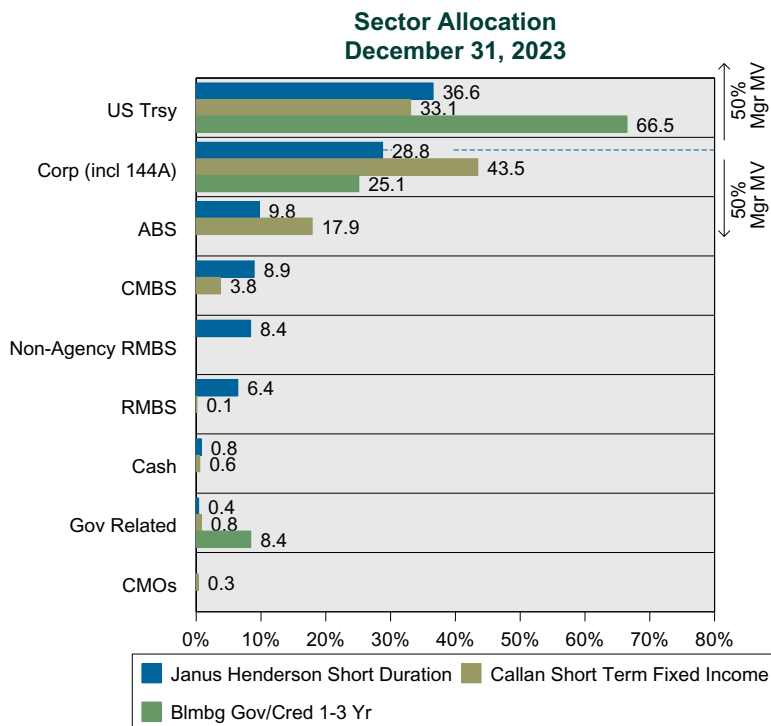
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan Short Term Fixed Income as of December 31, 2023



## Sector Allocation and Quality Ratings

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

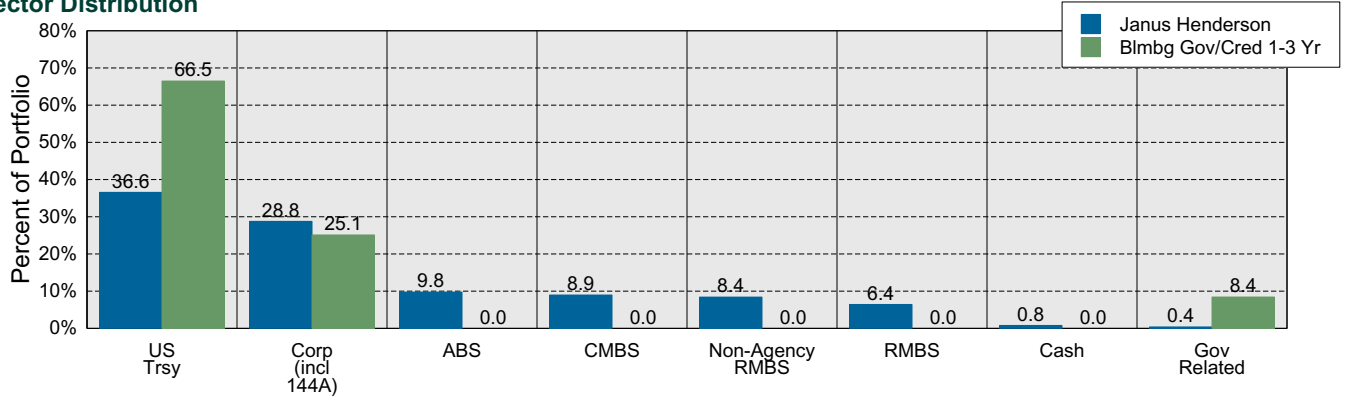


# Janus Henderson Portfolio Characteristics Summary As of December 31, 2023

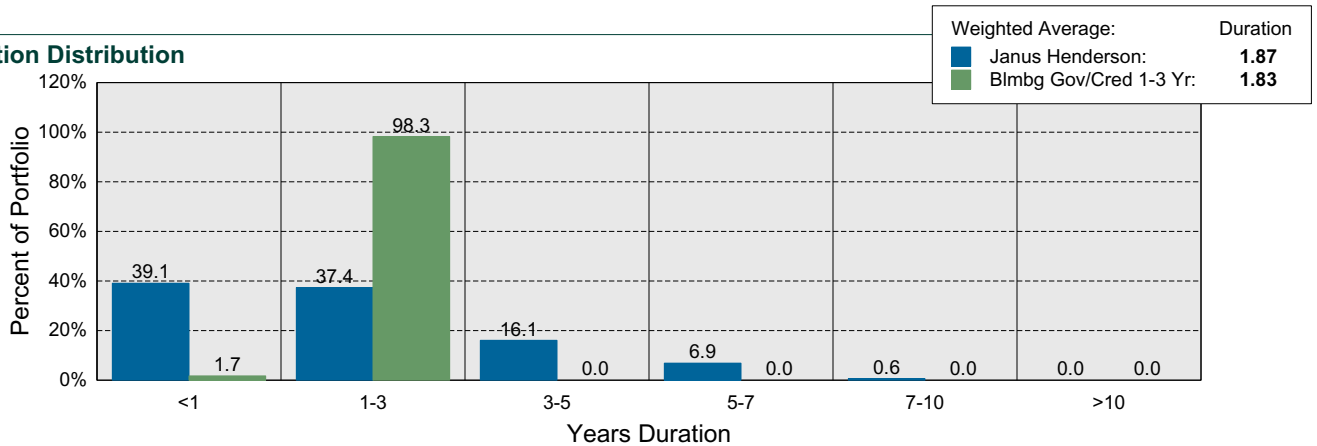
## Portfolio Structure Comparison

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

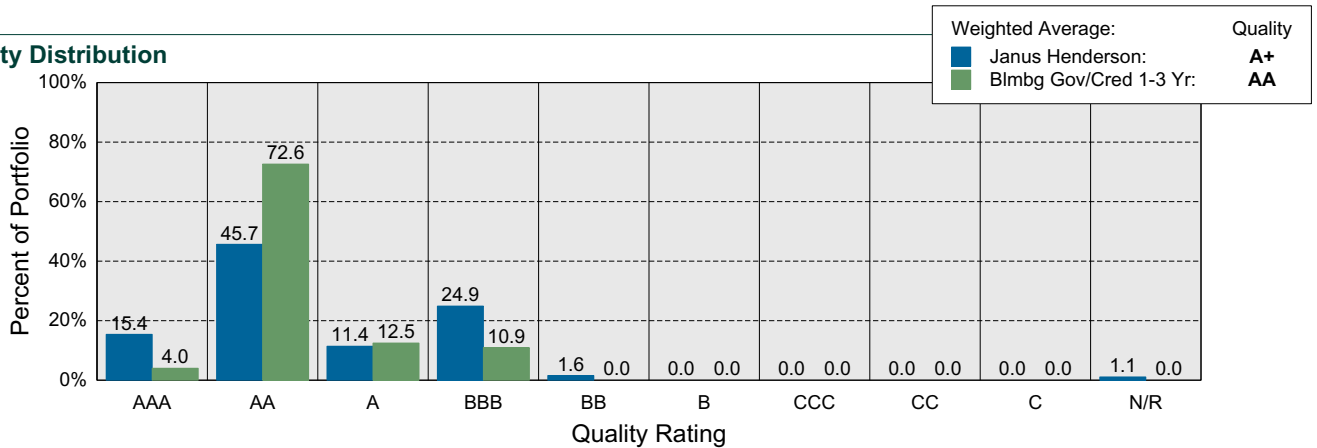
### Sector Distribution



### Duration Distribution



### Quality Distribution





# High Income Strategies

## Period Ended December 31, 2023

### Benchmark Definition

The High Income Strategies Benchmark consists of 85% Blmbg High Yield Index and 15% ICE BofA US All Cap Secs Index.

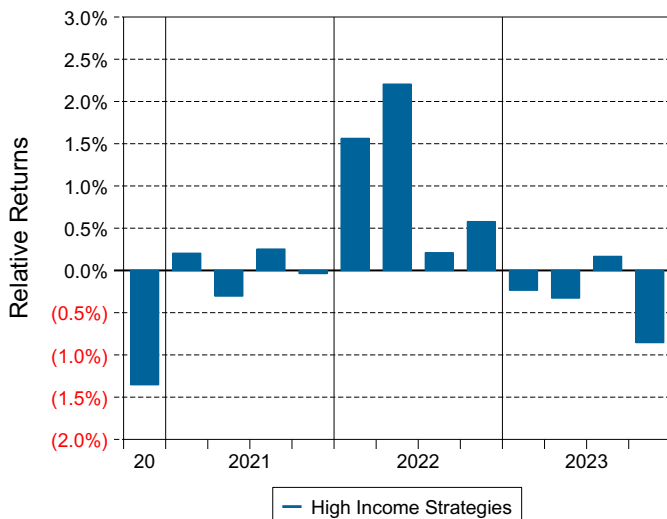
### Quarterly Summary and Highlights

- High Income Strategies's portfolio posted a 6.14% return for the quarter placing it in the 85 percentile of the Callan High Yield Fixed Income group for the quarter and in the 92 percentile for the last year.
- High Income Strategies's portfolio underperformed the High Income Strategies BM by 0.92% for the quarter and underperformed the High Income Strategies BM for the year by 1.41%.

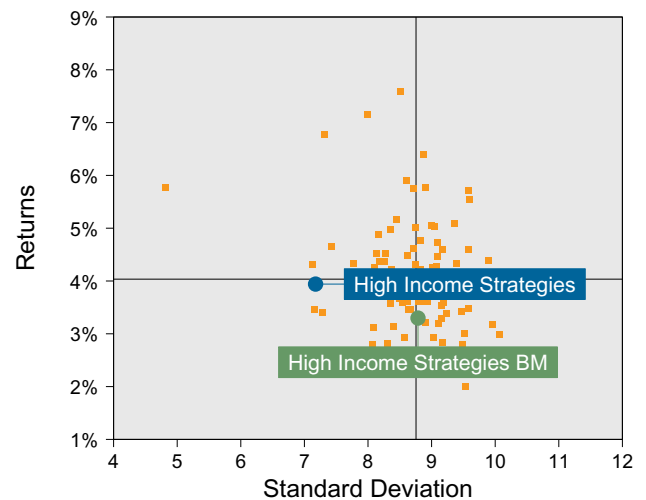
### Performance vs Callan High Yield Fixed Income (Gross)



### Relative Return vs High Income Strategies BM



### Callan High Yield Fixed Income (Gross) Annualized Three and One-Quarter Year Risk vs Return

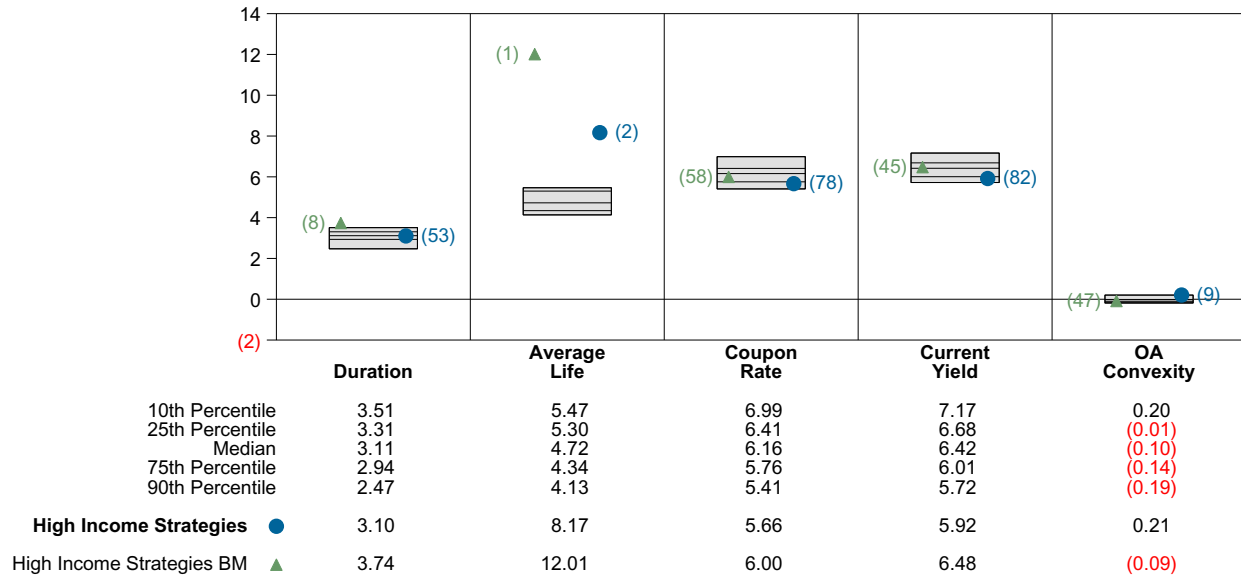


# High Income Strategies Bond Characteristics Analysis Summary

## Portfolio Characteristics

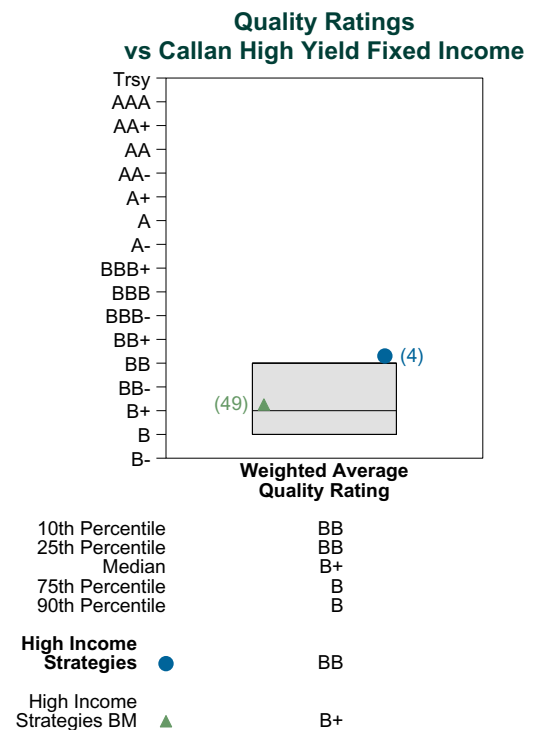
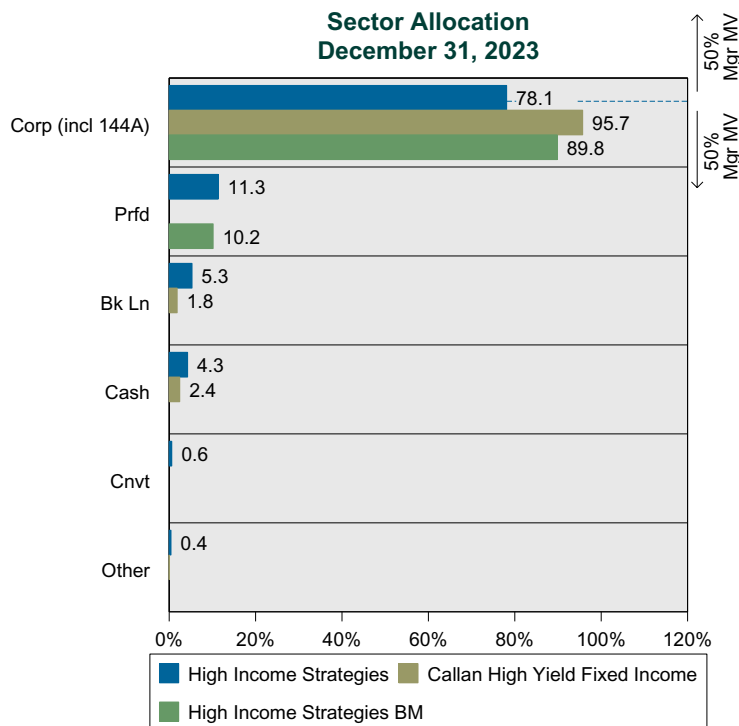
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan High Yield Fixed Income as of December 31, 2023



## Sector Allocation and Quality Ratings

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

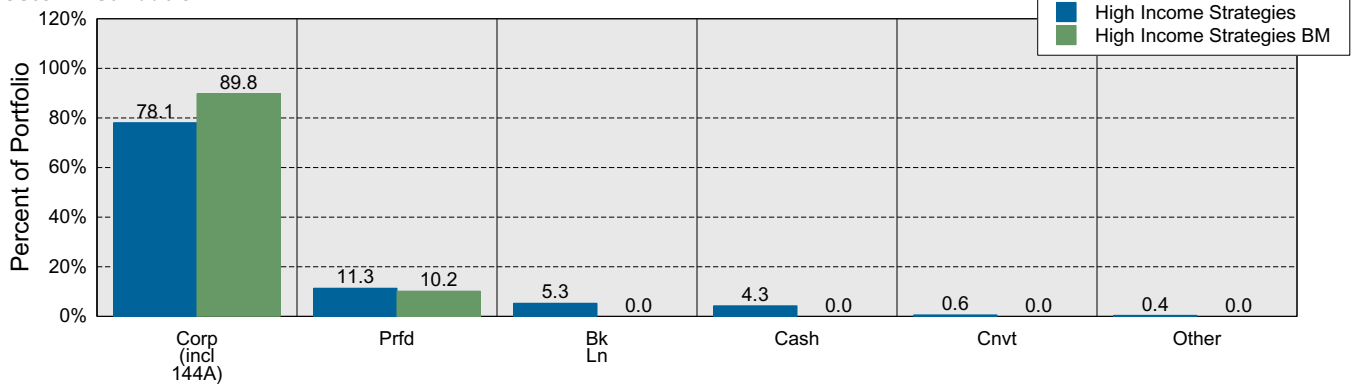


# High Income Strategies Portfolio Characteristics Summary As of December 31, 2023

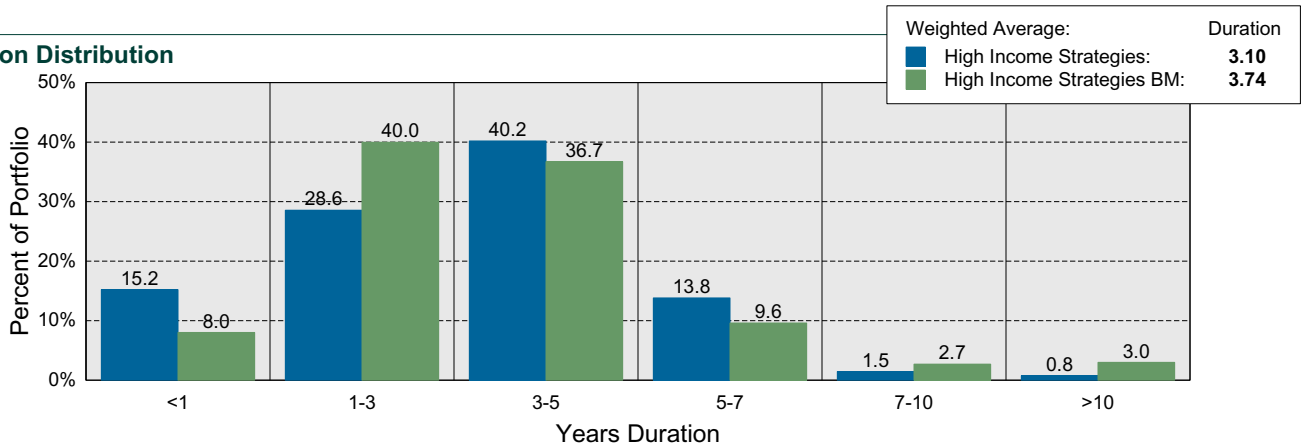
## Portfolio Structure Comparison

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

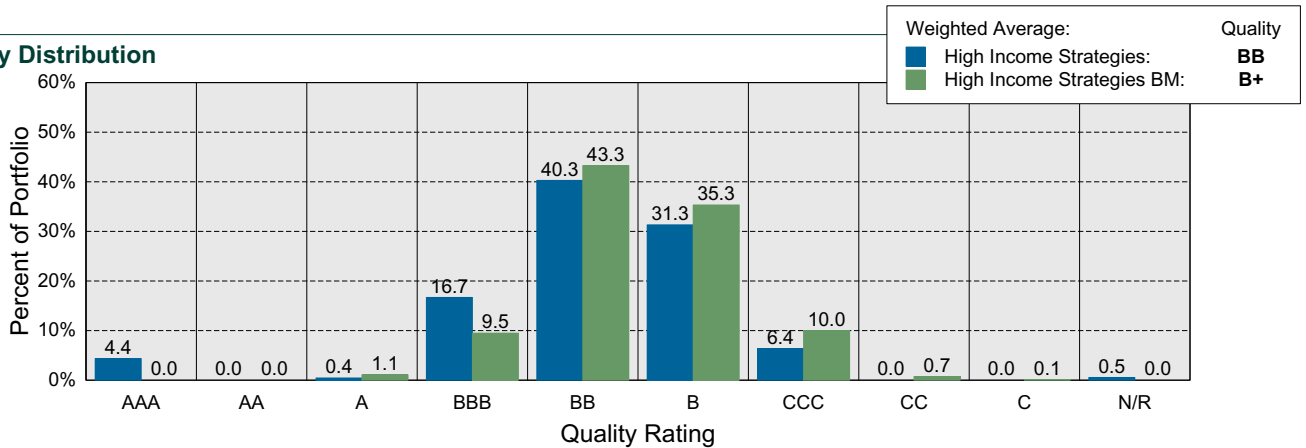
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Mackay Shield US High Yield Period Ended December 31, 2023

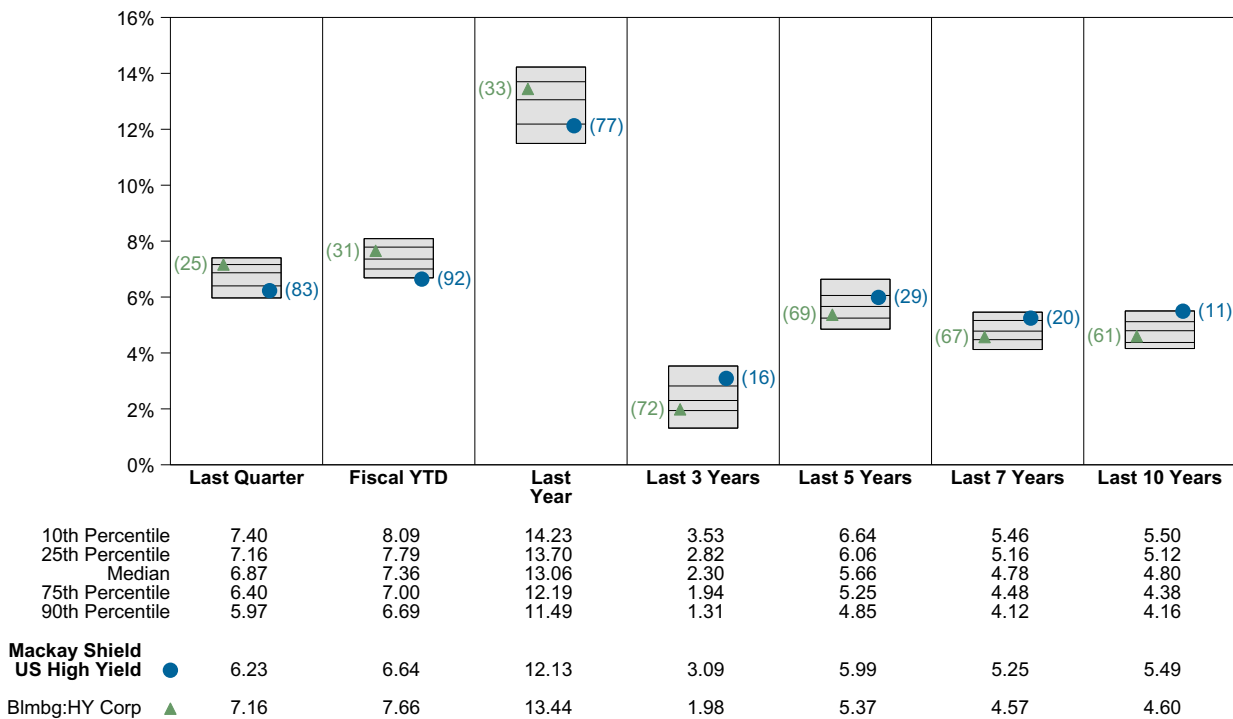
## Investment Philosophy

Mackay relies on rigorous fundamental analysis to select companies with strong free cash flow and asset coverage in its quest to maximize yield, adjusted for default risk. The strategy is well diversified with sector and quality weights a residual of the security selection process. Mackay believes that long-term value is best created by avoiding downside risk (i.e. defaults) while selecting companies with attractive valuations and a catalyst for spread compression. Mackay Shield US High Yield was funded July 24, 2020. Returns prior to inception reflect the manager's high yield composite returns.

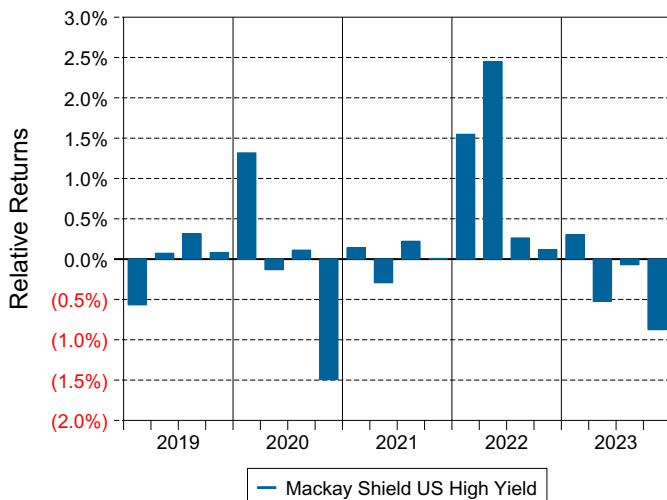
## Quarterly Summary and Highlights

- Mackay Shield US High Yield's portfolio posted a 6.23% return for the quarter placing it in the 83 percentile of the Callan High Yield Fixed Income group for the quarter and in the 77 percentile for the last year.
- Mackay Shield US High Yield's portfolio underperformed the Blmbg:HY Corp by 0.94% for the quarter and underperformed the Blmbg:HY Corp for the year by 1.32%.

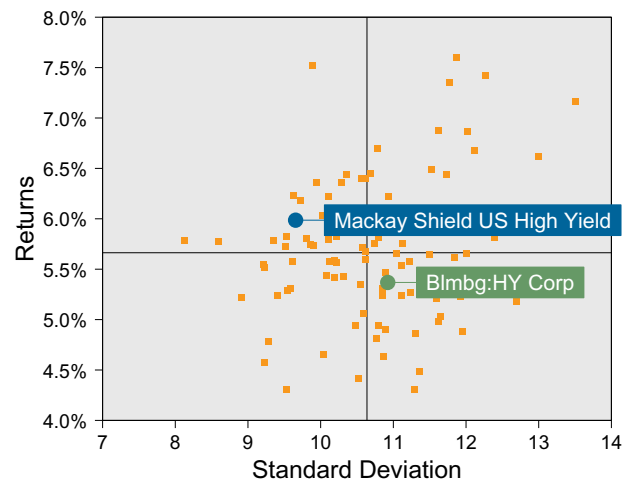
## Performance vs Callan High Yield Fixed Income (Gross)



## Relative Return vs Blmbg:HY Corp



## Callan High Yield Fixed Income (Gross) Annualized Five Year Risk vs Return

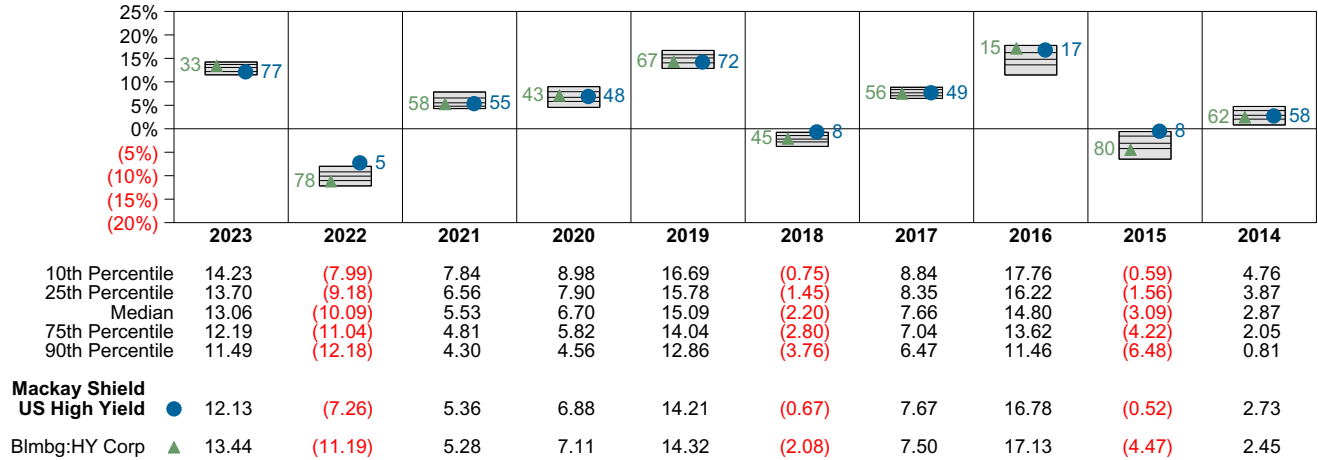


# Mackay Shield US High Yield Return Analysis Summary

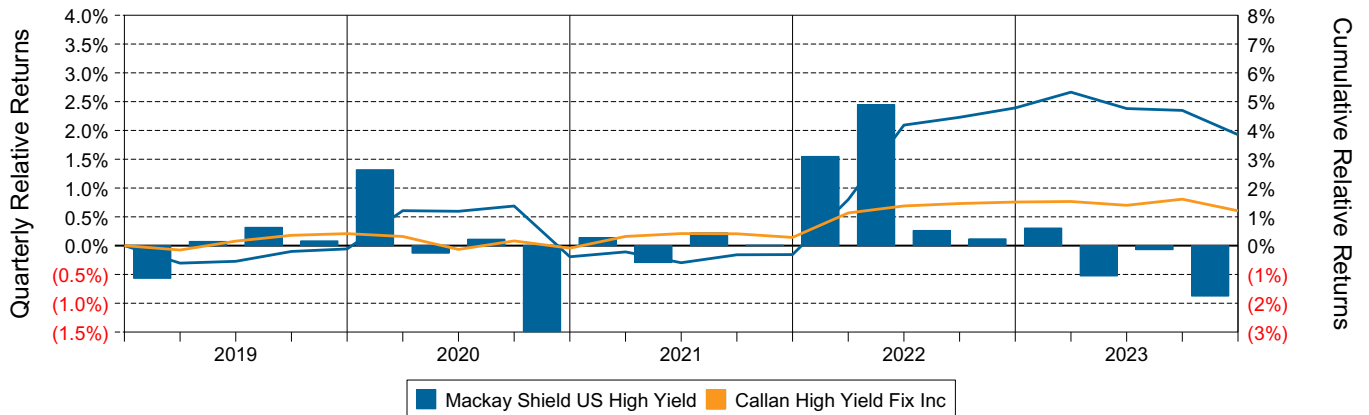
## Return Analysis

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

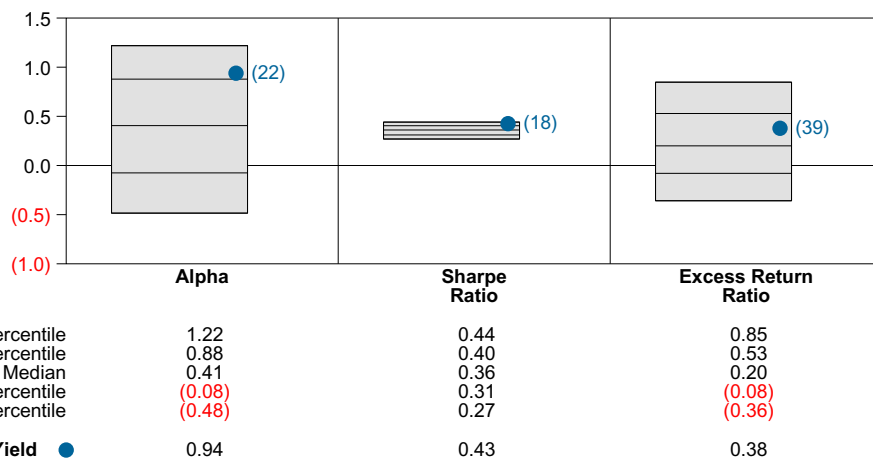
### Performance vs Callan High Yield Fixed Income (Gross)



### Cumulative and Quarterly Relative Returns vs Blmbg:HY Corp



### Risk Adjusted Return Measures vs Blmbg:HY Corp Rankings Against Callan High Yield Fixed Income (Gross) Five Years Ended December 31, 2023



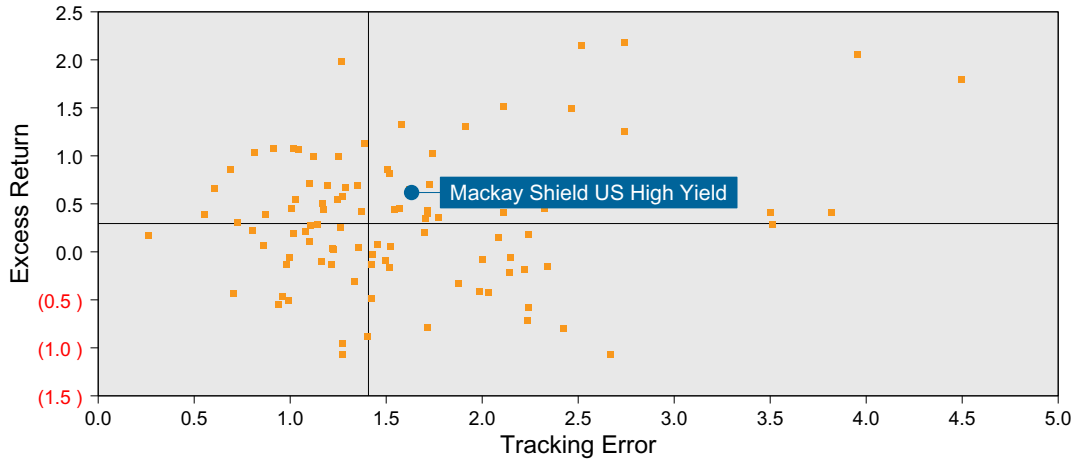


# Mackay Shield US High Yield Risk Analysis Summary

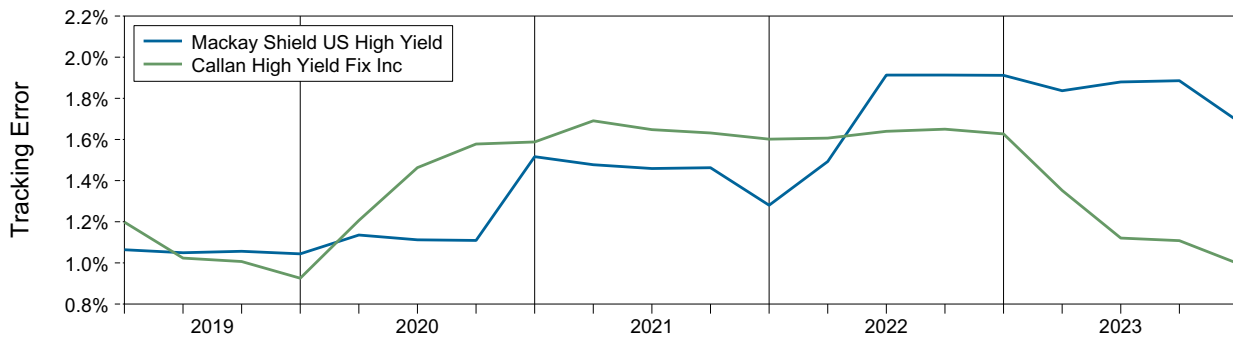
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows tracking error patterns versus the benchmark over time. The last two charts show the ranking of the manager's risk statistics versus the peer group.

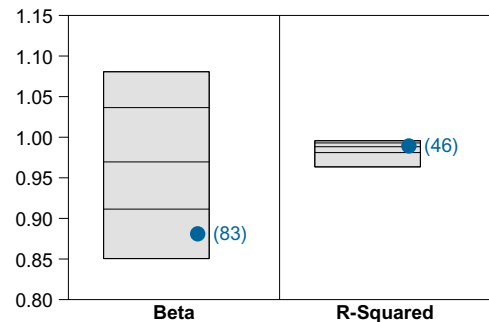
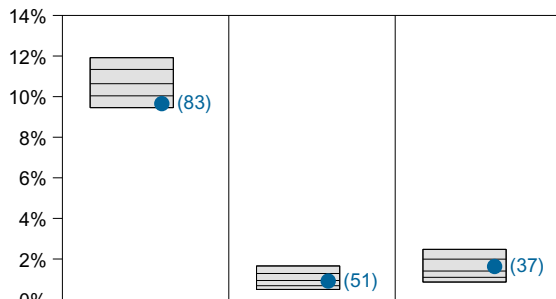
### Risk Analysis vs Callan High Yield Fixed Income (Gross) Five Years Ended December 31, 2023



### Rolling 12 Quarter Tracking Error vs Blmbg:HY Corp



### Risk Statistics Rankings vs Blmbg:HY Corp Rankings Against Callan High Yield Fixed Income (Gross) Five Years Ended December 31, 2023



10th Percentile	11.92
25th Percentile	11.34
Median	10.64
75th Percentile	10.04
90th Percentile	9.46

10th Percentile	1.66
25th Percentile	1.29
Median	0.94
75th Percentile	0.68
90th Percentile	0.50

10th Percentile	2.47
25th Percentile	1.99
Median	1.41
75th Percentile	1.10
90th Percentile	0.86

10th Percentile	1.08
25th Percentile	1.04
Median	0.97
75th Percentile	0.91
90th Percentile	0.85

10th Percentile	1.00
25th Percentile	0.99
Median	0.99
75th Percentile	0.98
90th Percentile	0.96

**Mackay Shield US High Yield** ● 9.66

0.91

1.63

**Mackay Shield US High Yield** ● 0.88

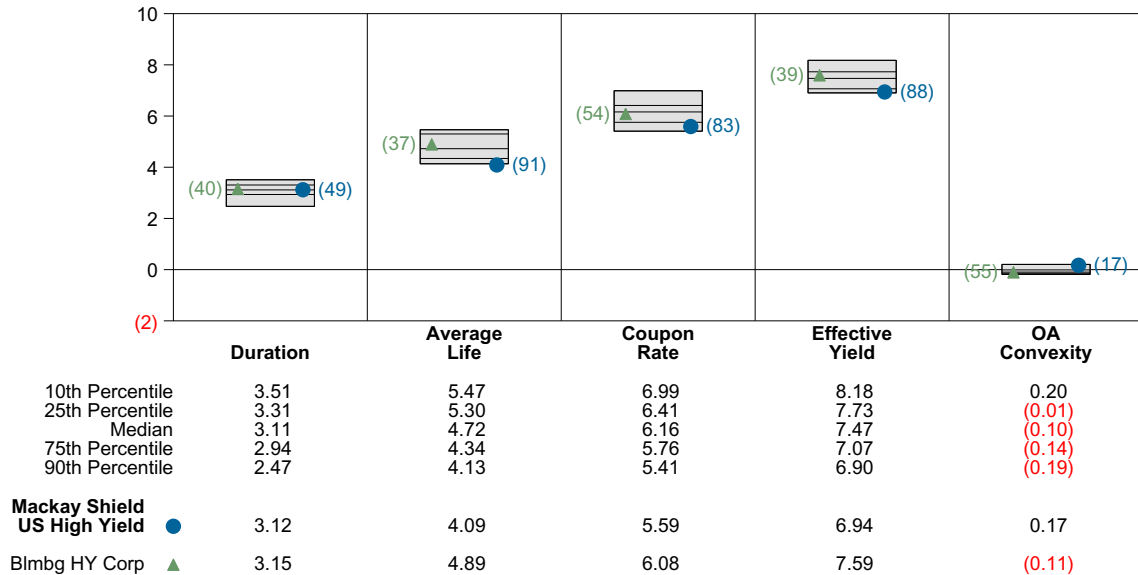
0.99

# Mackay Shield US High Yield Bond Characteristics Analysis Summary

## Portfolio Characteristics

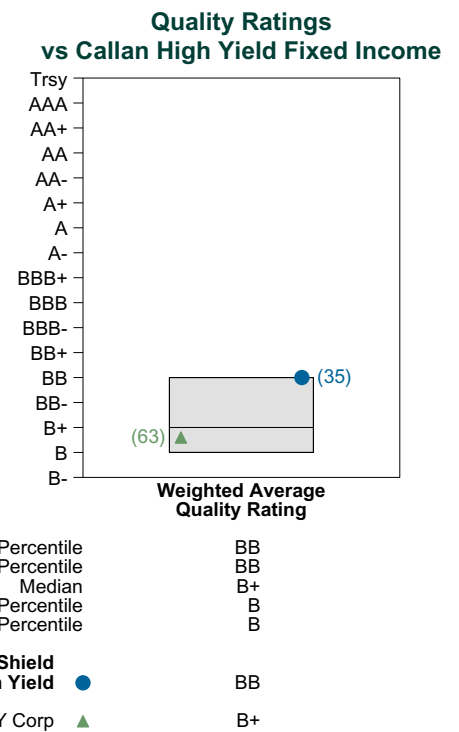
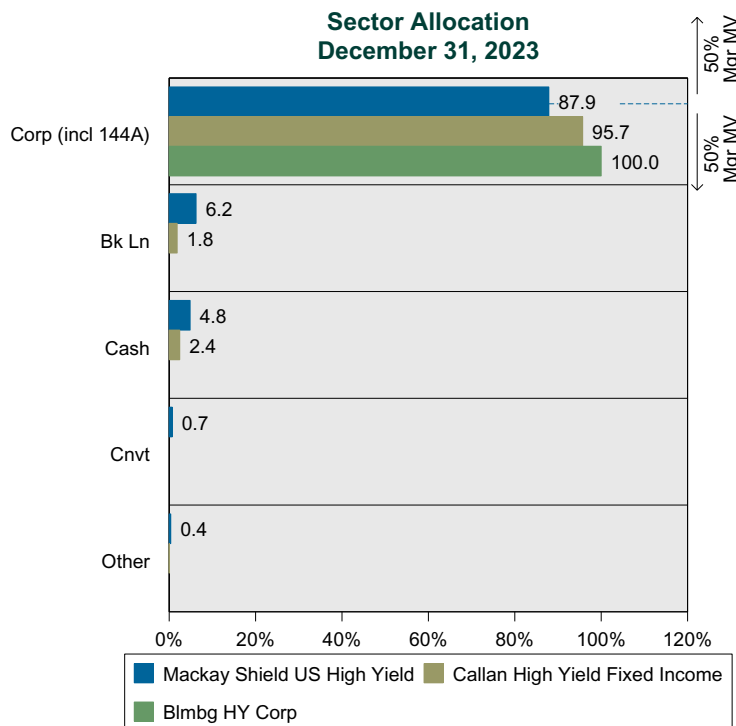
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan High Yield Fixed Income as of December 31, 2023



## Sector Allocation and Quality Ratings

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

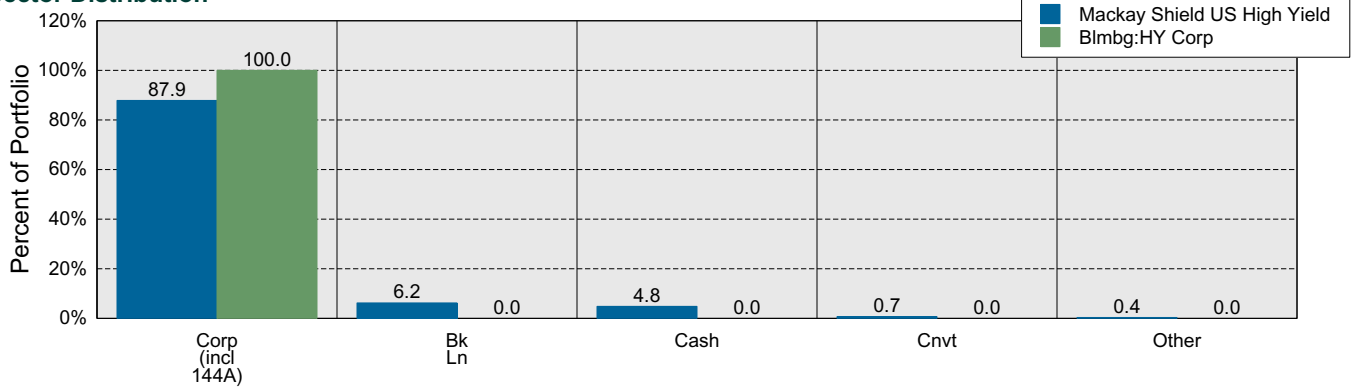


# Mackay Shield US High Yield Portfolio Characteristics Summary As of December 31, 2023

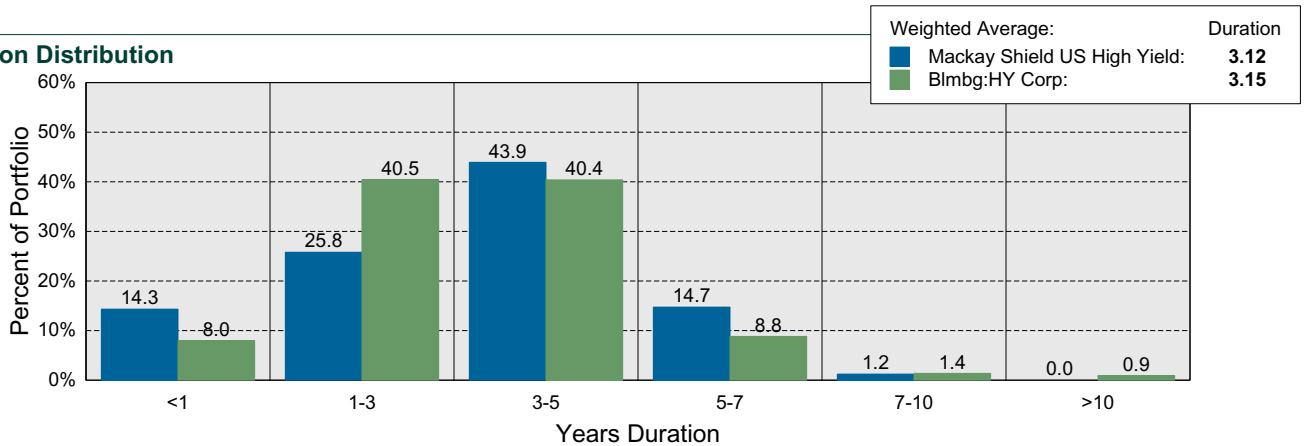
## Portfolio Structure Comparison

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

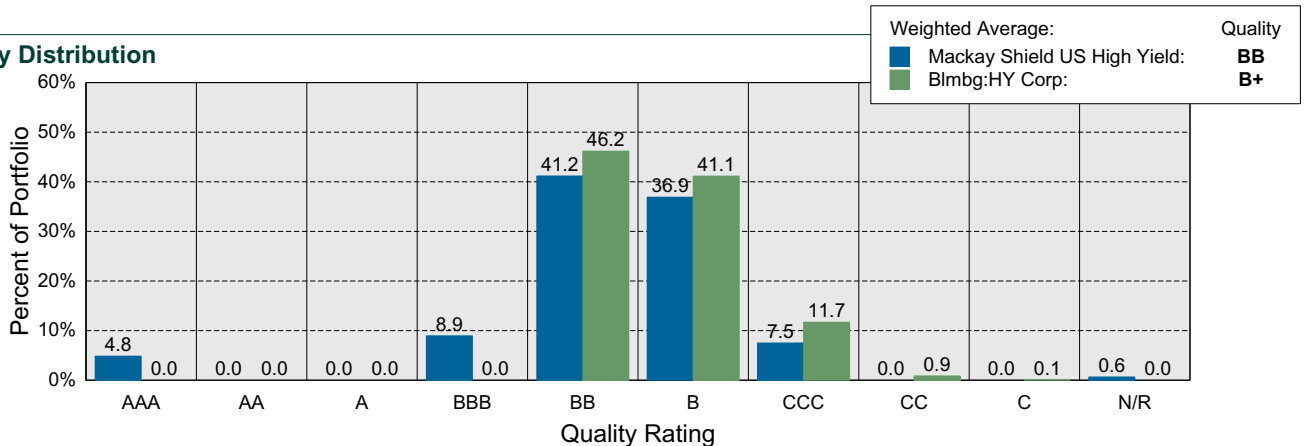
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Principal Preferred Securities Period Ended December 31, 2023

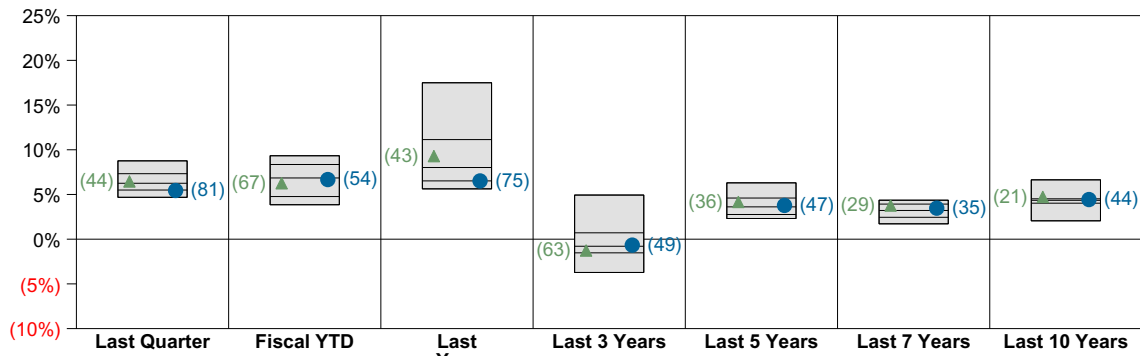
## Investment Philosophy

Spectrum is a wholly owned subsidiary of Principal Global Investors. The firm has an exclusive focus on preferred securities globally. The firm employs an active approach to managing this sector with an emphasis on income as well as total return. Preferred securities are structurally subordinated fixed income investments that come in many flavors, each with unique structures and with many different labels. Common characteristics, however, are that they are subordinate to senior investment grade debt, pay a specified coupon, and are callable by the issuer. Credit quality typically ranges from BBB+ to BB. Coupon payments can be deferrable, non-deferrable and cumulative or non-cumulative. These attributes make the instruments complex and active management requires skill and experience in this sector. Principal Preferred Securities was funded July 30, 2020. Returns prior to inception reflect the Principal Preferred Securities mutual fund historical returns.

## Quarterly Summary and Highlights

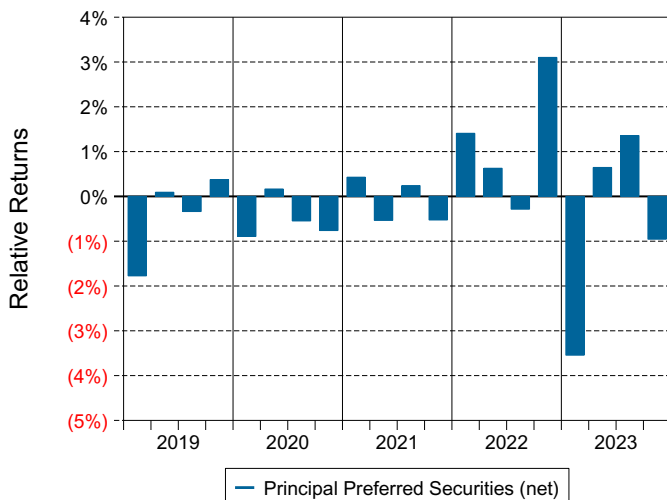
- Principal Preferred Securities (net)'s portfolio posted a 5.44% return for the quarter placing it in the 81 percentile of the Morningstar Preferred Stock Funds group for the quarter and in the 75 percentile for the last year.
- Principal Preferred Securities (net)'s portfolio underperformed the ICE BofA US All Cap Secs by 1.02% for the quarter and underperformed the ICE BofA US All Cap Secs for the year by 2.78%.

## Performance vs Morningstar Preferred Stock Funds (Net)

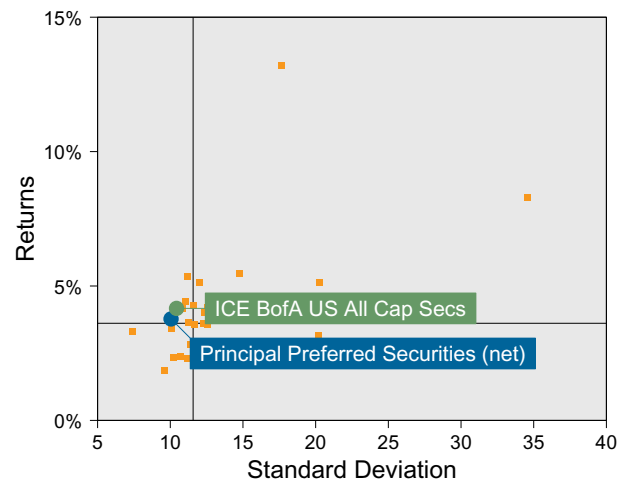


	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	8.76	9.33	17.49	4.93	6.30	4.36	6.64
25th Percentile	7.32	8.35	11.14	0.71	4.60	3.93	4.52
Median	6.25	6.85	8.01	(0.79)	3.61	3.21	4.35
75th Percentile	5.50	4.77	6.52	(1.53)	2.76	2.45	4.02
90th Percentile	4.68	3.85	5.63	(3.72)	2.31	1.72	2.06
<b>Principal Preferred Securities (net)</b>	● 5.44	6.67	6.51	(0.67)	3.77	3.47	4.43
ICE BofA US All Cap Secs	▲ 6.46	6.25	9.29	(1.27)	4.17	3.77	4.73

## Relative Return vs ICE BofA US All Cap Secs



## Morningstar Preferred Stock Funds (Net) Annualized Five Year Risk vs Return

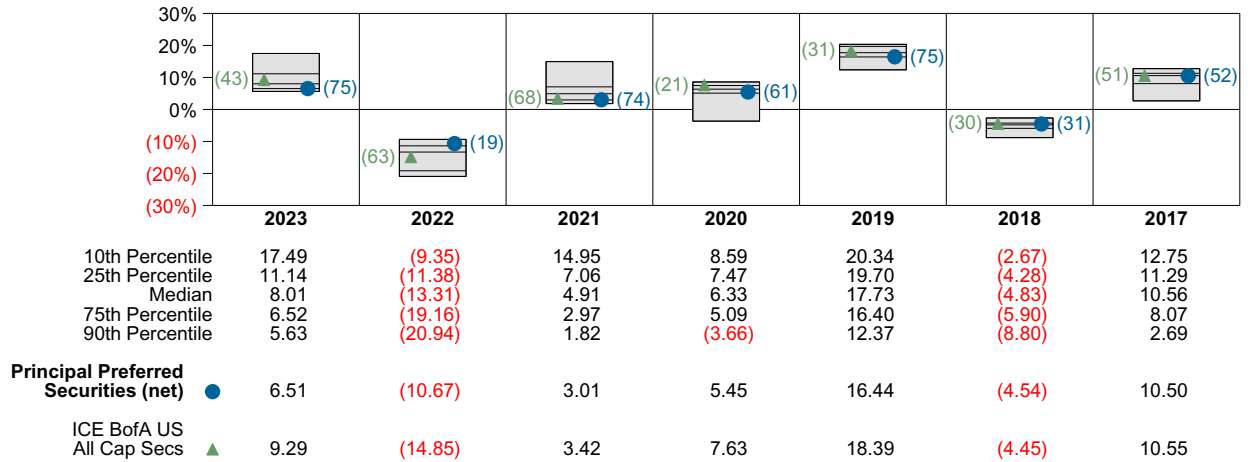


# Principal Preferred Securities Return Analysis Summary

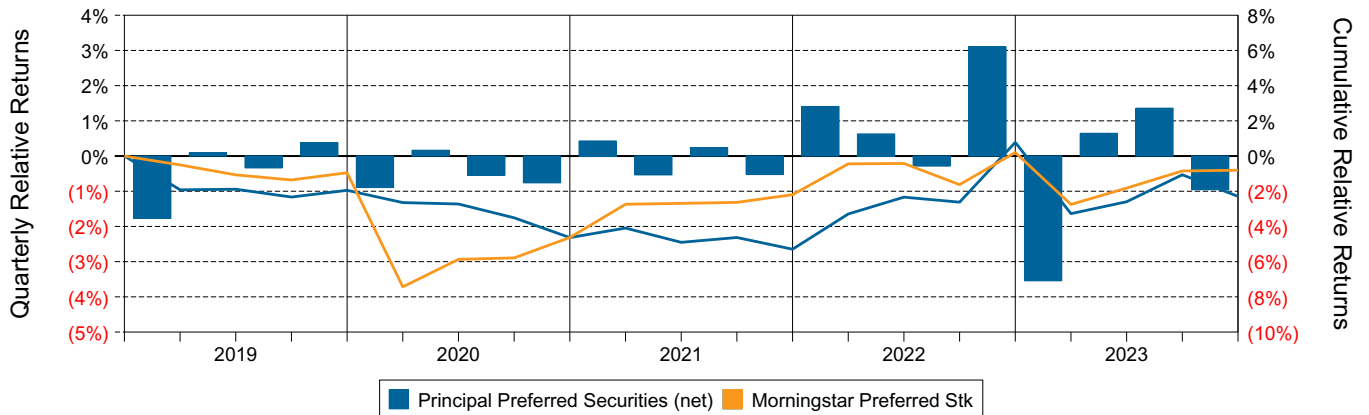
## Return Analysis

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

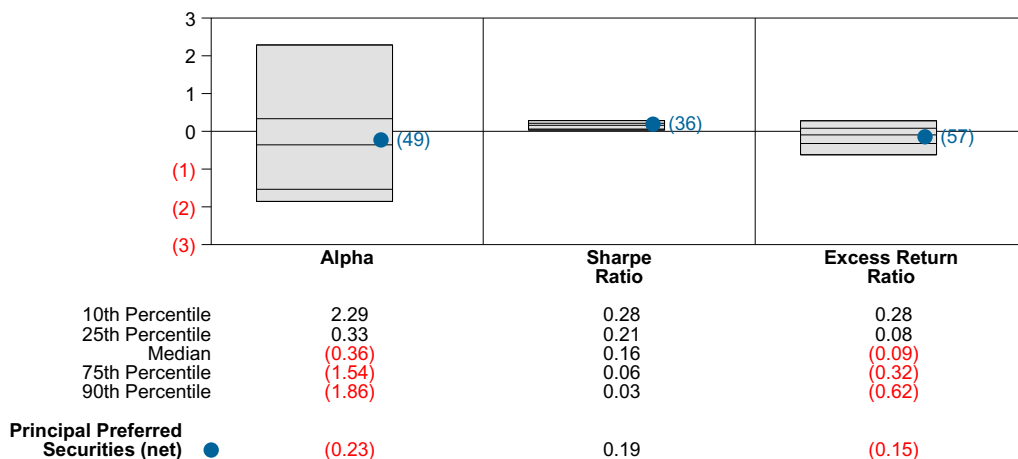
### Performance vs Morningstar Preferred Stock Funds (Net)



### Cumulative and Quarterly Relative Returns vs ICE BofA US All Cap Secs



### Risk Adjusted Return Measures vs ICE BofA US All Cap Secs Rankings Against Morningstar Preferred Stock Funds (Net) Five Years Ended December 31, 2023



# Principal Preferred Securities Risk Analysis Summary

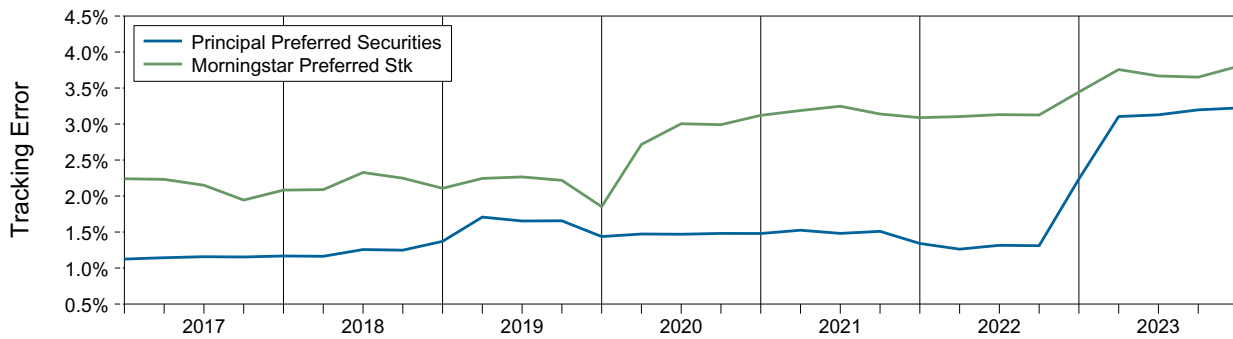
## Risk Analysis

The graphs below analyze the risk or variation of a manager's return pattern. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the benchmark. The second chart shows tracking error patterns versus the benchmark over time. The last two charts show the ranking of the manager's risk statistics versus the peer group.

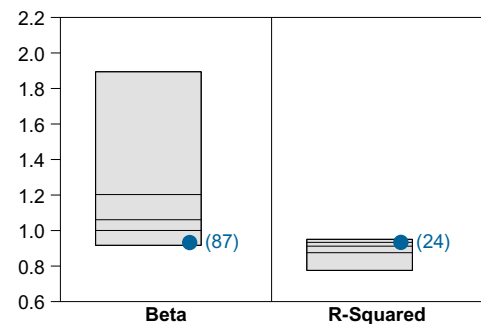
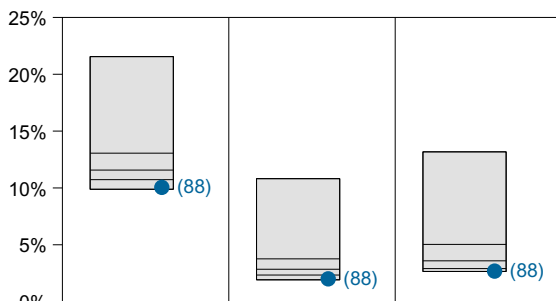
### Risk Analysis vs Morningstar Preferred Stock Funds (Net) Five Years Ended December 31, 2023



### Rolling 12 Quarter Tracking Error vs ICE BofA US All Cap Secs



### Risk Statistics Rankings vs ICE BofA US All Cap Secs Rankings Against Morningstar Preferred Stock Funds (Net) Five Years Ended December 31, 2023



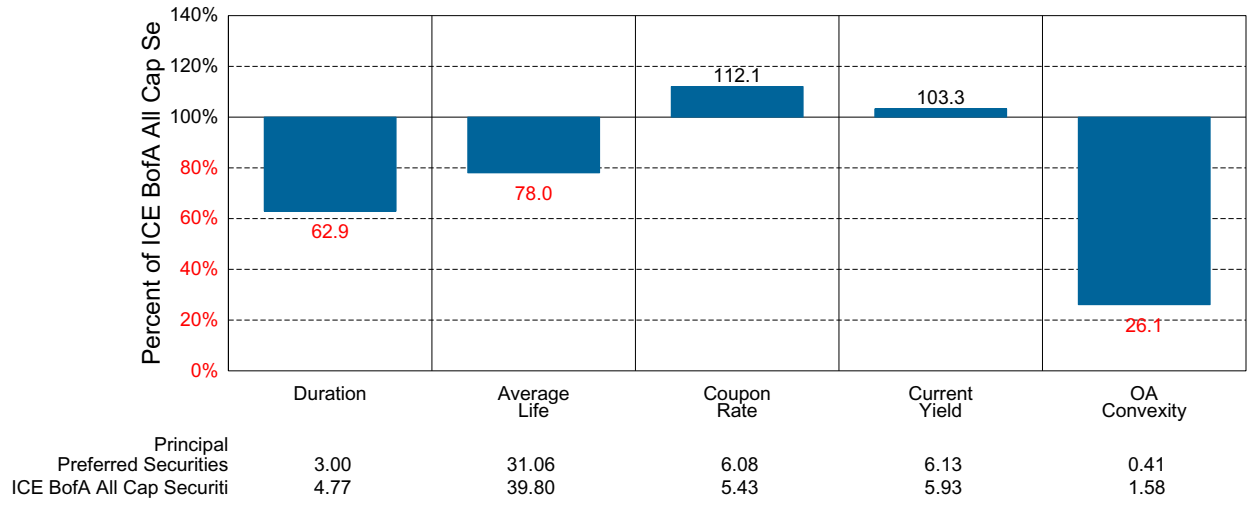
	Standard Deviation	Downside Risk	Tracking Error	Beta	R-Squared
10th Percentile	21.55	10.82	13.17	1.89	0.95
25th Percentile	13.06	3.76	5.03	1.20	0.93
Median	11.57	2.85	3.59	1.06	0.91
75th Percentile	10.73	2.34	2.91	1.00	0.88
90th Percentile	9.88	1.92	2.65	0.92	0.78
<b>Principal Preferred Securities</b>	<b>10.05</b>	<b>2.00</b>	<b>2.68</b>	<b>0.93</b>	<b>0.93</b>

# Principal Preferred Securities Bond Characteristics Analysis Summary

## Portfolio Characteristics

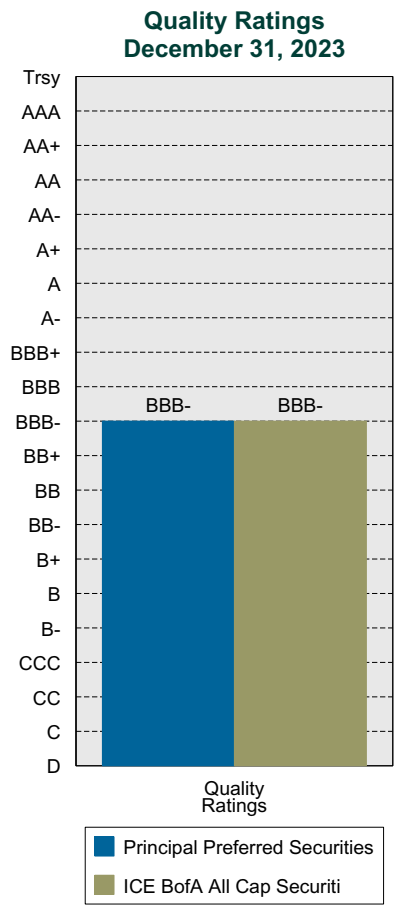
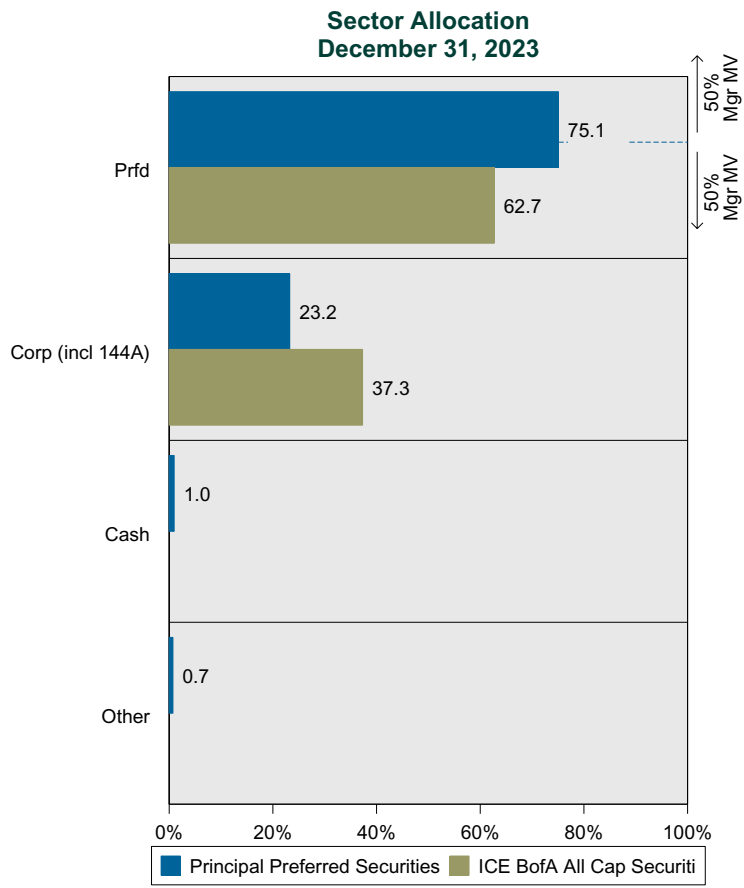
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Portfolio Characteristics Relative to ICE BofA All Cap Securiti as of December 31, 2023



## Sector Allocation and Quality Ratings

The first graph compares the manager's sector weights for the most recent quarter with those of the benchmark. The second graph compares the manager's weighted average quality rating with those of the benchmark.

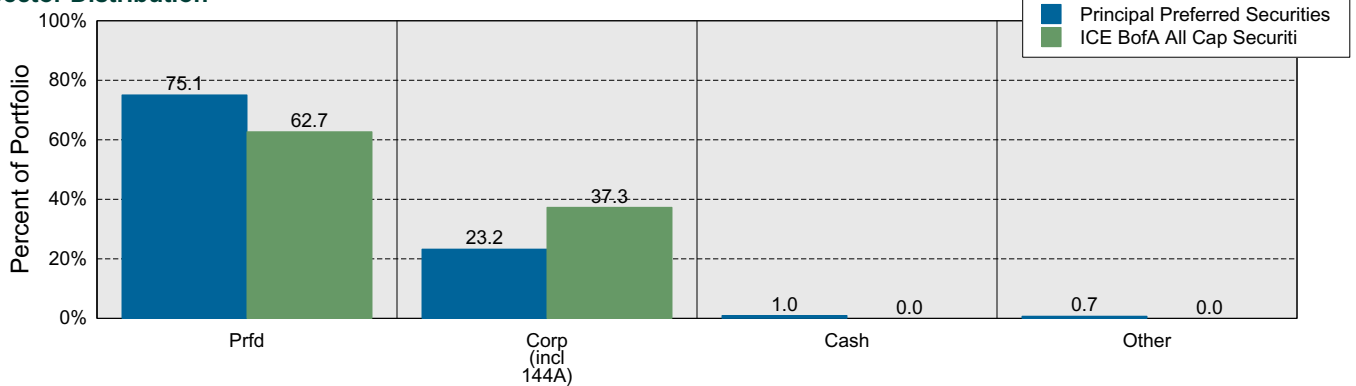


# Principal Preferred Securities Portfolio Characteristics Summary As of December 31, 2023

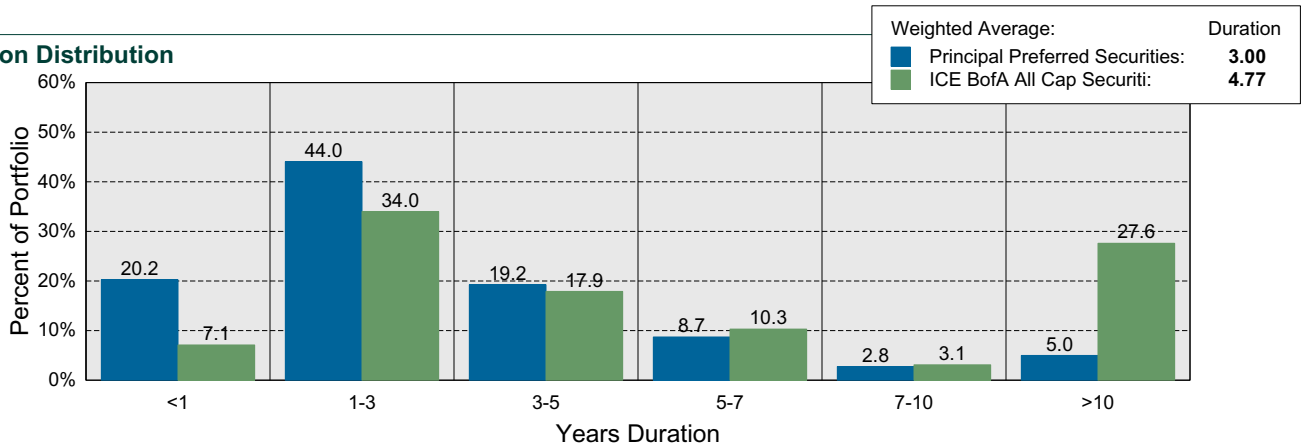
## Portfolio Structure Comparison

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

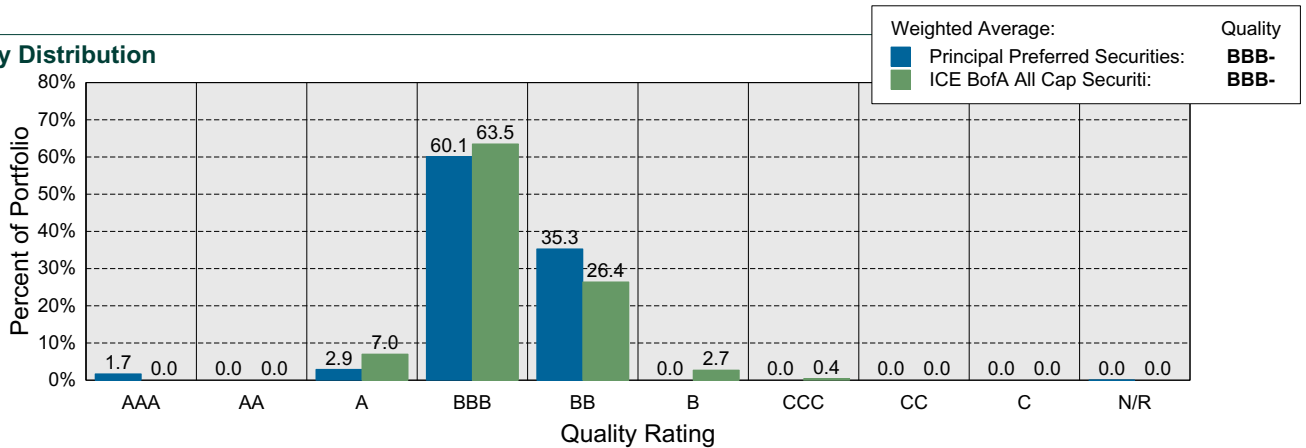
### Sector Distribution



### Duration Distribution



### Quality Distribution







## Quarterly Highlights

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

## New Research from Callan's Experts

**[2023 Nuclear Decommissioning Funding Study](#)** | Callan's annual study offers key insights into the status of nuclear decommissioning funding to make peer comparisons more accurate and relevant.

**[2023 Investment Management Fee Study](#)** | The purpose of the study is to provide a detailed analysis on fee levels and trends across multiple asset classes and mandate sizes, for both active and passive management.

**[2023 Asset Manager ESG Study](#)** | Callan's inaugural ESG Study analyzes responses to various environmental, social, and governance questions in Callan's manager database by firm size, asset class, country of domicile, and ownership structure.

## Webinar Replays

**[Research Cafe: Office-to-Residential Conversions](#)** | During this interview, Callan specialists Aaron Quach and Christine Mays of Callan's Real Assets Consulting Group discuss office-to-residential conversions.

**[Webinar: Callan's Retirement Conundrum](#)** | During this discussion, representatives from Callan and October Three (a human resource and actuarial consulting firm) discuss how a small provision in SECURE 2.0 has paved the way for cash-balance pension plans to meet retirement income needs.

## Blog Highlights

**[How Your Public DB Plan's Returns Compare](#)** | This 3Q23 update to our quarterly series of blog posts provides context for public defined benefit (DB) plans about their returns over time.

**[ILS on Pace for Banner Year in 2023](#)** | When reviewing hedge fund portfolios, those investing in insurance-linked securities (ILS) are finding that this oft-overlooked strategy is buoying performance.

## Quarterly Updates

**[Private Equity Update, 3Q23](#)** | A high-level summary of private equity activity in the quarter through all the investment stages

**[Active vs. Passive Charts, 3Q23](#)** | A comparison of active managers alongside relevant benchmarks over the long term

**[Market Pulse, 3Q23](#)** | A quarterly market reference guide covering trends in the U.S. economy, developments for institutional investors, and the latest data on the capital markets

**[Capital Markets Review, 3Q23](#)** | Analysis and a broad overview of the economy and public and private markets activity each quarter across a wide range of asset classes

**[Hedge Fund Update, 3Q23](#)** | Commentary on developments for hedge funds and multi-asset class (MAC) strategies

**[Real Assets Update, 3Q23](#)** | A summary of market activity for real assets and private real estate during the quarter

**[Private Credit Update, 3Q23](#)** | A review of performance and fundraising activity for private credit during the quarter

**[Callan Target Date Index™, 3Q23](#)** | Tracks the performance and asset allocation of available target date mutual funds and CITs

**[Callan DC Index™, 3Q23](#)** | Provides underlying fund performance, asset allocation, and cash flows of more than 100 large defined contribution plans representing approximately \$400 billion in assets

## Events

---

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

*Please mark your calendar and look forward to upcoming invitations:*

### 2024 National Conference

April 8-10, 2024 – San Francisco

### June Regional Workshops

June 25, 2024 – Atlanta

June 27, 2024 – San Francisco

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

## Education: By the Numbers

---

50+

Unique pieces of research the Institute generates each year

525

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

4,845

Total attendees of the "Callan College" since 1994

---

## Education

---

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

### Alternative Investments

Feb. 21-22, 2024 – Virtual

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

### Introduction to Investments

March 19-21, 2024 – Virtual

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

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

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



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

Greg Allen, CEO and Chief Research Officer



## List of Callan's Investment Manager Clients

Confidential – For Callan Client Use Only

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

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

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

### Manager Name

abrdn  
 ABS Global Investments  
 Acadian Asset Management LLC  
 Adams Street Partners, LLC  
 Aegon Asset Management  
 AEW Capital Management, L.P.  
 AllianceBernstein  
 Allspring Global Investments, LLC  
 Altrinsic Global Advisors, LLC  
 American Century Investments  
 Amundi US, Inc.  
 Antares Capital LP  
 Apollo Global Management, Inc.  
 AQR Capital Management  
 Ares Management LLC  
 Ariel Investments, LLC  
 Aristotle Capital Management, LLC  
 Atlanta Capital Management Co., LLC

### Manager Name

AXA Investment Managers  
 Baillie Gifford International, LLC  
 Baird Advisors  
 Barings LLC  
 Baron Capital Management, Inc.  
 Barrow, Hanley, Mewhinney & Strauss, LLC  
 Belle Haven Investments L.P.  
 BentallGreenOak  
 Beutel, Goodman & Company Ltd.  
 BlackRock  
 Blackstone Group (The)  
 Blue Owl Capital, Inc.  
 BNY Mellon Asset Management  
 Boston Partners  
 Brandes Investment Partners, L.P.  
 Brandywine Global Investment Management, LLC  
 Brookfield Asset Management Inc.  
 Brown Brothers Harriman & Company

**Manager Name**

Brown Investment Advisory &amp; Trust Company

Capital Group

CastleArk Management, LLC

CIBC Asset Management Inc.

ClearBridge Investments, LLC

Cohen &amp; Steers Capital Management, Inc.

Columbia Threadneedle Investments NA

Comvest Partners

Covenant Capital Group

CQS

Credit Suisse Asset Management, LLC

D.E. Shaw Investment Management, LLC

DePrince, Race &amp; Zollo, Inc.

Diamond Hill Capital Management, Inc.

Dimensional Fund Advisors L.P.

Doubleline

DWS

EARNEST Partners, LLC

Fayez Sarofim &amp; Company

Federated Hermes, Inc.

Fidelity Institutional Asset Management

Fiera Capital Corporation

First Eagle Investment Management, LLC

First Hawaiian Bank Wealth Management Division

First Sentier Investors

Fisher Investments

Franklin Templeton

Fred Alger Management, LLC

GAM (USA) Inc.

GlobeFlex Capital, L.P.

GoldenTree Asset Management, LP

Goldman Sachs

Golub Capital

Guggenheim Investments

GW&amp;K Investment Management

Harbor Capital Advisors

Harding Loevner LP

Hardman Johnston Global Advisors LLC

Heitman LLC

Hotchkis &amp; Wiley Capital Management, LLC

**Manager Name**

Impax Asset Management LLC

Income Research + Management

Insight Investment

Intech Investment Management LLC

Intercontinental Real Estate Corporation

Invesco

J.P. Morgan

Janus

Jennison Associates LLC

Jobs Peak Advisors

KeyCorp

Kohlberg Kravis Roberts &amp; Co. L.P. (KKR)

Lazard Asset Management

LGIM America

Lincoln National Corporation

Longview Partners

Loomis, Sayles &amp; Company, L.P.

Lord, Abbett &amp; Company

LSV Asset Management

MackKay Shields LLC

Macquarie Asset Management (MAM)

Manulife Investment Management

Marathon Asset Management, L.P.

MetLife Investment Management

MFS Investment Management

MidFirst Bank

Mondrian Investment Partners Limited

Montag &amp; Caldwell, LLC

Morgan Stanley Investment Management

MUFG Union Bank, N.A.

Natixis Investment Managers

Neuberger Berman

Newton Investment Management

Northern Trust Asset Management

Nuveen

Oaktree Capital Management, L.P.

P/E Investments

Pacific Investment Management Company

Pantheon Ventures

Parametric Portfolio Associates LLC

**Manager Name**

Partners Group (USA) Inc.

Pathway Capital Management, LP

PFM Asset Management LLC

PGIM DC Solutions

PGIM Fixed Income

PGIM Quantitative Solutions LLC

Pictet Asset Management

PineBridge Investments

Polen Capital Management, LLC

Pretium Partners, LLC

Principal Asset Management

Putnam Investments, LLC

Raymond James Investment Management

RBC Global Asset Management

Regions Financial Corporation

Robeco Institutional Asset Management, US Inc.

Rockpoint

S&amp;P Dow Jones Indices

Sands Capital Management

Schroder Investment Management North America Inc.

Segall Bryant &amp; Hamill

SLC Management

Smith Graham &amp; Co. Investment Advisors, L.P.

State Street Global Advisors

**Manager Name**

Strategic Global Advisors, LLC

T. Rowe Price Associates, Inc.

TD Global Investment Solutions – TD Epoch

The Carlyle Group

The TCW Group, Inc.

Thompson, Siegel &amp; Walmsley LLC

Top Tier Capital Partners

Tri-Star Trust Bank

Turning Rock Partners, L.P.

UBS Asset Management

VanEck

Versus Capital Group

Victory Capital Management Inc.

Virtus Investment Partners, Inc.

Vontobel Asset Management

Voya

Walter Scott &amp; Partners Limited

WCM Investment Management

Wellington Management Company, LLP

Western Asset Management Company LLC

Westfield Capital Management Company, LP

William Blair &amp; Company LLC

Xponance, Inc.

## Important Disclosures

Information contained in this document may include confidential, trade secret and/or proprietary information of Callan and the client. It is incumbent upon the user to maintain such information in strict confidence. Neither this document nor any specific information contained herein is to be used other than by the intended recipient for its intended purpose.

The content of this document is particular to the client and should not be relied upon by any other individual or entity. There can be no assurance that the performance of any account or investment will be comparable to the performance information presented in this document.

Certain information herein has been compiled by Callan from a variety of sources believed to be reliable but for which Callan has not necessarily verified for accuracy or completeness. Information contained herein may not be current. Callan has no obligation to bring current the information contained herein.

Callan's performance measurement service reports returns for a portfolio and compares them against relevant benchmarks and peer groups, as appropriate; such service may also report on historical portfolio holdings, comparing them to holdings of relevant benchmarks and peer groups, as appropriate ("portfolio holdings analysis"). To the extent that Callan's performance measurement service includes portfolio holdings analysis, Callan relies entirely on holdings data provided by third parties including custodian banks, record keepers and investment managers. Callan reports the performance and holdings data as received and does not attempt to audit or verify the holdings data. Callan is not responsible for the accuracy or completeness of the performance or holdings data received from third parties and such data may not have been verified for accuracy or completeness. Callan does not perform forward-looking risk analysis or guideline compliance analysis based on the performance or portfolio holdings data.

In no event should performance measurement service provided by Callan be used in the calculation, deliberation, policy determination, or any other action of the client as it pertains to determining contribution or funding amounts, timing or activity, benefit payments or distribution amounts, timing or activity, or performance-based fee amounts, timing or activity.

The content of this document may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact. The opinions expressed herein may change based upon changes in economic, market, financial and political conditions and other factors. Callan has no obligation to bring current the opinions expressed herein.

The information contained herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties. Actual results may vary, perhaps materially, from the future results projected in this document. Undue reliance should not be placed on forward-looking statements.

Callan is not responsible for reviewing the risks of individual securities or the compliance/non-compliance of individual security holdings with a client's investment policy guidelines.

This document should not be construed as legal or tax advice on any matter. You should consult with legal and tax advisers before applying any of this information to your particular situation.

Reference to, or inclusion in this document of, any product, service or entity should not necessarily be construed as recommendation, approval, or endorsement or such product, service or entity by Callan. This document is provided in connection with Callan's consulting services and should not be viewed as an advertisement of Callan, or of the strategies or products discussed or referenced herein.

The issues considered and risks highlighted herein are not comprehensive and other risks may exist that the user of this document may deem material regarding the enclosed information. Please see any applicable full performance report or annual communication for other important disclosures.

Unless Callan has been specifically engaged to do so, Callan does not conduct background checks or in-depth due diligence of the operations of any investment manager search candidate or investment vehicle, as may be typically performed in an operational due diligence evaluation assignment and in no event does Callan conduct due diligence beyond what is described in its report to the client.

Any decision made on the basis of this document is sole responsibility of the client, as the intended recipient, and it is incumbent upon the client to make an independent determination of the suitability and consequences of such a decision.

Callan undertakes no obligation to update the information contained herein except as specifically requested by the client.

Past performance is no guarantee of future results.



# Callan

February 2024



## **Colorado Public School Fund Investment Board**

Fourth Quarter 2023

---

**Janet Becker-Wold, CFA**  
Senior Vice President

**Alexander Browning**  
Senior Vice President

Callan

---

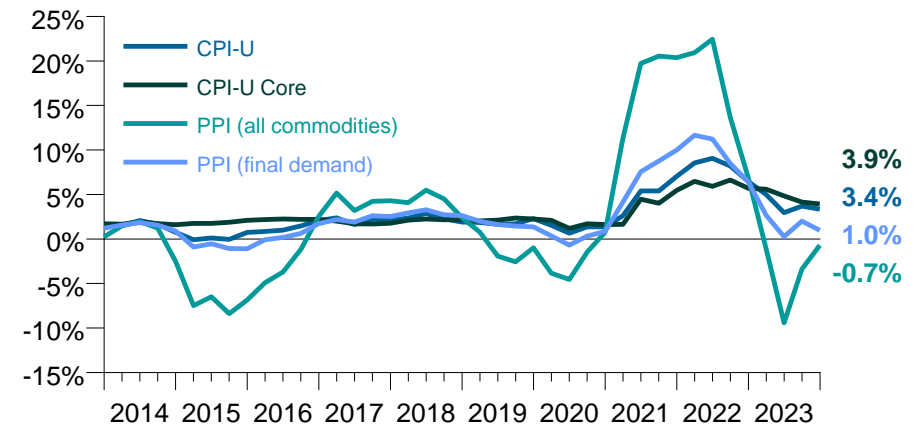
**Economic and Market Update**

# U.S. Economy—Summary

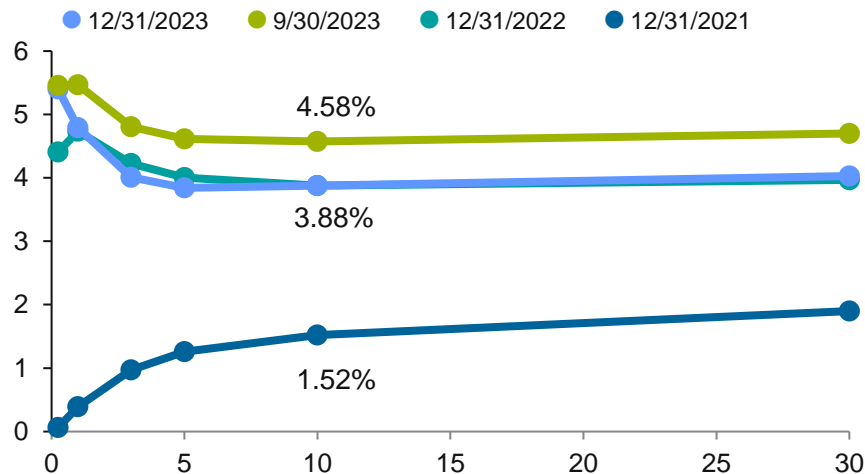
For periods ended 12/31/23

- The advance estimate of U.S. real GDP grew 3.3% in the fourth quarter. In the third quarter, real GDP rose at an annualized rate of 4.9%.
- CPI rose 3.4% year-over-year in December, while core CPI (ex food and energy) rose 3.9% over the same period. January CPI rose 3.1% (core: 3.7%).
- The Fed held short-term rates steady at the November, December and January 2024 FOMC meetings. Current target range remains 5.25-5.50%.
- The unemployment rate was unchanged at 3.7% in December. In January, employers added a higher than consensus 353,000 jobs and the unemployment rate remained at 3.7%.

Inflation Year-Over-Year

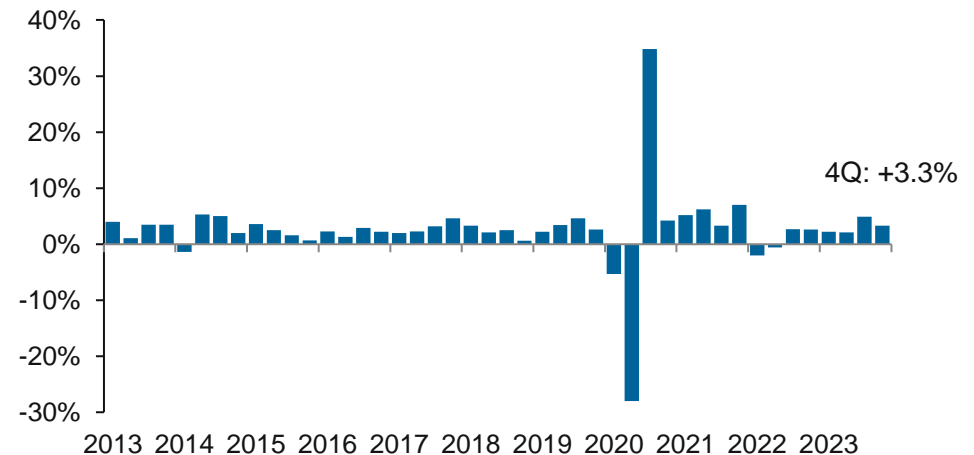


U.S. Treasury Yield Curves



Sources: Bloomberg, Bureau of Labor Statistics, Callan

Quarterly Real GDP Growth



## Public Markets Surge in 4Q, Following Decline in 3Q

Stocks have recovered losses of 2022, bonds still have ground to make up

### S&P 500 soared 11.7% in 4Q23

- The loss through first three quarters of 2022 was 23.9%; the rebound in the following five quarters brought the index back to a positive return of 1.7% over the past two years.

### Fixed income recovered in 4Q, up 6.8% after a sharp loss of 3.2% in 3Q

- The Bloomberg Aggregate was on track for another negative year through 3Q; softening Fed language on rates and a dot plot that showed cuts on the horizon in 4Q turned the market around.

### Economic data defied expectations of recession in 2023

- GDP growth came in at 2.1% in 1Q, 2.2% in 2Q, and jumped to a stunning 4.9% in 3Q (annualized rates). The “advance” estimate of 4Q growth is 3.3%.
- Job market remains solid, providing support to Fed efforts to fight inflation.

Returns for Periods ended 12/31/23

	Quarter	1 Year	2 Years	5 Years	10 Years	25 Years
<b>U.S. Equity</b>						
Russell 3000	12.07	25.96	0.88	15.16	11.48	7.74
S&P 500	11.69	26.29	1.69	15.69	12.03	7.56
Russell 2000	14.03	16.93	-3.55	9.97	7.16	7.91
<b>Global ex-U.S. Equity</b>						
MSCI World ex USA	10.51	17.94	0.54	8.45	4.32	4.62
MSCI Emerging Markets	7.86	9.83	-6.32	3.69	2.66	--
MSCI ACWI ex USA Small Cap	10.12	15.66	-3.79	7.89	4.88	7.28
<b>Fixed Income</b>						
Bloomberg Aggregate	6.82	5.53	-4.19	1.10	1.81	3.85
90-day T-Bill	1.37	5.01	3.22	1.88	1.25	1.90
Bloomberg Long Gov/Credit	13.24	7.13	-11.62	1.12	3.22	5.21
Bloomberg Global Agg ex-US	9.21	5.72	-7.29	-1.56	-0.79	2.25
<b>Real Estate</b>						
NCREIF Property*	-1.37	-8.39	3.12	5.26	7.40	8.31
FTSE Nareit Equity	16.22	13.73	-7.25	7.39	7.65	9.27
<b>Alternatives</b>						
HFRI Fund Weighted	3.59	7.52	1.52	7.00	4.53	6.30
Cambridge Private Equity*	1.60	2.78	3.19	15.18	14.78	13.61
Bloomberg Commodity	-4.63	-7.91	3.40	7.23	-1.11	2.83
Gold Spot Price	11.02	13.45	6.44	10.09	5.59	8.19
<b>Inflation - CPI-U</b>	-0.34	3.35	4.89	4.07	2.79	2.54

\*Cambridge PE data as of 6/30/23; NCREIF Property data as of 9/30/23

Sources: Bloomberg, Callan, Cambridge, FTSE Russell, HFRI, MSCI, NCREIF, S&P Dow Jones Indices

# U.S. Equity Performance: 4Q23

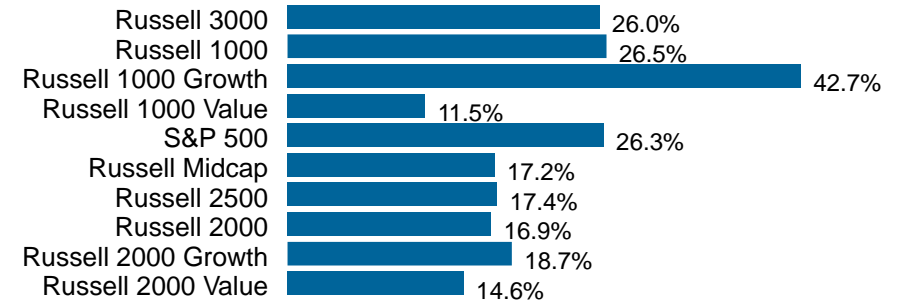
The U.S. equity market rallied in 4Q, closing the year near record highs

- U.S. equity markets rebounded in the last two months of the year as the impact of possible rate cuts in 2024 started to get priced in.
- 2023 saw the narrowest breadth of leadership (“the Magnificent Seven”) since 1987 with just 27% of stocks outperforming the S&P 500. Historically, such concentrated leadership has not been the sign of a healthy market. However, gains started broadening out in the last two months of the year with the equal-weighted S&P index outperforming the capitalization-weighted version.
- Smaller cap stocks outperformed their large cap counterparts in 4Q23, further proof of the broadening out of returns; for the full year, large cap stocks outperformed small cap stocks by almost 10 percentage points.
- Growth vs. value performance was mixed across market capitalization during the quarter. Within large cap, growth outperformed value, while the opposite was true within small cap.

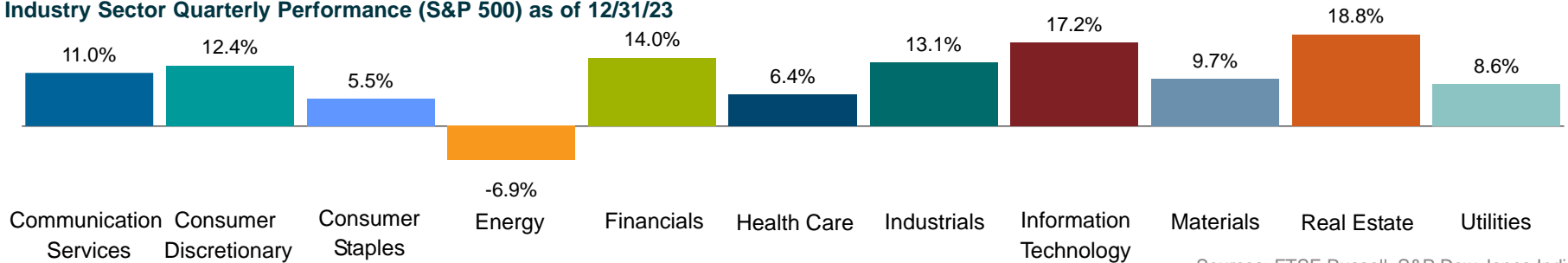
## U.S. Equity: Quarter Ended 12/31/23



## U.S. Equity: One Year Ended 12/31/23



## Industry Sector Quarterly Performance (S&P 500) as of 12/31/23



Sources: FTSE Russell, S&P Dow Jones Indices

# Global/Global ex-U.S. Equity Performance: 4Q23

Dovish central banks drove market higher

## Most global markets in the black for 4Q

### Broad market

- Dovish signaling from central banks and dropping yields led to a broad market rally in 4Q.
- Global ex-U.S. small caps reclaimed some of their lagging performance in 4Q but ended the year as the worst-performing broad-based index, albeit up over 12%. Elevated borrowing costs and the persistent risk of a recession have kept investors away.
- Japan's low rates have benefited exporters, and the threat of being delisted spurred a stock buy-back spree. Coupled with an increased focus on governance, this spurred Japan to a multi-decade high.

### Emerging markets

- Emerging markets underperformed developed markets.
- India's rally couldn't overcome China's weakness, whose economic growth was near the government's target, but investor concerns around stimulus and a surprisingly sluggish reopening drove stocks lower.

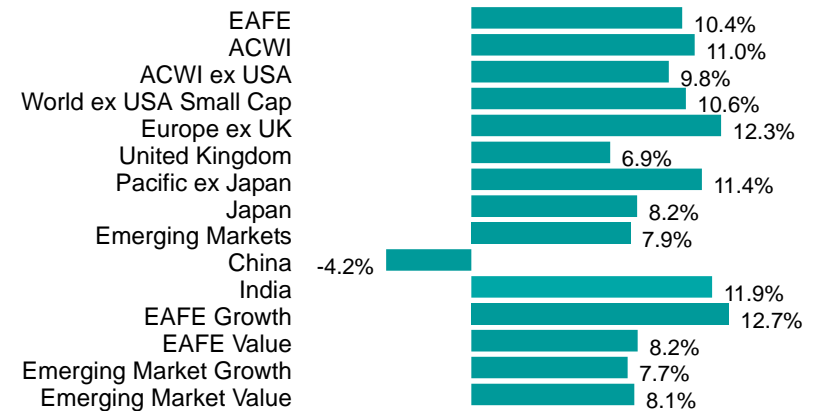
### Growth vs. value

- Energy, a volatile area in the market, pulled back value's rally after having a strong 3Q. Global ex-U.S. growth rallied on lowering yields but couldn't overcome earlier underperformance and ended the year behind its value peers in both emerging and developed markets.

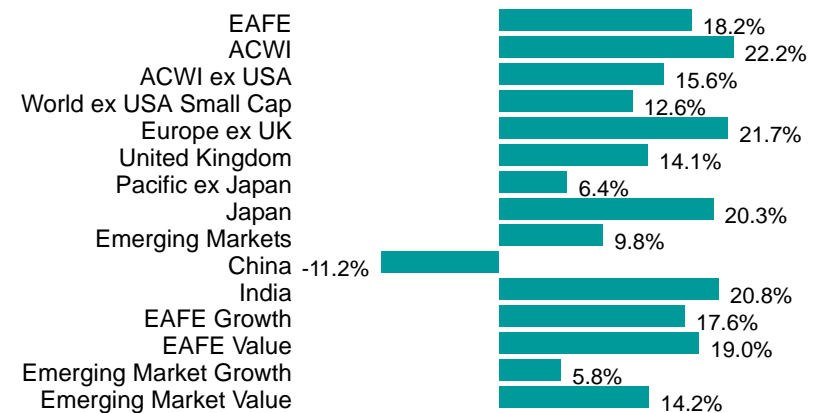
### U.S. dollar vs. other currencies

- The U.S. dollar weakened in 4Q as investors believed that U.S. interest rates would fall faster than much of the developed world.

Global Equity Returns: Quarter Ended 12/31/23



Global Equity Returns: One Year Ended 12/31/23



Source: MSCI

# U.S. Fixed Income Performance: 4Q23

Bonds bounce back at year-end; U.S. Treasury yield has volatile 2023

## Strong returns at end of year

- Driven by falling rates and strong risk-on sentiment, the Agg returned 6.8%, the highest quarterly return since 2Q89 (when the 90-day T-bill was over 8% and inflation hit 14% earlier in the decade)!
- 10-year U.S. Treasury yield closed the year at 3.88%.
  - A round trip from 12/2022, masking significant volatility during the year
  - High was 4.98% in October and low was 3.30% in April
- Corporates and mortgages outperformed Treasuries for the quarter and year.
- High yield corporates soared as defaults remained low, economy resilient.

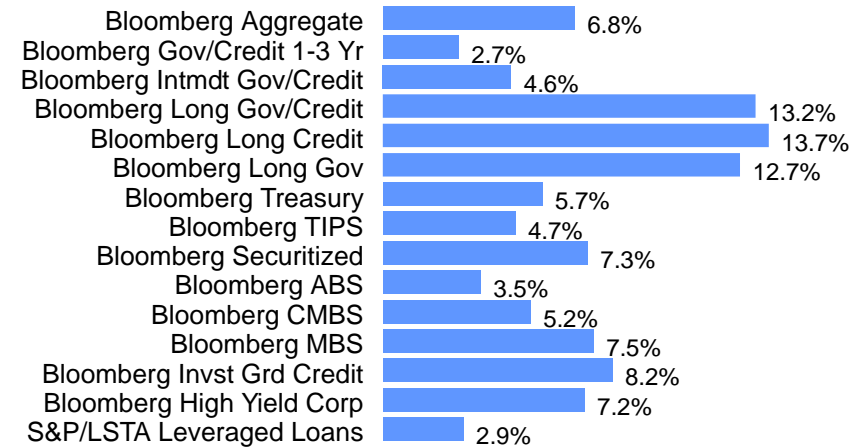
## U.S. Treasury yield curve remained inverted, but less so

- 106 bps as of 6/30; 44 bps as of 9/30; 35 bps as of 12/31

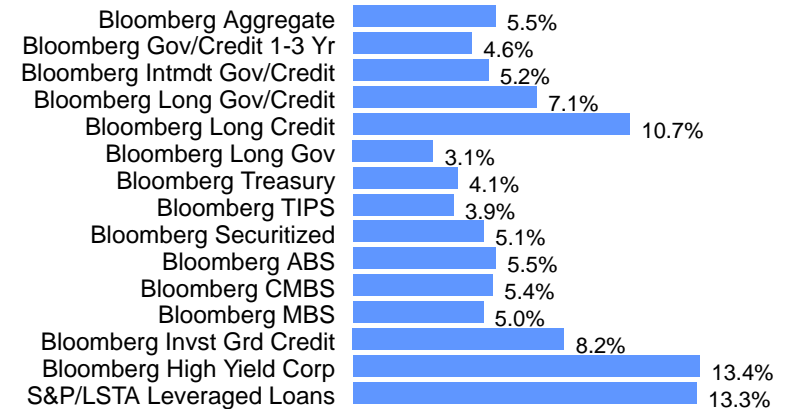
## Fed kept Fed Funds rate on hold and softened language

- Pivoted from “higher for longer” to projected rate cuts in 2024
- Inflation over past six months below Fed’s 2% target
  - Core PCE Price Index was 1.9% annualized in November
- Markets expect six rate cuts in 2024 versus three in the Fed’s Summary of Economic Projections

## U.S. Fixed Income Returns: Quarter Ended 12/31/23



## U.S. Fixed Income Returns: One Year Ended 12/31/23



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

---

## Recent Activity and Plan Performance



---

## Quarterly Total Fund Highlights

As of December 31, 2023

---

**CO PSPF ended the quarter with \$1.5 billion in assets, up \$150.0 million from Q3 2023 after income, distributions and net new investments.**

- Net investment gains were \$106.0 million while cash inflows were \$44.2 million during the quarter.

**The Total Fund gained 7.8% for the quarter and rose 11.3% for the trailing year. Ahead of the benchmark in both periods.**

**The Total Equity Composite surged 11.4% for the quarter and gained 22.1% for the year.**

- U.S. Equity outperformed International Equity for the quarter with returns of 12.2% and 10.2%, respectively. For the year, U.S. equity was up 26.2% while International Equity gained 16.1%.

**The Fixed Income Composite lagged its benchmark by 25 basis points with a return of 6.1%. For the year, the portfolio was up 5.8%, ahead of the benchmark by 37 basis points.**

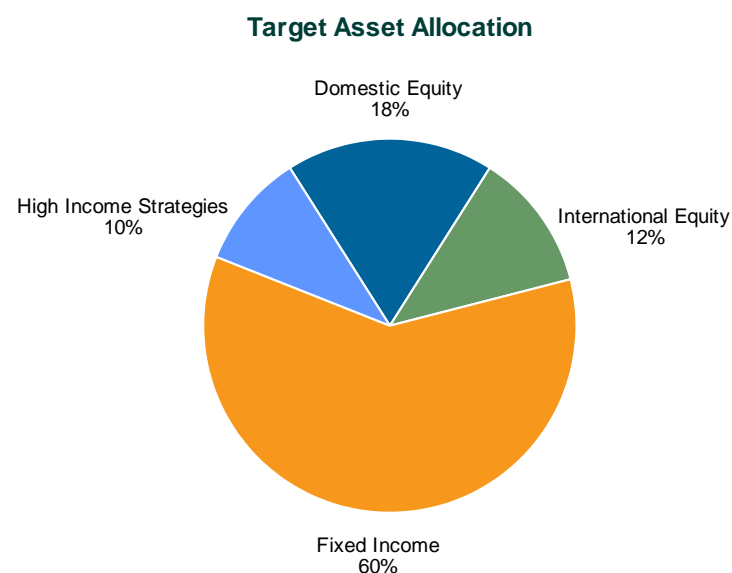
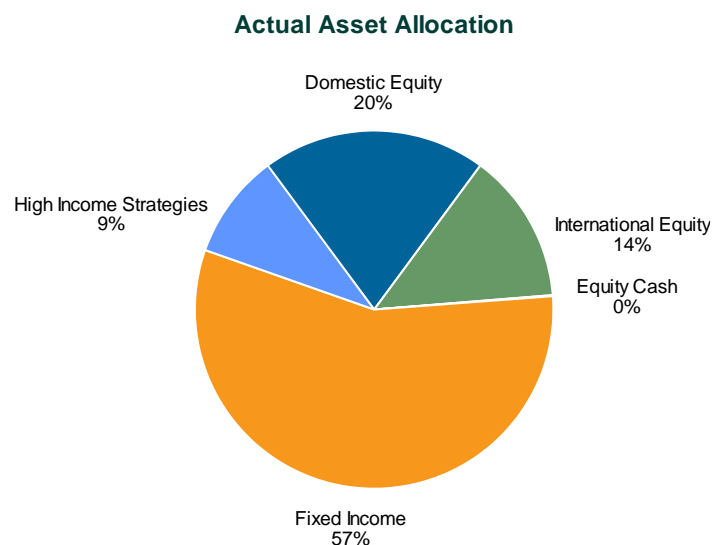
- The Market Duration bond portfolio trailed its benchmark by 33 basis points with a return of 6.5% in the quarter. The portfolio rose 5.8% for the year.
- The JanusHenderson Short Duration bond portfolio exceeded its benchmark by 56 basis points with a return of 3.3%. The portfolio gained 6.0% for the year.

**The High Income Strategies Composite trailed its benchmark for the quarter by 92 basis points with a return of 6.1%. For the year, the Composite surged 11.4%, 1.4% behind the benchmark.**

- The MacKay Shields' high yield bond portfolio rose 6.2% and 12.1% for the quarter and year, respectively.
- The Principal Spectrum preferred securities portfolio returned 5.7% and 7.4% for the quarter and year, respectively, lagging its benchmark in both periods.

# Total Fund Asset Allocation

December 31, 2023



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Domestic Equity	304,162	20.3%	18.0%	2.3%	34,470
International Equity	203,446	13.6%	12.0%	1.6%	23,651
Equity Cash	1,321	0.1%	0.0%	0.1%	1,321
Fixed Income	847,714	56.6%	60.0%	(3.4%)	(51,259)
High Income Strategies	141,646	9.5%	10.0%	(0.5%)	(8,183)
Total	1,498,289	100.0%	100.0%		

# Asset Distribution

	December 31, 2023			September 30, 2023		
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
<b>Total Equity (1)</b>	<b>\$508,057,742</b>	<b>33.91%</b>	<b>\$14,290,282</b>	<b>\$50,748,086</b>	<b>\$443,019,374</b>	<b>32.86%</b>
<b>Domestic Equity</b>	<b>\$304,162,159</b>	<b>20.30%</b>	<b>\$6,590,931</b>	<b>\$32,393,218</b>	<b>\$265,178,009</b>	<b>19.67%</b>
iShares S&P 1500 ETF	304,162,159	20.30%	6,590,931	32,393,218	265,178,009	19.67%
<b>International Equity</b>	<b>\$203,445,792</b>	<b>13.58%</b>	<b>\$7,944,855</b>	<b>\$18,345,777</b>	<b>\$177,155,160</b>	<b>13.14%</b>
iShares MSCI Emerging ETF	55,242,262	3.69%	2,679,817	4,143,332	48,419,113	3.59%
iShares MSCI Canada ETF	20,234,559	1.35%	650,349	1,988,399	17,595,811	1.31%
iShares Core MSCI EAFE ETF	127,968,972	8.54%	4,614,689	12,214,047	111,140,236	8.24%
Equity Cash	449,791	0.03%	(245,504)	9,091	686,204	0.05%
<b>Total Fixed Income</b>	<b>\$847,714,015</b>	<b>56.58%</b>	<b>\$25,973,751</b>	<b>\$47,205,417</b>	<b>\$774,534,847</b>	<b>57.46%</b>
<b>Market Duration</b>	<b>\$738,319,236</b>	<b>49.28%</b>	<b>\$24,809,917</b>	<b>\$43,786,447</b>	<b>\$669,722,872</b>	<b>49.68%</b>
Colorado Treasurer's Portfolio	738,319,236	49.28%	24,809,917	43,786,447	669,722,872	49.68%
<b>Short Duration</b>	<b>\$109,394,779</b>	<b>7.30%</b>	<b>\$1,163,834</b>	<b>\$3,418,970</b>	<b>\$104,811,975</b>	<b>7.78%</b>
Janus Henderson (2)	109,394,779	7.30%	1,163,834	3,418,970	104,811,975	7.78%
<b>High Income Strategies</b>	<b>\$141,646,216</b>	<b>9.45%</b>	<b>\$3,572,187</b>	<b>\$8,005,214</b>	<b>\$130,068,815</b>	<b>9.65%</b>
<b>High Yield Fixed Income</b>	<b>\$120,239,453</b>	<b>8.03%</b>	<b>\$1,983,791</b>	<b>\$6,943,370</b>	<b>\$111,312,291</b>	<b>8.26%</b>
Mackay Shield US High Yield (3)	120,239,453	8.03%	1,983,791	6,943,370	111,312,291	8.26%
<b>Preferred Securities</b>	<b>\$21,406,763</b>	<b>1.43%</b>	<b>\$1,588,396</b>	<b>\$1,061,843</b>	<b>\$18,756,524</b>	<b>1.39%</b>
Principal Preferred Securities (3)	21,406,763	1.43%	1,588,396	1,061,843	18,756,524	1.39%
<b>Cash Available For Investing</b>	<b>\$871,195</b>	<b>0.06%</b>	<b>\$369,787</b>	<b>\$85,398</b>	<b>\$416,010</b>	<b>0.03%</b>
<b>Total Fund</b>	<b>\$1,498,289,168</b>	<b>100.0%</b>	<b>\$44,206,007</b>	<b>\$106,044,115</b>	<b>\$1,348,039,046</b>	<b>100.0%</b>

The Fund ended the quarter at \$1.5 billion, a net increase of \$150.0 million from the third quarter.

There were net new investments of \$44.2 million and \$106.0 million in investment gains.

(1) Funded in December 2017.

(2) Funded in November 2018.

(3) Funded in July 2020.

# Manager & Composite Cumulative Returns

As of December 31, 2023

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>Total Equity</b>	<b>11.41%</b>	<b>22.08%</b>	<b>5.97%</b>	<b>12.01%</b>	-
60% Russell 3000/40% ACWI ex US	11.14%	21.77%	5.77%	11.93%	8.43%
<b>Domestic Equity</b>	<b>12.23%</b>	<b>26.15%</b>	<b>8.55%</b>	<b>15.09%</b>	-
Russell 3000 Index	12.07%	25.96%	8.54%	15.16%	11.48%
<b>International Equity</b>	<b>10.21%</b>	<b>16.05%</b>	<b>1.97%</b>	<b>7.43%</b>	-
MSCI ACWI ex US	9.75%	15.62%	1.55%	7.08%	3.83%
<b>Total Fixed Income</b>	<b>6.05%</b>	<b>5.80%</b>	<b>(2.76%)</b>	<b>1.32%</b>	<b>2.18%</b>
Total Fixed Income Benchmark (1)	6.30%	5.43%	(2.90%)	1.20%	1.60%
<b>Market Duration</b>	<b>6.49%</b>	<b>5.77%</b>	<b>(3.28%)</b>	<b>1.10%</b>	<b>2.09%</b>
Colorado Treasurer's Portfolio (2)	6.49%	5.77%	(3.28%)	1.10%	2.09%
PSPF Custom Benchmark (3)	6.82%	5.53%	(3.31%)	1.10%	1.55%
<b>Short Duration</b>	<b>3.25%</b>	<b>6.03%</b>	<b>0.84%</b>	<b>2.37%</b>	-
Janus Henderson Short Duration	3.25%	6.03%	0.84%	2.37%	-
Bmbg Gov/Cred 1-3 Yr	2.69%	4.61%	0.09%	1.51%	1.27%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.89%	5.24%	0.51%	1.98%	1.67%
<b>High Income Strategies</b>	<b>6.14%</b>	<b>11.41%</b>	<b>2.65%</b>	-	-
High Income Strategies Benchmark (5)	7.06%	12.82%	1.50%	5.20%	4.63%
<b>High Yield Fixed Income</b>	<b>6.23%</b>	<b>12.13%</b>	<b>3.09%</b>	-	-
Mackay Shield US High Yield	6.23%	12.13%	3.09%	-	-
Bmbg High Yield	7.16%	13.44%	1.98%	5.37%	4.60%
<b>Preferred Securities</b>	<b>5.66%</b>	<b>7.36%</b>	<b>0.14%</b>	-	-
Principal Preferred Securities	5.66%	7.36%	0.14%	-	-
ICE BofA US All Cap Secs	6.46%	9.29%	(1.27%)	4.17%	4.73%
<b>Total Fund w/o CAI (6)</b>	<b>7.84%</b>	<b>11.32%</b>	<b>0.10%</b>	<b>4.19%</b>	<b>3.37%</b>
Total Fund Benchmark (6)	7.83%	10.93%	(0.22%)	4.17%	2.91%

Performance footnotes are detailed on page 23.

# Manager & Composite Fiscal Year Returns

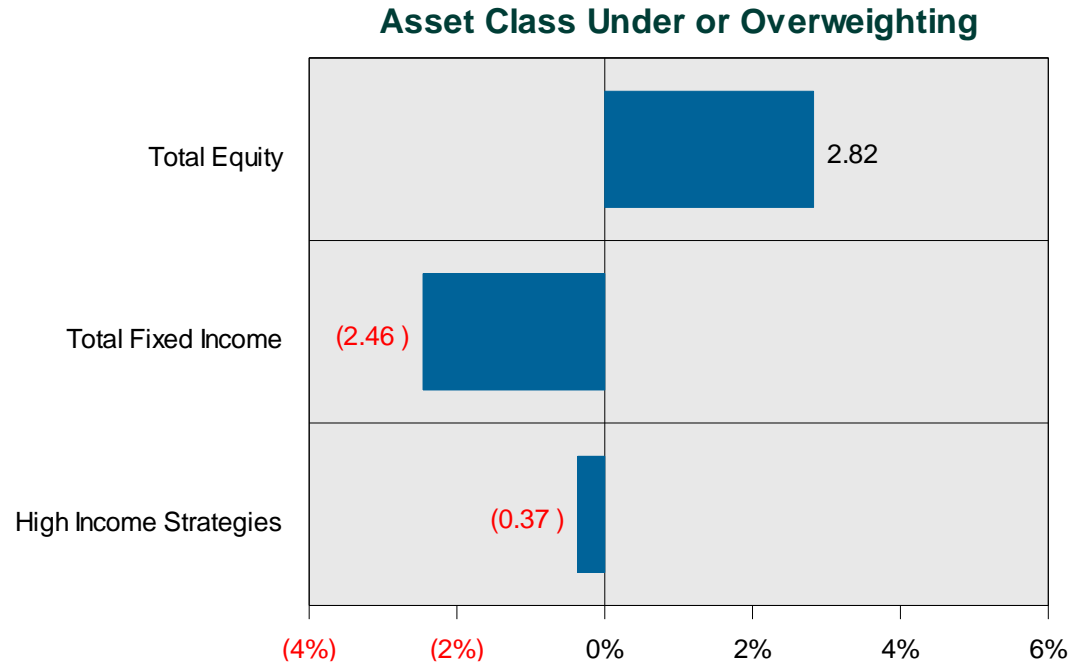
As of December 31, 2023

	6/2023- 12/2023	FY 2023	FY 2022	FY 2021	FY 2020
<b>Total Equity</b>	<b>7.33%</b>	<b>16.33%</b>	<b>(15.85%)</b>	<b>41.59%</b>	<b>1.82%</b>
60% Russell 3000/40% ACWI ex US	7.30%	16.57%	(16.06%)	40.77%	1.90%
<b>Domestic Equity</b>	<b>8.56%</b>	<b>18.83%</b>	<b>(13.95%)</b>	<b>44.30%</b>	<b>6.40%</b>
Russell 3000 Index	8.43%	18.95%	(13.87%)	44.16%	6.53%
<b>International Equity</b>	<b>5.50%</b>	<b>12.28%</b>	<b>(18.97%)</b>	<b>37.78%</b>	<b>(4.71%)</b>
MSCI ACWI ex US	5.61%	12.72%	(19.42%)	35.72%	(4.80%)
<b>Total Fixed Income</b>	<b>3.38%</b>	<b>(0.04%)</b>	<b>(9.76%)</b>	<b>(0.27%)</b>	<b>8.79%</b>
Total Fixed Income Benchmark (1)	3.39%	(0.75%)	(9.46%)	(0.26%)	8.28%
<b>Market Duration</b>	<b>3.33%</b>	<b>(0.53%)</b>	<b>(10.55%)</b>	<b>(0.55%)</b>	<b>9.26%</b>
Colorado Treasurer's Portfolio (2)	3.33%	(0.53%)	(10.55%)	(0.55%)	9.26%
PSPF Custom Benchmark (3)	3.37%	(0.94%)	(10.29%)	(0.33%)	8.74%
<b>Short Duration</b>	<b>3.70%</b>	<b>2.92%</b>	<b>(4.33%)</b>	<b>2.33%</b>	<b>4.41%</b>
Janus Henderson Short Duration	3.70%	2.92%	(4.33%)	2.33%	4.41%
Blmbg Gov/Cred 1-3 Yr	3.44%	0.52%	(3.56%)	0.44%	4.20%
85% 1-3YR G/C; 15% 1-3YR BB (4)	3.69%	1.49%	(3.83%)	1.70%	3.94%
<b>High Income Strategies</b>	<b>6.70%</b>	<b>8.18%</b>	<b>(9.38%)</b>	-	-
High Income Strategies Benchmark (5)	7.44%	7.93%	(12.89%)	15.13%	0.46%
<b>High Yield Fixed Income</b>	<b>6.64%</b>	<b>9.23%</b>	<b>(9.09%)</b>	-	-
Mackay Shield US High Yield	6.64%	9.23%	(9.09%)	-	-
Blmbg High Yield	7.66%	9.06%	(12.81%)	15.37%	0.03%
<b>Preferred Securities</b>	<b>7.10%</b>	<b>2.29%</b>	<b>(11.11%)</b>	-	-
Principal Preferred Securities	7.10%	2.29%	(11.11%)	-	-
ICE BofA US All Cap Secs	6.25%	1.66%	(13.33%)	13.67%	2.86%
<b>Total Fund w/o CAI (6)</b>	<b>5.02%</b>	<b>5.66%</b>	<b>(11.58%)</b>	<b>8.30%</b>	<b>7.37%</b>
Total Fund Benchmark (6)	4.98%	5.18%	(11.64%)	7.98%	7.87%

Performance footnotes are detailed on page 23.

# One Quarter Performance Attribution

December 31, 2023



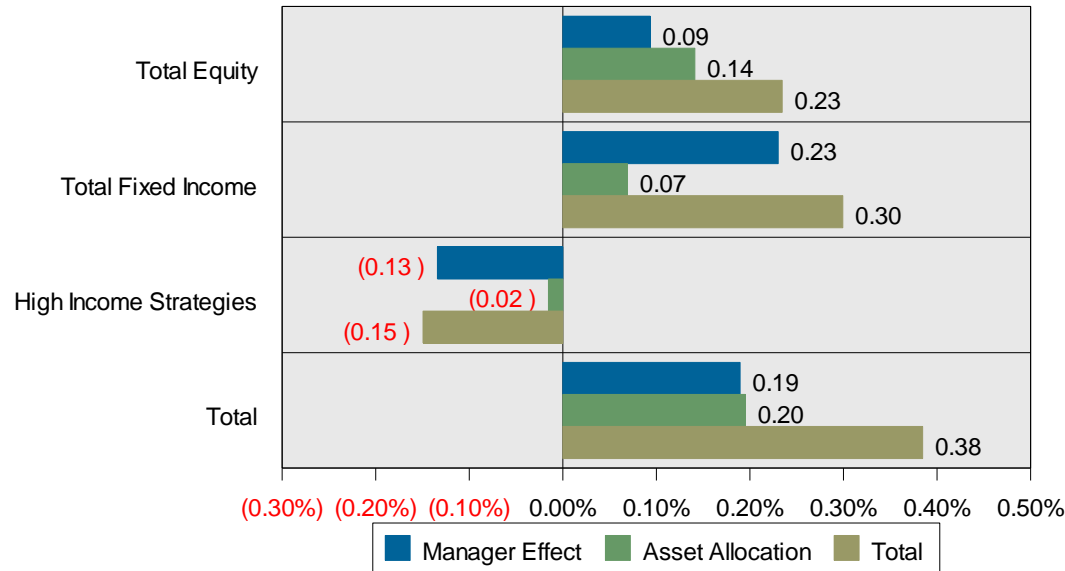
## Relative Attribution Effects for Quarter ended December 31, 2023

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	33%	30%	11.41%	11.14%	0.09%	0.10%	0.19%
Total Fixed Income	58%	60%	6.05%	6.30%	(0.14%)	0.04%	(0.10%)
High Income Strategies	10%	10%	6.14%	7.06%	(0.09%)	0.00%	(0.09%)
<b>Total</b>			<b>7.84%</b>	<b>= 7.83%</b>	<b>+ (0.14%)</b>	<b>+ 0.15%</b>	<b>0.00%</b>

# One Year Performance Attribution

As of December 31, 2023

## One Year Relative Attribution Effects



## One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	32%	30%	22.08%	21.77%	0.09%	0.14%	0.23%
Total Fixed Income	59%	60%	5.80%	5.43%	0.23%	0.07%	0.30%
High Income Strategies	10%	10%	11.41%	12.82%	(0.13%)	(0.02%)	(0.15%)
<b>Total</b>			<b>11.32%</b>	<b>10.93%</b>	<b>+ 0.19%</b>	<b>+ 0.20%</b>	<b>0.38%</b>

---

## Performance Footnotes

---

- (1) Current quarter's Total Fixed Income Benchmark consists of 87.5% Bloomberg U.S. Aggregate and 12.5% Bloomberg Gov/Credit 1-3 Yrs.
  - (2) Includes cash returns starting July 2017.
  - (3) The PSPF Fixed Income Portfolio Custom Benchmark consisted of 37% U.S. Treasury 1-10 Year Index, 34% Mortgages 0-10 Year WAL Index, 19% AAA U.S. Agencies 1-10 Year Index and 10% U.S. Corporates AAA Rated 1-10 Years Index through March 31, 2017, 100% Bloomberg U.S. Aggregate, thereafter.
  - (4) Benchmark consists of 85% Bloomberg 1-3 Year Government/Credit Index and 15% BofAML 1-3 Year BB US Cash Pay High Yield Index.
  - (5) Benchmark consists of 85% Blmbg High Yield Index and 15% ICE BofA US All Cap Secs Index.
  - (6) Current quarter's Total Fund Benchmark consists of 18.0% Russell 3000, 12.0% MSCI ACWI ex US, 52.5% Bloomberg U.S. Aggregate, 7.5% Bloomberg Gov/Credit 1-3 Yrs, 8.5% Bloomberg US High Yield and 1.5% ICE BofA U.S. All Capital Securities Index.
- \*All composites and manager returns are shown gross-of-fees.



Callan

---

**Callan Update**

# Published Research Highlights from 4Q23

**2023 Nuclear  
Decommissioning Funding  
Study**



**2023 Investment  
Management Fee Study**



**2023 Asset Manager ESG  
Study**



**Callan's Retirement  
Conundrum Webinar**



## Recent Blog Posts

**ILS on Pace for  
Banner Year in  
2023**

Sean Lee

**Carbon-  
Footprinting  
Basics for  
Institutional  
Investors**

Amit Bansal

**Key Issues to  
Know for the  
Proposed  
Fiduciary Rule**

Jana Steele

## Additional Reading

*Alternatives Focus* quarterly newsletter

Active vs. Passive quarterly charts

*Capital Markets Review* quarterly newsletter

Monthly Updates to the Periodic Table

*Market Pulse Flipbook* quarterly markets update

*Real Estate Indicators* market outlook

# Callan Institute Events

## Upcoming conferences, workshops, and webinars

### Callan College

#### Intro to Investments—Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

- March 19-21, 2024 – Virtual Session via Zoom
- June 18-19, 2024 – In Person Session in Chicago

#### Intro to Alternatives

This course is for institutional investors, including trustees and staff members of public plans, corporate plans, and nonprofits. This session familiarizes trustees and staff with alternative investments like private equity, hedge funds, and real estate and how they can play a key role in any portfolio. You will learn about the importance of allocations to alternatives and how to consider integrating, evaluating, and monitoring them.

- February 21–22, 2024 – Virtual Session via Zoom

Please visit our website at [callan.com/events-education](https://callan.com/events-education) as we add dates to our 2024 calendar!

### Mark Your Calendar

#### 2024 National Conference

April 8–10, 2024 – San Francisco

#### 2024 Regional Workshops

June 25, 2024 – Atlanta

June 27, 2024 – San Francisco

October 22, 2024 – Denver

October 24, 2024 – Location TBD

*Watch your email for further details and an invitation.*

### Webinars & Research Café Sessions

#### Webinar: Capital Markets Assumptions

January 17, 2024 – Virtual Session via Zoom

#### Webinar: Market Intelligence

January 19, 2024 – Virtual Session via Zoom

#### Research Café: ESG Interview Series

March 12, 2024 – Virtual Session via Zoom

# 2024 National Conference

April 8–10, 2024 | San Francisco, California

## Speakers

### Ian Bremmer

President and Founder of Eurasia Group and  
GZERO Media

### Cassie Kozyrkov

CEO at Data Scientific, Founder of Decision  
Intelligence, AI Strategist

### Mark Zandi

Chief Economist of Moody's Analytics,  
Cofounder of Economy.com

### Tim Urban

Blog Creator, Wait, But Why

## Workshops

Callan's *2024 DC Trends Survey* Results  
The Value of Risk Assets Portfolio Diversification  
Callan's Fee Study Workshop  
Market Intel Live!



# Callan Updates

## Firm updates by the numbers, as of 12/31/23

### Total Associates: ~200

#### Ownership

- ▶ 100% employees
- ▶ ~70% of employees are equity owners
- ▶ ~55% of shareholders identify as women or minority

Total General and Investment Consultants: more than 55

Total Specialty and Research Consultants: more than 50

Total CFA/CAIA/FRMs: more than 55

Total Institutional Investor Clients: more than 475

Assets Under Advisement: more than \$4 trillion

### Atlanta Office Move

- ▶ In December, Callan's Atlanta office moved just a few miles from its previous location.

### Milestones

- ▶ Our Alternatives Consulting Group completed a 5-year strategic growth plan, and now has 26 research specialists.

**“[The investment consulting business] has become extremely complex... front-line consultants have to possess a greater deal of broad-based knowledge than ever before... it also means that we have more consultants and analysts with specialized areas of expertise to back them up.”**

— Ron Peyton, Executive Chairman, when asked what's changed since 1974, in *Pensions & Investments* 50<sup>th</sup> Anniversary Special Edition article, **“Minimizing risk over chasing returns: Insights from consulting veteran Ronald Peyton.”**



# Important Disclosures

Information contained in this document may include confidential, trade secret and/or proprietary information of Callan and the client. It is incumbent upon the user to maintain such information in strict confidence. Neither this document nor any specific information contained herein is to be used other than by the intended recipient for its intended purpose.

The content of this document is particular to the client and should not be relied upon by any other individual or entity. There can be no assurance that the performance of any account or investment will be comparable to the performance information presented in this document.

Certain information herein has been compiled by Callan from a variety of sources believed to be reliable but for which Callan has not necessarily verified for accuracy or completeness. Information contained herein may not be current. Callan has no obligation to bring current the information contained herein.

This content of this document may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact. The opinions expressed herein may change based upon changes in economic, market, financial and political conditions and other factors. Callan has no obligation to bring current the opinions expressed herein.

The statements made herein may include forward-looking statement regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties. Actual results may vary, perhaps materially, from the future results projected in this document. Undue reliance should not be placed on forward-looking statements.

Callan disclaims any responsibility for reviewing the risks of individual securities or the compliance/non-compliance of individual security holdings with a client's investment policy guidelines.

This document should not be construed as legal or tax advice on any matter. You should consult with legal and tax advisers before applying any of this information to your particular situation.

Reference to, or inclusion in this document of, any product, service or entity should not necessarily be construed as recommendation, approval, or endorsement or such product, service or entity by Callan.

This document is provided in connection with Callan's consulting services and should not be viewed as an advertisement of Callan, or of the strategies or products discussed or referenced herein.

The issues considered and risks highlighted herein are not comprehensive and other risks may exist that the user of this document may deem material regarding the enclosed information.

Any decision you make on the basis of this document is sole responsibility of the client, as the intended recipient, and it is incumbent upon you to make an independent determination of the suitability and consequences of such a decision.

Callan undertakes no obligation to update the information contained herein except as specifically requested by the client.

**Past performance is no guarantee of future results.**

February 2023



## **Colorado Public School Permanent Fund**

2023 Asset Allocation Update &  
Rebalancing Recommendation

---

**Janet Becker-Wold, CFA**  
Senior Vice President & Manager

**Alex Browning**  
Senior Vice President

---

# Summary of Important Changes for 2024 Capital Markets Assumptions

## 10 Year Geometric Return Differences

---

- Cash return increased 0.25%
- Inflation assumption remained the same at 2.50%
- Large Cap U.S. Equity increased 0.25% (from 7.25% to 7.50%)
- Small-Mid Cap U.S. Equity increased 0.25% (from 7.45% to 7.70%)
- Global ex-U.S. equity increased 0.20% (from 7.45% to 7.65%)
- Core U.S. fixed income increased 1.00% (from 4.25% to 5.25%)
- High Yield return projections increased by 0.55% (from 6.25% to 6.80%)



# 2024 Projected Risk and Returns

## Colorado Public School Permanent Fund (PSPF) Asset Classes

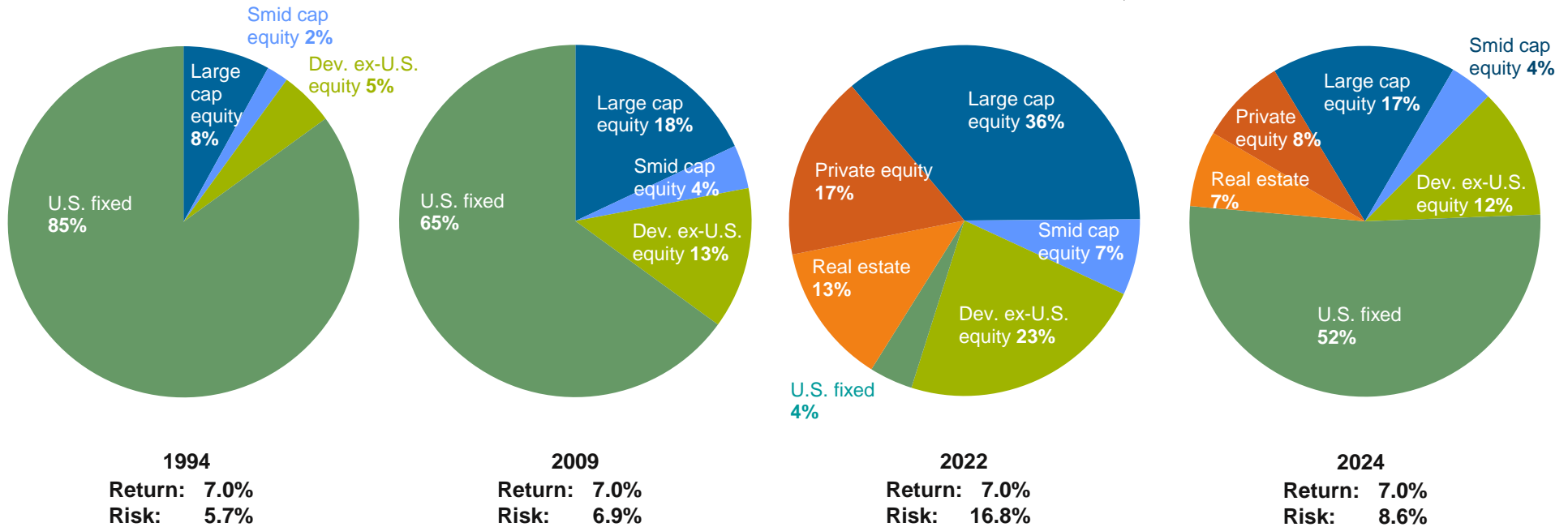
### Summary of Callan's Long-Term Capital Market Assumptions (2024 – 2033)

Asset Class	Index	Projected Return		Real	Projected Risk
		1-Year Arithmetic	10-Year Geometric*		Standard Deviation
<b>Equities</b>					
Large Cap U.S. Equity	S&P 500	8.70%	7.50%	5.00%	17.00%
Smid Cap U.S. Equity	Russell 2500	9.80%	7.70%	5.20%	22.00%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.65%	7.65%	5.15%	21.40%
Developed ex-U.S. Equity	MSCI World ex USA	9.25%	7.50%	5.00%	20.15%
Emerging Market Equity	MSCI Emerging Markets	10.65%	7.70%	5.20%	25.60%
<b>Fixed Income</b>					
Short Duration Gov/Credit	Bloomberg 1-3 Year Gov/Credit	4.25%	4.25%	1.75%	2.40%
Core U.S. Fixed	Bloomberg Aggregate	5.25%	5.25%	2.75%	4.25%
High Yield	Bloomberg High Yield	7.30%	6.80%	4.30%	11.75%

\* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

# 7% Expected Returns Over Past 30 Years

## Increasing Complexity



## Increasing Risk

<p>In 1994, our return expectation for broad U.S. fixed income was 6.2%.</p> <p>Just 15% in return-seeking assets was required to earn a 7% projected return.</p>	<p>15 years later, an institutional investor would have needed an additional 20% of the portfolio in public equities for a total of 35% to achieve a 7% projected return.</p>	<p>In 2022 an investor was required to include 96% in return-seeking assets (including 30% in private markets investments) to earn a 7% projected return at almost 3x the volatility compared to 1994.</p>	<p>Today's 7% expected return portfolio is much more reasonable than it was just two years ago. The allocation to fixed income jumps to 52%, while risk is essentially cut in half. Private markets investments are also cut in half.</p>
---	---	--	---

# Projected Return and Risk for PSPF

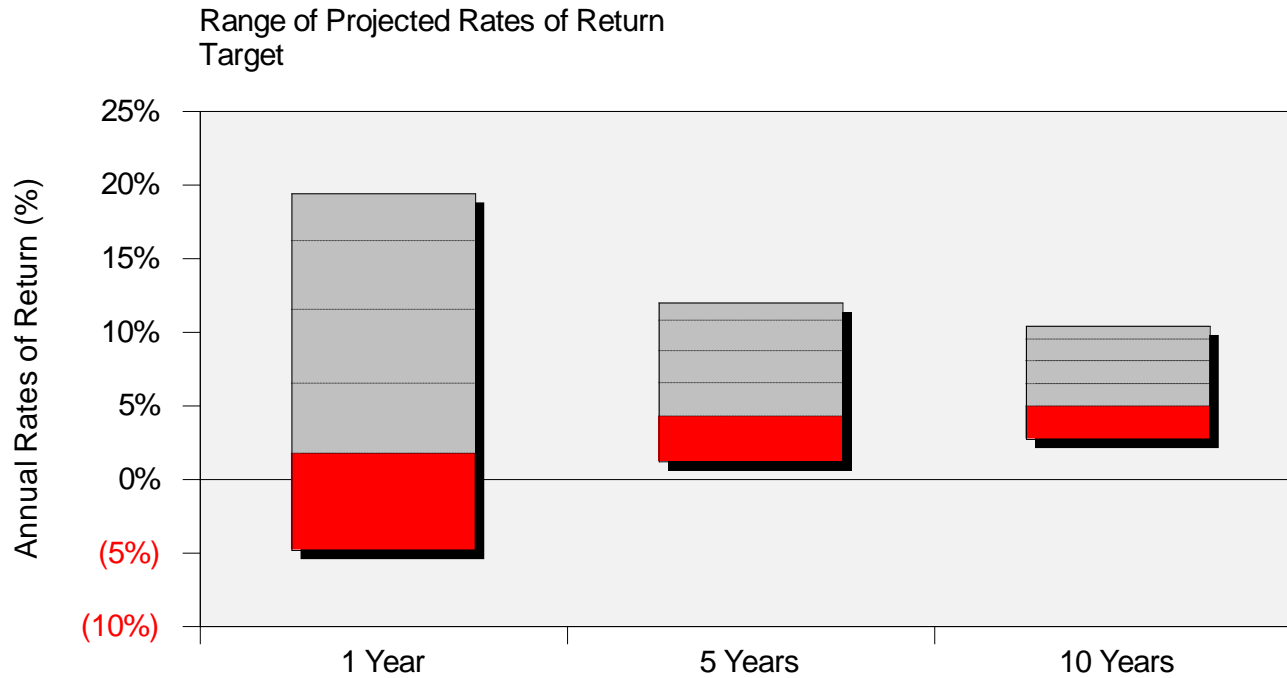
Utilizing Callan's 2024 10-Year Capital Market Assumptions

Portfolio Component	Target
Broad US Equity	18
Global ex-US Equity	12
Core US Fixed	52
High Yield	10
Short Duration Gov't/Credit	8
Totals	100
10 Yr. Geometric Mean Return	6.48%
Projected Standard Deviation	6.96%
10 Yr. Simulated Sharpe Ratio	0.48%
Projected Yield	4.38%

- As a point of reference, the expected return on the portfolio using Callan's 2023 projections was 5.78% with a standard deviation of 6.92%.
- The increase in equity, and especially fixed income, expectations from 2023 to 2024 improved the expected return by 0.70% with roughly the same level of risk.
- The yield is projected to be 4.38% with 2024 expectations compared to 4.11% with the 2023 expectations.

# Range of Returns – One, Five and 10-Year Periods

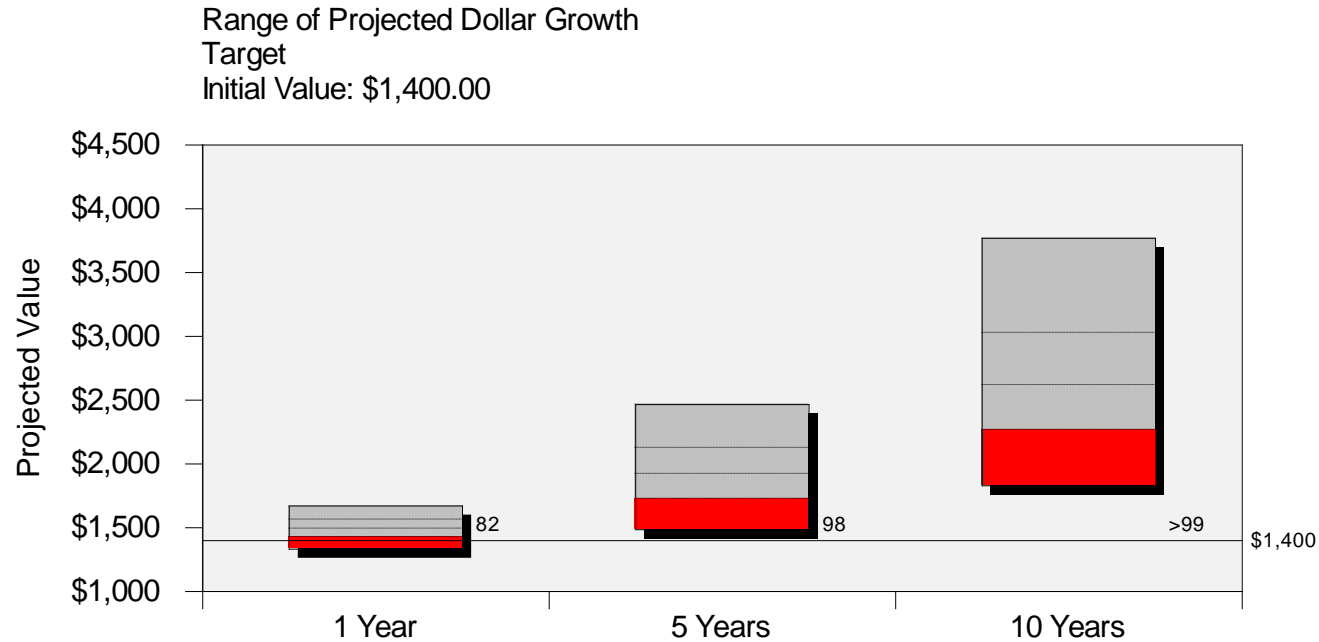
5<sup>th</sup> to 95<sup>th</sup> Percentile



	1 Year	5 Years	10 Years
5th Percentile	19.4%	12.0%	10.4%
10th Percentile	16.2%	10.8%	9.5%
25th Percentile	11.5%	8.7%	8.0%
Median	6.5%	6.5%	6.4%
75th Percentile	1.7%	4.3%	4.9%
95th Percentile	(4.8%)	1.2%	2.7%

# Projected Market Values – One, Five and 10-Year Periods

5<sup>th</sup> to 95<sup>th</sup> Percentile



5th Percentile	\$1,672	\$2,466	\$3,769
25th Percentile	\$1,561	\$2,123	\$3,026
Median	\$1,491	\$1,920	\$2,616
75th Percentile	\$1,424	\$1,724	\$2,265
95th Percentile	\$1,332	\$1,486	\$1,831
Prob > \$1,400	81.6%	98.0%	>99.0%

Note that projected dollar values do not include incoming cash flows or disbursements.

Dollars in hundreds of thousands.

# Asset Allocation and Rebalancing Guidelines

## Colorado Public School Fund Investment Board – Investment Policy Statement (IPS)

ASSET CLASSES	STRUCTURE	Lower Limit	Strategic Allocation	Upper Limit
<u>Equities:</u>	Domestic Equity	14%	18.0%	22%
	International Equity	8%	12.0%	16%
	<b>Total Equities</b>	24%	<b>30.0%</b>	36%
<u>Fixed Income:</u>	Market Duration Bonds	45%	52.5%	60%
	Short Duration Bonds	5%	7.5%	10%
	<b>Total Fixed Income</b>	60%	<b>60.0%</b>	70%
<u>High Income Strategies:</u>	High Yield Fixed Income	4.5%	8.5%	12.5%
	Preferred Securities	0%	1.5%	3.0%
	<b>Total High Income Strategies</b>	5%	<b>10.0%</b>	15%
<b>Total Portfolio</b>			<b>100%</b>	

The IPS states:

The asset allocation of the PSPF will be reviewed monthly by the Portfolio Administrator and at least quarterly by the PSFIB. The goal of the review is to evaluate whether action should be taken to rebalance the PSPF toward the IPS strategic asset allocation ranges.

When available, cash inflows will be deployed in a manner consistent with the strategic asset allocation and individual asset class structures. **The PSFIB may deviate from the aforementioned allocation of cash inflows if deemed to be in the best interest of the PSPF.**

All actions authorized by the PSFIB will be executed by the Portfolio Administrator as soon as practicable with guidance provided by the PSFIB as needed or requested.

# Rebalancing Recommendation: \$26.4 million in Cash Available For Investing

Asset values as of February 19, 2024

	2/19/24 Balance	%	Target	Difference	New Allocation	New Total	New %	IPS Ranges
Treasury Bond Port	\$ 716,870,711	48.2%	52.5%	-4.3%	\$ 9,800,000	\$ 726,670,711	48.0%	45%-60%
Equity - Parametric	\$ 522,857,619	35.1%	30.0%	5.1%	\$ 10,500,000	\$ 533,357,619	35.2%	24%-36%
Short Duration - Janus	\$ 108,127,857	7.3%	7.5%	-0.2%	\$ 2,000,000	\$ 110,127,857	7.3%	5%-10%
Preferred Sec - Spectrum	\$ 21,673,741	1.5%	1.5%	0.0%	\$ -	\$ 21,673,741	1.4%	0%-3%
High Yield - Mackay	\$ 118,014,546	7.9%	8.5%	-0.6%	\$ 3,500,000	\$ 121,514,546	8.0%	4.5%-12.5%
<b>Grand Total</b>	<b>\$ 1,487,544,473</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>\$ 25,800,000</b>	<b>\$ 1,513,344,473</b>	<b>100.0%</b>	

Cash available	\$ 26,377,003
Cash available -\$500,000	\$ 25,877,003

- All asset classes are within rebalancing ranges as of February 19, 2024
- Callan has reviewed the asset allocation and recommend that the Cash Available for Investing be deployed as noted in the table above.
- Per Treasury's request, \$500,000 will remain in cash.

Callan

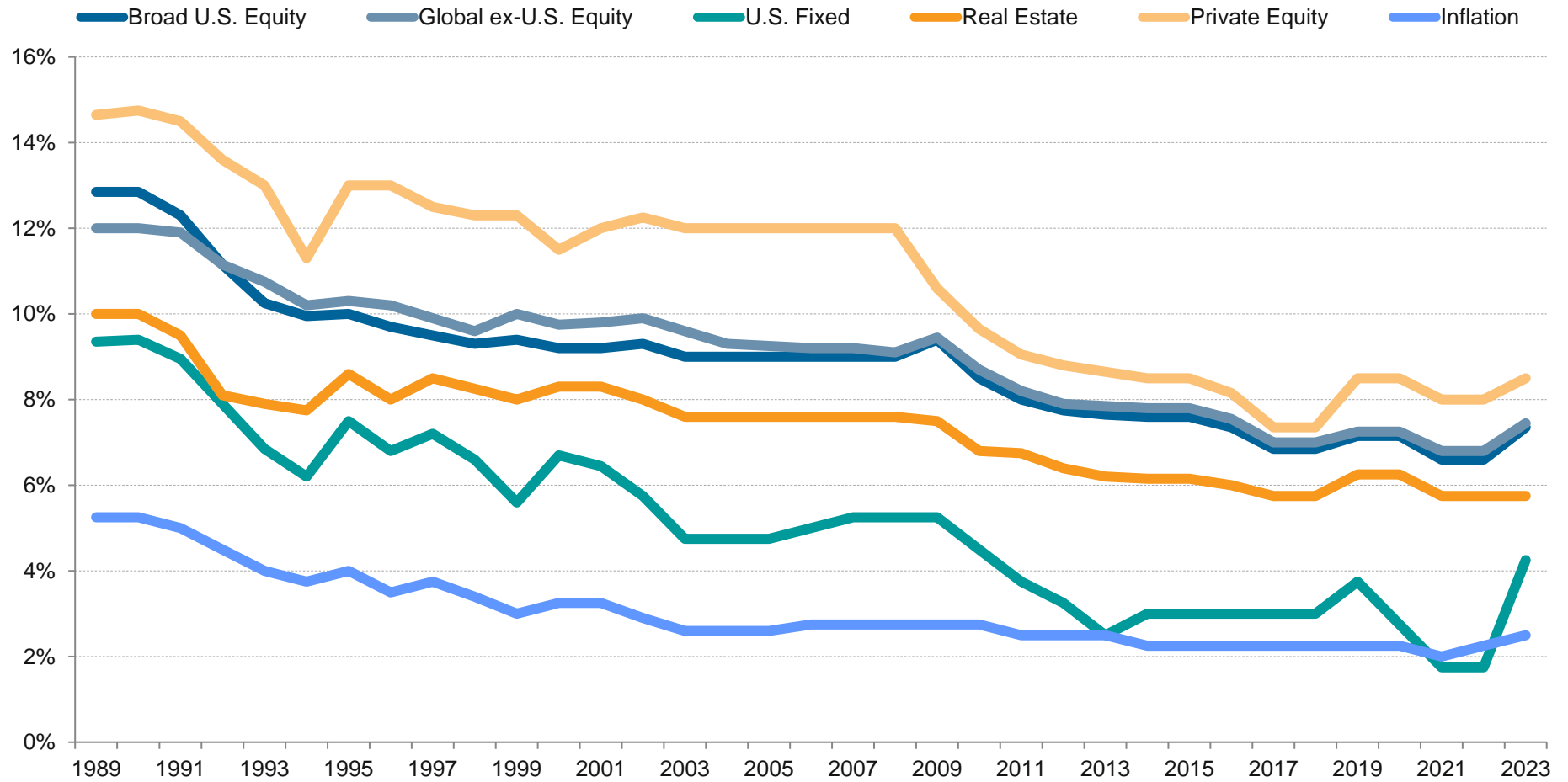
---

**APPENDIX**



# Return Projections: Major Asset Classes

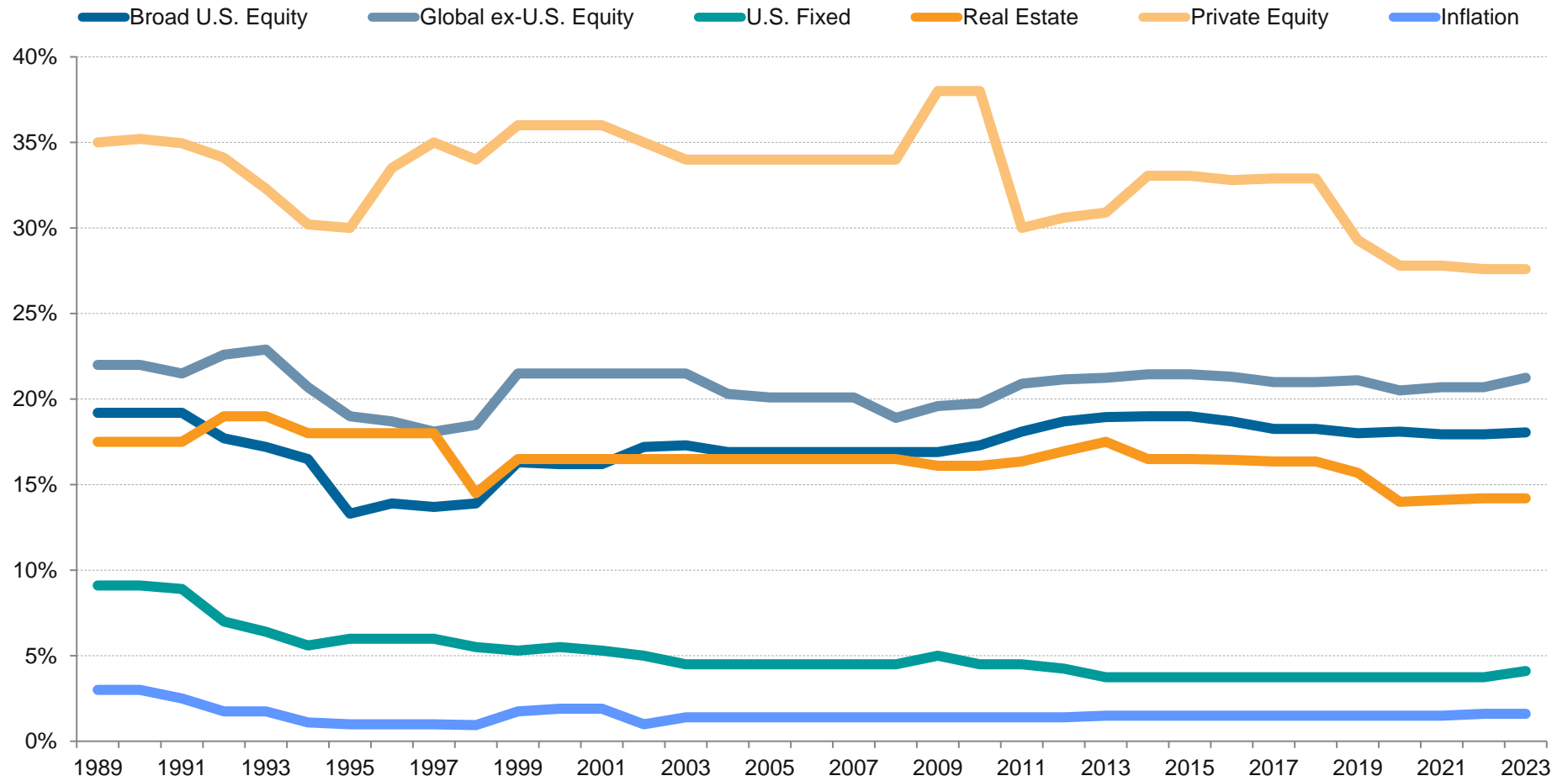
1989–2023



Source: Callan

# Risk Projections: Major Asset Classes

1989–2023



Source: Callan



# Colorado Public School Fund Investment Board Portfolio Review

**February 26, 2024**

**Dan Ryan**

*Executive Director – Relationship Management*

Parametric Portfolio Associates® LLC

(206) 381-7036

Dryan@paraport.com

**Jim Reber**

*Managing Director - Portfolio Management*

Parametric Portfolio Associates® LLC

(206) 694-4145

Jreber@paraport.com

# Parametric Overview

We innovate and build customized solutions for institutional portfolios.



*Extensive, established investment capabilities*

An industry pioneer in overlay solutions and custom indexing, Parametric is a trusted fiduciary for institutional asset owners.



*Focus on transparency and repeatability*

We provide research and rules-based solutions with a quantitative approach. Our solutions span global markets, asset classes, and instrument types.



*Extension of staff partnership*

We help investors solve specific portfolio challenges, implementing tailored solutions via a high-touch service model.

**\$475.1B**

Firm wide AUM<sup>1</sup>, including \$198.0B in institutional assets

**500+**

Institutional client relationships

**191**

Investment professionals, including 105 CFA charterholders and 10 PhDs

**30+**

Years of investment experience across equities, fixed income, and derivatives

Asset figures are approximate as of 12/31/2023.

<sup>1</sup>AUM includes overlay exposure, and both discretionary and non-discretionary assets of Parametric Portfolio Associates® LLC (the Firm).

Certain statements contained herein reflect the subjective view of Parametric and its personnel and as such cannot be independently verified. Please refer to the disclosures for additional information.

# Institutional Capabilities

We offer a comprehensive platform for investors seeking to:

- ✓ Eliminate inefficiencies
- ✓ Create custom exposures
- ✓ Capitalize on market opportunities
- ✓ Address strategic and episodic risks

## Efficient implementation

Flexible exposure management programs tailored to fit specific needs

### Solution ideas

- Cash overlay
- Rebalancing
- Transition exposure
- Custom equity exposures
- Custom fixed income exposures
- Responsible investing (ESG)

## Return enhancement

Systematic strategies that seek alpha across asset classes

### Solution ideas

- Alternative risk premia
- Systematic alpha
- Portable alpha
- Commodity management
- Tax management

## Risk mitigation

Customizable tools that address and manage specific portfolio risks

### Solution ideas

- Tail-risk strategies
- Market and security hedging programs
- Asset and liability hedging
- Currency management

Investing involves market- and program-specific risks. All investments are subject to loss.

# The Parametric Difference



## Collaborative, client-centric approach

Clients are supported by a high-touch, consultative team with decades of experience structuring and executing custom strategies.



## The next level of implementation refinement

Our investments in technology and thoughtful trade execution deliver highly competitive solutions across markets.



## Comprehensive, transparent investment approach

Clients gain comprehensive exposure management tools with daily reporting delivered in a customizable format.

Certain statements contained herein reflect the subjective view of Parametric and its personnel and as such cannot be independently verified. Please refer to the disclosures for additional information.

# Diversity, Equity, and Inclusion

## Our mission

We aspire to be an industry leader in our representation of a truly diverse and inclusive workforce to reflect the communities in which we live and work.

## Our principles



### Accountability

Senior leadership teams take actions to improve diversity, equity, and inclusion.



### Advancement

Through training and education, we support all employees along their career journeys.



### Representation

We boost representation through targeted recruitment, development, and retention.



### Culture

We aim to foster an atmosphere of inclusion and belonging.

## Helping our clients stay true to their DEI missions

We offer you customizable ways to pursue your missions through our wide array of responsible investing strategies, including portfolio construction and active ownership.

# Representative Client List as of December 31, 2023

## > **Public**

East Bay Municipal Utility District  
Fairfax County Employees' Retirement Systems  
Houston Police Officers' Pension System  
Manhattan & Bronx Surface Transit Operating Authority Pension Plan  
Marin County Employees' Retirement Association  
Massachusetts Pension Reserves Investment Management Board  
New Mexico Public Employees' Retirement Association  
Orange County Employees Retirement System  
San Mateo County Employees' Retirement Association  
Teachers' Retirement System of Louisiana  
Utah School and Institutional Trust Funds Office  
State of Wisconsin Investment Board

## > **Endowments**

Carnegie Institution of Washington  
Florida State University Foundation  
Indiana University Foundation  
Pepperdine University  
Texas Christian University  
Regents of the University of Michigan  
University of Minnesota Foundation

## > **Faith Based**

Catholic Diocese of Fort Worth  
Covenant Ministries of Benevolence  
Ministers & Missionaries' Benefit Board of American Baptist Churches  
Pension Fund of the Christian Church  
YMCA Retirement Fund

## > **Healthcare**

Advocate Health and Hospitals Corporation  
North Memorial Health Care  
Trinity Health Pension

## > **Taft-Hartley**

ABC-NABET Retirement Trust Fund  
Boilermaker-Blacksmith National Pension Trust  
Greater Pennsylvania Carpenters' Pension Fund  
Chicago Laborers' Pension & Welfare Funds  
International Union of Painters and Allied Trades Annuity Plan  
SEIU Pension Plans Master Trust  
Western Pennsylvania Teamsters & Employers Pension Fund

## > **Foundations**

John D. & Catherine T. MacArthur Foundation  
The McKnight Foundation  
Strada Education Network, Inc.  
Wisconsin Alumni Research Foundation

## > **Corporate**

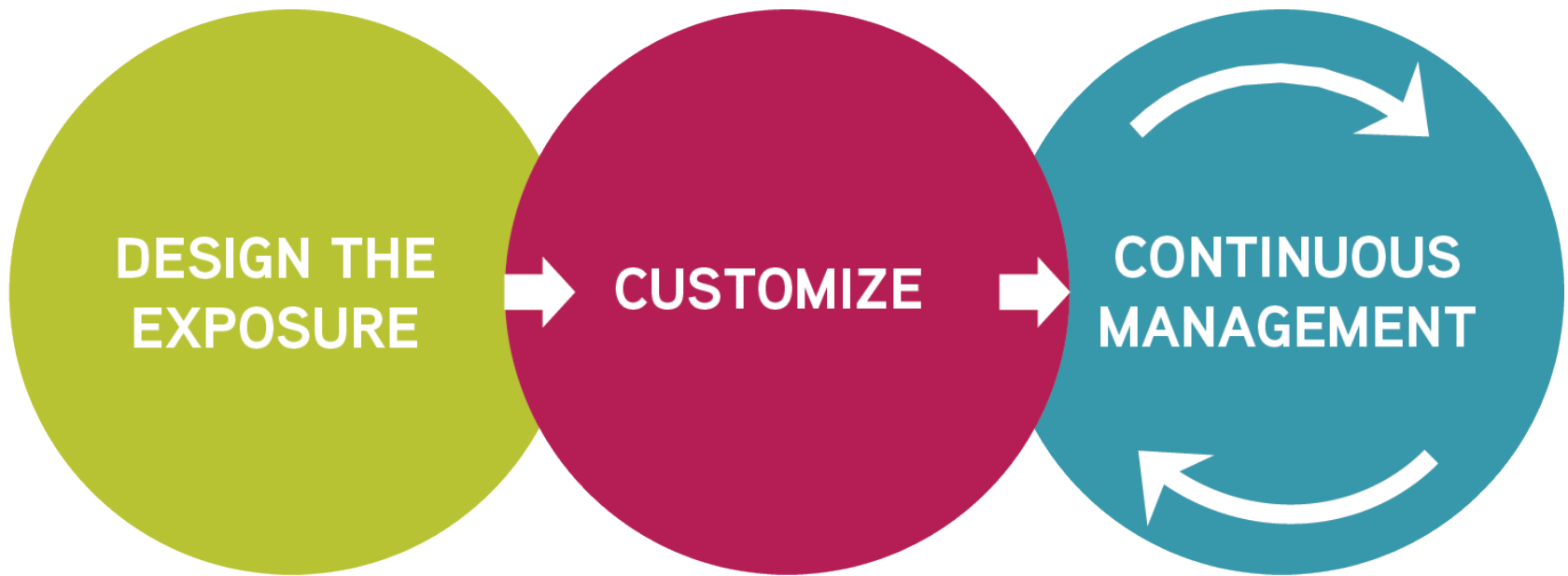
The Boeing Company  
EverSource Energy  
Raytheon Technologies Corporation

It is not known whether the listed clients approve or disapprove of the adviser. The partial list of clients included herein were selected as being representative of the different types of institutional clients and businesses serviced by Parametric. Performance-based data was not a determining factor in their selection.



# Portfolio Review

# Custom Core<sup>®</sup> Equity Investment Process



# Design the Exposure

Parametric offers over 100 benchmark and strategy options that can be blended to create a portfolio that represents a custom geographic exposure, investment style, or responsible investment goal. Examples include:

## Licensed benchmarks

### Cap-weighted benchmarks

- US, International, Global

### Responsible investing benchmarks

- MSCI ESG
- KLD 400

### Factor benchmarks

- MSCI Factor Indexes
- S&P® Factor Indexes

## Parametric strategies

### Responsible investing strategies

- FFV Catholic Values
- Fossil Fuel Free
- ESG
- Jewish Values
- Clean Technology

### Factor strategies

- Value
- Dividend Yield
- Momentum
- Quality
- Low Volatility
- Value, Size, Profitability
- Value, Momentum, Profitability

Customization options vary by firm and platform.

# Colorado Public School Fund Investment Board's Portfolio

Portfolio structure:

---

**Objective:** Provide global equity exposure while adhering to CPSFIB's gain/loss requirement

**Custom benchmark:** 60% Russell 3000 Index/40% MSCI ACWI ex-US Index

**Instruments:** Exchange Traded Funds (ETFs)

**Target tracking error:** +/- 1% per annum

**Rebalancing:** Coordinated with tracking error and gain/loss realization goals

CPSFIB Customizations:

---

**Loss Avoidance:** Managed to avoid realization of losses; Parametric rebalances back to policy weights if only a realized gain is assured

**Individual equity securities prohibited:** Utilize basket of ETFs

**Dividends:** Swept quarterly

**Consultative management:** Regular discussions with CPSFIB staff and Callan to review positioning, performance, gain/loss needs

**Customizable:** Will strive to realize gains to offset losses elsewhere in CPSFIB portfolio, when directed to do so

# Customize

Parametric offers many customization options to help investors manage risk in their portfolios. Here are a few examples.

## Exposure options

- > Index blending
- > Factor tilts
- > Management of in-kind assets
- > ETF management
- > Call-writing overlays
- > Sector and industry exclusions

## Tax management

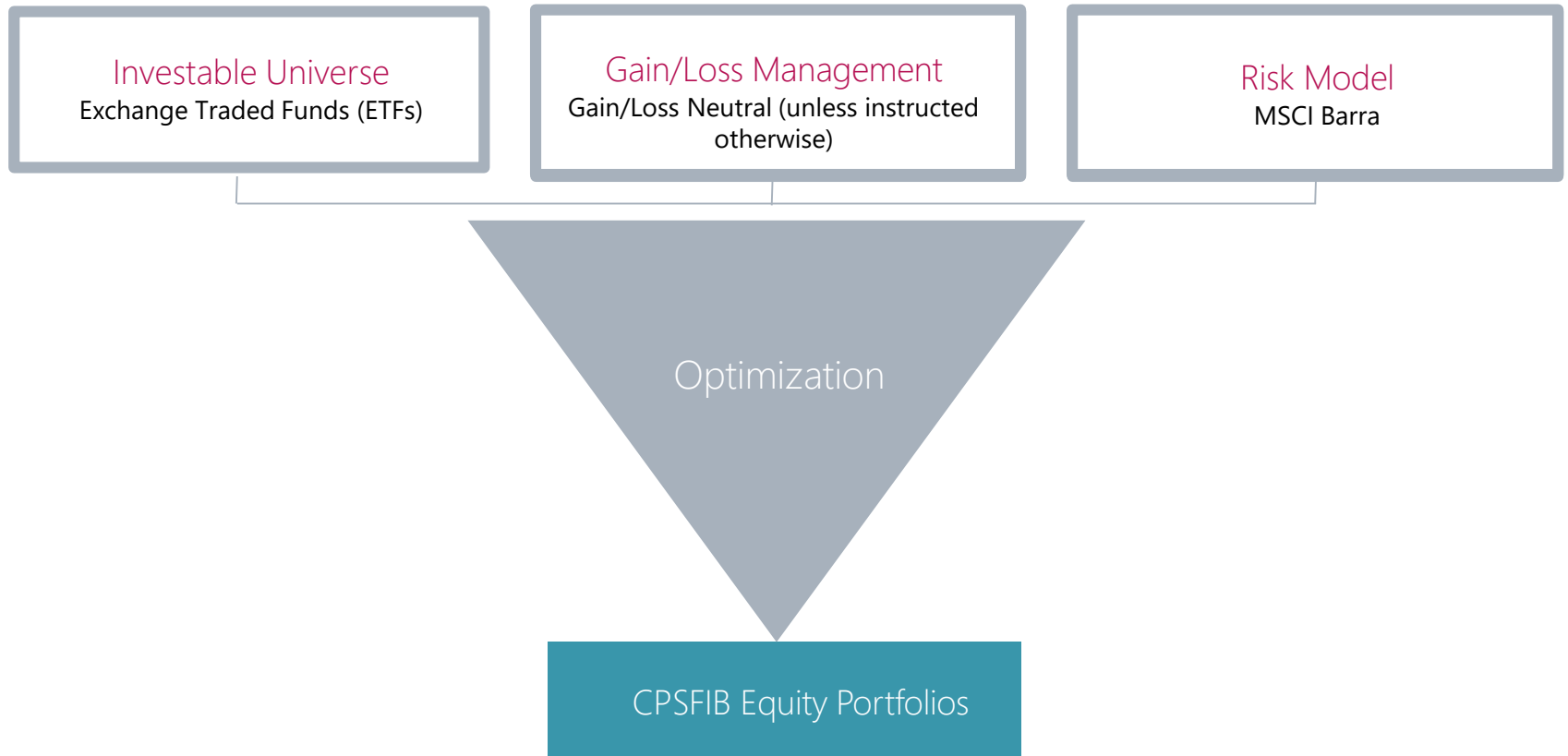
- > Systematic tax management
- > Transition analysis
- > Staged diversification
- > Charitable gifting
- > Tax-efficient cash withdrawals
- > Client-directed gain/risk budgets

## Responsible investing

- > Screens
- > Integrations
- > Socially responsible indexes
- > Proxy voting
- > Shareholder resolutions

Customization options vary by firm and platform.

# Equity Investment Process



# Colorado Public School Fund Investment Board Relationship Review

**December 12, 2017:** Initial investment of \$50,000,000  
**2018:** Additional investment of \$165,000,000  
**2019:** Additional investment of \$11,000,000  
**2020:** Net Additional investment of \$3,075,000  
**2021:** Net Additional investment of \$65,400,000  
**2022:** Additional investment of \$53,425,000  
**2023:** Additional investment of \$55,500,000  
**December 31, 2023:** \$ 512,515,429

## Performance as of December 31, 2023

*Periods over one year are annualized*

	Q4 2023	1 Year	3 Year	5 Year	2018	2019	2020	2021	2022	2023	Since Inception*
Colorado Public School Fund Investment Board (Gross-of-Fees)	11.39	21.95	5.89	11.95	-8.82	26.99	16.62	18.79	-18.05	21.95	8.36
Colorado Public School Fund Investment Board (Net-of-Fees)	11.38	21.88	5.82	11.86	-8.90	26.87	16.51	18.72	-18.11	21.88	8.27
60% Russell 3000 / 40% ACWI ex US	11.15	21.76	5.77	11.93	-8.83	27.16	16.75	18.30	-17.85	21.77	8.33

\*Inception date: 12/12/2017

Performance reflects the deduction of brokerage commissions and the reinvestment of dividends and other earnings. Performance for periods of less than one year has not been annualized. Performance, cost basis, unrealized gain/losses, and realized gains/losses calculated and reported by Parametric may vary from official custodial statements based on different accounting procedures, reporting dates or valuation methodologies for certain securities. This information has not been audited and is subject to change without notice. Past performance is not indicative of future results. It is not possible to invest directly in an index; they are unmanaged and do not reflect the deduction of fees, taxes and expenses. See Disclosures for additional information.

# Portfolio Characteristics

Colorado Public School Fund Investment Board  
As of December 31, 2023

<b>Characteristics</b>	<b>Portfolio</b>	<b>Benchmark</b>
Number Of Holdings	8,400	5,283
Dividend Yield	2.06	2.06
Weighted Avg. Cap. (millions)	\$404,872	\$411,790

<b>Sector Weights (%)</b>	<b>Portfolio</b>	<b>Benchmark</b>
Communication Services	6.77	6.88
Consumer Discretionary	11.09	11.13
Consumer Staples	6.50	6.64
Energy	4.64	4.64
Financials	16.39	16.70
Health Care	10.96	11.28
Industrials	11.77	11.36
Information Technology	21.36	21.25
Materials	4.94	4.82
Real Estate	2.94	2.64
Utilities	2.62	2.66

Source: Parametric as of 12/31/2023. Sectors, as of the date indicated, are based on weightings, not performance. Information is as of the date indicated and is subject to change at any time. It is not possible to invest directly in an index.



# Portfolio Characteristics

## Colorado Public School Fund Investment Board As of December 31, 2023

		Weight	Cost Basis	Market Value	Unrealized Gain/Loss	Dividend Yield
<b>EWC</b>	ISHARES MSCI CANADA	3.95%	\$17,707,911	\$20,234,559	\$2,526,648	3.0
<b>ITOT</b>	ISHARES CORE S&P TOTAL US STOCK MKT ETF	59.34%	\$215,447,998	\$304,162,159	\$88,714,161	1.4
<b>IEMG</b>	ISHARES CORE MSCI EMERGING	10.78%	\$59,184,798	\$55,242,262	-\$3,942,535	2.8
<b>IEFA</b>	ISHARES TR CORE MSCI EAFE	24.97%	\$121,950,018	\$127,968,972	\$6,018,954	3.0
	US Dollars	0.96%	\$4,907,478	\$4,907,478		
<b>TOTAL</b>		<b>100%</b>	<b>\$419,198,202</b>	<b>\$512,515,429</b>	<b>\$93,317,227</b>	<b>2.0</b>

Source: Parametric as of 12/31/2023. Sectors, as of the date indicated, are based on weightings, not performance. Information is as of the date indicated and is subject to change at any time. It is not possible to invest directly in an index.

# Country Weights

## Colorado Public School Fund Investment Board As of December 31, 2023

Weights (%)	Portfolio	Benchmark
Argentina	0.00	0.01
Australia	2.03	2.01
Austria	0.08	0.05
Belgium	0.25	0.24
Brazil	0.63	0.65
Canada	4.00	3.10
Chile	0.06	0.06
China	2.55	2.94
Colombia	0.01	0.01
Cyprus	0.00	0.00
Czech Republic	0.01	0.02
Denmark	0.80	0.86
Egypt	0.01	0.01
Finland	0.22	0.28
France	2.76	3.11
Germany	2.03	2.22
Greece	0.05	0.05
Hong Kong	0.56	0.60
Hungary	0.03	0.03
India	1.95	1.88
Indonesia	0.20	0.21
Ireland	0.07	0.19
Israel	0.24	0.19
Italy	0.69	0.68
Japan	6.03	5.77
Kuwait	0.09	0.08

	Portfolio	Benchmark
Malaysia	0.16	0.15
Mexico	0.29	0.31
Netherlands	1.08	1.20
New Zealand	0.07	0.05
Norway	0.22	0.18
Peru	0.03	0.04
Philippines	0.07	0.07
Poland	0.11	0.11
Portugal	0.06	0.06
Qatar	0.09	0.10
Russia	0.00	0.00
Saudi Arabia	0.45	0.47
Singapore	0.37	0.36
South Africa	0.33	0.34
South Korea	1.42	1.45
Spain	0.65	0.69
Sweden	0.96	0.86
Switzerland	2.34	2.56
Taiwan	1.85	1.80
Thailand	0.22	0.20
Turkey	0.08	0.07
United Arab Emirates	0.13	0.14
United Kingdom	3.75	3.79
United States	59.93	59.75

Source: Parametric and FactSet as of 12/31/2023. Countries, as of the date indicated, are based on weightings, not performance. Information is as of the date indicated and is subject to change at any time. It is not possible to invest directly in an index.

# Appendix

# Parametric Investment Committee: Custom Core<sup>®</sup>

**Thomas Lee, CFA**  
Co-President & Chief Investment Officer

**Brian Herscovici, CFA**  
Chief Operating Officer for Investments

## Investment Strategy

**Jeremy Milleson** (chair)  
Director, Investment Strategy

**Jennifer Sireklove, CFA**  
Managing Director, Investment Strategy

## Portfolio Management

**Thomas Seto**  
Head of Investment Management

## Research

**Paul Bouchey, CFA**  
Global Head of Research

# Biographies

## **Thomas Lee, CFA**

Co-President & Chief Investment Officer

Tom is a member of Parametric's Executive Committee and leads Parametric's Research, Strategy, Portfolio Management, and Trading teams, coordinating resources, aligning priorities, and establishing processes for achieving clients' investment objectives. Tom has coauthored articles on topics ranging from liability-driven investing to the volatility risk premium. He is a voting member of all the firm's investment committees. Prior to joining Parametric in 1994 (originally as an employee of the Clifton Group, which was acquired by Parametric in 2012), Tom spent two years working for the Board of Governors of the Federal Reserve in Washington, DC. He earned a BS in economics and an MBA in finance from the University of Minnesota. A CFA charterholder, Tom is a member of the CFA Society of Minnesota.

## **Jennifer Sireklove, CFA**

Managing Director, Investment Strategy

Jennifer leads the Investment Strategy Team at Parametric, which is responsible for all aspects of Parametric's equity-based investment strategies. In addition, she has direct investment responsibility for Parametric's Emerging Markets and International Equity Strategies and chairs Parametric's Stewardship Committee. Previously she helped build Parametric's active ownership and custom ESG portfolio construction practices. Prior to joining Parametric in 2013, she worked in equity research, primarily covering the energy, utility, and industrial sectors at firms including D.A. Davidson and McAdams Wright Ragen. Jennifer earned an MBA in finance and accounting from the University of Chicago and a BA in economics from Reed College. A CFA charterholder since 2006, Jennifer is a member of the CFA Society of Seattle.

## **Dan Ryan**

Executive Director, Client Relationship Management

Dan is responsible for managing client relationships throughout the western US. Prior to joining Parametric in 2013, Dan was vice president and senior relationship manager at State Street Global Advisors. He earned a BA in history from the University of Michigan.

## **Thomas Seto**

Head of Investment Management

Thomas is responsible for all portfolio management and trading related to our equity strategies. Prior to joining Parametric in 1998, Thomas served as the head of US Equity Index investments at Barclays Global Investors. He earned an MBA in finance from the University of Chicago Booth School of Business and a BS in electrical engineering from the University of Washington.

## **Paul Bouchey, CFA**

Global Head of Research

Paul leads Parametric's research and development activities across equity and derivative strategies. He is the Co-Editor of the Journal of Wealth Management and has authored numerous journal articles on tax management, risk management, and factor investing. Paul earned a BA in mathematics and physics from Whitman College and an MS in computational finance and risk management from the University of Washington. A CFA charterholder, he is a member of the CFA Society of Seattle.

## **Jeremy Milleson**

Director, Investment Strategy

Jeremy is responsible for assisting in the continued evolution of Parametric's Custom Core® Strategies. He works closely with clients and advisors to design, develop, and implement custom portfolio solutions. Prior to joining Parametric in 2012, Jeremy worked as an instructor in economics at the University of Washington and also worked for Bernstein Investment Research and Management and Banc of America Investment Services. He earned MA and BS degrees in economics from the University of Washington.

## **Jim Reber**

Managing Director, Portfolio Management

James is responsible for portfolio management of Parametric's Private Client Direct Group, primarily serving Parametric's wealth management and family office client base. The Private Client Direct Group manages US, non-US, and global Custom Core® portfolios. Prior to joining Parametric in 2004, James was a senior associate with Standard and Poor's Corporate Value Consulting Group, providing financial valuation services to IT and technology industries. He earned an MBA from the University of Washington and a BS in chemical engineering from Michigan State University.

# Disclosure

Parametric Portfolio Associates® LLC ("Parametric"), headquartered in Seattle, is registered as an investment advisor with the Securities and Exchange Commission under the Investment Advisors Act of 1940. Parametric is a leading global asset management firm, providing investment strategies and customized exposure management directly to institutional investors and indirectly to individual investors through financial intermediaries. Parametric offers a variety of rules-based investment strategies, including alpha-seeking equity, fixed-income, alternative and options strategies. Parametric also offers implementation services, including customized equity, traditional overlay and centralized portfolio management. Parametric is part of Morgan Stanley Investment Management, the asset management division of Morgan Stanley, and offers these capabilities through offices located in Seattle, Boston, Minneapolis, New York, and Westport. This material may not be forwarded or reproduced, in whole or in part, without the written consent of Parametric. Parametric and its affiliates are not responsible for its use by other parties.

This information is intended solely to report on investment strategies and opportunities identified by Parametric. Opinions and estimates offered constitute our judgment and are subject to change without notice, as are statements of financial market trends, which are based on current market conditions. We believe the information provided here is reliable, but do not warrant its accuracy or completeness. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. Past performance is not indicative of future results. The views and strategies described may not be suitable for all investors. Investing entails risks and there can be no assurance that Parametric will achieve profits or avoid incurring losses. Parametric and Morgan Stanley do not provide legal, tax or accounting advice or services. Clients should consult with their own tax or legal advisor prior to entering into any transaction or strategy described herein.

Charts, graphs and other visual presentations and text information were derived from internal, proprietary, and/or service vendor technology sources and/or may have been extracted from other firm data bases. As a result, the tabulation of certain reports may not precisely match other published data. Data may have originated from various sources including, but not limited to, Bloomberg, MSCI/Barra, FactSet, and/or other systems and programs. Parametric makes no representation or endorsement concerning the accuracy or propriety of information received from any other third party.

Client portfolio performance is presented gross of advisory fees. Advisory fees are deducted quarterly from a client's portfolio and would impact performance adversely. As an example, assuming (a) \$1,000,000 investment, (b) portfolio return of 5% per year, and (c) 1.00% annual investment advisory fee, the cumulative fees paid would be \$10,209.57 in the first year, \$55,254.43 over five years, and \$122,351.51 over ten years. Actual fees charged vary by portfolio due to various conditions, including account size. Parametric's investment advisory fees are described further in Part 2A of Form ADV, which is available upon request.

When calculating after-tax returns, Parametric applies the client's individual tax rate (which may include federal and state income taxes), if provided by the client. If the individual tax rate is not provided by the client, Parametric applies the highest U.S. federal tax rates. For short-term gains, the highest U.S. federal marginal income tax rate is 37% plus the 3.8% net investment income tax, for a combined rate of 40.8%. For long-term gains, the highest U.S. capital gains tax rate is 20% plus the 3.8% net investment income tax, for a combined rate of 23.8%. These assumed tax rates are applied to both net realized gains and losses in the portfolio. State and local taxes are not reflected unless provided by the client. Applying the highest rate may cause the after-tax performance shown to be different than an investor's actual experience. Investors' actual tax rates, the presence of current or future capital loss carry forwards, and other investor tax circumstances will cause an investor's actual after-tax performance to be over or under Parametric's estimates presented here. In periods when net realized losses exceed net realized gains, applying the highest tax rates to our calculations illustrates the highest after-tax return that could be expected of the portfolio, and assumes the maximum potential tax benefit was derived. Actual client after-tax returns will vary. As with all after-tax performance, the after-tax performance reported here is an estimate. In particular, it has been assumed that the investor has, or will have sufficient capital gains from sources outside of this portfolio to fully offset any net capital losses realized, and any resulting tax benefit has been included in Parametric's computation of after-tax performance.

*Disclosures continue on next page.*

# Disclosures (Continued)

Performance, cost basis, unrealized gain/losses, and realized gains/losses calculated and reported by Parametric may vary from official custodial statements based on different accounting procedures, reporting dates or valuation methodologies for certain securities. Client performance summaries and any related data produced by Parametric are not audited. Clients are encouraged to carefully review and compare the official custodial records with the various data and performance statistics reported by Parametric.

Benchmark after-tax returns are simulated for each client portfolio using client-specific, after-tax benchmark portfolios. Performance of the after-tax benchmark is simulated using the same inception date, cash flows, cost basis, and tax rates as the client portfolio. The after-tax benchmark's capital gain realization rate is based on the average turnover rate of the pre-tax benchmark and ending gain or loss of the after-tax benchmark for each period. The dividend income is estimated using the pre-tax benchmark index's dividend return during the period. After-tax benchmark returns reflect the deduction of taxes, but do not include any other fees or expenses. After-tax benchmark returns are hypothetical, do not reflect actual trading, and may not be relied upon for investment decisions.

Benchmark/index information provided is for illustrative purposes only. Indexes are unmanaged and cannot be invested in directly. Deviations from the benchmarks provided herein may include, but are not limited to, factors such as: the purchase of higher risk securities, over/under-weighting specific sectors and countries, limitations in market capitalization, company revenue sources, and/or client restrictions. Parametric's proprietary investment process considers factors such as additional guidelines, restrictions, weightings, allocations, market conditions and other investment characteristics. Thus, returns may at times materially differ from the stated benchmark and/or other disciplines provided for comparison.

There is no assurance that a separately managed account ("SMA") will achieve its investment objective. SMAs are subject to market risk, which is the possibility that the market values of the securities in an account will decline and that the value of the securities may therefore be less than what you paid for them. Market values can change daily due to economic and other events (e.g., natural disasters, health crises, terrorism, conflicts and social unrest) that affect markets, countries, companies or governments. It is difficult to predict the timing, duration, and potential adverse effects (e.g., portfolio liquidity) of events. Accordingly, you can lose money investing in an SMA.

Investment strategies that seek to enhance after-tax performance may be unable to fully realize strategic gains or harvest losses due to various factors. Market conditions may limit the ability to generate tax losses. Tax-loss harvesting involves the risks that the new investment could perform worse than the original investment and that transaction costs could offset the tax benefit. Also, a tax-managed strategy may cause a client portfolio to hold a security in order to achieve more favorable tax treatment or to sell a security in order to create tax losses. Prospective investors should consult with a tax or legal advisor before making any investment decision.

An environmental, social and governance ("ESG") investment strategy limits the types and number of investment opportunities available to the investor and, as a result, the investor's portfolio may underperform other investment strategies that do not have an ESG focus. The ESG investment strategy may result in investments in securities or industry sectors that underperform the market as a whole or underperform other strategies which apply ESG standards. An issuer's ESG performance or the investment adviser's assessment of such performance may change over time, which could cause the investor to temporarily hold securities that do not comply with the investor's responsible investment criteria. In evaluating an investment, the investment adviser is dependent upon information and data that may be incomplete, inaccurate or unavailable, which could adversely affect the analysis of the ESG factors relevant to a particular investment. Successful application of the investor's responsible investment strategy will depend on the investment adviser's skill in properly identifying and analyzing material ESG issues.

All contents ©2024 Parametric Portfolio Associates® LLC. All rights reserved. Parametric Portfolio Associates®, Parametric with the triangle logo, DeltaShift®, PIOS®, Custom Core®, Custom to the Core®, and Make passive investing personal® are trademarks registered in the US Patent and Trademark Office.

Parametric is located at 800 Fifth Avenue, Suite 2800, Seattle, WA 98104. For more information regarding Parametric and its investment strategies, or to request a copy of the firm's Form ADV or a list of composites, contact us at 206 694 5500 or visit [www.parametricportfolio.com](http://www.parametricportfolio.com).

**NOT FDIC INSURED. OFFER NOT A BANK GUARANTEE. MAY LOSE VALUE.  
NOT INSURED BY ANY FEDERAL GOVERNMENT AGENCY. NOT A DEPOSIT.**

RO 3184795