



Public School Fund Investment Board Meeting  
Meeting Minutes September 25, 2024  
Held Via Zoom

**Board Members in Attendance:**

Dave Young  
Jerome DeHerrera  
Wendy Dominguez  
Deborah Froeb

**12:01 – 12:04 PM Welcome, roll call**

**12:04 – 12:06 PM Meeting Minutes from the May 13th Board Meeting**

Mr. DeHerrera made a motion to approve the March 28th meeting minutes. Ms. Dominguez seconded the motion. The motion passed.

- Dave Young – Yes
- Jerome DeHerrera – Yes
- Wendy Dominguez – Yes
- Deborah Froeb – Yes

**12:06 – 12:11 PM Board Member Terms**

Deb Froeb, End of 1st Term – 8/31/26

Jerome DeHerrera, End of 2nd Term, 11/30/24

Wendy Dominguez, End of 2nd Term, 11/30/24

As new board members are added, their terms will be staggered in compliance with the recent change to statute.

Introduction of Deborah Froeb who is filling the seat from the State Land Board. Ms. Froeb introduced herself.

Treasurer Young thanked Peter Calamari for his time on the Board. His seat is open.

**12:11 – 12:16 PM MacKay-Shields Contract Extension**

Mr. Baumann from the Attorney General's office explained the extension. This board meeting was postponed, and the deadline for contract extension fell before the Board meeting. The State exercised the option to extend the contract for two months. The original option goes through early November. The Board is voting to approve an extension of one year. Callan recommends retaining Mackay-Shields.

Ms. Dominguez moved to extend the MacKay-Shields contract to September 8<sup>th</sup>, 2025. The motion passed.

- Dave Young – Yes
- Jerome DeHerrera – Yes
- Wendy Dominguez – Yes
- Deborah Froeb – Yes

### **12:16 – 12:46 PM Community Investment Check-In**

Mary Wickersham introduced herself and explained a brief history of her work with the Board and the State Treasury. Ms. Wickersham shared a presentation on impact investing. The Board asked discussed whether they would like to move forward. It was decided that a working group meeting would be scheduled before the next Board meeting.

### **12:46-1:01 PM Market Update and Performance Report**

Alex Browning from Callan presented the update for Quarter 2 updates – Ending June 30, 2024.

Janet Becker-Wold from Callan presented the Fiscal Year Quarter 4 updates – Ending June 30, 2024.

### **1:01 – 1:35 PM Cash Deployment/Asset Allocation Review**

Ms. Becker-Wold shared a presentation that showed the current and expected return of the Fund, as well as an evaluation of Fund allocation options. Callan recommends the following: Assuming a market value of \$1.5 billion, a 40% allocation to public equity would be an increase of \$150 million and 50% would be a \$300 million increase. Ms. Becker-Wold recommended 50%. This would happen over 1-2 years. Callan answered questions from the Board.

Ms. Dominguez moved a recommendation to 50% allocation for public equity over an eight-quarter time span. Ms. Froeb seconded the motion. The motion passed.

- Dave Young – Yes
- Jerome DeHerrera – Yes
- Wendy Dominguez – Yes
- Deborah Froeb – Yes

### **1:35 – 1:57 PM Fund Manager Presentation: Treasury Portfolio**

Maruti More and the Department of Treasury Investment team presented.

### **1:57 – 2:09 PM Other Business**

- RFP Update  
The team is still working on getting some answers before presenting the RFP process to the Board.
- Annual Report

### **2:09 – 2:15 PM Public comments**

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

**2:15 PM** The Board adjourned.



Public School Fund Investment Board Working Group Meeting  
October 16, 2024  
Held Via Zoom

**Board Members in Attendance:**

Dave Young  
Jerome DeHerrera  
Wendy Dominguez  
Deborah Froeb - Excused

**1:02 – 1:04 PM Welcome and Roll Call**

**1:04 – 1:20 PM Draft Annual Report**

Mr. Rothaus from the Department of the Treasury shared the draft annual report. The Board reviewed and discussed the report. The Report will be sent to the General Assembly on November 1<sup>st</sup>.

**1:20 – 2:09 PM Community Investment Presentation and Discussion**

Ms. Wickersham introduced herself. She presented to the Board and answered questions from the working group.

Meeting Objectives:

- Engage in a more detailed discussion of the potential for the PSPF to invest in Colorado Communities.
- Allow board members the opportunity to ask questions, gain additional information, and raise issues for discussion.
- Develop board consensus around the possibility of amending board investment policy to include investments in Colorado communities.
- Identify next steps

Discussion Topics:

- Quick review of the history and purpose of the PSPF
- HB 22-1146 Working group recommendation and discussion
- Other states
- Examples of potential investments
- Mission Statement/ Investment Objective
- Timeline
- Next steps

**2:09 – 2:15 PM Public comments**

- Written Comments
  - o There were no written comments.

- Verbal Comments
  - o There were no verbal comments.

# Callan

October 2024



## **Callan's Manager Search Capabilities**

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

**Alex Browning**  
Senior Vice President

# Manager Due Diligence

## Search Process Overview

### The Process

- Disciplined, consistent and transparent practice driven solely by client needs and requirements
- No buy lists
- Process guided by internal partnership between research specialist and consultant
- Manager Search Committee ensures quality control

### The Outcome

- Managers and strategies that best fit the investment program and specific mandate

### The Benefit

- One size does not fit all
- Encourages creative solutions to client's manager structure

**Customization for the PSFIB: Provide public notice on Callan's website, social media (LinkedIn) and the State's procurement site.**

\*DWDO stands for Diverse-, Women- and Disabled-owned.

### Manager Search Process

▼ Client and Manager Profiles

▼ Quantitative Screening

▼ Qualitative Screening

▼ Manager Search Committee

▼ Semi-Finalist Review

Finalists

Every search includes a DWDO candidate

# Manager Research

## Callan's Manager Database

Investment Manager Database		
	No. Strategies	No. Managers
<b>U.S.</b>		
Equity	3,928	988
Fixed Income	2,925	492
Balanced	255	127
<b>Global ex-U.S. / Global / Emerging</b>		
Equity	3,403	1,266
Fixed Income	633	264
Balanced	130	77
<b>Real Estate</b>		
Public	186	87
Private	2,348	700
<b>Real Assets</b>		
Public	115	73
Private	515	211
<b>Private Equity</b>	4024	914
<b>Private Credit</b>	1,104	359
<b>Hedge Funds</b>	902	262
<b>Multi Asset Class</b>	168	87
<b>Target Date Funds</b>	1,180	59
<b>Other</b> (currency, derivatives, etc.)	208	143
<b>Total</b>	<b>22,024</b>	<b>3,777*</b>

Managers are never charged a fee to be in Callan's database.  
\*Represents Unique Organizations

### Multiple Manager Touchpoints

- 521 DWDO firms in database
- 2,000+ manager meetings / onsite annually
  - 200 meetings with DWDO firms in 2023
- 240 manager searches/evaluations per year
  - DWDO firms included in each search
- Hundreds of managers analyzed / year via client performance measurement

As of 12/31/23

Active funds as of June 30, 2024



# Callan's Research Resources

## Research Team by the Numbers

**57** Specialty consultants

**75%** Callan shareholders

**29** CFA and/or CAIA charterholders

**26** Advanced degrees

## Searches and Database by the Numbers\*

**1,208** Manager searches completed over the last five years

**\$261bn** Assets represented by these searches

**2,000+** Average number of manager meetings per year

**2,600+** Organizations tracked in proprietary database

**16,500+** Strategies tracked in proprietary database

## Commitment to dedicated resources

- Sole focus is research
- Highly valued, high-profile, career positions
- Original research, in-depth due diligence

## Proprietary database and analytics

- Full control over data collection and due diligence
- Clean, detailed, and continuous data

## Searches are client-driven and customized

- No buy-list
- Emphasis on both quantitative and qualitative analysis
- Thorough documentation of entire process

## Oversight committee for manager searches

- Best thinking across the firm
- Ensures quality control and adherence to well-defined and robust process

As of December 31, 2023

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## Fee Proposal

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Callan proposes an additional per annum fee of \$10,000 billed \$2,500 per quarter.

Billing to begin in FY25 third quarter.

This will cover all searches until our contract expiration June 30, 2027.

# Callan

November 2024



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

Third Quarter 2024

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

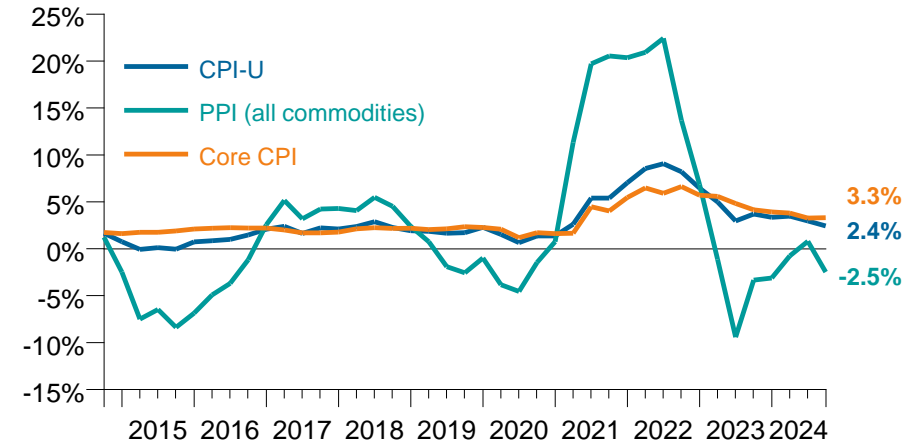
**Alexander Browning**  
Senior Vice President

# U.S. Economy—Summary

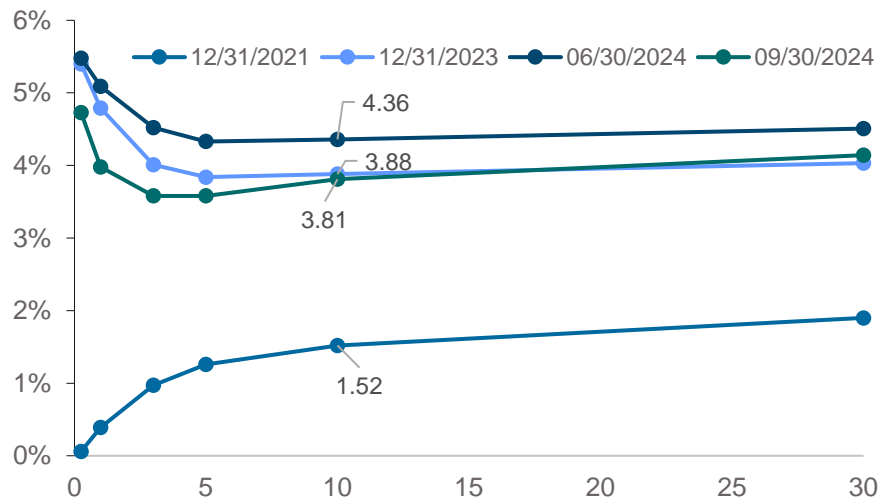
For periods ended 9/30/24

- GDP rose 2.8% in the 3Q according to the “advance” estimate. A decrease from the 2Q reading of 3.0%.
- Headline CPI increased 2.4% year-over-year in September, while core CPI (ex-food and energy) increased 3.3% over the same period.
- The Fed cut short-term rates 50 bps at the September FOMC meeting, with a current target range of 4.75%-5.00%. They made an additional cut of 25 bps on November 7.
- The unemployment rate was 4.1% in September, a slight decrease from the August reading of 4.2% and the July reading of 4.3%.

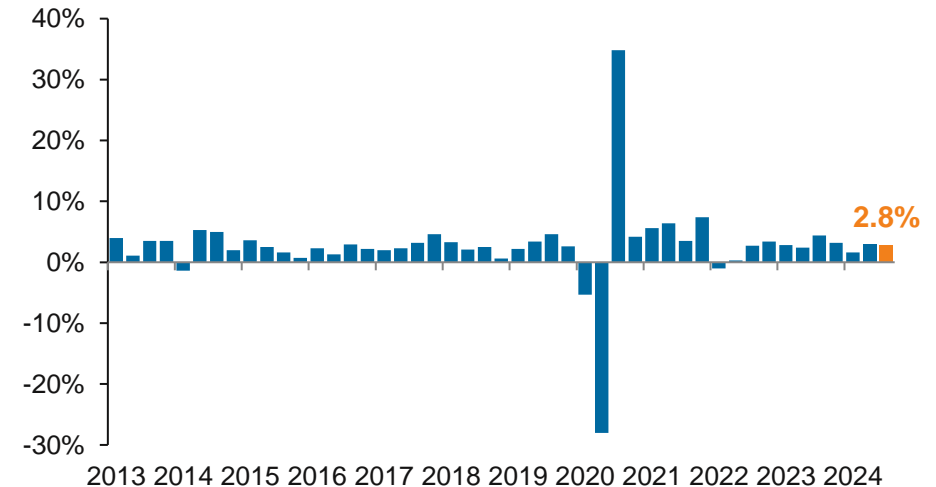
Inflation Year-Over-Year



U.S. Treasury Yield Curves



Quarterly Real GDP Growth



Sources: Bureau of Labor Statistics, Callan, Federal Reserve

# Equity and Bond Markets Up Sharply in 3Q

Equities have recovered losses of 2022; fixed income and real estate still lag

## S&P 500 climbed 5.9% in 3Q24

- U.S. small cap outperformed U.S. large cap, as did developed ex-U.S. markets and emerging markets.
- Emerging Markets had a good quarter rising 8.7%, ahead of the developed markets.

## Strong quarter for core fixed income

- The Bloomberg Aggregate rose 5.2% as rates fell over the quarter.
- Long duration fixed income and non-U.S. bonds saw even stronger returns than the Aggregate.
- Interest rates remain volatile as the markets assess how the Fed will continue with easing.

Returns for Periods ended 9/30/24

	Quarter	1 Year	1/1/22 - Current	5 Years	10 Years	25 Years
<b>U.S. Equity</b>						
Russell 3000	6.23	35.19	7.74	15.26	12.83	8.38
S&P 500	5.89	36.35	8.85	15.98	13.38	8.20
Russell 2000	9.27	26.76	1.23	9.39	8.78	8.27
<b>Global ex-U.S. Equity</b>						
MSCI World ex USA	7.76	24.98	4.99	8.36	5.68	4.77
MSCI Emerging Markets	8.72	26.05	0.92	5.75	4.03	--
MSCI ACWI ex USA Small Cap	8.90	23.25	1.29	8.21	6.08	6.79
<b>Fixed Income</b>						
Bloomberg Aggregate	5.20	11.57	-1.52	0.33	1.84	4.06
90-day T-Bill	1.37	5.46	3.81	2.32	1.65	1.92
Bloomberg Long Gov/Credit	7.96	17.24	-7.43	-1.97	2.32	5.62
Bloomberg Global Agg ex-US	8.52	12.28	-4.40	-1.86	-0.50	2.62
<b>Real Estate</b>						
NCREIF Property	0.78	-3.47	-1.21	3.26	5.88	7.67
FTSE Nareit Equity	16.09	34.74	-0.10	5.46	7.83	10.08
<b>Alternatives</b>						
Cambridge Private Equity*	1.00	4.62	1.94	13.84	13.10	12.73
Cambridge Senior Debt*	1.19	7.51	6.08	6.92	6.76	4.33
HFRI Fund Weighted	2.84	12.64	4.23	7.41	5.12	6.09
Bloomberg Commodity	0.68	0.96	4.60	7.79	0.03	2.21
<b>CPI-U</b>	<b>0.36</b>	<b>2.44</b>	<b>4.58</b>	<b>4.19</b>	<b>2.85</b>	<b>2.55</b>

\*Cambridge Private Equity and Cambridge Senior Debt data as of 6/30/24.

Returns greater than one year are annualized. Sources: Bloomberg, Callan, Cambridge, FTSE Russell, HFRI, MSCI, NCREIF, S&P Dow Jones Indices

# Contributors to Recent Inflation: Primary Categories

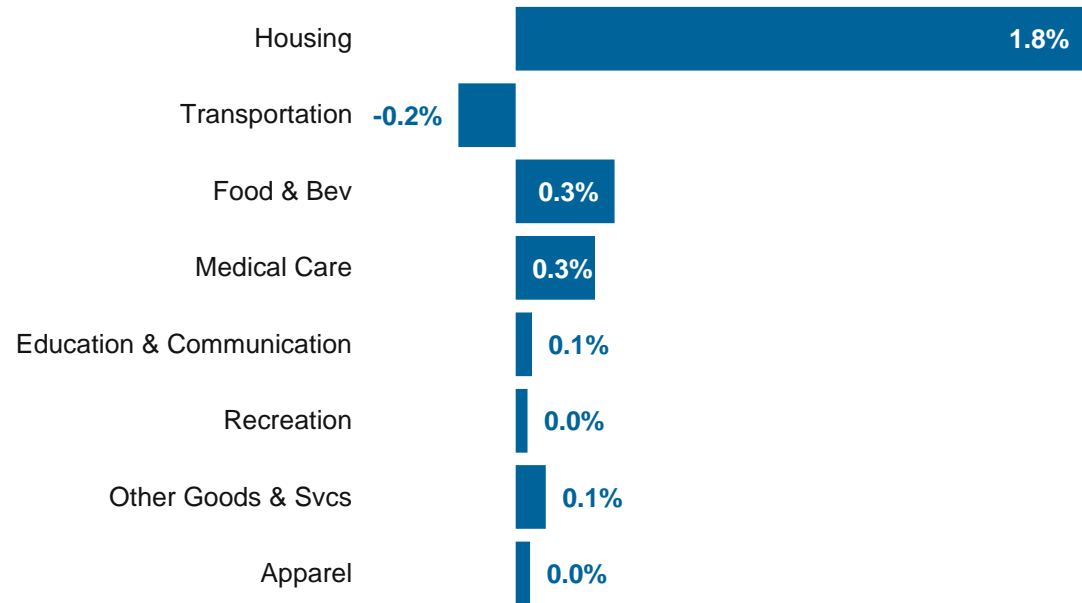
**Housing is a broad category that includes Shelter, Fuels and Utilities, and Household Furnishings and Operations as sub-components.**

- The Shelter sub-component makes up 34.9% of the overall index and accounted for almost 70% of September’s increase in year-over-year headline CPI.

**Energy is not shown in this view of CPI because it is a sub-component of other categories.**

- Energy makes up 7.2% of the index and is split roughly evenly between Housing (fuel for powering homes) and Transportation (motor fuel).

Contribution to September 2024 Year-Over-Year Inflation

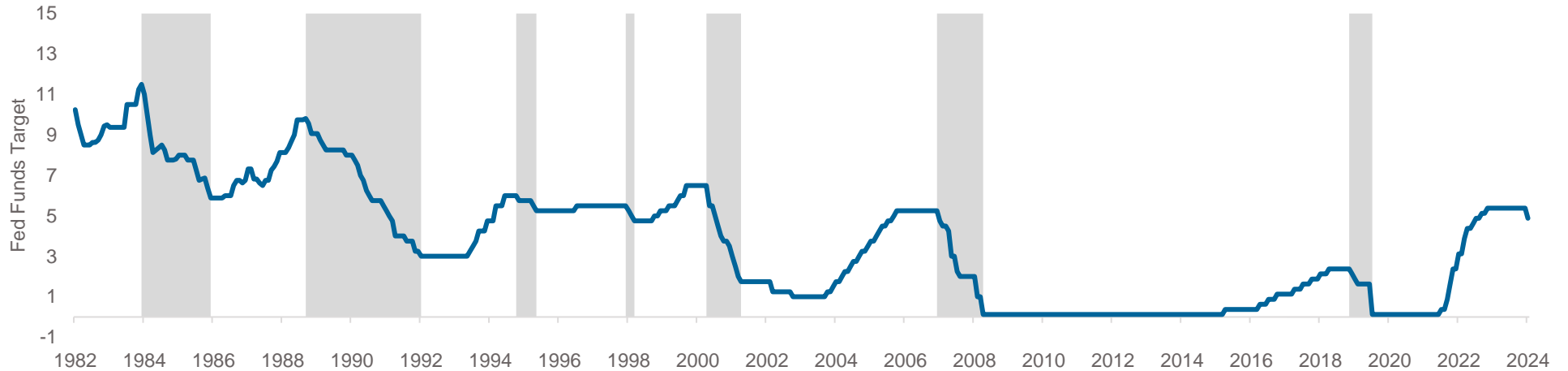


Primary Category	Primary Category Weight	Year-over-Year Change											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
All Items	100.0%	3.2%	3.1%	3.4%	3.1%	3.2%	3.5%	3.4%	3.3%	3.0%	2.9%	2.5%	2.4%
Housing	44.6%	5.2%	5.2%	4.8%	4.6%	4.5%	4.7%	4.5%	4.6%	4.4%	4.4%	4.4%	4.1%
Transportation	17.2%	0.8%	0.9%	2.9%	1.6%	2.7%	4.0%	3.5%	2.9%	1.3%	1.0%	-1.0%	-1.1%
Food & Bev	14.2%	3.3%	2.9%	2.7%	2.6%	2.2%	2.2%	2.2%	2.1%	2.2%	2.2%	2.0%	2.2%
Medical Care	7.8%	-0.8%	0.2%	0.5%	1.1%	1.4%	2.2%	2.6%	3.1%	3.3%	3.2%	3.0%	3.3%
Education & Communication	5.7%	0.9%	-0.1%	-0.1%	0.0%	0.4%	0.2%	0.4%	0.5%	0.7%	0.9%	1.0%	0.9%
Recreation	5.3%	3.2%	2.5%	2.7%	2.8%	2.1%	1.8%	1.5%	1.3%	1.3%	1.4%	1.6%	0.7%
Other Goods & Svcs	2.7%	6.2%	5.6%	5.5%	5.7%	4.7%	4.7%	4.3%	3.8%	4.2%	4.2%	3.9%	3.5%
Apparel	2.6%	2.6%	1.1%	1.0%	0.1%	0.0%	0.4%	1.3%	0.8%	0.8%	0.2%	0.3%	1.8%

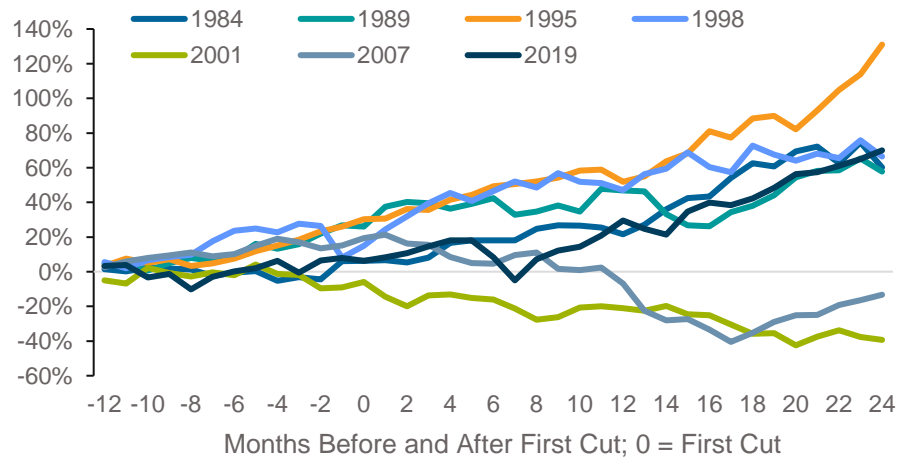
Source: U.S. Bureau of Labor Statistics

# Market Performance Around Fed Cutting Cycles

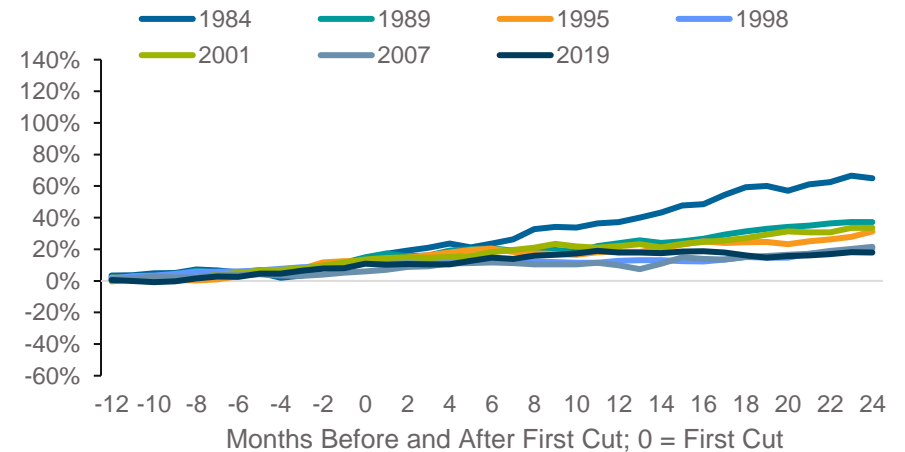
Federal Reserve Cutting Cycles



S&P 500 Cumulative Returns When Fed Cuts Rates



Bloomberg Agg Cumulative Returns When Fed Cuts Rates



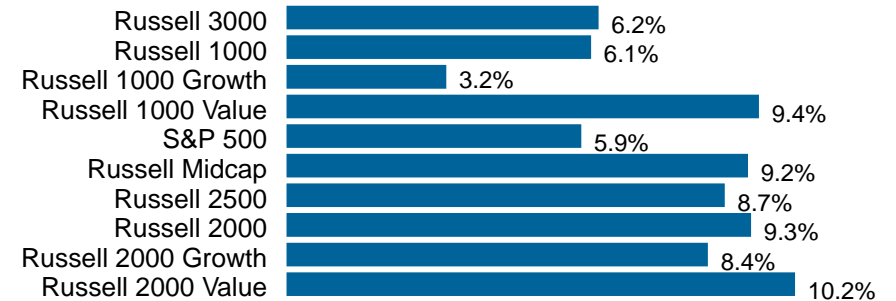
Sources: Bloomberg, Federal Reserve, S&P Dow Jones Indices

# U.S. Equity Performance: 3Q24

## U.S. market reaches record high after spike in volatility

- The U.S. equity market had a disappointing start to 3Q24 as the S&P 500 Index dropped in July.
- But the market rallied in the last months of 3Q to end the quarter at a record high.
- All sectors within the S&P 500 posted positive returns over the quarter except for the Energy sector. As a result of the Fed's rate cut decision, the bond proxy sectors (Real Estate and Utilities) performed the best.
- During 3Q, value outperformed growth across the market cap spectrum. Small cap stocks outperformed large cap stocks.
- Narrow leadership continues to be an issue for U.S. stocks. YTD, the "Magnificent Seven" stock returns accounted for 45% of the returns of the S&P 500 Index.

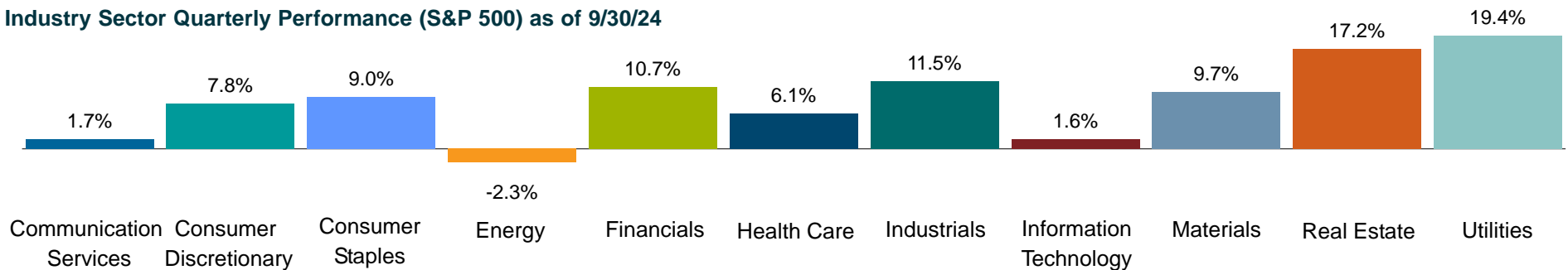
### U.S. Equity: Quarter Ended 9/30/24



### U.S. Equity: One Year Ended 9/30/24



### Industry Sector Quarterly Performance (S&P 500) as of 9/30/24



Sources: FTSE Russell, S&P Dow Jones Indices

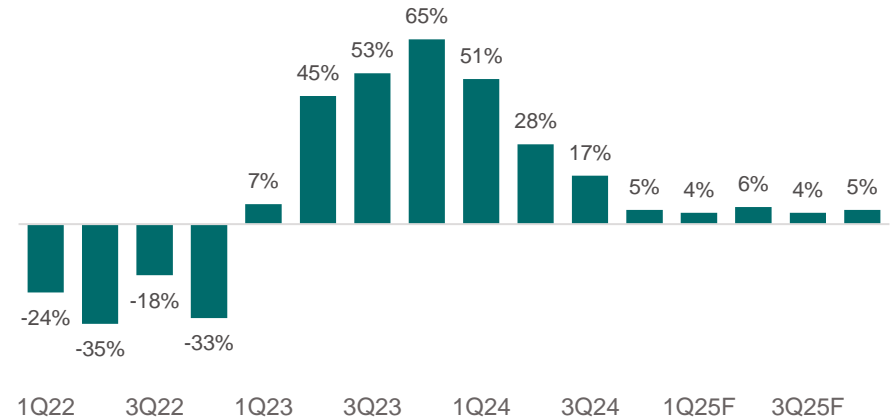


# U.S. Equity Key Theme

Top performers have broadened out from the mega cap growth stocks

- The “Magnificent Seven” stocks experienced increased volatility and mixed results in 3Q. Four of these stocks underperformed the S&P 500 Index.
- Better earnings growth expectations for the market relative to the “Magnificent Seven” could result in broader market leadership.
- Although the long-term trend may have reversed in the last quarter, a large percentage of S&P 500 Index returns since 2021 are attributable to the “Magnificent Seven.”

Earnings Growth Gap Between the Magnificent Seven and the Rest of the S&P 500 (y/y quarterly earnings growth)



## Magnificent Seven Return Contribution (S&P 500): 2021-3Q24

Returns	2021	2022	2023	YTD 2024
<b>Magnificent Seven</b>	<b>40%</b>	<b>-40%</b>	<b>76%</b>	<b>35%</b>
—Share of returns	33%	56%	63%	45%
<b>S&amp;P 500 ex-Mag Seven</b>	<b>17%</b>	<b>-8%</b>	<b>8%</b>	<b>11%</b>
—Share of returns	67%	44%	37%	55%

## Magnificent Seven Absolute Returns: 3Q24

Stock	3Q Total Return
Tesla	32.22%
Meta Platforms	13.53%
Apple	10.58%
NVIDIA	-1.70%
Amazon.com	-3.58%
Microsoft	-3.77%
Alphabet	-8.96%
<b>S&amp;P 500</b>	<b>5.89%</b>

Sources: FactSet, J.P. Morgan, Westfield Capital

# U.S. Equity Key Theme

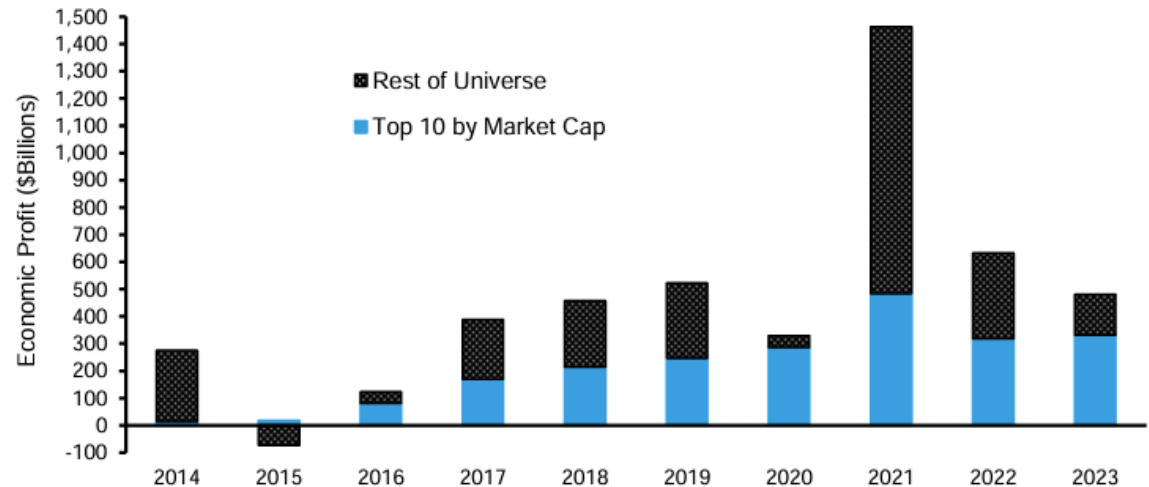
## Historical context for market concentration in U.S. equity indices

- “Magnificent Seven” stock returns drove increased concentration of the top 10 stocks in the S&P 500 to 36% as of 3Q24, an increase from the low point of ~17% in 2016.
- The weight of the top 10 largest companies in the Russell 1000 Growth Index accounted for roughly 60% of the index in 3Q.
- The largest and most successful stocks were generating more earnings, earnings growth, and cash relative to the smaller stocks in the index. Price appreciation for the largest stocks is supported by strong earnings growth and large economic profits.\*
- In the 10 years through 2023, the top 10 stocks averaged 19% of the market capitalization while the companies averaged 47% of the economic profit.
- The top 10 stocks at YE 2023 were 27% of the market capitalization and earned 69% of the economic profit.

Weight of Top 10 Stocks in the S&P 500 as of 3Q24



Economic Profit of Top 10 by Market Cap for U.S. – 2014-23



Sources: J.P. Morgan, Morgan Stanley

\*Economic Profit = money earned after taking explicit and implicit costs into account

# Global/Global ex-U.S. Equity Performance: 3Q24

## Non-U.S. markets outpace U.S. as technology sector lags

### Broad market

- Global equity markets rose while central banks began easing monetary policy and cutting interest rates.
- Market gains broadened to include more value stocks and underperforming sectors.
- Non-U.S. markets outpaced U.S. markets as the technology sector, a large portion of the U.S. market, faced pressure from AI spending scrutiny.
- Emerging markets outperformed developed markets with Asia being the strongest region within emerging markets.

### Emerging markets

- China led a sharp rally higher in emerging markets after the Chinese government announced extensive stimulus measures aimed at tackling weakening economic activity, deflation, and its deteriorating property market.

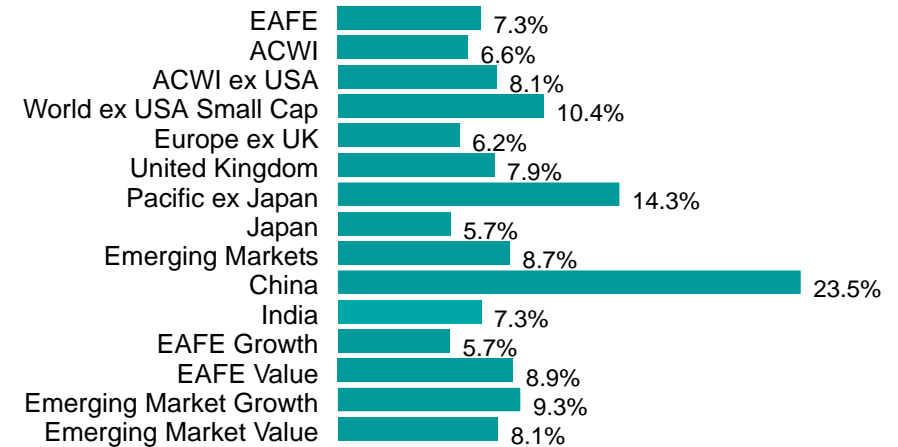
### Growth vs. value

- Generally, value-oriented sectors led markets higher as the Technology sector lagged on growth concerns. One exception was China as stimulus announcements boosted beaten-down Chinese tech companies.

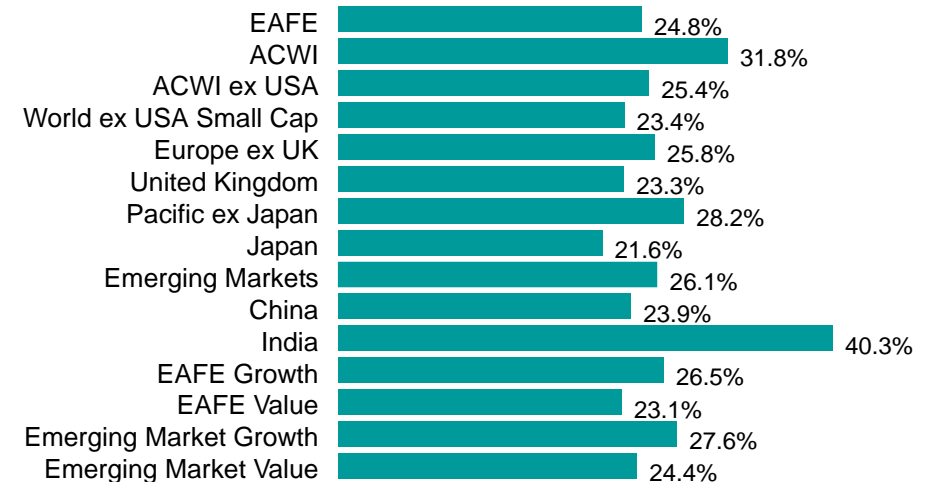
### U.S. dollar strength

- The U.S. Dollar Index (DXY), declined over 3Q24 amid a much-anticipated rate cut by the U.S. Federal Reserve.

### Global Equity Returns: Quarter Ended 9/30/24



### Global Equity Returns: One Year Ended 9/30/24



Source: MSCI

# U.S. Fixed Income Performance: 3Q24

## U.S. taxable bond markets rallied in 3Q

### Macro environment

- The Fed lowered rates for the first time since 2020, reducing its overnight target by 50 bps; Fed “dot plot” indicates two more cuts by year-end.
- U.S. Treasuries fell across the curve; 10-year Treasury yield declined to 3.81% from 4.36% at the beginning of the quarter.
- The yield curve took a step toward normalization with the 2s/10s ending positive, though rates at the front-end remain elevated vs. intermediate- and long-term.

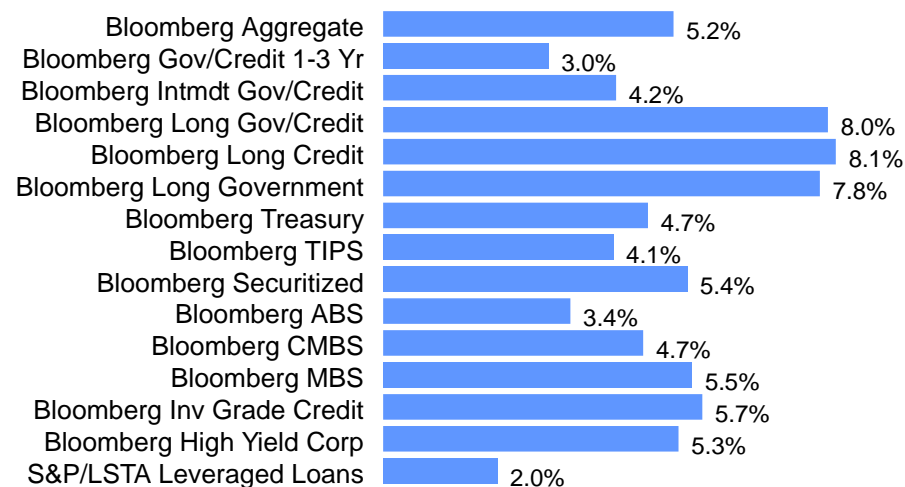
### Performance and drivers

- Bloomberg US Aggregate Index gained 5.2%, the second-best quarter in nearly 30 years, led by the rally in rates.
- Investment grade corporates and all securitized sectors outperformed U.S. Treasuries on a duration-adjusted basis.
- High yield corporate excess returns (+1.7%) outpaced investment grade corporates excess returns (+0.8%).

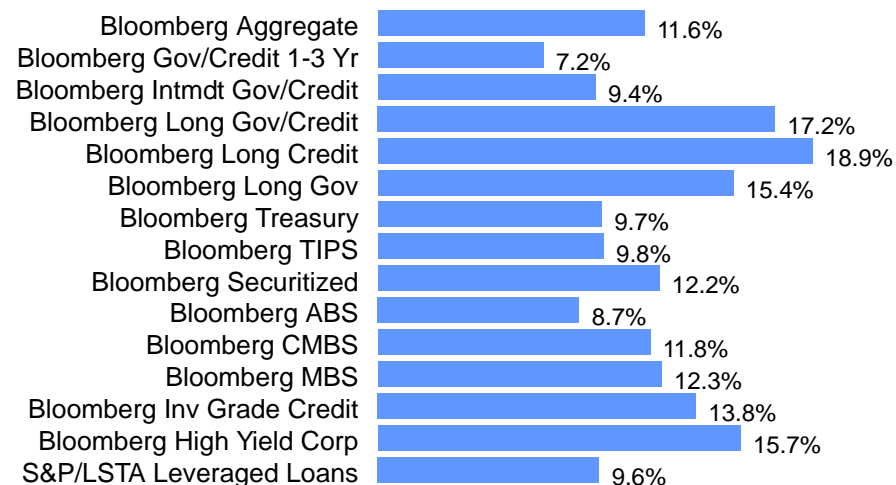
### Valuations

- Despite significant widening in late July, both IG and HY spreads ended tighter over the quarter.
- HY defaults declined to 1.8%, while bank loans increased to 3.1%, widening the gap between them to the highest since 2014.
- New issuance continued to be strong, adding \$424 billion in IG and \$78 billion in HY debt.

### U.S. Fixed Income Returns: Quarter Ended 9/30/24



### U.S. Fixed Income Returns: One Year Ended 9/30/24



Sources: Bloomberg, Callan, S&P Dow Jones Indices, J.P. Morgan, SIFMA

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## Recent Activity and Plan Performance

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## Quarterly Total Fund Highlights

As of September 30, 2024

▶ **CO PSPF ended the quarter with \$1.7 billion in assets, up \$105.0 million from Q3 2024 including investment returns and net new investments.**

– Net investment gains were \$85.3 million while net cash inflows were \$19.8 million during the quarter.

▶ **The Total Fund gained 5.48% for the quarter and rose 17.9% for the trailing year. Ahead of the benchmark the trailing year. The Total Equity Composite returned 2.37% for the quarter and gained 18.33% for the fiscal year.**

– U.S. Equity outperformed International Equity for the quarter with returns of 6.16% and 7.92%, respectively. Both had very strong returns for the trailing year: US Equity, +35.3%; Non-US Equity, +25.43%.

– For the year, the US equity portfolio ranks 15<sup>th</sup> percentile against Callan’s Endowment and Foundation – Domestic Equity peer group. International ranks 46<sup>th</sup>.

▶ **The Fixed Income Composite trailed its benchmark by 7 basis points with a return of 4.85%. For the trailing year, the portfolio was up 11.29%, ahead of the benchmark by 27 basis points.**

– The Market Duration bond portfolio equaled its benchmark with a return of 5.21% in the quarter. The portfolio rose 11.75% for the year. The portfolio ranks 77<sup>th</sup> percentile relative to Core Bond peers over three years.

– The JanusHenderson Short Duration bond portfolio lagged its benchmark by 45 basis points with a return of 2.51%. The portfolio gained 8.33% for the year.

▶ **The High Income Strategies Composite trailed its benchmark for the quarter by 1.24% with a return of 4.16%. For the year, the Composite returned 14.46%, 1.72% behind the benchmark.**

– The MacKay Shields’ high yield bond portfolio lagged the benchmark for the quarter and year with returns of 4.05% and 13.00%, respectively.

– The Principal Spectrum preferred securities portfolio also lagged its benchmark for the quarter and year with returns of 4.83% and 17.05%, respectively.

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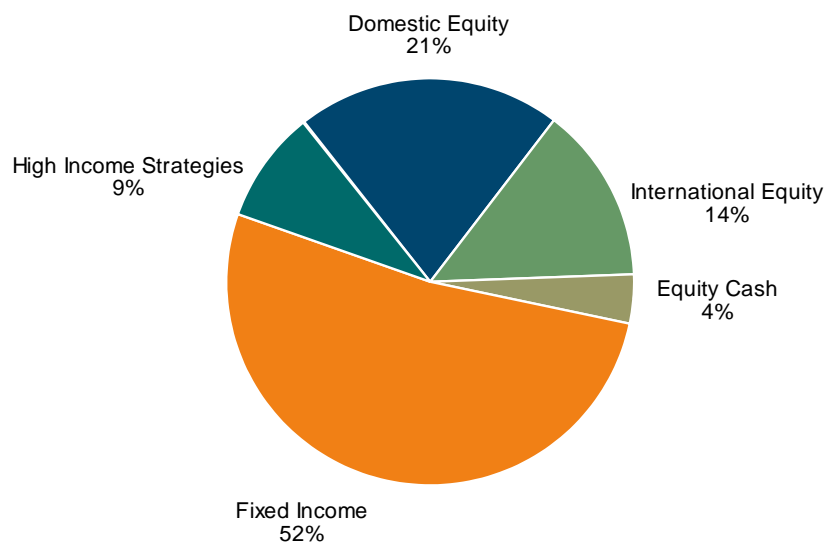
## Asset Allocation Change Implementation Update

- ▶ **The Board approved a new asset allocation at the September 9, 2024, meeting.**
  - The new asset allocation is 50% equity (30% US/20% Non-US); 32% core bonds; 10% High Yield; and 8% short duration fixed income.
- ▶ **Implementation plan is to deploy roughly 12.5% of the total amount over eight quarter.**
- ▶ **LOD was sent to Parametric on November 8<sup>th</sup> directing them to invest \$27.2 million with a trade date of November 13. Dollar amounts will be adjusted quarterly.**
- ▶ **Parametric implements with the following ETFs:**
  - US Equity: iShares Core S&P Total US Stock Market
  - Non-US: iShares Core MSCI EAFE ETF; iShares MSCI Canada; iShares MSCI Emerging Markets
- ▶ **The next trade amount will be determined based on year end fund market values and executed early in the first quarter of 2025.**
- ▶ **Interim targets for performance will be implemented for 4Q24 reporting.**

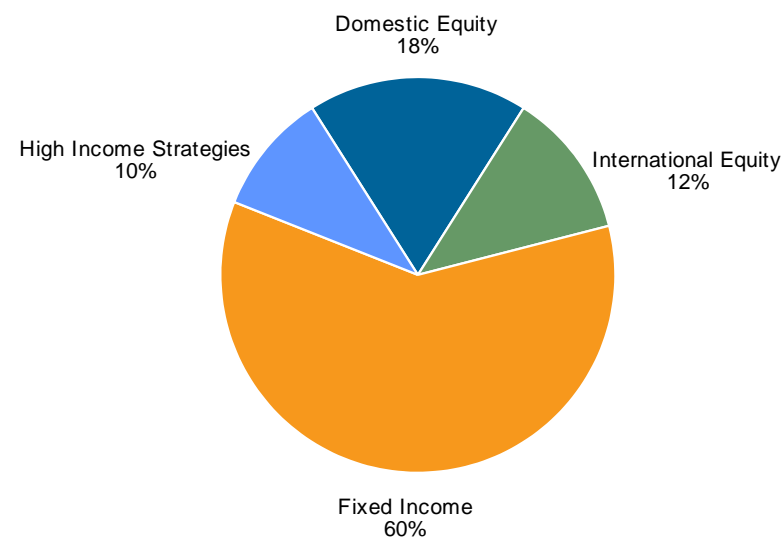
# Total Fund Asset Allocation

As of September 30, 2024

**Actual Asset Allocation**



**Target Asset Allocation**



Asset Class	\$000s Actual	Weight Actual	Target	Percent Difference	\$000s Difference
Domestic Equity	356,241	21.0%	18.0%	3.0%	51,356
International Equity	237,881	14.0%	12.0%	2.0%	34,625
Equity Cash	65,887	3.9%	0.0%	3.9%	65,887
Fixed Income	882,403	52.1%	60.0%	(7.9%)	(133,879)
High Income Strategies	151,392	8.9%	10.0%	(1.1%)	(17,989)
Total	1,693,803	100.0%	100.0%		

As of September 30, the Domestic Equity portfolio was at the high end of the rebalancing range and Fixed Income



# Asset Distribution

	September 30, 2024			June 30, 2024		
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
<b>Total Equity (1)</b>	<b>\$595,652,033</b>	<b>35.17%</b>	<b>\$(2,629)</b>	<b>\$37,755,879</b>	<b>\$557,898,782</b>	<b>35.12%</b>
<b>Domestic Equity</b>	<b>\$356,240,608</b>	<b>21.03%</b>	<b>\$(4,536,657)</b>	<b>\$20,441,087</b>	<b>\$340,336,177</b>	<b>21.42%</b>
iShares S&P 1500 ETF	356,240,608	21.03%	(4,536,657)	20,441,087	340,336,177	21.42%
<b>International Equity</b>	<b>\$237,881,272</b>	<b>14.04%</b>	<b>\$3,339,186</b>	<b>\$17,312,673</b>	<b>\$217,229,413</b>	<b>13.67%</b>
iShares MSCI Emerging ETF	69,536,599	4.11%	1,592,241	4,756,743	63,187,615	3.98%
iShares MSCI Canada ETF	18,374,095	1.08%	91,484	1,966,980	16,315,631	1.03%
iShares Core MSCI EAFE ETF	149,970,577	8.85%	1,655,461	10,588,950	137,726,166	8.67%
Equity Cash	1,530,154	0.09%	1,194,842	2,119	333,193	0.02%
<b>Total Fixed Income</b>	<b>\$882,402,511</b>	<b>52.10%</b>	<b>\$(8,033,107)</b>	<b>\$41,007,992</b>	<b>\$849,427,626</b>	<b>53.47%</b>
<b>Market Duration</b>	<b>\$766,884,903</b>	<b>45.28%</b>	<b>\$(6,636,374)</b>	<b>\$38,199,259</b>	<b>\$735,322,019</b>	<b>46.28%</b>
Colorado Treasurer's Portfolio	766,884,903	45.28%	(6,636,374)	38,199,259	735,322,019	46.28%
<b>Short Duration</b>	<b>\$115,517,607</b>	<b>6.82%</b>	<b>\$(1,396,732)</b>	<b>\$2,808,733</b>	<b>\$114,105,606</b>	<b>7.18%</b>
Janus Henderson (2)	115,517,607	6.82%	(1,396,732)	2,808,733	114,105,606	7.18%
<b>High Income Strategies</b>	<b>\$151,391,615</b>	<b>8.94%</b>	<b>\$(2,184,317)</b>	<b>\$6,049,977</b>	<b>\$147,525,954</b>	<b>9.29%</b>
<b>High Yield Fixed Income</b>	<b>\$128,722,775</b>	<b>7.60%</b>	<b>\$(1,879,583)</b>	<b>\$5,041,393</b>	<b>\$125,560,965</b>	<b>7.90%</b>
Mackay Shield US High Yield (3)	128,722,775	7.60%	(1,879,583)	5,041,393	125,560,965	7.90%
<b>Preferred Securities</b>	<b>\$22,668,840</b>	<b>1.34%</b>	<b>\$(304,734)</b>	<b>\$1,008,584</b>	<b>\$21,964,989</b>	<b>1.38%</b>
Principal Preferred Securities (3)	22,668,840	1.34%	(304,734)	1,008,584	21,964,989	1.38%
<b>Cash Available For Investing</b>	<b>\$64,357,021</b>	<b>3.80%</b>	<b>\$29,982,028</b>	<b>\$486,707</b>	<b>\$33,888,286</b>	<b>2.13%</b>
<b>Total Fund</b>	<b>\$1,693,803,179</b>	<b>100.0%</b>	<b>\$19,761,975</b>	<b>\$85,300,555</b>	<b>\$1,588,740,649</b>	<b>100.0%</b>

(1) Funded in December 2017.  
(2) Funded in November 2018.  
(3) Funded in July 2020.

# Manager & Composite Cumulative Returns

As of September 30, 2024

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>Total Equity</b>	<b>6.76%</b>	<b>31.13%</b>	<b>7.77%</b>	<b>12.23%</b>	-
60% Russell 3000/40% ACWI ex US	6.96%	31.23%	7.87%	12.20%	9.80%
<b>Domestic Equity</b>	<b>6.16%</b>	<b>35.25%</b>	<b>10.19%</b>	<b>15.22%</b>	-
Russell 3000 Index	6.23%	35.19%	10.29%	15.26%	12.83%
<b>International Equity</b>	<b>7.92%</b>	<b>25.43%</b>	<b>4.07%</b>	<b>7.79%</b>	-
MSCI ACWI ex US	8.06%	25.35%	4.14%	7.59%	5.22%
<b>Total Fixed Income</b>	<b>4.85%</b>	<b>11.29%</b>	<b>(0.72%)</b>	<b>0.76%</b>	<b>2.15%</b>
Total Fixed Income Benchmark (1)	4.92%	11.02%	(1.02%)	0.52%	1.77%
<b>Market Duration</b>	<b>5.21%</b>	<b>11.75%</b>	<b>(1.18%)</b>	<b>0.48%</b>	<b>2.06%</b>
Colorado Treasurer's Portfolio (2)	5.21%	11.75%	(1.18%)	0.48%	2.06%
PSPF Custom Benchmark (3)	5.20%	11.57%	(1.39%)	0.33%	1.73%
<b>Short Duration</b>	<b>2.51%</b>	<b>8.33%</b>	<b>2.25%</b>	<b>2.57%</b>	-
Janus Henderson Short Duration	2.51%	8.33%	2.25%	2.57%	-
Blmbg Gov/Cred 1-3 Yr	2.96%	7.19%	1.50%	1.70%	1.64%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.96%	7.63%	1.87%	2.11%	2.06%
<b>High Income Strategies</b>	<b>4.16%</b>	<b>14.46%</b>	<b>3.72%</b>	-	-
High Income Strategies Benchmark (5)	5.40%	16.18%	2.82%	4.52%	5.03%
<b>High Yield Fixed Income</b>	<b>4.05%</b>	<b>14.00%</b>	<b>3.97%</b>	-	-
Mackay Shield US High Yield	4.05%	14.00%	3.97%	-	-
Blmbg High Yield	5.28%	15.74%	3.10%	4.72%	5.04%
<b>Preferred Securities</b>	<b>4.83%</b>	<b>17.05%</b>	<b>2.20%</b>	-	-
Principal Preferred Securities	4.83%	17.05%	2.20%	-	-
ICE BofA US All Cap Secs	6.08%	18.65%	1.22%	3.38%	4.86%
<b>Total Fund w/o CAI (6)</b>	<b>5.48%</b>	<b>17.94%</b>	<b>2.47%</b>	<b>4.15%</b>	<b>3.77%</b>
Total Fund Benchmark (6)	5.58%	17.38%	2.11%	4.00%	3.52%

Performance footnotes are detailed after the performance attribution exhibits.

# Manager & Composite Fiscal Year Returns

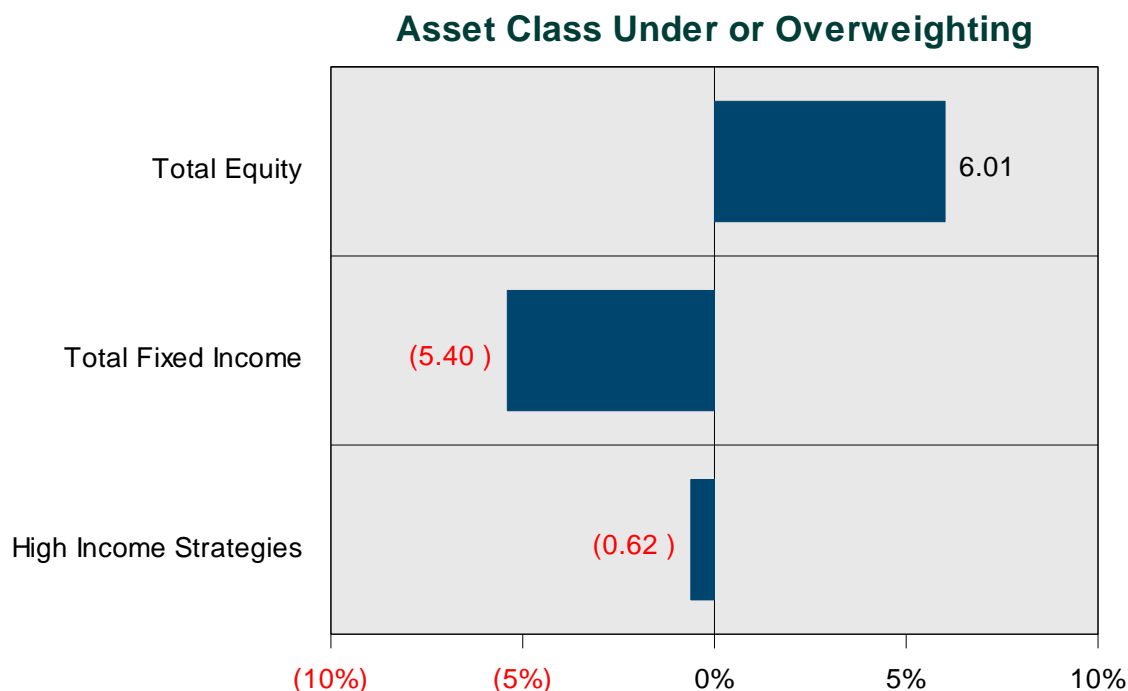
As of September 30, 2024

	6/2024- 9/2024	FY 2024	FY 2023	FY 2022	FY 2021
<b>Total Equity</b>	<b>6.76%</b>	<b>18.33%</b>	<b>16.33%</b>	<b>(15.85%)</b>	<b>41.59%</b>
60% Russell 3000/40% ACWI ex US	6.96%	18.44%	16.57%	(16.06%)	40.77%
<b>Domestic Equity</b>	<b>6.16%</b>	<b>23.24%</b>	<b>18.83%</b>	<b>(13.95%)</b>	<b>44.30%</b>
Russell 3000 Index	6.23%	23.13%	18.95%	(13.87%)	44.16%
<b>International Equity</b>	<b>7.92%</b>	<b>11.26%</b>	<b>12.28%</b>	<b>(18.97%)</b>	<b>37.78%</b>
MSCI ACWI ex US	8.06%	11.62%	12.72%	(19.42%)	35.72%
<b>Total Fixed Income</b>	<b>4.85%</b>	<b>3.47%</b>	<b>(0.04%)</b>	<b>(9.76%)</b>	<b>(0.27%)</b>
Total Fixed Income Benchmark (1)	4.92%	2.93%	(0.75%)	(9.46%)	(0.26%)
<b>Market Duration</b>	<b>5.21%</b>	<b>3.06%</b>	<b>(0.53%)</b>	<b>(10.55%)</b>	<b>(0.55%)</b>
Colorado Treasurer's Portfolio (2)	5.21%	3.06%	(0.53%)	(10.55%)	(0.55%)
PSPF Custom Benchmark (3)	5.20%	2.63%	(0.94%)	(10.29%)	(0.33%)
<b>Short Duration</b>	<b>2.51%</b>	<b>6.13%</b>	<b>2.92%</b>	<b>(4.33%)</b>	<b>2.33%</b>
Janus Henderson Short Duration	2.51%	6.13%	2.92%	(4.33%)	2.33%
Blmbg Gov/Cred 1-3 Yr	2.96%	4.87%	0.52%	(3.56%)	0.44%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.96%	5.35%	1.49%	(3.83%)	1.70%
<b>High Income Strategies</b>	<b>4.16%</b>	<b>10.47%</b>	<b>8.18%</b>	<b>(9.38%)</b>	-
High Income Strategies Benchmark (5)	5.40%	10.62%	7.93%	(12.89%)	15.13%
<b>High Yield Fixed Income</b>	<b>4.05%</b>	<b>10.00%</b>	<b>9.23%</b>	<b>(9.09%)</b>	-
Mackay Shield US High Yield	4.05%	10.00%	9.23%	(9.09%)	-
Blmbg High Yield	5.28%	10.44%	9.06%	(12.81%)	15.37%
<b>Preferred Securities</b>	<b>4.83%</b>	<b>13.18%</b>	<b>2.29%</b>	<b>(11.11%)</b>	-
Principal Preferred Securities	4.83%	13.18%	2.29%	(11.11%)	-
ICE BofA US All Cap Secs	6.08%	11.63%	1.66%	(13.33%)	13.67%
<b>Total Fund w/o CAI (6)</b>	<b>5.48%</b>	<b>8.89%</b>	<b>5.66%</b>	<b>(11.58%)</b>	<b>8.30%</b>
Total Fund Benchmark (6)	5.58%	8.24%	5.18%	(11.64%)	7.98%

Performance footnotes are detailed after the performance attribution exhibits.

# One Quarter Performance Attribution

As of September 30, 2024



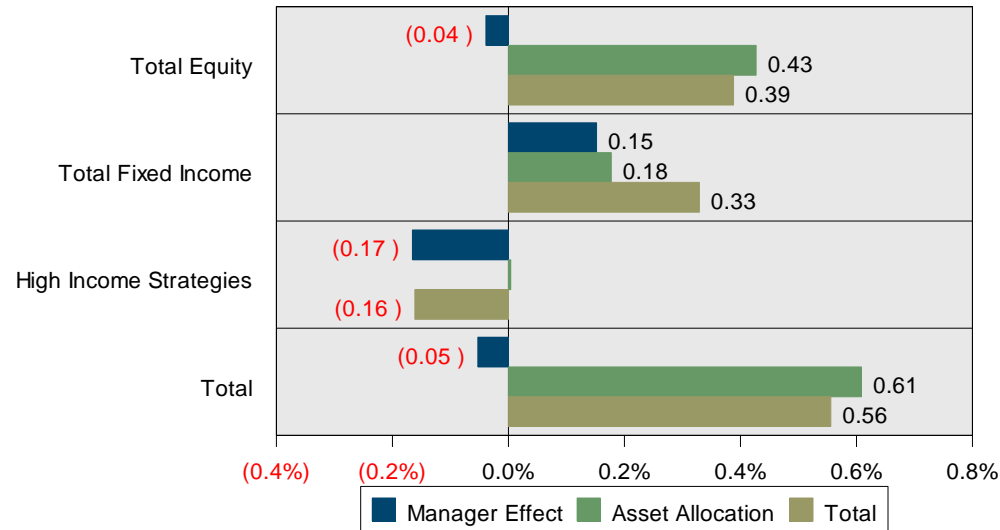
## Relative Attribution Effects for Quarter ended September 30, 2024

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	36%	30%	6.76%	6.96%	(0.07%)	0.09%	0.02%
Total Fixed Income	55%	60%	4.85%	4.92%	(0.04%)	0.04%	0.00%
High Income Strategies	9%	10%	4.16%	5.40%	(0.12%)	0.00%	(0.12%)
<b>Total</b>			<b>5.48%</b>	<b>5.58%</b>	<b>(0.23%)</b>	<b>0.13%</b>	<b>(0.10%)</b>

# One Year Performance Attribution

As of September 30, 2024

## 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	35%	30%	31.13%	31.23%	(0.04%)	0.43%	0.39%
Total Fixed Income	56%	60%	11.29%	11.02%	0.15%	0.18%	0.33%
High Income Strategies	9%	10%	14.46%	16.18%	(0.17%)	0.00%	(0.16%)
<b>Total</b>			<b>17.94%</b>	<b>17.38%</b>	<b>+ (0.05%)</b>	<b>+ 0.61%</b>	<b>0.56%</b>

## Asset Allocation Target & Rebalancing Ranges

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>	

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## Performance Footnotes

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- (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.

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## Callan Update



# Published Research Highlights: 3Q24

## STAR Report (clients-only)



## Private Equity Fees and Terms Study



## 2Q24 Market Intelligence Report (clients-only)



## Coming Soon: ESG Survey



## Recent Blog Posts

**Navigating U.S. Equity Concentration: A Look at Global Stocks**

Fanglue Zhou

**Nonprofits: Same Mission, but New Approach to Allocations**

Tony Lissuzzo

**The Supermicro Conundrum: When Success Hurts Managers**

Nicole Wubbena

## Additional Reading

Active vs. Passive quarterly charts  
*Capital Markets Review* quarterly newsletter  
Monthly Updates to the Periodic Table  
*Market Pulse Flipbook* quarterly markets update  
Market Intelligence (clients-only)  
*Real Estate Indicators* market outlook

# Callan Institute Events

Upcoming conferences, workshops, and webinars

## 2025 National Conference

Mark your calendars for this event in Scottsdale on April 27-29, 2025

Our annual conference will feature mainstage speakers and Callan-led workshops on a variety of topics.

This year we welcome Zanny Minton Beddoes to the stage.

Registration for this event will open in January 2025!

Please visit our website at [callan.com/events-education](https://callan.com/events-education) as we add dates to our 2025 calendar!



## Mark Your Calendar

### 2025 Regional Workshops

June 3, 2025 – Denver

June 5, 2025 – New York

October 28, 2025 – Chicago

October 30, 2025 – San Francisco

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

## Upcoming Webinars

### November 21, 2024

Research Café featuring Callan's 2024 Private Equity Fees and Terms Study

### January 2025

Callan's 2025 Capital Markets Assumptions Webinar

# Introducing Callan On-Demand Education (CODE)

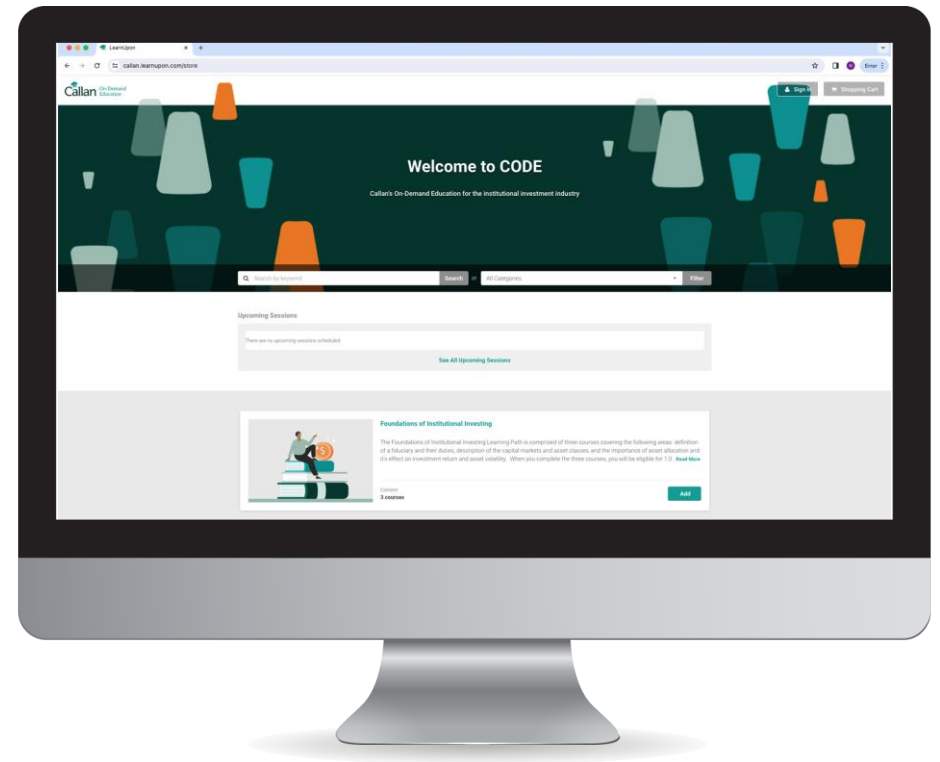


- ▶ Variety of educational courses
- ▶ Interactive and engaging
- ▶ Self-guided modules
- ▶ Eligible for continuing education credits
- ▶ Learning at your own pace

**CODE** courses are designed for investment professionals of all levels—and they're self-guided. Access them anytime, from anywhere, and get continuing education credits for each completed course.

**CODE** is for you, your colleagues, your new hires, and your interns. It's for anyone interested in learning about institutional investing.

[callan.com/code](https://callan.com/code)



## 3 Reasons to Take CODE Courses

- 1 Become a better fiduciary
- 2 Showcase your skills and knowledge
- 3 Learn from Callan's investment experts

## Callan Updates

Firm updates by the numbers, as of September 30, 2024

**Total Associates:** ~200

**Company Ownership:**

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

Total General and Investment Consultants: 50+

Total Specialty and Research Consultants: 65+

Total CFA/CAIA/FRMs: 60+

Total Institutional Investor Clients: 475+

Provides advisory services to institutional investor clients with assets over \$4+ trillion

### NEW ON CODE: The Framework of Alternative Investments

Our newest online learning course series, the Framework of Alternative Investments, is live on **CODE**, the Callan On-Demand Education portal. Topics covered include private equity, private credit, hedge funds, and real assets. Callan clients have full access to all CODE courses for free.

**“CODE is aimed at educating client and non-client, investment and non-investment professional board members alike in how institutional investment portfolios are constructed and maintained across asset classes, including alternatives.”**

— Greg Allen, CEO, Chief Research Officer in a June 2024 *FundFire* story about CODE



# Diversity, Equity & Belonging (DEB)

Building a diverse workforce, pursuing equitable outcomes, and creating a sense of belonging

## Five-Year Strategic Plan: Key Areas



### DEB Leadership:

Greg Allen, Executive Sponsor, and Lauren Mathias, Champion

### DEB Council:

Citlali Cuevas, Laura Dawson, Ruth Duque, Mike Joecken, Lindsay Jones, Paola Cardenales, Erik Partida, Juan Pablo Piz, Avery Robinson, Jeff Salyer, Alvaro Vega, Nicole Wubbena

**Client DEB projects:** *Investment manager Callan DEI Score trends, investment manager team and employee demographics review versus peers, diverse-owned manager searches, incorporating diversity in an IPS, and review of DEI in DC plans.*

### Accomplishments

- ▶ Inclusive culture education for all
- ▶ Engagement surveys
- ▶ Inclusive interviewing and resume review guides
- ▶ Equitable policies for promotion and partnership
- ▶ Enhanced pay equity and supplier diversity policies
- ▶ Pronoun education
- ▶ DEB Awareness Calendar
- ▶ Buddy program
- ▶ Employee resource groups (CallanUnites ERGs)
- ▶ 2024 Asset Manager DEI Study
- ▶ 2024 DEB Advancement Report



### Near-Term Plans

- ▶ Ongoing education
- ▶ Mentorship program



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## Important Disclosures

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Callan's performance measurement service reports estimated 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 reports include a portfolio holdings analysis, Callan relies entirely on holdings, pricing, characteristics, and risk data provided by third parties including custodian banks, record keepers, pricing services, index providers, 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's performance measurement service may report on illiquid asset classes, including, but not limited to, private real estate, private equity, private credit, hedge funds and infrastructure. The final valuation reports, which Callan receives from third parties, for of these types of asset classes may not be available at the time a Callan performance report is issued. As a result, the estimated returns and market values reported for these illiquid asset classes, as well as for any composites including these illiquid asset classes, including any total fund composite prepared, may not reflect final data, and therefore may be subject to revision in future quarters.

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.

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## Important Disclosures (continued)

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.

September 30, 2024

**CO Public School Permanent Fund**



**Investment Measurement Service  
Quarterly Review**



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### September 30, 2024

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**U.S. EQUITIES**

**U.S. market reaches record high after spike in volatility**

- The U.S. equity market had a disappointing start to 3Q24 as the S&P 500 Index dropped in July.
- But the market rallied in the last months of 3Q to end the quarter at a record high.
- All sectors within the S&P 500 posted positive returns over the quarter except for the Energy sector. As a result of the Fed’s rate cut decision, the bond proxy sectors (Real Estate and Utilities) performed the best.
- During 3Q, value outperformed growth across the market cap spectrum. Small cap stocks outperformed large cap stocks.
- Narrow leadership continues to be an issue for U.S. stocks. YTD, the “Magnificent Seven” stock returns accounted for 45% of the returns of the S&P 500 Index.

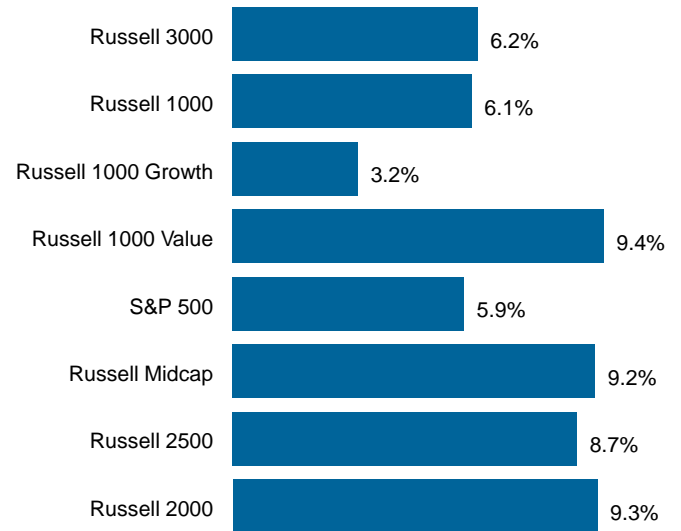
**Top performers have broadened out**

- The “Magnificent Seven” stocks experienced increased volatility and mixed results in 3Q. Four of these stocks underperformed the S&P 500 Index.
- Better earnings growth expectations for the market relative to the “Magnificent Seven” could result in broader market leadership.
- Although the long-term trend may have reversed in the last quarter, a large percentage of S&P 500 Index returns since 2021 are attributable to the “Magnificent Seven.”

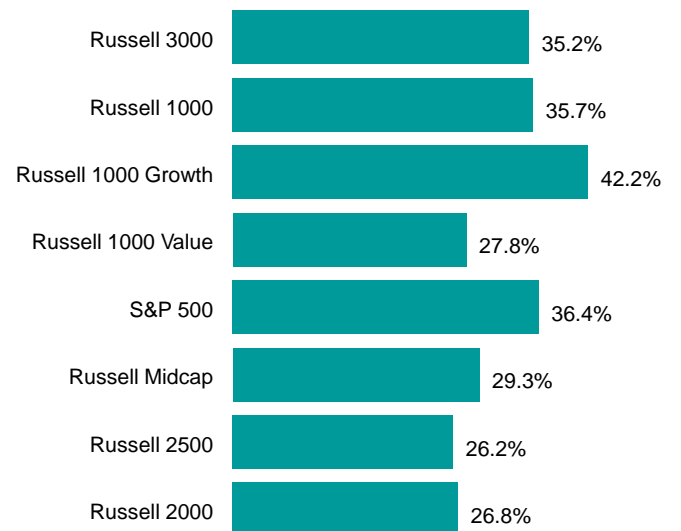
**Small cap valuations**

- Small cap relative valuations are historically low across numerous forward and trailing valuation multiples.
- Small cap continues to trade at large discounts relative to large cap.
- This may be indicative of an attractive entry point for increased allocation.

**U.S. Equity: Quarterly Returns**

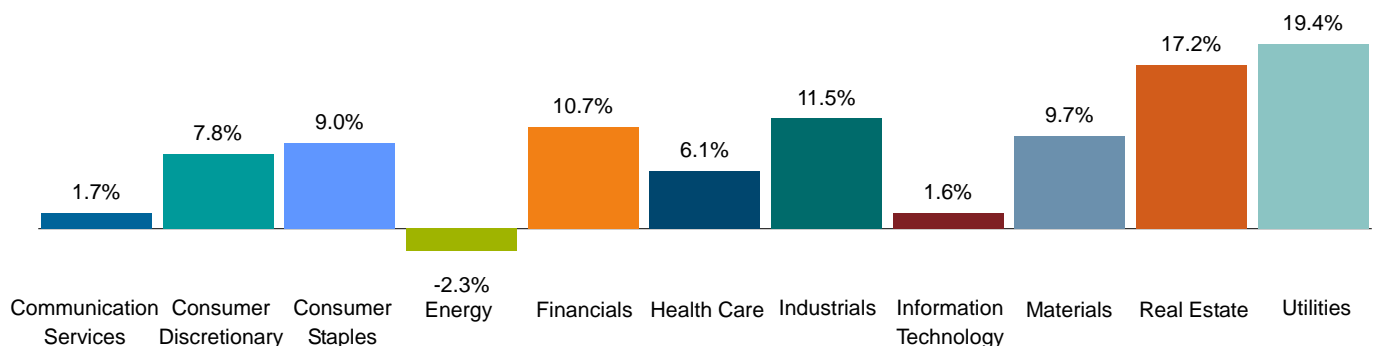


**U.S. Equity: One-Year Returns**



Sources: FTSE Russell, S&P Dow Jones Indices

**S&P Sector Returns, Quarter Ended 9/30/24**



Source: S&P Dow Jones Indices

**GLOBAL EQUITIES**

**Global ex-U.S. markets outpace U.S. as technology lags**

- Global equity markets rose while central banks began easing monetary policy and cutting interest rates.
- Market gains broadened to include more value stocks and previously underperforming sectors.
- Global ex-U.S. markets outpaced U.S. markets as the technology sector, a large portion of the U.S. market, faced pressure from AI spending scrutiny.
- Emerging markets outperformed developed markets with Asia being the strongest region within emerging markets.

**Emerging markets**

- China led a sharp rally higher in emerging markets after the Chinese government announced extensive stimulus measures aimed at tackling weakening economic activity, deflation, and its deteriorating property market.

**Growth vs. value**

- Generally, value-oriented sectors led markets higher as the technology sector hindered growth concerns. One exception was China, as stimulus announcements boosted beaten-down Chinese tech companies.

**U.S. dollar strength**

- The U.S. Dollar Index (DXY), declined over 3Q amid a much-anticipated rate cut by the U.S. Federal Reserve.

**Quality growth managers struggle**

- While outperforming in 2022, global quality growth managers have struggled since 2023, as high-growth names, often viewed as low-quality, have driven much of the market.

**High growth rewarded last 18 months**

- While high-growth managers were punished in 2022, they performed exceptionally well in 2023 and 2024.
- Still, on a three-year basis, quality growth managers have tended to outperform high-growth managers but still struggle against the ACWI index.

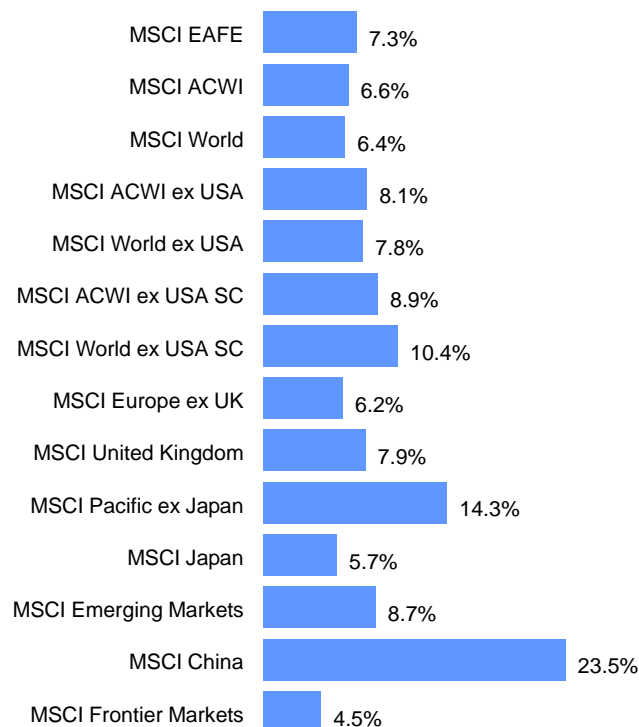
**China’s stimulus: what and why**

- On Sept. 24, 2024, China announced a broad economic stimulus package. This is likely due to declining consumer sentiment and investor pressure.

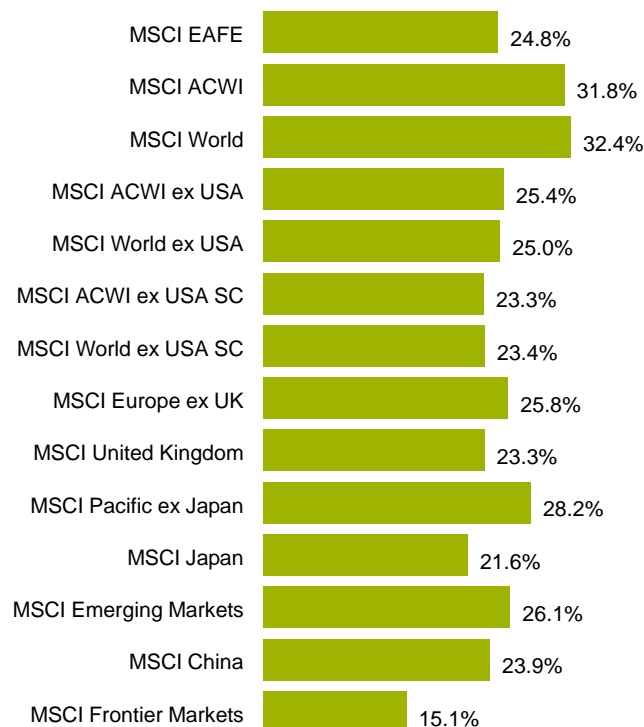
**Results**

- Stock markets initially rallied between 10%-30%, moving into YTD gain territory. Valuations are still at 10-year lows.
- China has the worst pass-through from GDP growth to earnings and investor returns since 2010. While the stimulus may assist with GDP growth, it may not correlate to better stock performance.

**Global Equity: Quarterly Returns**



**Global Equity: One-Year Returns**



Source: MSCI

**U.S. FIXED INCOME**

**Rate cut spurs market rally**

- The Fed lowered rates for the first time since 2020, reducing its overnight target by 50 bps; Fed “dot plot” indicates two more cuts by year-end.
- U.S. Treasuries fell across the curve; 10-year Treasury yield declined to 3.81% from 4.36% at the beginning of the quarter.
- The yield curve took a step toward normalization with the 2s/10s ending positive, though rates at the front-end remain elevated vs. intermediate- and long-term.

**Performance and drivers**

- The Bloomberg US Aggregate Index gained 5.2%, the second-best quarter in nearly 30 years, led by the rally in rates.
- Investment grade corporates and all securitized sectors outperformed U.S. Treasuries on a duration-adjusted basis.
- High yield corporate excess returns (+1.7%) outpaced investment grade corporates excess returns (+0.8%).

**Valuations**

- Despite significant widening in late July, both IG and HY spreads ended tighter over the quarter.
- HY defaults declined to 1.8%, while bank loans rose to 3.1%, widening the gap between them to the highest since 2014.
- New issuance continued to be strong, adding \$424 billion in IG and \$78 billion in HY debt.

**Munis posted gains but underperformed U.S. Treasuries**

- Bloomberg Municipal Bond Index (+2.7%) vs Bloomberg US Treasury Index (+4.7%)

**AAA-rated muni yield curve normalized**

- 2-year and 10-year AAA rates fell by 77 bps and 23 bps, respectively; spread now +24 bps
- Maximum inversion of -50 bps was April 2024
- Followed path of U.S. Treasury yield curve, which also normalized during the quarter (2-year vs 10-year)

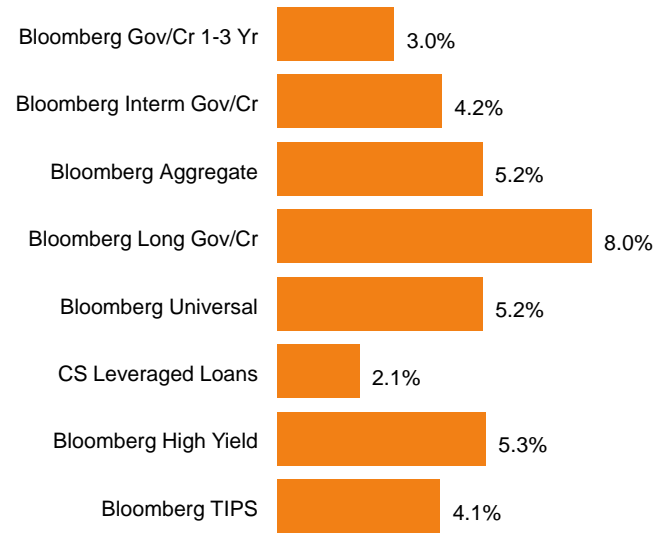
**Quality was not a major differentiator in 3Q**

- AAA: 2.8%
- AA: 2.7%
- A: 2.7%
- BBB: 2.9%

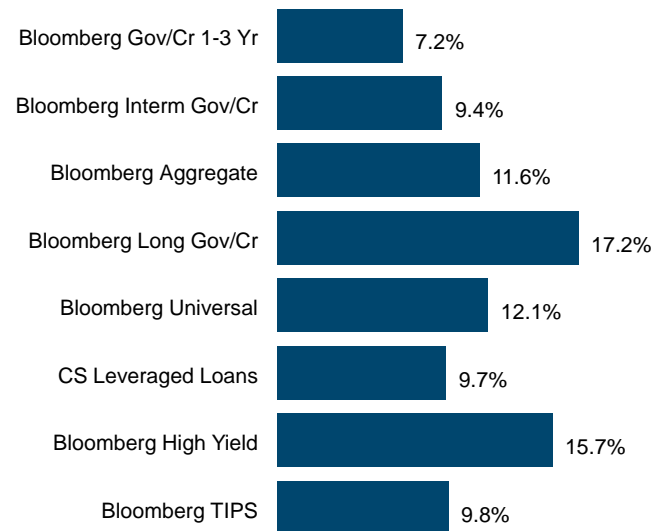
**Muni valuations vs. U.S. Treasuries remain rich**

- 10-year AAA Muni/10-year U.S. Treasury yield ratio rich relative to 10-year median (69% now vs. 85% historical)
- Need for increased infrastructure spending could benefit municipal bond issuance in years to come

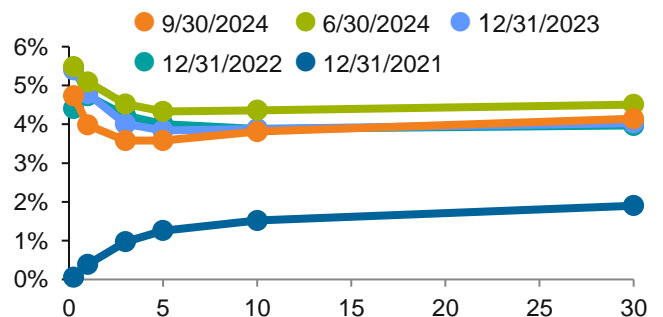
**U.S. Fixed Income: Quarterly Returns**



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



**U.S. Treasury Yield Curves**



Sources: Bloomberg, Credit Suisse

**U.S. FIXED INCOME (continued)**

**Fed makes first cut, and markets anticipate more**

- The Fed cut rates in September with a 50 bps decrease, citing a slowdown in job gains, higher unemployment, and inflation nearing its target of 2%. The move marked the first reduction since March 2020.
- Fed Funds futures now imply three additional rate cuts by year end and seven more over the coming year.
- Yields fell across the curve by no less than 37 bps, and the spread between 2-year and 10-year rates became positive for the first time since July 5, 2022, ending the quarter at +15 bps. However, the front end remains well above intermediate- and long-term rates.

**Corporate new debt issuance remains robust**

- Investment-grade corporate issuers continued the surge of new debt, issuing \$424 billion in 3Q, bringing the total YTD to more than \$1.3 trillion, already more than 7 of the last 10 years. At the current pace, new issuance will surpass \$1.7 trillion by year-end, the second-highest total on record.
- High yield new issuance was also robust, with approximately \$78 billion issued over the quarter. This brings the total issuance YTD to nearly \$250 billion, more than each of the last two calendar years.
- Concerning labor reports in late July initially led to a pullback in the market.
- But spreads narrowed once again with both IG and HY ending the quarter tighter than they began.

**GLOBAL FIXED INCOME**

**Macro environment**

- Developed market rates declined as growth and inflation expectations moved lower.
- Several central banks cut rates over the quarter while the Bank of Japan unexpectedly raised its target to 0.25%, its highest rate since 2008.

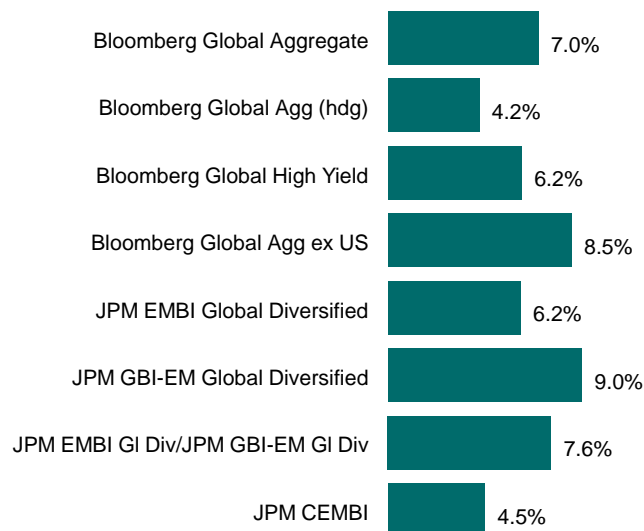
**U.S. dollar weakens**

- The U.S. dollar weakened relative to major currencies, reversing the trend from the first half of the year and enhancing returns for unhedged investors.
- Within the U.S. Dollar Index (DXY), Japanese yen saw the largest relative gain, rising 12% vs. the U.S dollar.

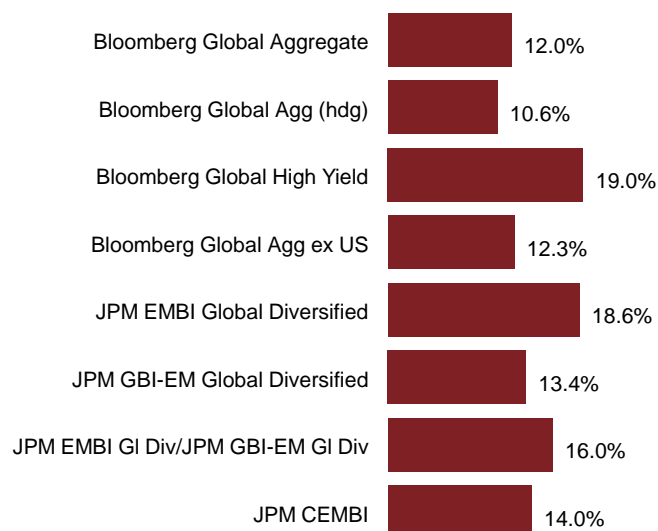
**Emerging market debt posts strong quarter**

- EM central banks broadly continued their easing policies, though Brazil raised its rate and signaled future hikes.
- The rally in EM currencies enhanced returns for EM debt, with the JPM GBI-EM Global Diversified Index gaining 9.0%.

**Global Fixed Income: Quarterly Returns**

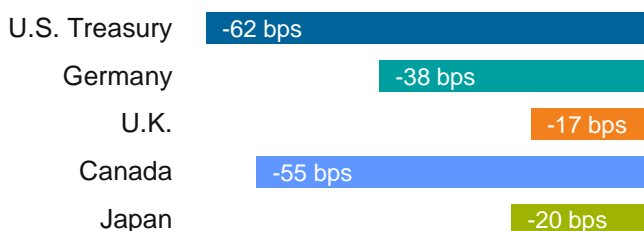


**Global Fixed Income: One-Year Returns**



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

**2Q24 to 3Q24**

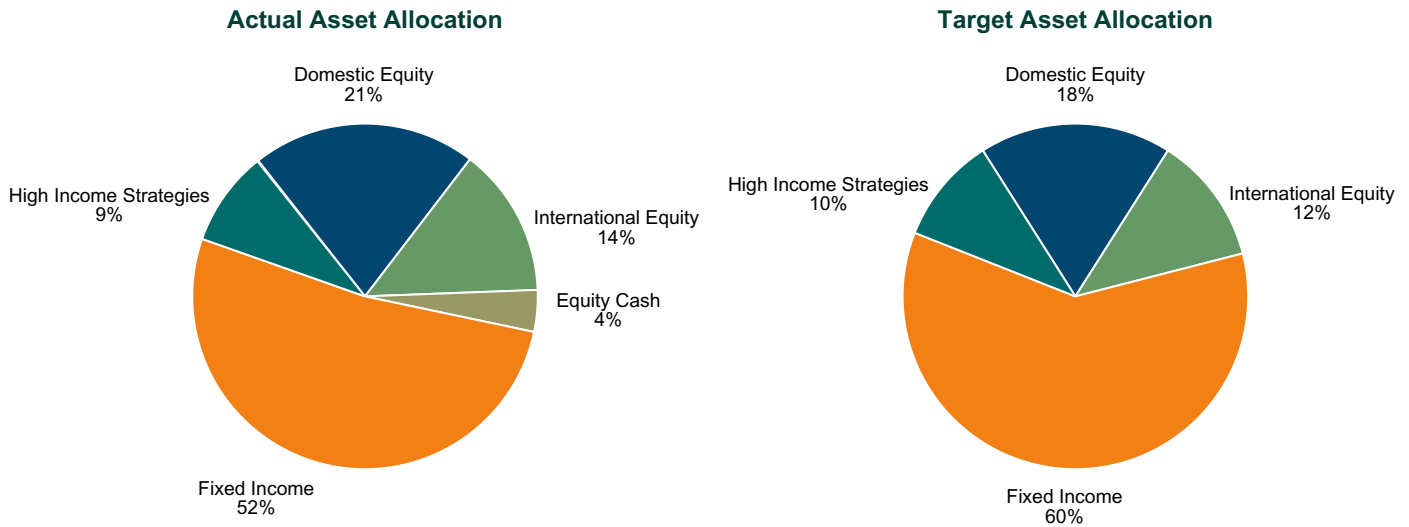


Sources: Bloomberg, JP Morgan

Actual vs. Target  
Asset Allocation

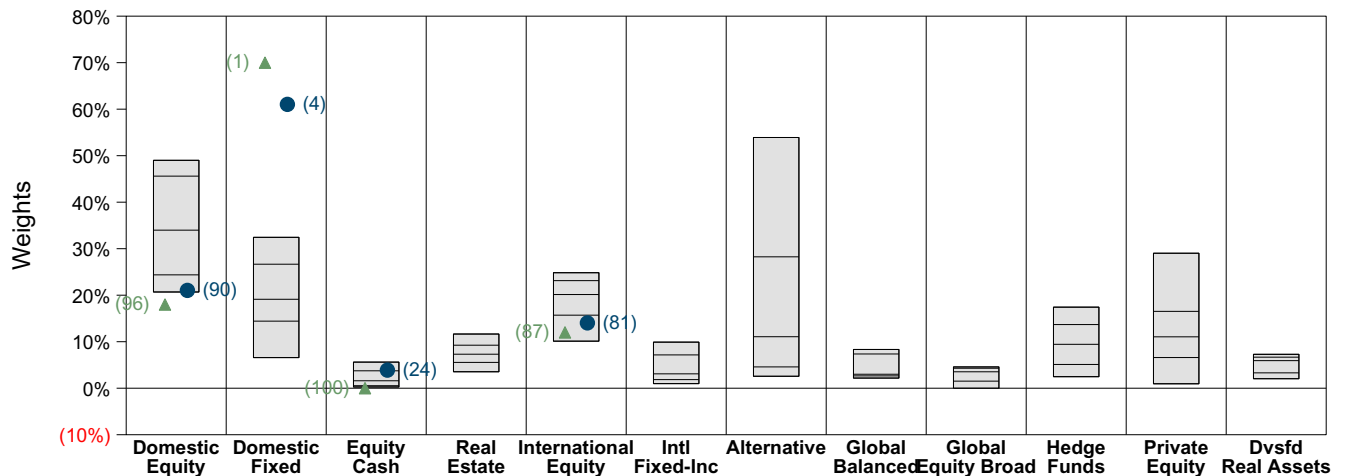
## Actual vs Target Asset Allocation As of September 30, 2024

The top left chart shows the Fund's asset allocation as of September 30, 2024. 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	356,241	21.0%	18.0%	3.0%	51,356
International Equity	237,881	14.0%	12.0%	2.0%	34,625
Equity Cash	65,887	3.9%	0.0%	3.9%	65,887
Fixed Income	882,403	52.1%	60.0%	(7.9%)	(133,879)
High Income Strategies	151,392	8.9%	10.0%	(1.1%)	(17,989)
Total	1,693,803	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	49.00	32.44	5.61	11.65	24.83	9.91	53.91	8.33	4.57	17.43	29.03	7.29
25th Percentile	45.60	26.66	3.74	9.25	23.13	7.16	28.25	7.36	4.29	13.69	16.52	6.68
Median	33.98	19.12	1.60	7.31	20.15	3.09	11.07	3.00	3.53	9.44	11.05	5.93
75th Percentile	24.38	14.42	0.54	5.55	15.71	1.85	4.58	2.66	1.52	5.11	6.59	3.30
90th Percentile	20.69	6.58	0.27	3.54	10.12	0.99	2.57	2.18	0.00	2.48	0.95	2.04
<b>Fund</b> ●	21.03	61.03	3.89	-	14.04	-	-	-	-	-	-	-
<b>Target</b> ▲	18.00	70.00	0.00	-	12.00	-	-	-	-	-	-	-
% Group Invested	96.55%	96.55%	82.76%	53.45%	89.66%	12.07%	68.97%	8.62%	8.62%	29.31%	41.38%	22.41%

\* 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 September 30, 2024, with the distribution as of June 30, 2024. 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

	September 30, 2024			Inv. Return	June 30, 2024	
	Market Value	Weight	Net New Inv.		Market Value	Weight
<b>Total Equity (1)</b>	<b>\$595,652,033</b>	<b>35.17%</b>	<b>\$(2,629)</b>	<b>\$37,755,879</b>	<b>\$557,898,782</b>	<b>35.12%</b>
<b>Domestic Equity</b>	<b>\$356,240,608</b>	<b>21.03%</b>	<b>\$(4,536,657)</b>	<b>\$20,441,087</b>	<b>\$340,336,177</b>	<b>21.42%</b>
iShares S&P 1500 ETF	356,240,608	21.03%	(4,536,657)	20,441,087	340,336,177	21.42%
<b>International Equity</b>	<b>\$237,881,272</b>	<b>14.04%</b>	<b>\$3,339,186</b>	<b>\$17,312,673</b>	<b>\$217,229,413</b>	<b>13.67%</b>
iShares MSCI Emerging ETF	69,536,599	4.11%	1,592,241	4,756,743	63,187,615	3.98%
iShares MSCI Canada ETF	18,374,095	1.08%	91,484	1,966,980	16,315,631	1.03%
iShares Core MSCI EAFE ETF	149,970,577	8.85%	1,655,461	10,588,950	137,726,166	8.67%
Equity Cash	1,530,154	0.09%	1,194,842	2,119	333,193	0.02%
<b>Total Fixed Income</b>	<b>\$882,402,511</b>	<b>52.10%</b>	<b>\$(8,033,107)</b>	<b>\$41,007,992</b>	<b>\$849,427,626</b>	<b>53.47%</b>
<b>Market Duration</b>	<b>\$766,884,903</b>	<b>45.28%</b>	<b>\$(6,636,374)</b>	<b>\$38,199,259</b>	<b>\$735,322,019</b>	<b>46.28%</b>
Colorado Treasurer's Portfolio	766,884,903	45.28%	(6,636,374)	38,199,259	735,322,019	46.28%
<b>Short Duration</b>	<b>\$115,517,607</b>	<b>6.82%</b>	<b>\$(1,396,732)</b>	<b>\$2,808,733</b>	<b>\$114,105,606</b>	<b>7.18%</b>
Janus Henderson (2)	115,517,607	6.82%	(1,396,732)	2,808,733	114,105,606	7.18%
<b>High Income Strategies</b>	<b>\$151,391,615</b>	<b>8.94%</b>	<b>\$(2,184,317)</b>	<b>\$6,049,977</b>	<b>\$147,525,954</b>	<b>9.29%</b>
<b>High Yield Fixed Income</b>	<b>\$128,722,775</b>	<b>7.60%</b>	<b>\$(1,879,583)</b>	<b>\$5,041,393</b>	<b>\$125,560,965</b>	<b>7.90%</b>
Mackay Shield US High Yield (3)	128,722,775	7.60%	(1,879,583)	5,041,393	125,560,965	7.90%
<b>Preferred Securities</b>	<b>\$22,668,840</b>	<b>1.34%</b>	<b>\$(304,734)</b>	<b>\$1,008,584</b>	<b>\$21,964,989</b>	<b>1.38%</b>
Principal Preferred Securities (3)	22,668,840	1.34%	(304,734)	1,008,584	21,964,989	1.38%
<b>Cash Available For Investing</b>	<b>\$64,357,021</b>	<b>3.80%</b>	<b>\$29,982,028</b>	<b>\$486,707</b>	<b>\$33,888,286</b>	<b>2.13%</b>
<b>Total Fund</b>	<b>\$1,693,803,179</b>	<b>100.0%</b>	<b>\$19,761,975</b>	<b>\$85,300,555</b>	<b>\$1,588,740,649</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 September 30, 2024. 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 September 30, 2024

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
<b>Total Equity</b>	<b>6.76%</b>	<b>31.13%</b>	<b>7.77%</b>	<b>12.23%</b>	<b>-</b>
60% Russell 3000/40% ACWI ex US	6.96%	31.23%	7.87%	12.20%	9.80%
<b>Domestic Equity</b>	<b>6.16%</b>	<b>35.25%</b>	<b>10.19%</b>	<b>15.22%</b>	<b>-</b>
Russell 3000 Index	6.23%	35.19%	10.29%	15.26%	12.83%
<b>International Equity</b>	<b>7.92%</b>	<b>25.43%</b>	<b>4.07%</b>	<b>7.79%</b>	<b>-</b>
MSCI ACWI ex US	8.06%	25.35%	4.14%	7.59%	5.22%
<b>Total Fixed Income</b>	<b>4.85%</b>	<b>11.29%</b>	<b>(0.72%)</b>	<b>0.76%</b>	<b>2.15%</b>
Total Fixed Income Benchmark (1)	4.92%	11.02%	(1.02%)	0.52%	1.77%
<b>Market Duration</b>	<b>5.21%</b>	<b>11.75%</b>	<b>(1.18%)</b>	<b>0.48%</b>	<b>2.06%</b>
Colorado Treasurer's Portfolio (2)	5.21%	11.75%	(1.18%)	0.48%	2.06%
PSPF Custom Benchmark (3)	5.20%	11.57%	(1.39%)	0.33%	1.73%
<b>Short Duration</b>	<b>2.51%</b>	<b>8.33%</b>	<b>2.25%</b>	<b>2.57%</b>	<b>-</b>
Janus Henderson Short Duration	2.51%	8.33%	2.25%	2.57%	-
Blmbg Gov/Cred 1-3 Yr	2.96%	7.19%	1.50%	1.70%	1.64%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.96%	7.63%	1.87%	2.11%	2.06%
<b>High Income Strategies</b>	<b>4.16%</b>	<b>14.46%</b>	<b>3.72%</b>	<b>-</b>	<b>-</b>
High Income Strategies Benchmark (5)	5.40%	16.18%	2.82%	4.52%	5.03%
<b>High Yield Fixed Income</b>	<b>4.05%</b>	<b>14.00%</b>	<b>3.97%</b>	<b>-</b>	<b>-</b>
Mackay Shield US High Yield	4.05%	14.00%	3.97%	-	-
Blmbg High Yield	5.28%	15.74%	3.10%	4.72%	5.04%
<b>Preferred Securities</b>	<b>4.83%</b>	<b>17.05%</b>	<b>2.20%</b>	<b>-</b>	<b>-</b>
Principal Preferred Securities	4.83%	17.05%	2.20%	-	-
ICE BofA US All Cap Secs	6.08%	18.65%	1.22%	3.38%	4.86%
<b>Total Fund w/o CAI (6)</b>	<b>5.48%</b>	<b>17.94%</b>	<b>2.47%</b>	<b>4.15%</b>	<b>3.77%</b>
Total Fund Benchmark (6)	5.58%	17.38%	2.11%	4.00%	3.52%

(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.

	6/2024- 9/2024	FY 2024	FY 2023	FY 2022	FY 2021
<b>Total Equity</b>	<b>6.76%</b>	<b>18.33%</b>	<b>16.33%</b>	<b>(15.85%)</b>	<b>41.59%</b>
60% Russell 3000/40% ACWI ex US	6.96%	18.44%	16.57%	(16.06%)	40.77%
<b>Domestic Equity</b>	<b>6.16%</b>	<b>23.24%</b>	<b>18.83%</b>	<b>(13.95%)</b>	<b>44.30%</b>
Russell 3000 Index	6.23%	23.13%	18.95%	(13.87%)	44.16%
<b>International Equity</b>	<b>7.92%</b>	<b>11.26%</b>	<b>12.28%</b>	<b>(18.97%)</b>	<b>37.78%</b>
MSCI ACWI ex US	8.06%	11.62%	12.72%	(19.42%)	35.72%
<b>Total Fixed Income</b>	<b>4.85%</b>	<b>3.47%</b>	<b>(0.04%)</b>	<b>(9.76%)</b>	<b>(0.27%)</b>
Total Fixed Income Benchmark (1)	4.92%	2.93%	(0.75%)	(9.46%)	(0.26%)
<b>Market Duration</b>	<b>5.21%</b>	<b>3.06%</b>	<b>(0.53%)</b>	<b>(10.55%)</b>	<b>(0.55%)</b>
Colorado Treasurer's Portfolio (2)	5.21%	3.06%	(0.53%)	(10.55%)	(0.55%)
PSPF Custom Benchmark (3)	5.20%	2.63%	(0.94%)	(10.29%)	(0.33%)
<b>Short Duration</b>	<b>2.51%</b>	<b>6.13%</b>	<b>2.92%</b>	<b>(4.33%)</b>	<b>2.33%</b>
Janus Henderson Short Duration	2.51%	6.13%	2.92%	(4.33%)	2.33%
Blmbg Gov/Cred 1-3 Yr	2.96%	4.87%	0.52%	(3.56%)	0.44%
85% 1-3YR G/C; 15% 1-3YR BB (4)	2.96%	5.35%	1.49%	(3.83%)	1.70%
<b>High Income Strategies</b>	<b>4.16%</b>	<b>10.47%</b>	<b>8.18%</b>	<b>(9.38%)</b>	<b>-</b>
High Income Strategies Benchmark (5)	5.40%	10.62%	7.93%	(12.89%)	15.13%
<b>High Yield Fixed Income</b>	<b>4.05%</b>	<b>10.00%</b>	<b>9.23%</b>	<b>(9.09%)</b>	<b>-</b>
Mackay Shield US High Yield	4.05%	10.00%	9.23%	(9.09%)	-
Blmbg High Yield	5.28%	10.44%	9.06%	(12.81%)	15.37%
<b>Preferred Securities</b>	<b>4.83%</b>	<b>13.18%</b>	<b>2.29%</b>	<b>(11.11%)</b>	<b>-</b>
Principal Preferred Securities	4.83%	13.18%	2.29%	(11.11%)	-
ICE BofA US All Cap Secs	6.08%	11.63%	1.66%	(13.33%)	13.67%
<b>Total Fund w/o CAI (6)</b>	<b>5.48%</b>	<b>8.89%</b>	<b>5.66%</b>	<b>(11.58%)</b>	<b>8.30%</b>
Total Fund Benchmark (6)	5.58%	8.24%	5.18%	(11.64%)	7.98%

(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%

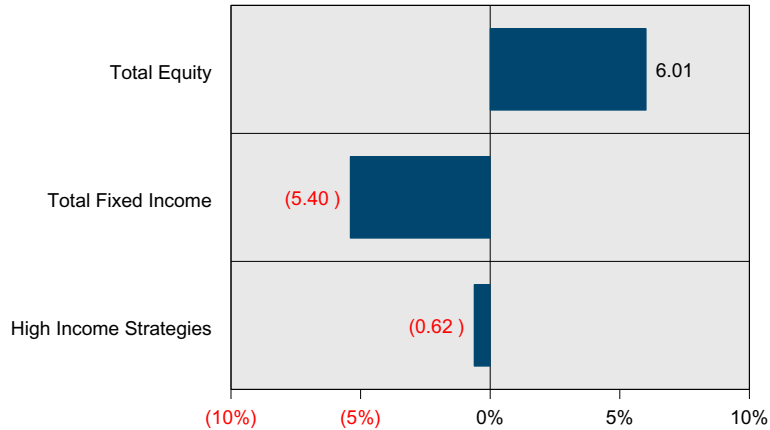
### October 1st, 2021 - Current

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%

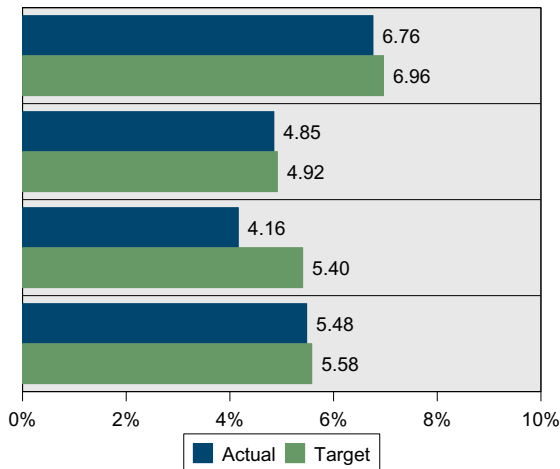
## Quarterly Total Fund Relative Attribution - September 30, 2024

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.

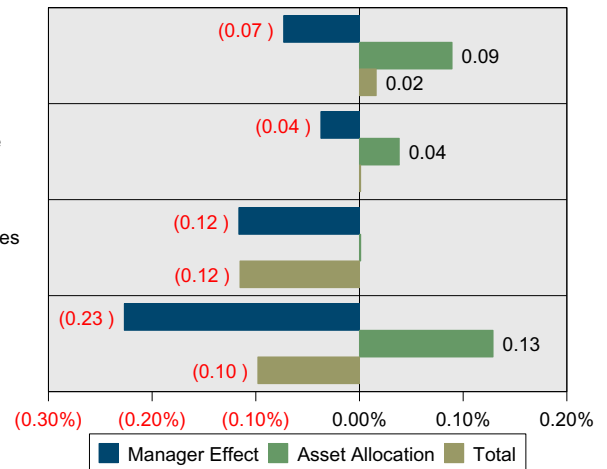
### Asset Class Under or Overweighting



### Actual vs Target Returns



### Relative Attribution by Asset Class



### Relative Attribution Effects for Quarter ended September 30, 2024

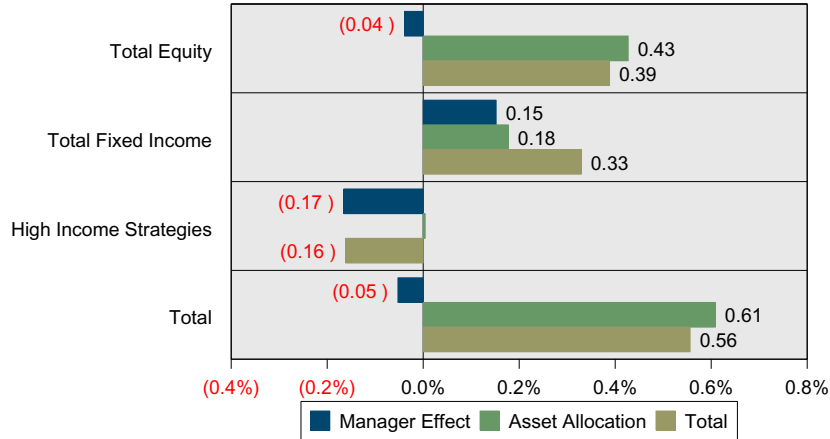
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	36%	30%	6.76%	6.96%	(0.07%)	0.09%	0.02%
Total Fixed Income	55%	60%	4.85%	4.92%	(0.04%)	0.04%	0.00%
High Income Strategies	9%	10%	4.16%	5.40%	(0.12%)	0.00%	(0.12%)
<b>Total</b>			<b>5.48%</b>	<b>5.58%</b>	<b>(0.23%)</b>	<b>0.13%</b>	<b>(0.10%)</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.

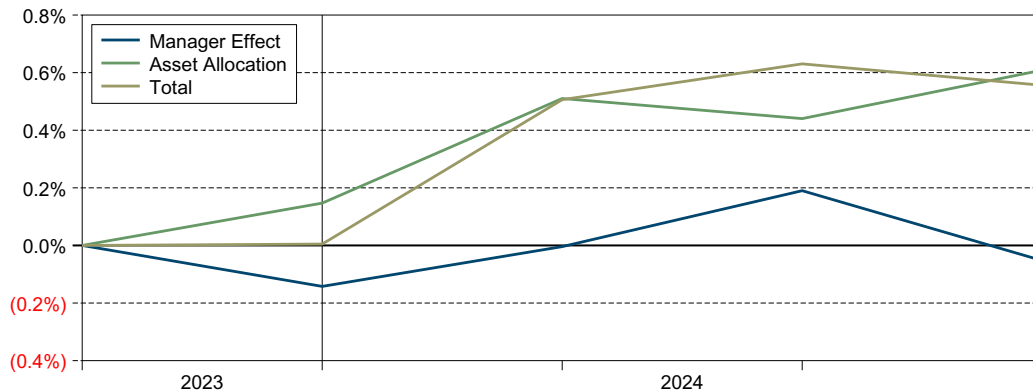
## Cumulative Total Fund Relative Attribution - September 30, 2024

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

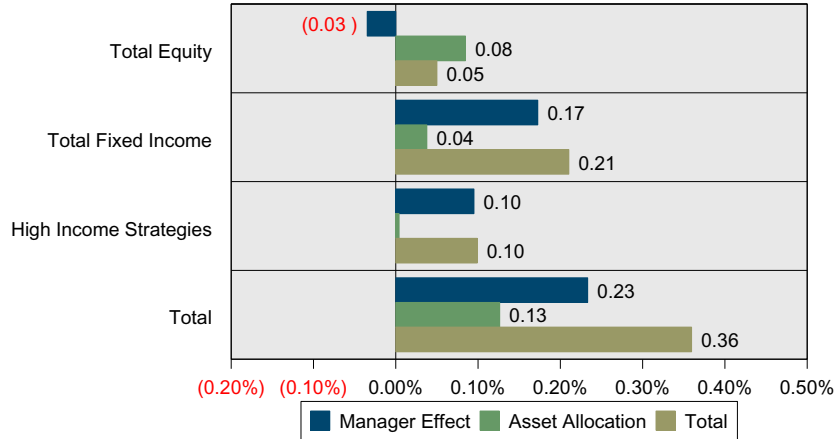
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	35%	30%	31.13%	31.23%	(0.04%)	0.43%	0.39%
Total Fixed Income	56%	60%	11.29%	11.02%	0.15%	0.18%	0.33%
High Income Strategies	9%	10%	14.46%	16.18%	(0.17%)	0.00%	(0.16%)
<b>Total</b>			<b>17.94%</b>	<b>17.38%</b>	<b>+ (0.05%)</b>	<b>+ 0.61%</b>	<b>0.56%</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.

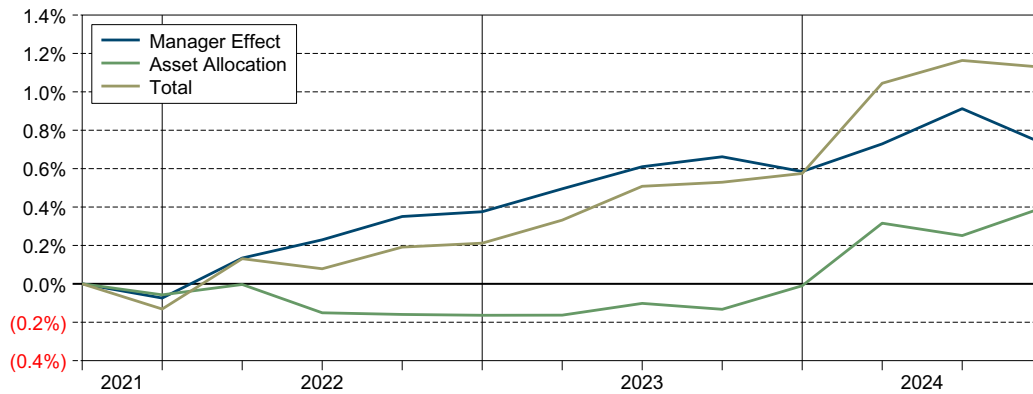
## Cumulative Total Fund Relative Attribution - September 30, 2024

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

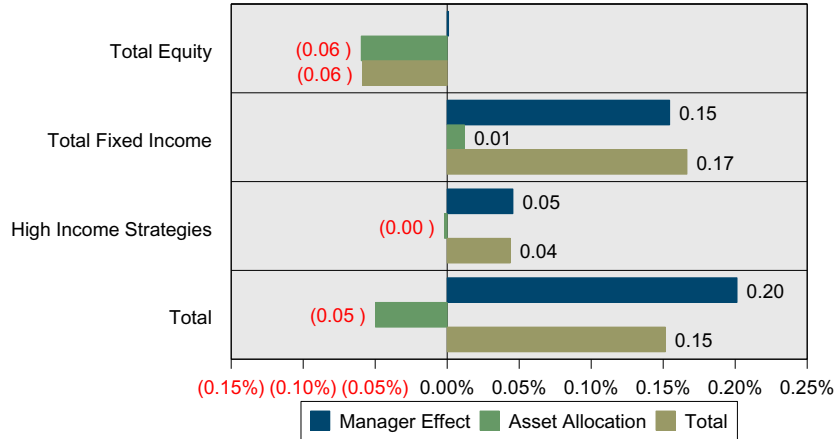
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Total Equity	32%	30%	7.77%	7.87%	(0.03%)	0.08%	0.05%
Total Fixed Income	58%	60%	(0.72%)	(1.02%)	0.17%	0.04%	0.21%
High Income Strategies	10%	10%	3.72%	2.82%	0.10%	0.00%	0.10%
<b>Total</b>			<b>2.47%</b>	<b>2.11%</b>	<b>+ 0.23%</b>	<b>+ 0.13%</b>	<b>0.36%</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.

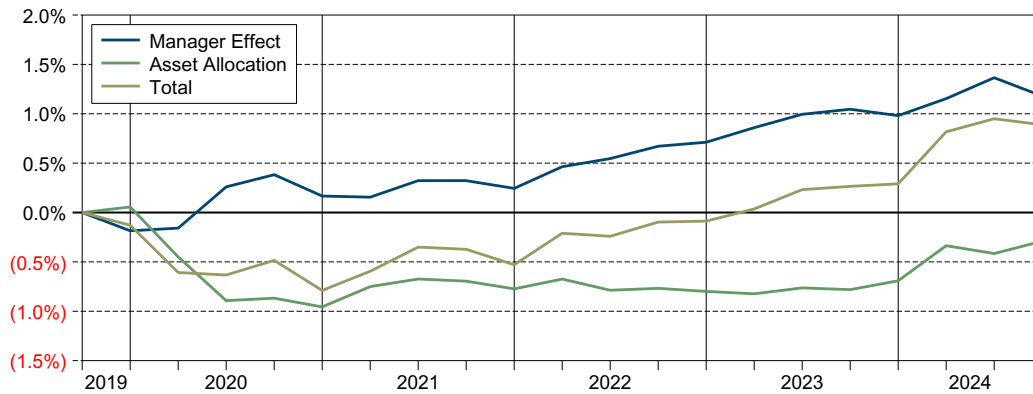
## Cumulative Total Fund Relative Attribution - September 30, 2024

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.

### Five Year Annualized Relative Attribution Effects



### Cumulative Relative Attribution Effects



### Five 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	28%	27%	12.23%	12.20%	0.00%	(0.06%)	(0.06%)
Total Fixed Income	65%	66%	0.76%	0.52%	0.15%	0.01%	0.17%
High Income Strategies	7%	7%	-	-	0.05%	(0.00%)	0.04%
<b>Total</b>			<b>4.15%</b>	<b>4.00%</b>	<b>+ 0.20%</b>	<b>(0.05%)</b>	<b>0.15%</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

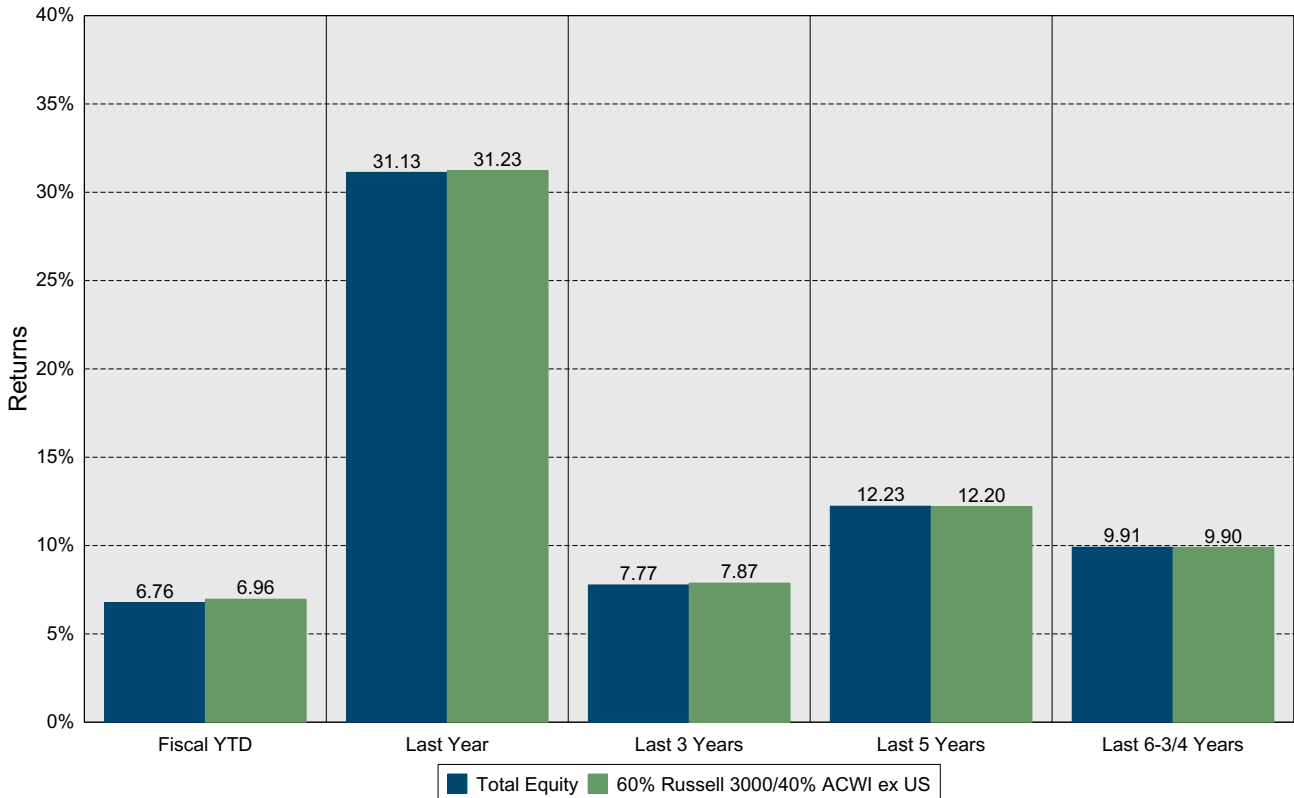
## Period Ended September 30, 2024

### Inception Date

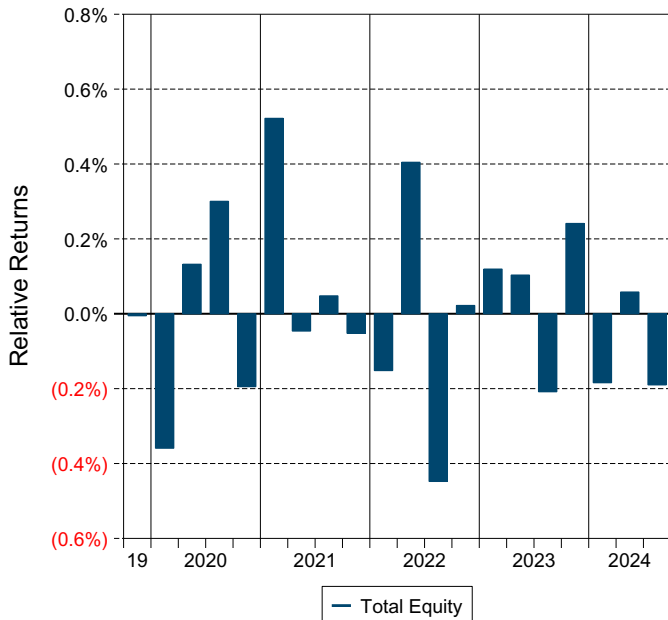
Parametric was funded December 12th, 2017.

### Quarterly Summary and Highlights

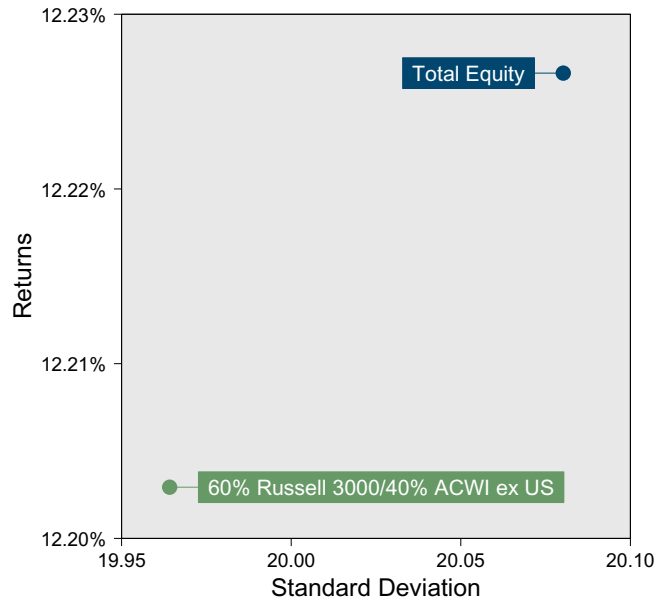
- Total Equity's portfolio underperformed the 60% Russell 3000/40% ACWI ex US by 0.20% for the quarter and underperformed the 60% Russell 3000/40% ACWI ex US for the year by 0.10%.



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



**Annualized Five Year Risk vs Return**

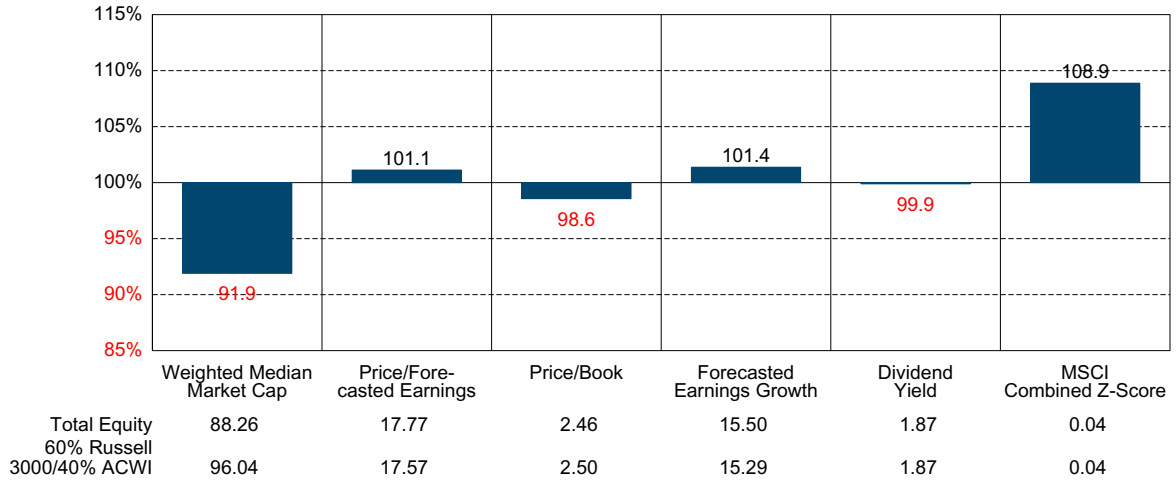


# Total Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

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

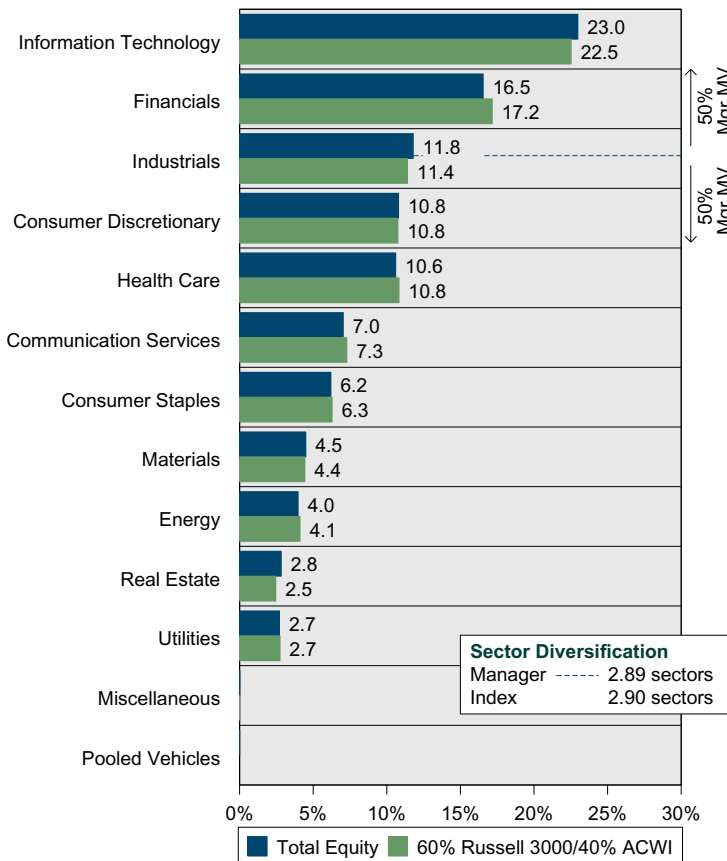
### Portfolio Characteristics Relative to 60% Russell 3000/40% ACWI as of September 30, 2024



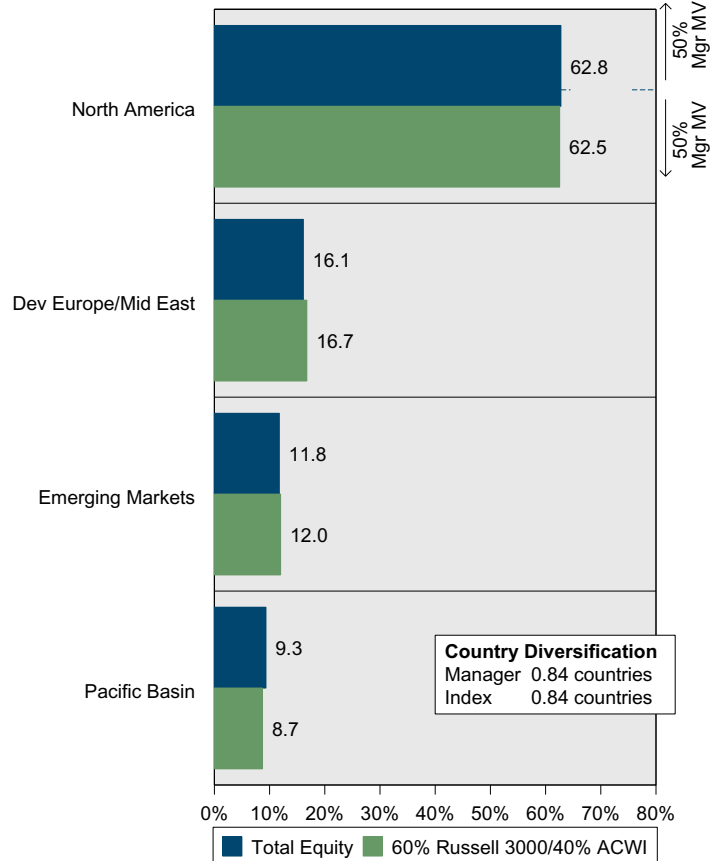
## Sector Weights

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 September 30, 2024



### Regional Allocation September 30, 2024



# Domestic Equity

## Period Ended September 30, 2024

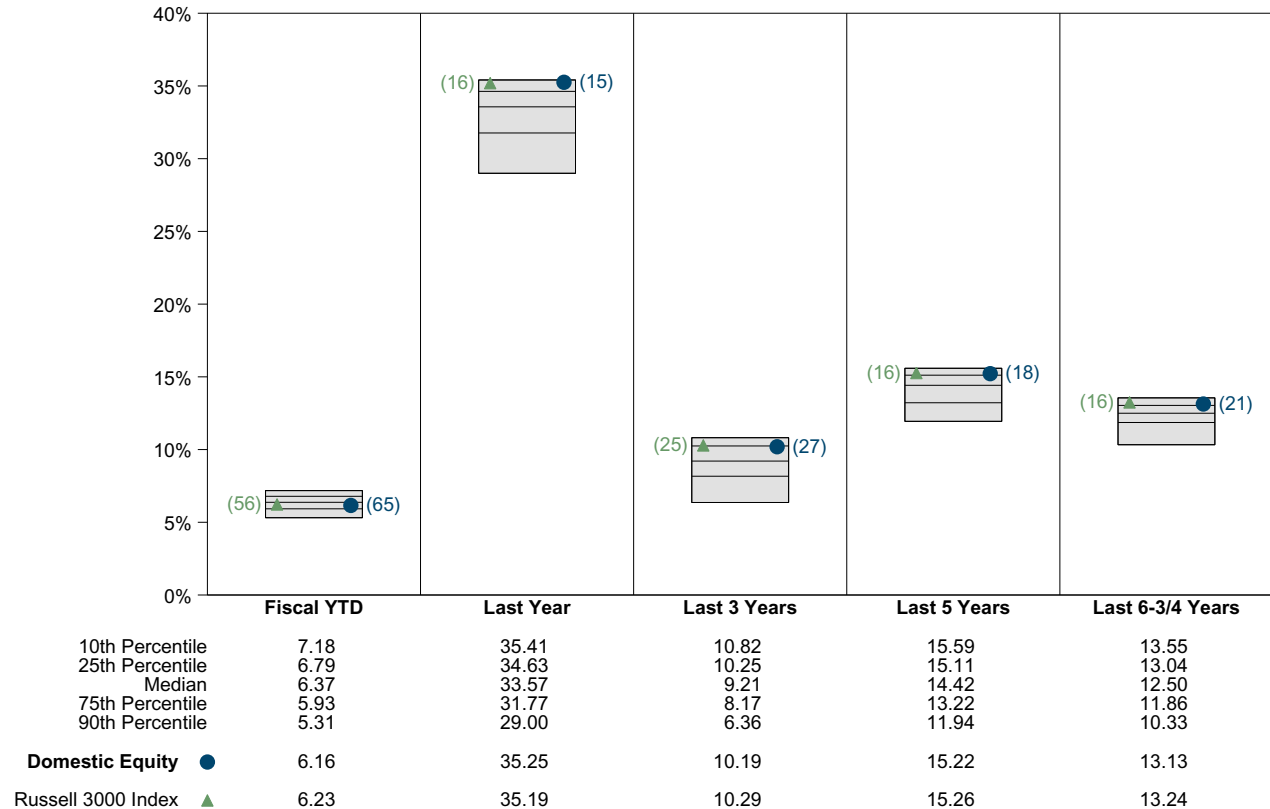
### Inception Date

Parametric was funded December 12th, 2017.

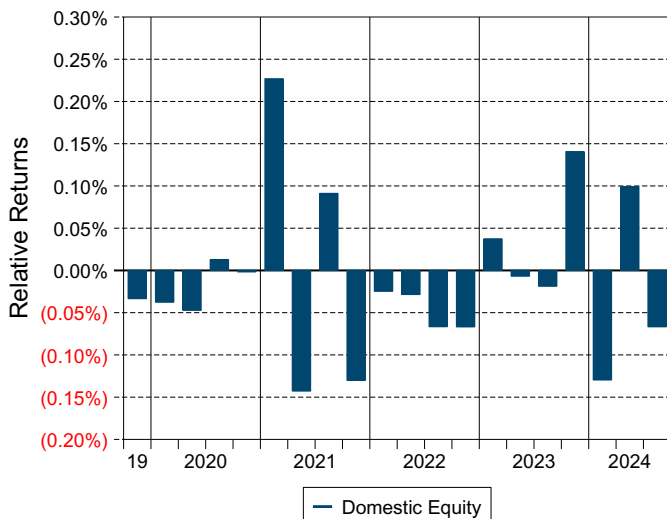
### Quarterly Summary and Highlights

- Domestic Equity's portfolio posted a 6.16% return for the quarter placing it in the 65 percentile of the EF- Domestic Equity group for the quarter and in the 15 percentile for the last year.
- Domestic Equity's portfolio underperformed the Russell 3000 Index by 0.07% for the quarter and outperformed the Russell 3000 Index for the year by 0.06%.

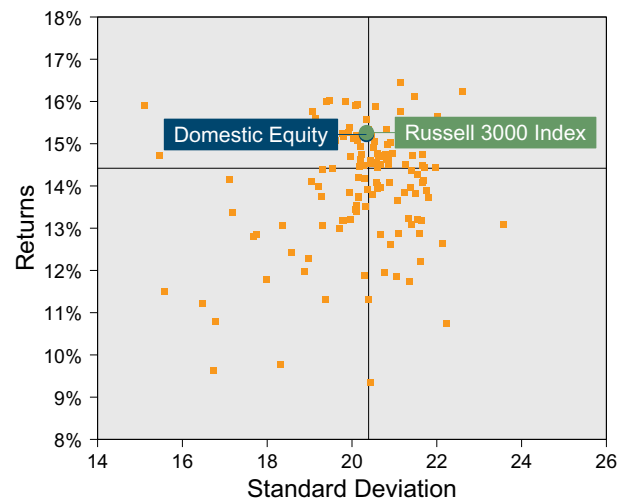
### Performance vs EF- Domestic Equity (Gross)



### Relative Return vs Russell 3000 Index



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

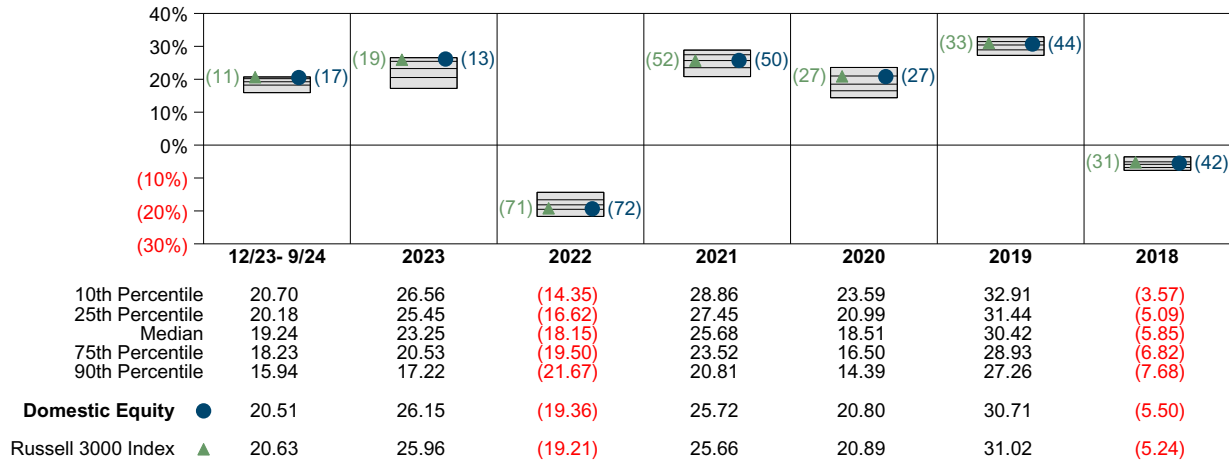


# Domestic Equity Return Analysis Summary

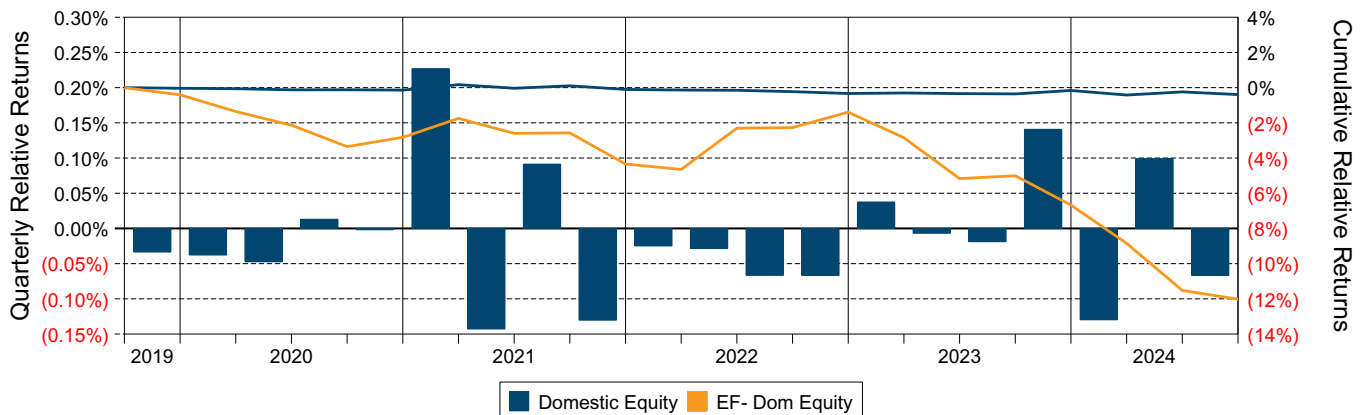
## Return Analysis

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.

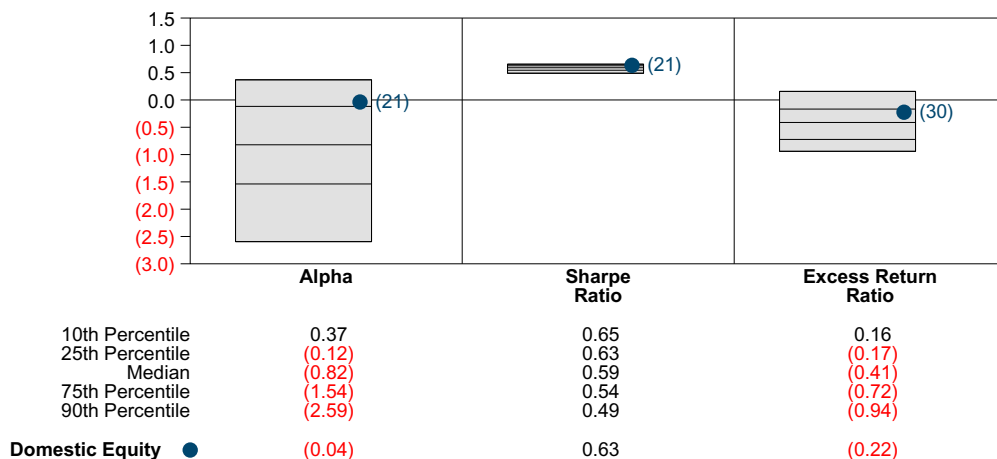
### Performance vs EF- Domestic Equity (Gross)



### 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 September 30, 2024

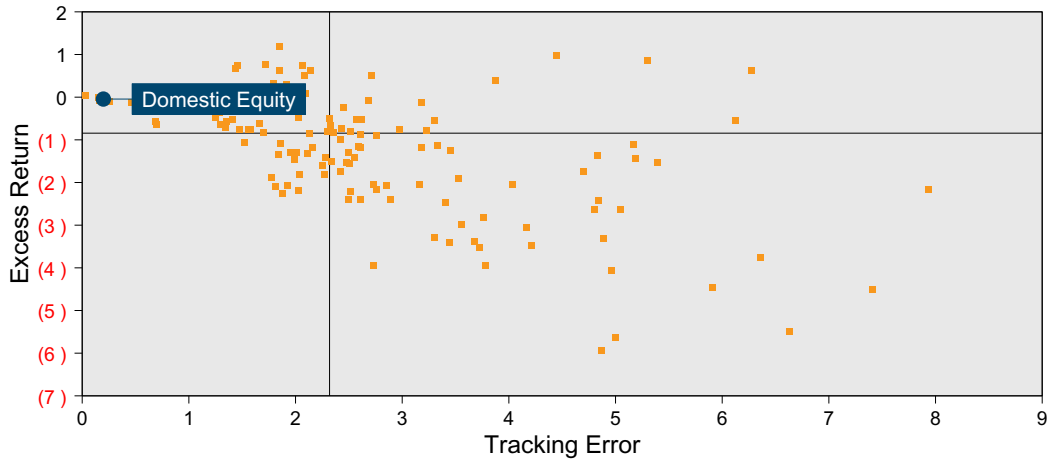


# Domestic Equity Risk Analysis Summary

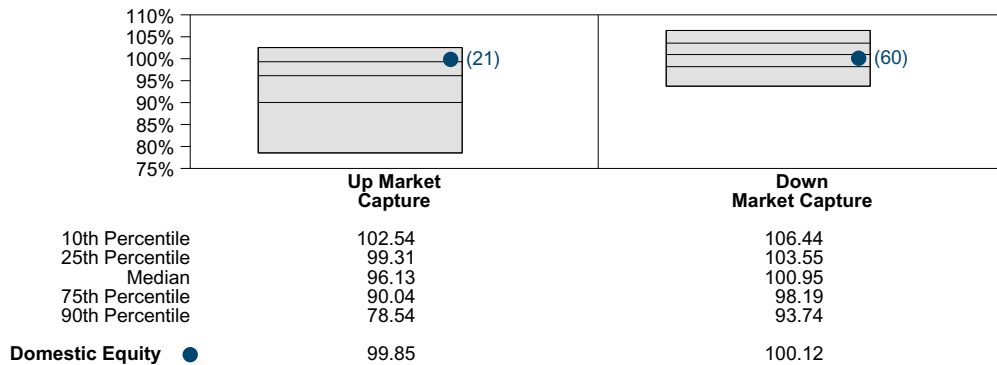
## Risk Analysis

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.

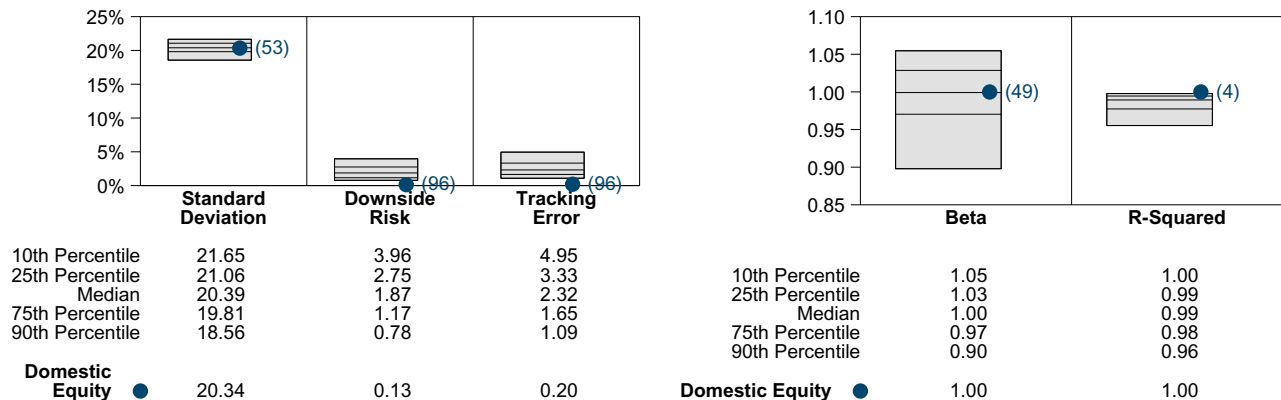
### Risk Analysis vs EF- Domestic Equity (Gross) Five Years Ended September 30, 2024



### Market Capture vs Russell 3000 Index Rankings Against EF- Domestic Equity (Gross) Five Years Ended September 30, 2024



### Risk Statistics Rankings vs Russell 3000 Index Rankings Against EF- Domestic Equity (Gross) Five Years Ended September 30, 2024

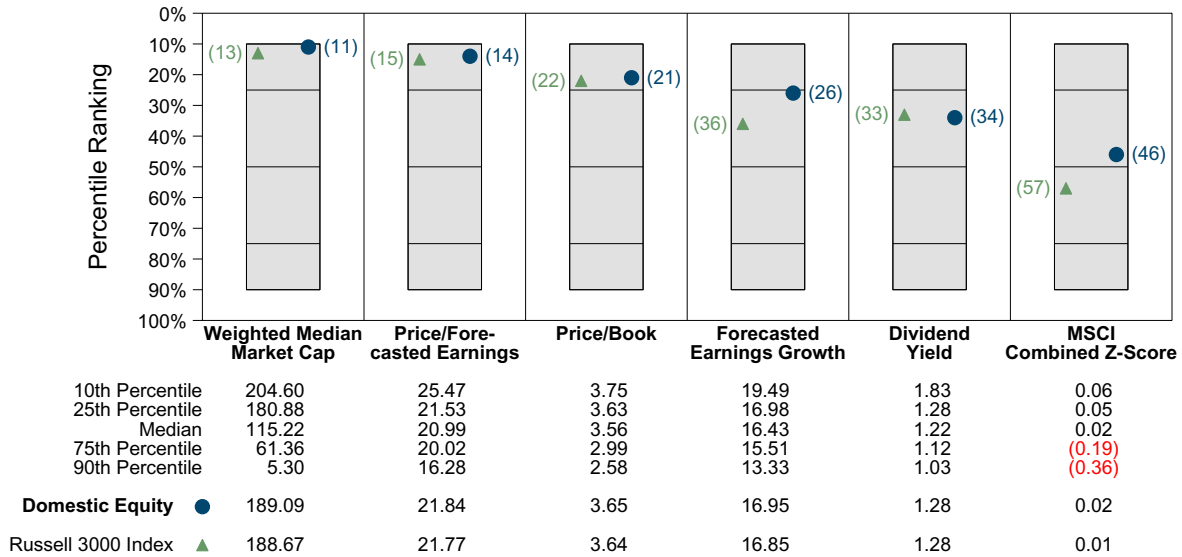


# Domestic Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

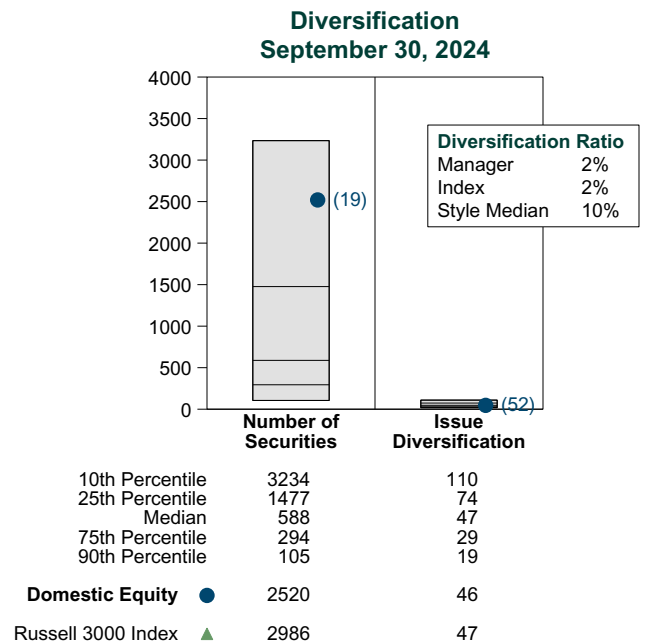
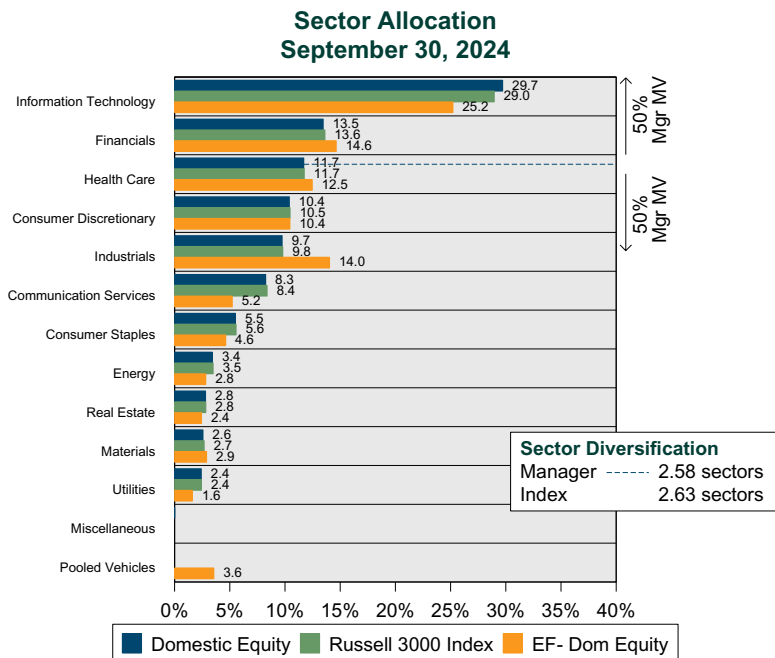
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against EF- Domestic Equity as of September 30, 2024



## 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 September 30, 2024

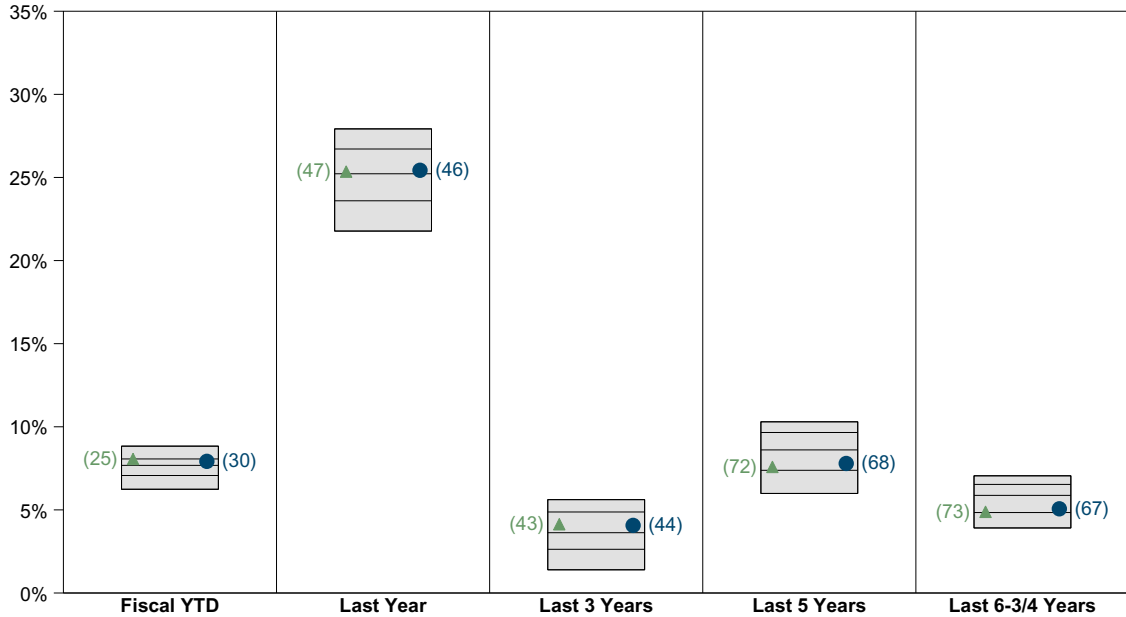
### Inception Date

Parametric was funded December 12th, 2017.

### Quarterly Summary and Highlights

- International Equity's portfolio posted a 7.92% return for the quarter placing it in the 30 percentile of the EF-International Equity group for the quarter and in the 46 percentile for the last year.
- International Equity's portfolio underperformed the MSCI ACWI ex US by 0.14% for the quarter and outperformed the MSCI ACWI ex US for the year by 0.08%.

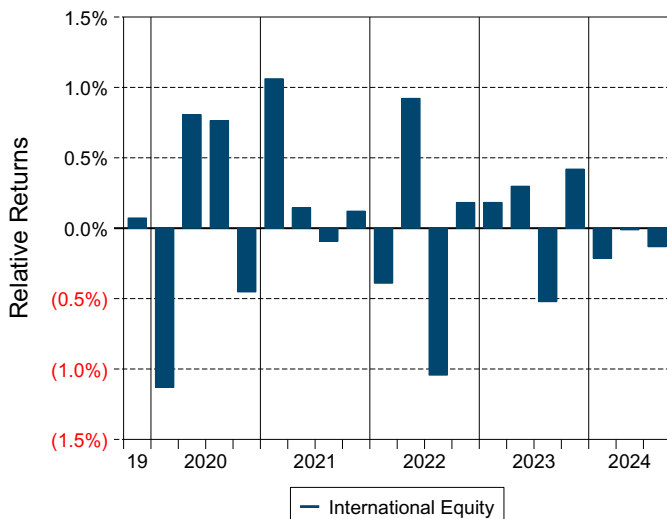
### Performance vs EF- International Equity (Gross)



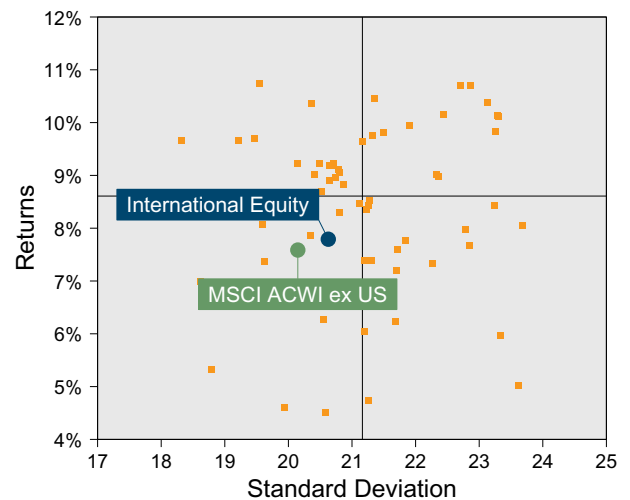
10th Percentile	8.84	27.92	5.62	10.30	7.05
25th Percentile	8.06	26.71	4.87	9.66	6.53
Median	7.68	25.22	3.63	8.61	5.87
75th Percentile	7.07	23.60	2.63	7.38	4.84
90th Percentile	6.24	21.77	1.40	5.99	3.91

<b>International Equity</b> ●	7.92	25.43	4.07	7.79	5.07
MSCI ACWI ex US ▲	8.06	25.35	4.14	7.59	4.88

### Relative Return vs MSCI ACWI ex US



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



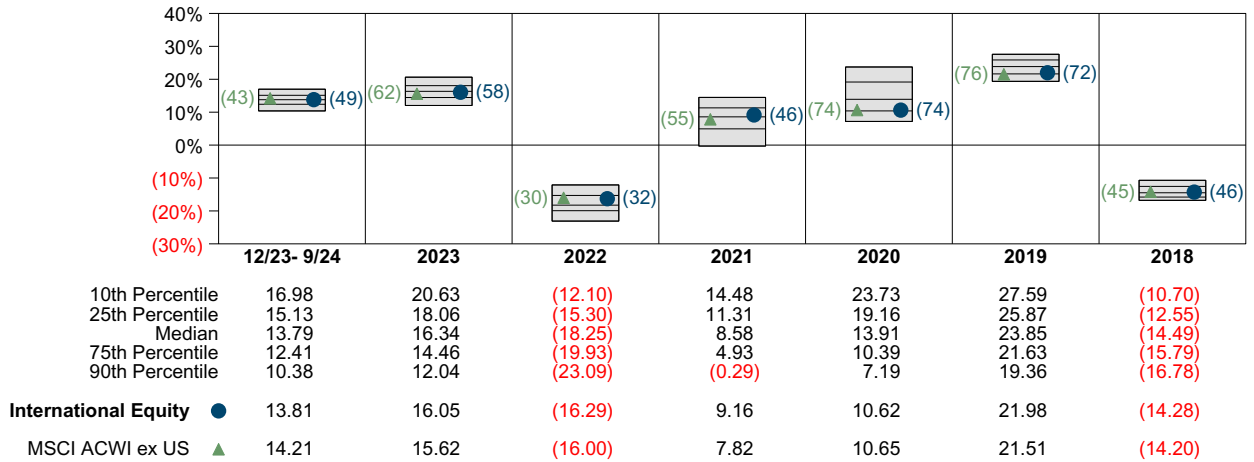


# International Equity Return Analysis Summary

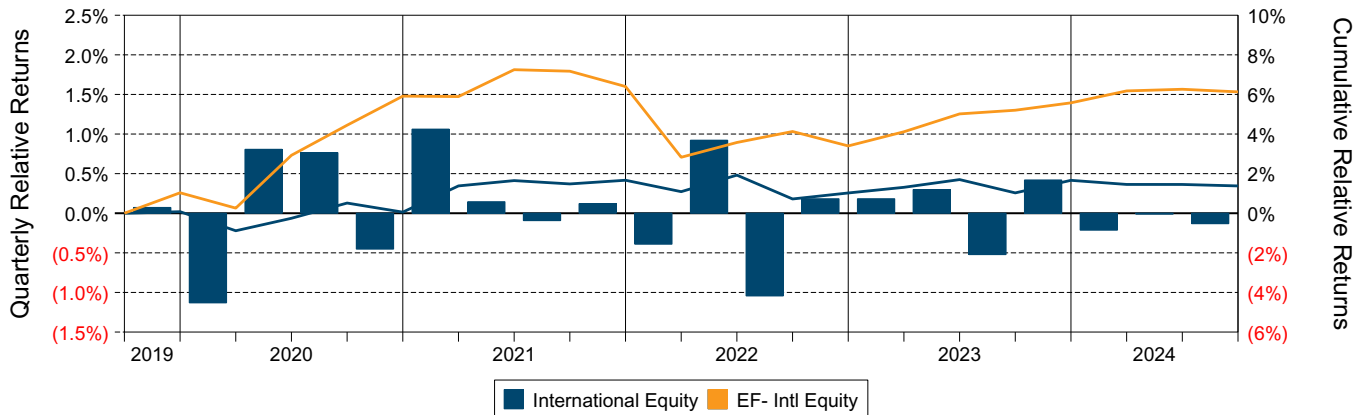
## Return Analysis

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.

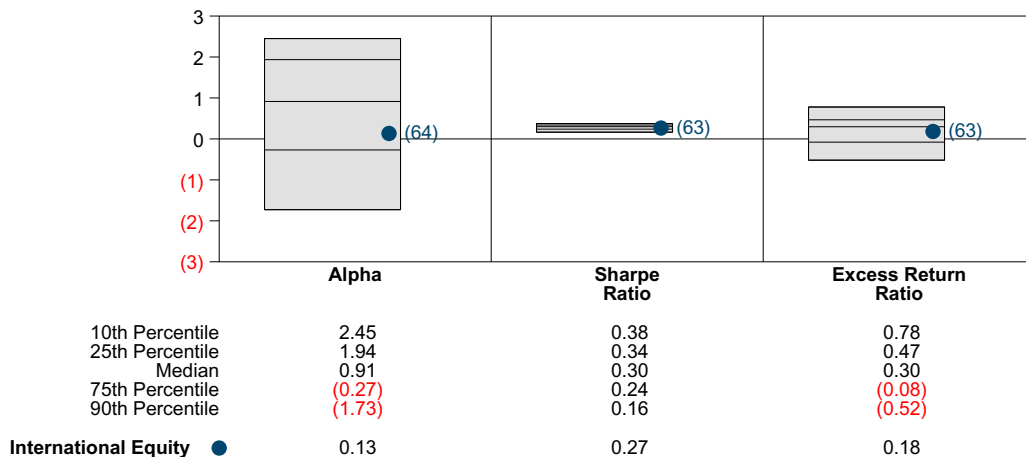
### Performance vs EF- International Equity (Gross)



### 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 September 30, 2024

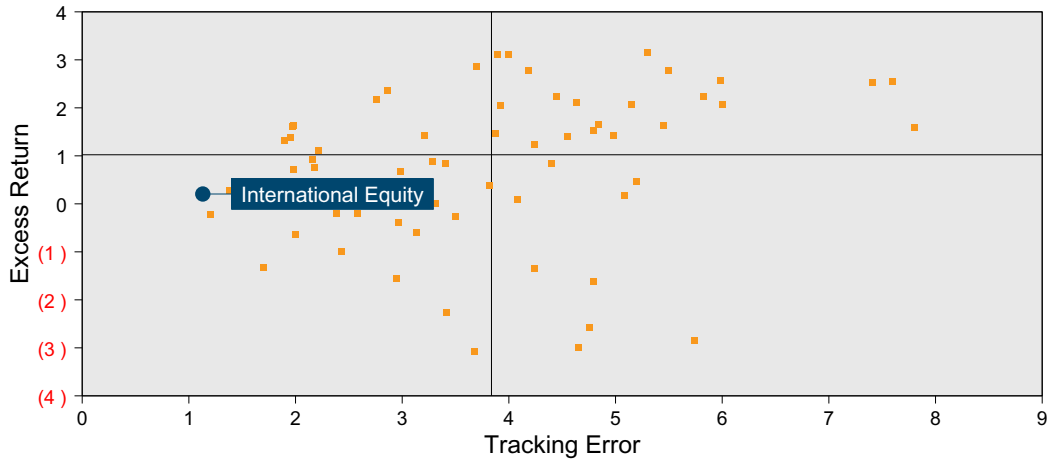


# International Equity Risk Analysis Summary

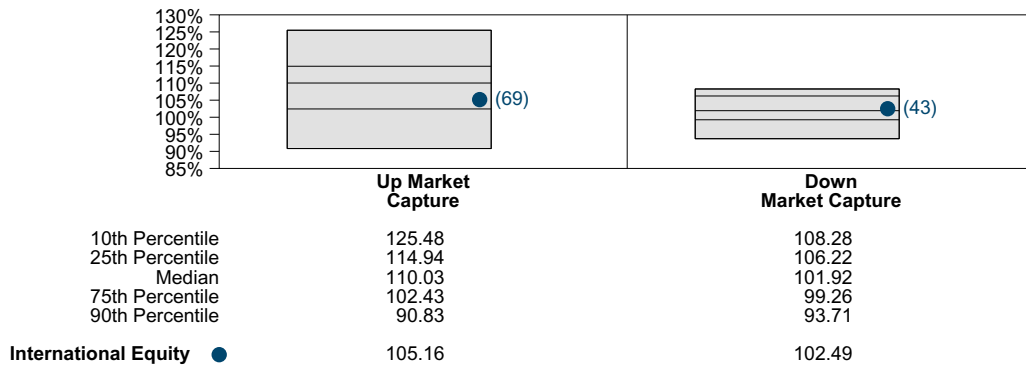
## Risk Analysis

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.

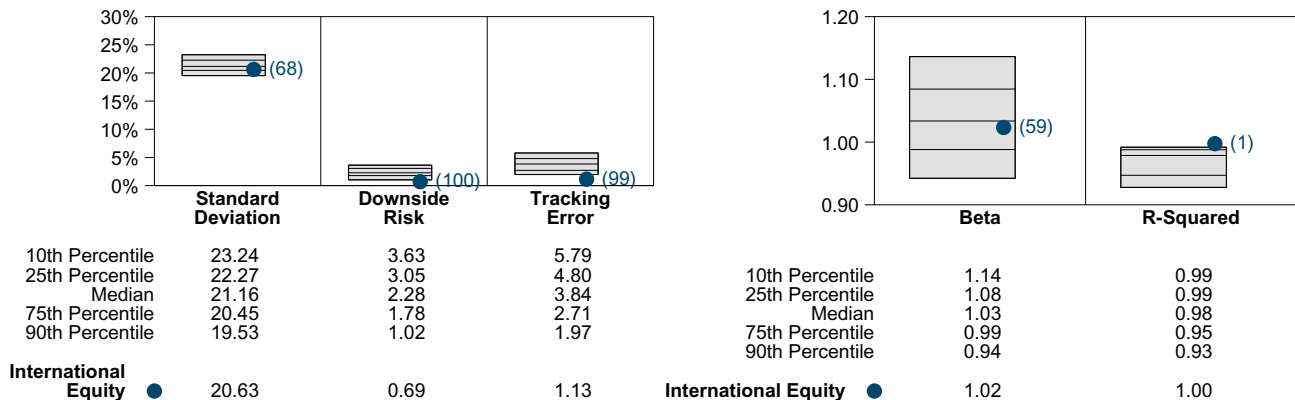
### Risk Analysis vs EF- International Equity (Gross) Five Years Ended September 30, 2024



### Market Capture vs MSCI ACWI ex US Rankings Against EF- International Equity (Gross) Five Years Ended September 30, 2024



### Risk Statistics Rankings vs MSCI ACWI ex US Rankings Against EF- International Equity (Gross) Five Years Ended September 30, 2024

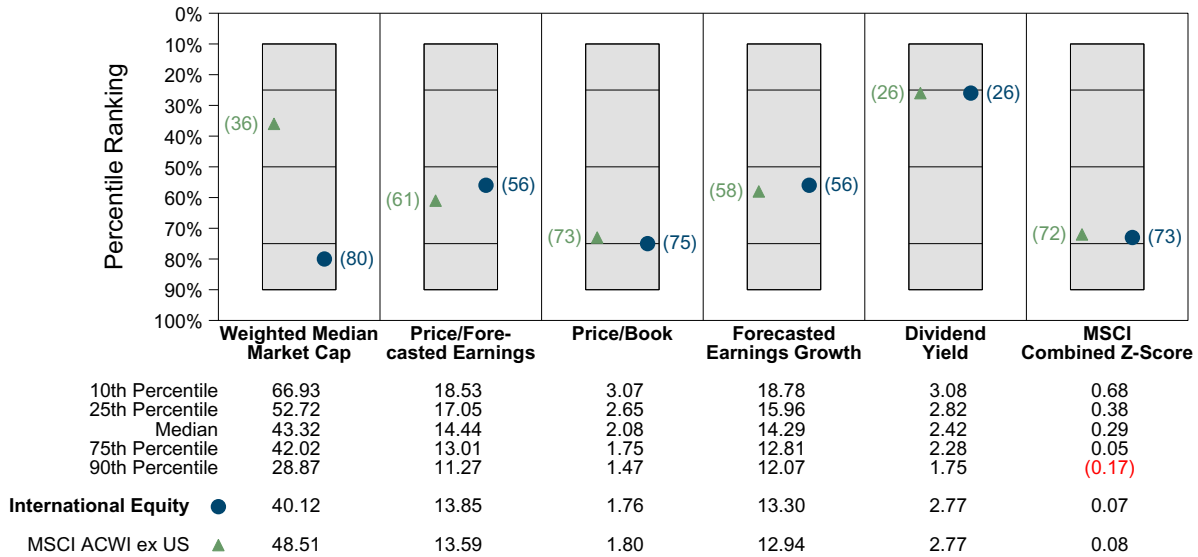


# International Equity Equity Characteristics Analysis Summary

## Portfolio Characteristics

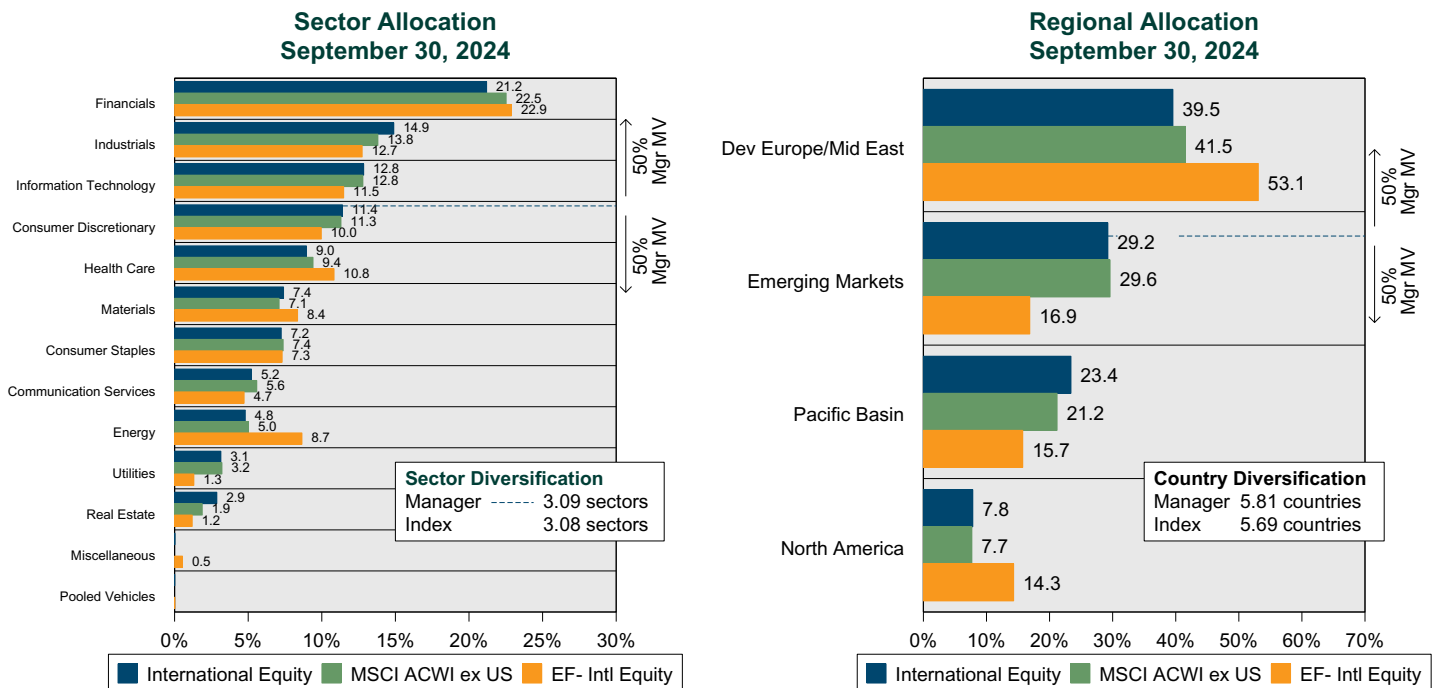
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Portfolio Characteristics Percentile Rankings Rankings Against EF- International Equity as of September 30, 2024



## 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 September 30, 2024

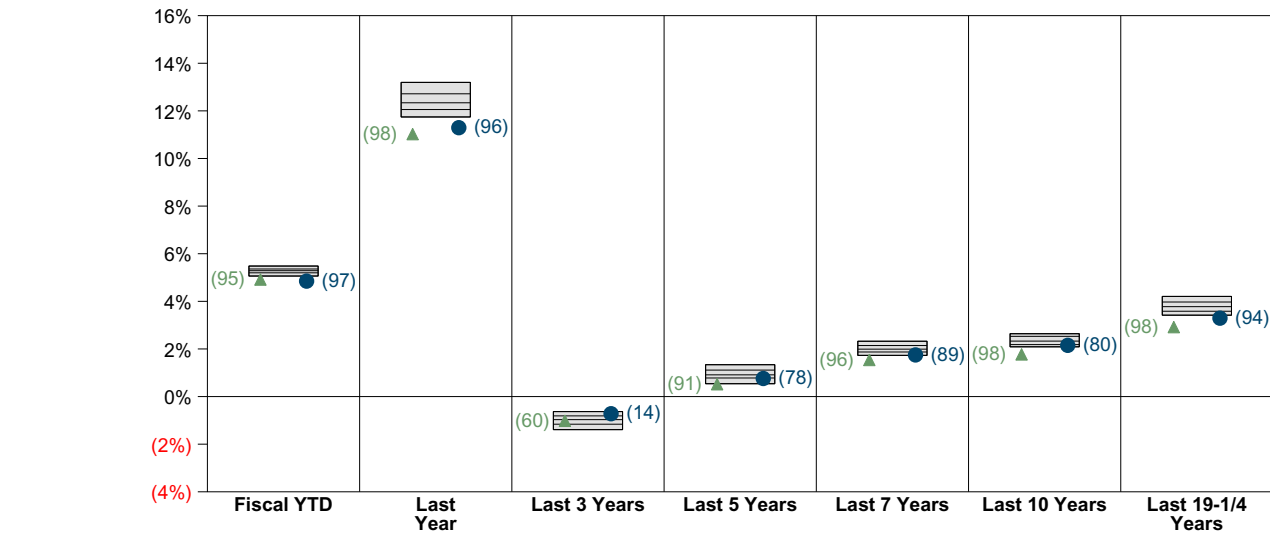
## Benchmark Definition

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.

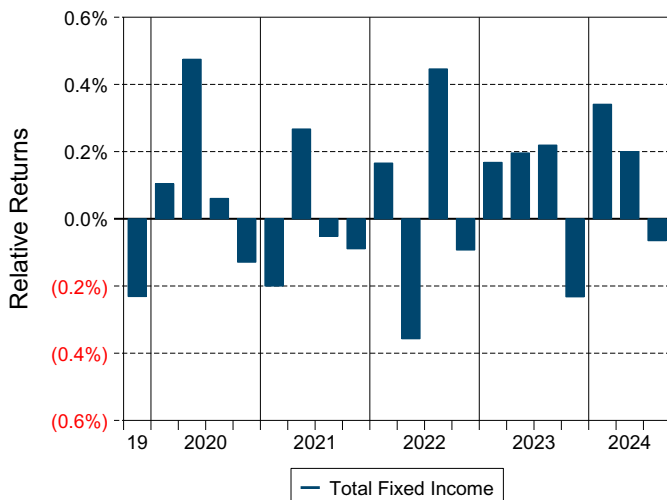
## Quarterly Summary and Highlights

- Total Fixed Income's portfolio posted a 4.85% return for the quarter placing it in the 97 percentile of the Callan Core Bond Fixed Income group for the quarter and in the 96 percentile for the last year.
- Total Fixed Income's portfolio underperformed the Total Fixed Income Benchmark by 0.07% for the quarter and outperformed the Total Fixed Income Benchmark for the year by 0.27%.

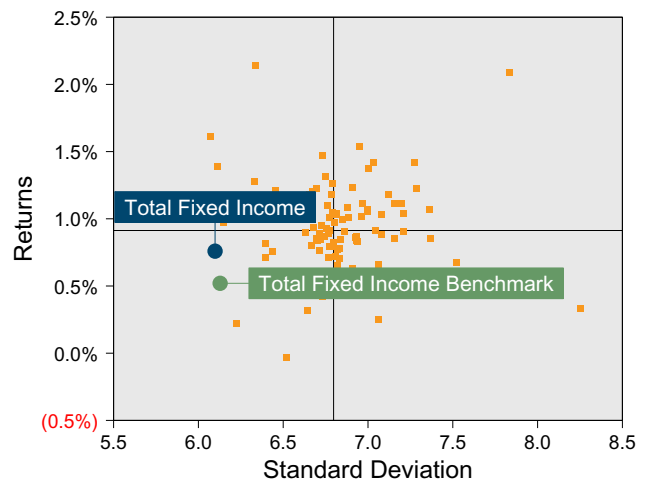
## Performance vs Callan Core Bond Fixed Income (Gross)



## Relative Returns vs Total Fixed Income Benchmark



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

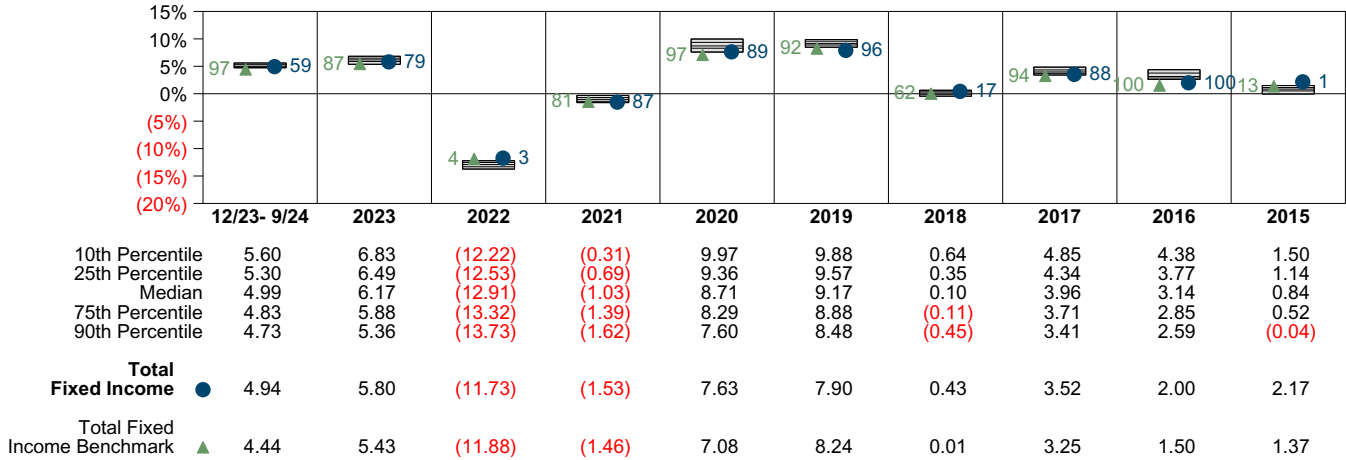


# Total Fixed Income Return Analysis Summary

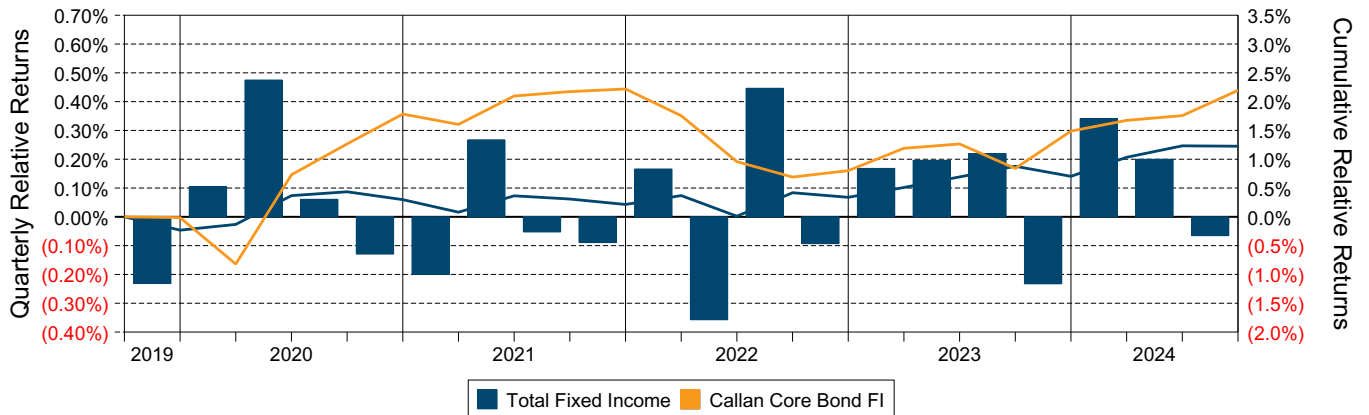
## Return Analysis

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.

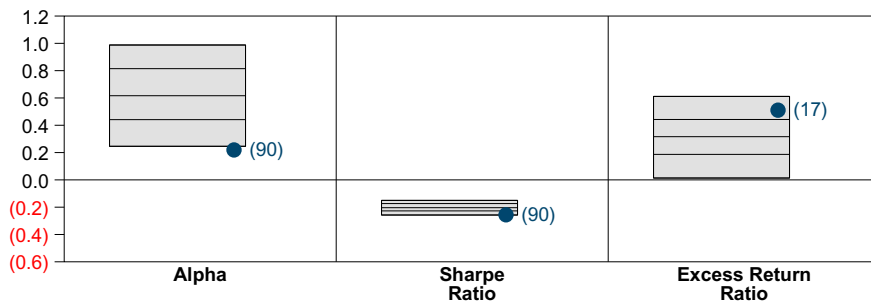
### Performance vs Callan Core Bond Fixed Income (Gross)



### 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 September 30, 2024



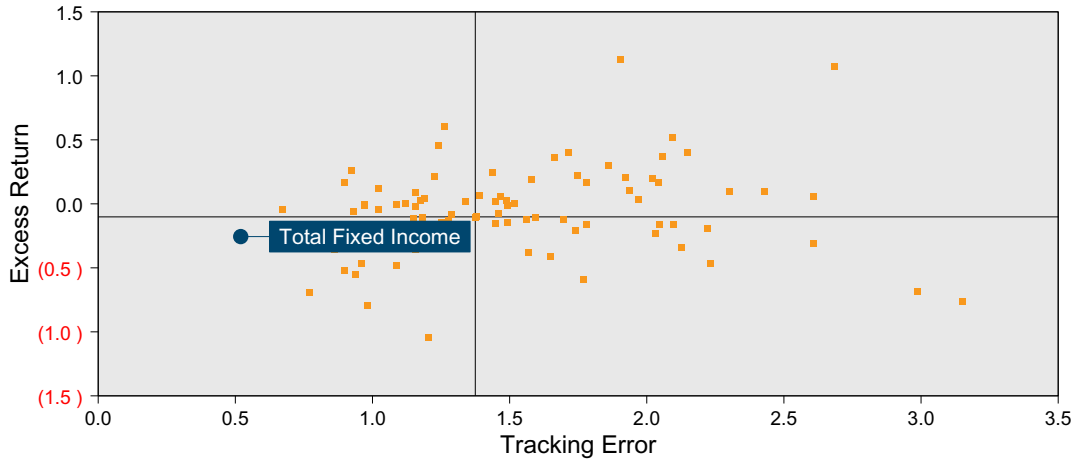
10th Percentile	0.99	(0.15)	0.61
25th Percentile	0.81	(0.17)	0.44
Median	0.62	(0.20)	0.32
75th Percentile	0.44	(0.23)	0.19
90th Percentile	0.25	(0.26)	0.01
<b>Total Fixed Income</b>	● 0.22	(0.26)	0.51

# Total Fixed Income Risk Analysis Summary

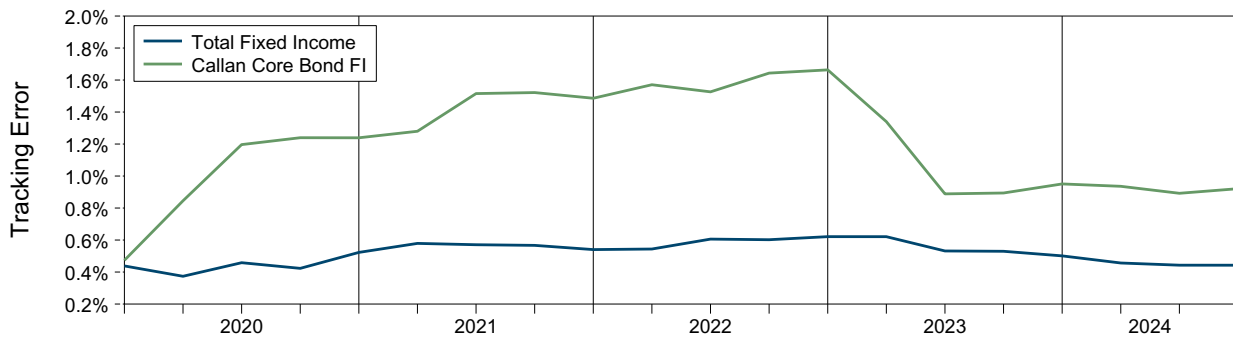
## Risk Analysis

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.

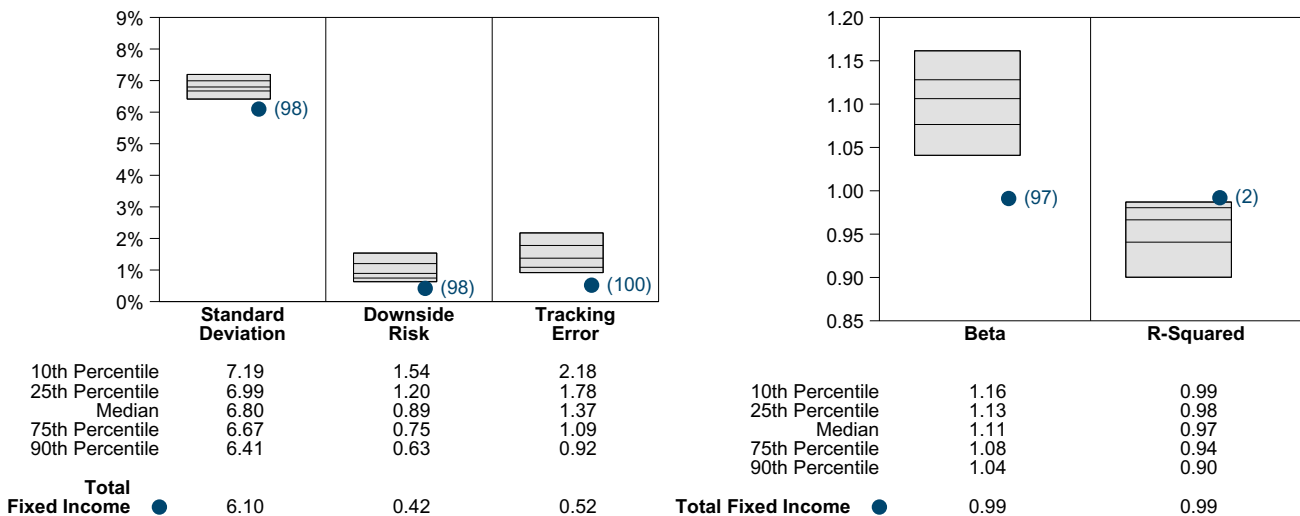
### Risk Analysis vs Callan Core Bond Fixed Income (Gross) Five Years Ended September 30, 2024



### 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 September 30, 2024

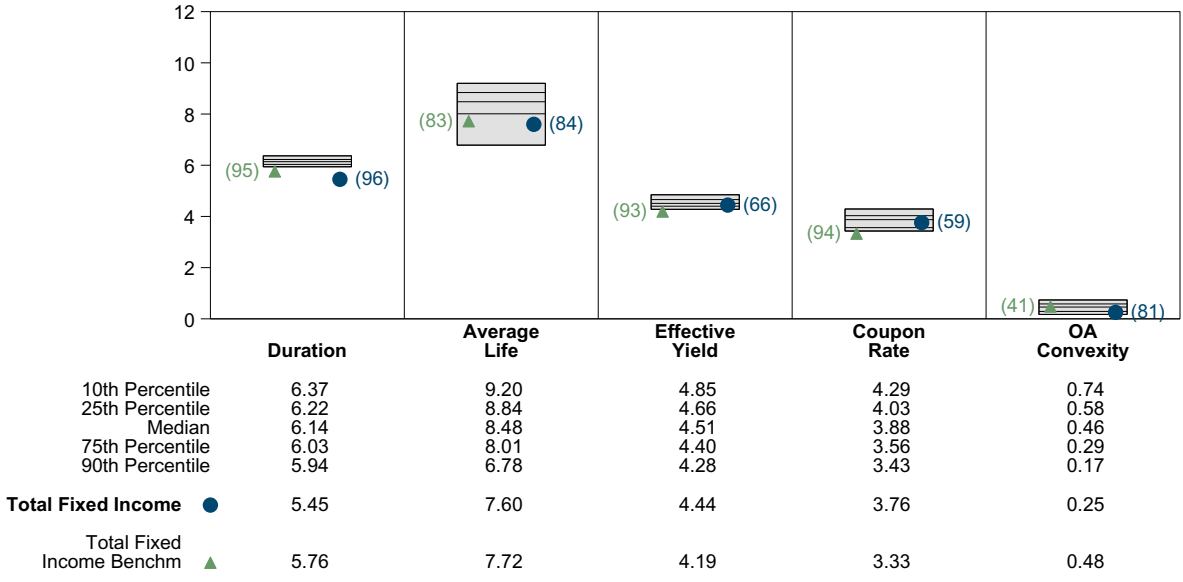


# Total Fixed Income Bond Characteristics Analysis Summary

## Portfolio Characteristics

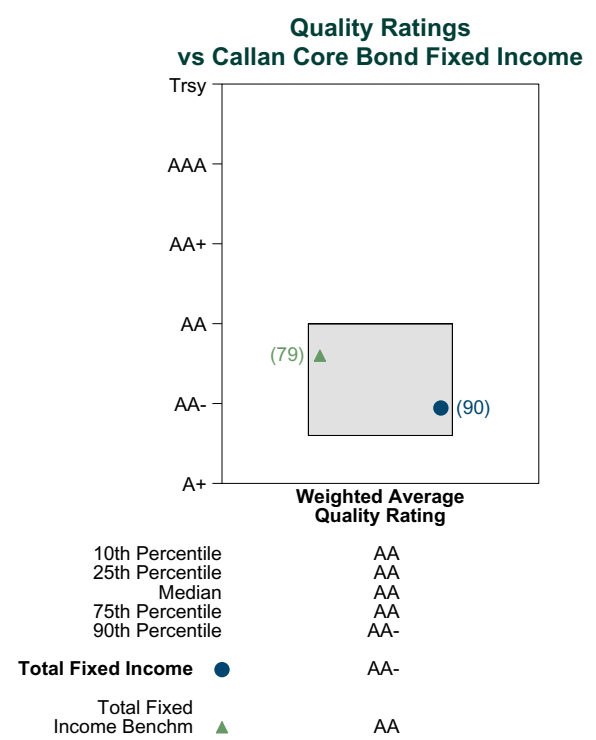
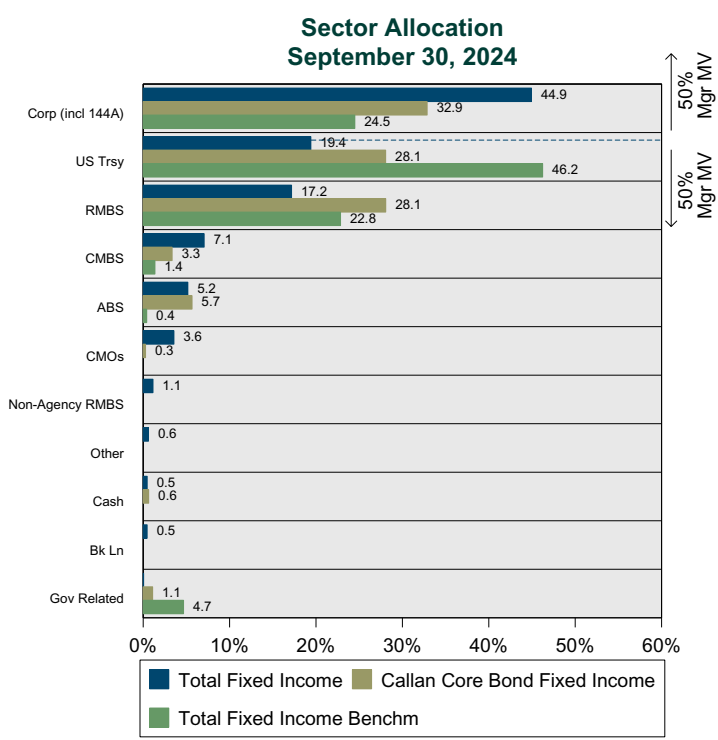
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style.

## Fixed Income Portfolio Characteristics Rankings Against Callan Core Bond Fixed Income as of September 30, 2024



## 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.



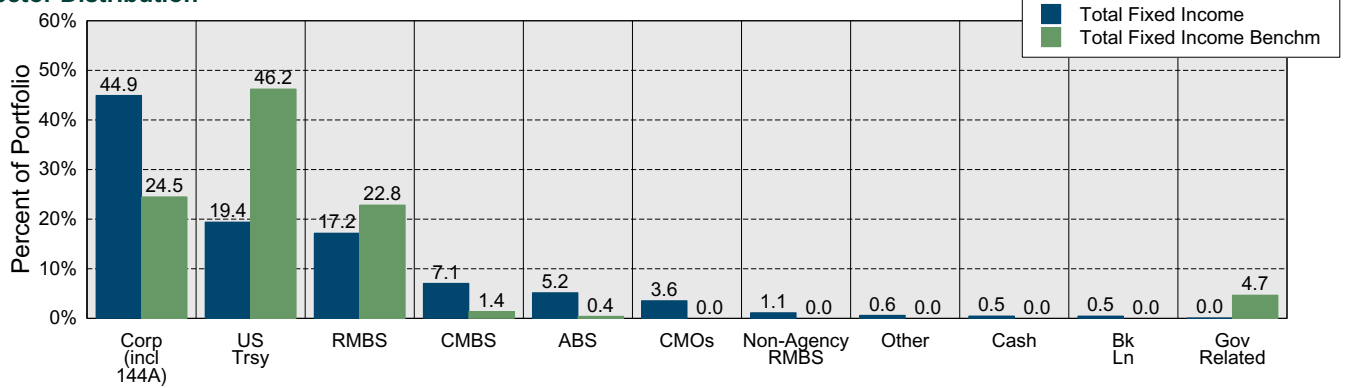


# Total Fixed Income Portfolio Characteristics Summary As of September 30, 2024

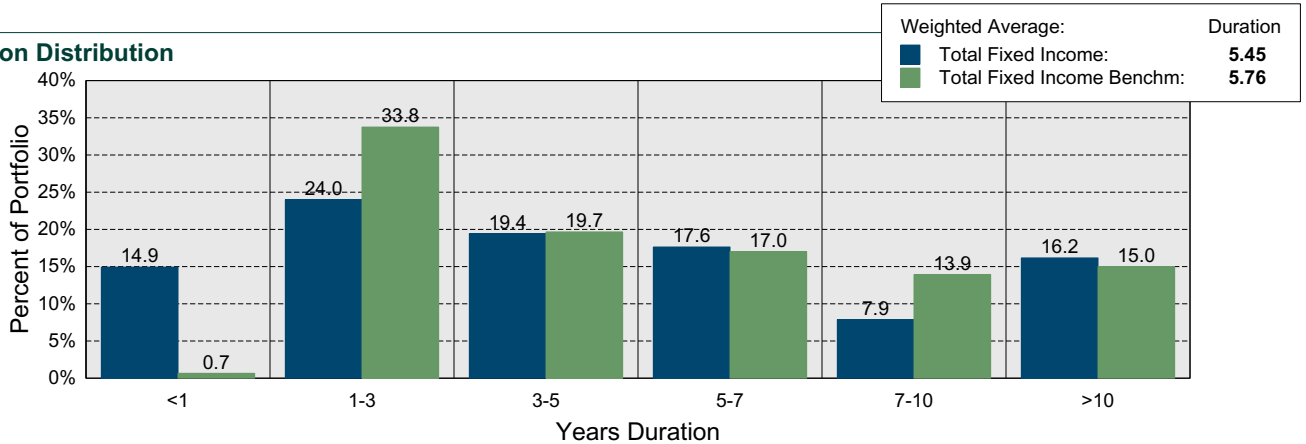
## Portfolio Structure Comparison

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.

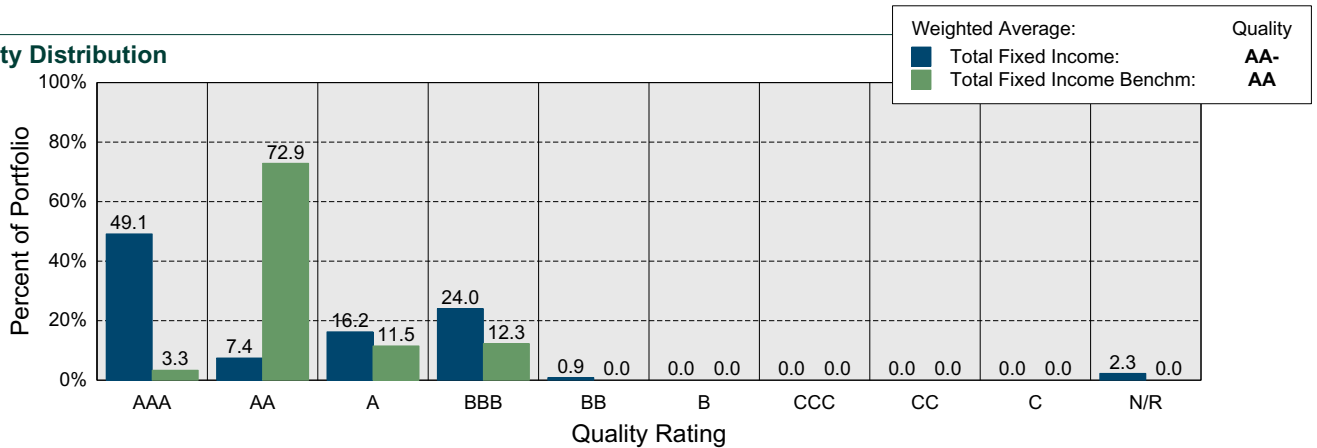
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Colorado Treasurer's Portfolio

## Period Ended September 30, 2024

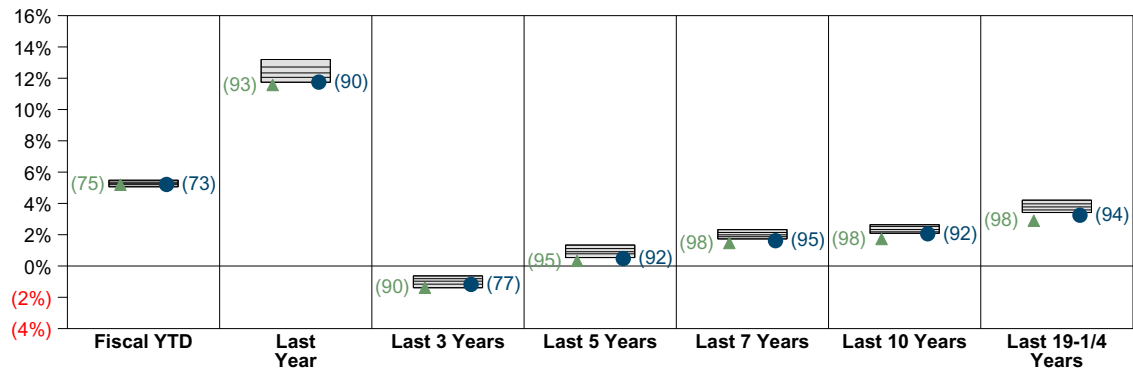
### Investment Philosophy

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

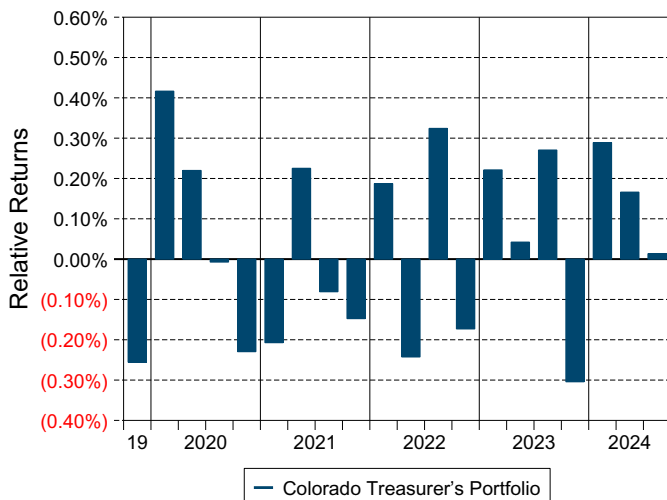
- Colorado Treasurer's Portfolio's portfolio posted a 5.21% return for the quarter placing it in the 73 percentile of the Callan Core Bond Fixed Income group for the quarter and in the 90 percentile for the last year.
- Colorado Treasurer's Portfolio's portfolio outperformed the PSPF Bond Custom Benchmark by 0.01% for the quarter and outperformed the PSPF Bond Custom Benchmark for the year by 0.18%.

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

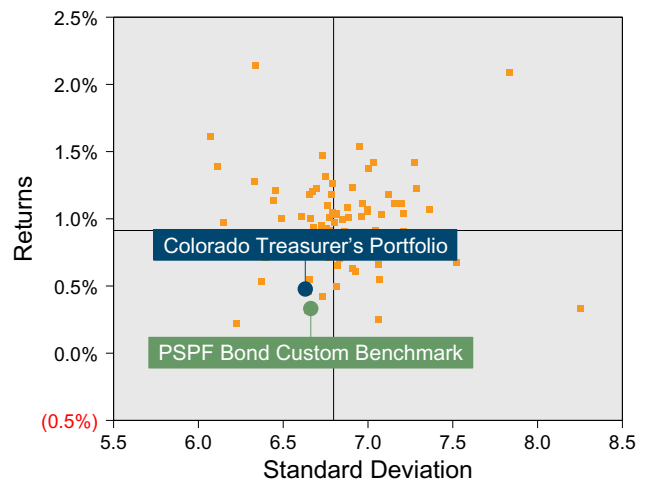


	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 19-1/4 Years
10th Percentile	5.48	13.20	(0.63)	1.34	2.32	2.64	4.21
25th Percentile	5.36	12.72	(0.81)	1.11	2.14	2.53	3.97
Median	5.29	12.34	(0.97)	0.91	1.99	2.33	3.78
75th Percentile	5.20	12.06	(1.16)	0.78	1.87	2.18	3.58
90th Percentile	5.06	11.74	(1.39)	0.54	1.73	2.09	3.42
<b>Colorado Treasurer's Portfolio</b>	<b>5.21</b>	<b>11.75</b>	<b>(1.18)</b>	<b>0.48</b>	<b>1.62</b>	<b>2.06</b>	<b>3.24</b>
PSPF Bond Custom Benchmark	5.20	11.57	(1.39)	0.33	1.47	1.73	2.89

### Relative Returns vs PSPF Bond Custom Benchmark



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

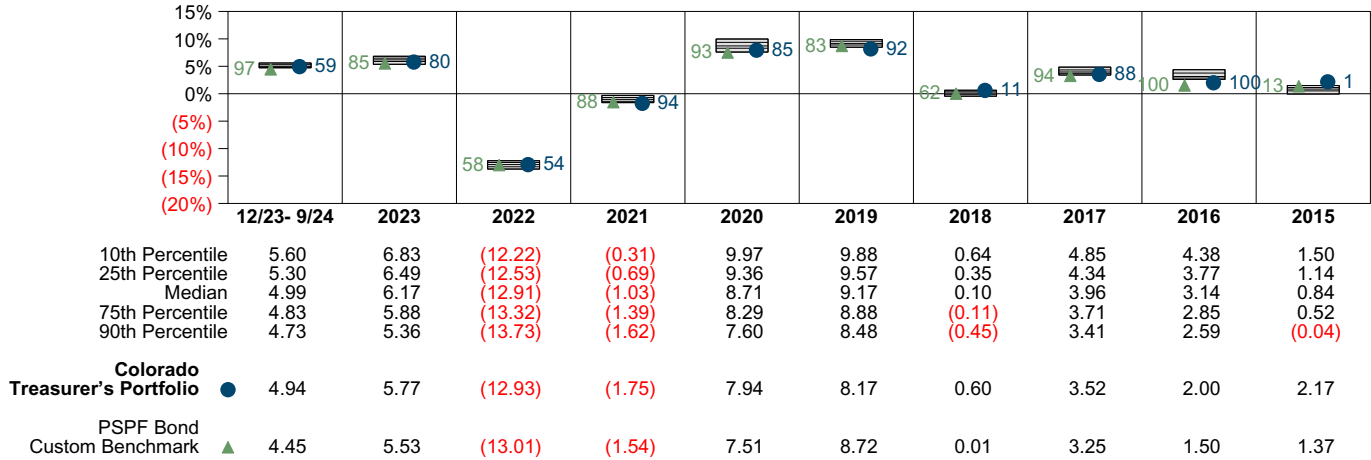


# Colorado Treasurer's Portfolio Return Analysis Summary

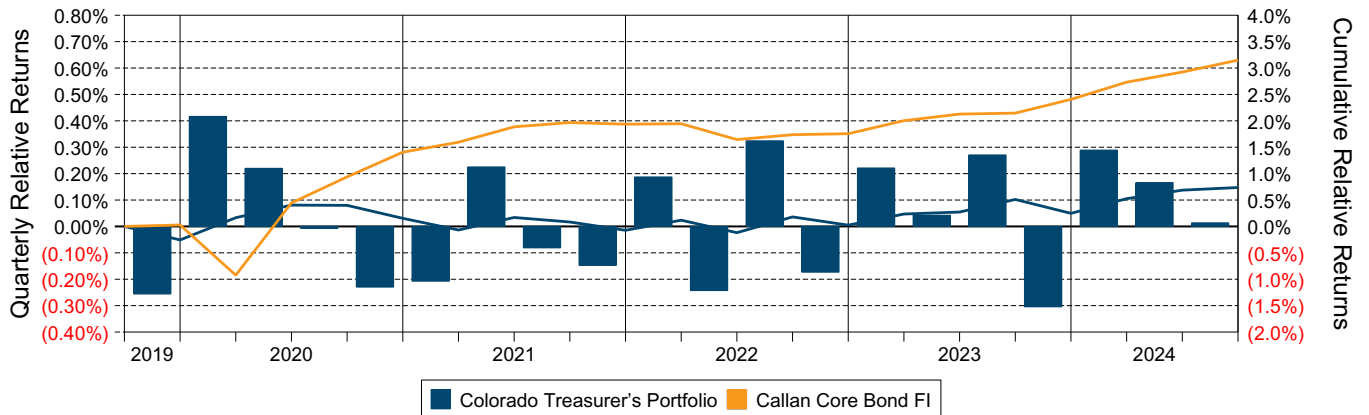
## Return Analysis

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.

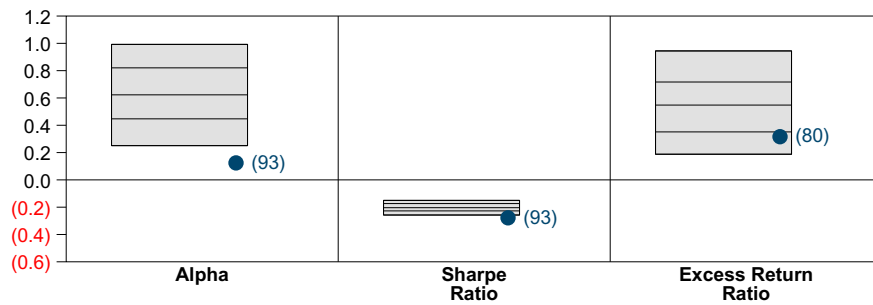
### Performance vs Callan Core Bond Fixed Income (Gross)



### 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 September 30, 2024

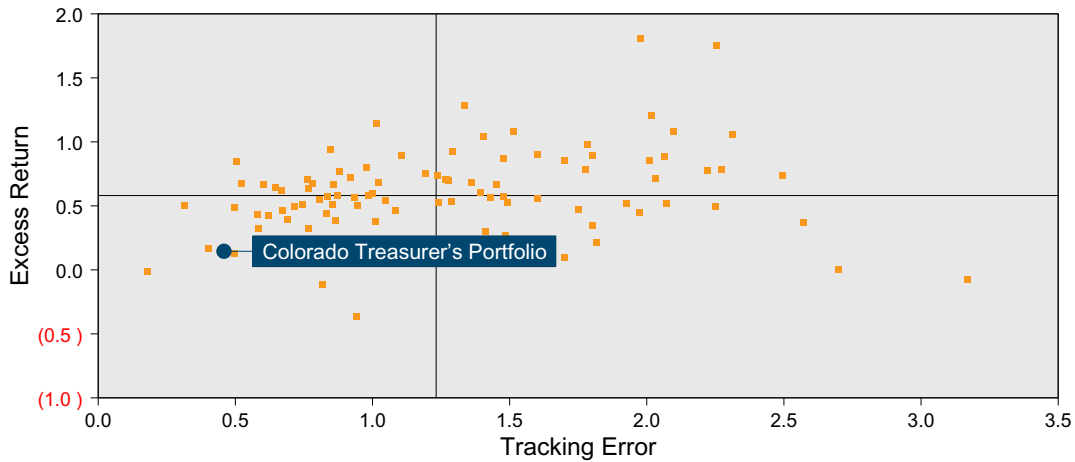


# Colorado Treasurer's Portfolio Risk Analysis Summary

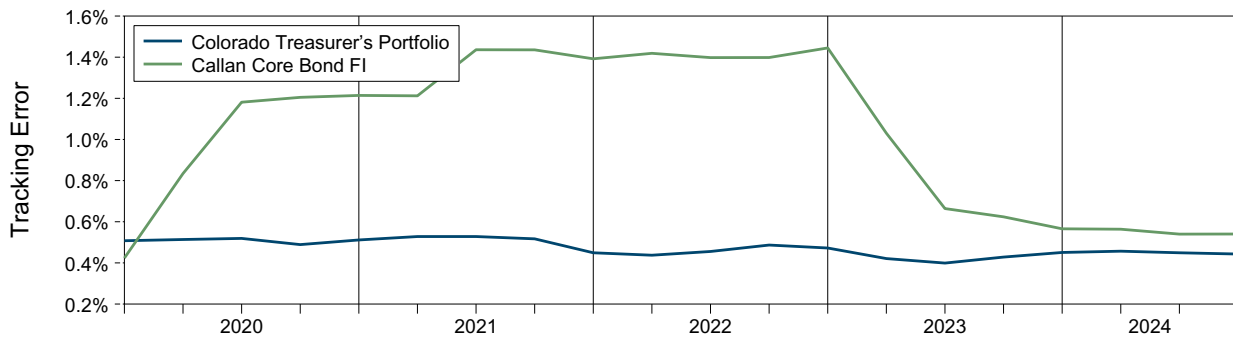
## Risk Analysis

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.

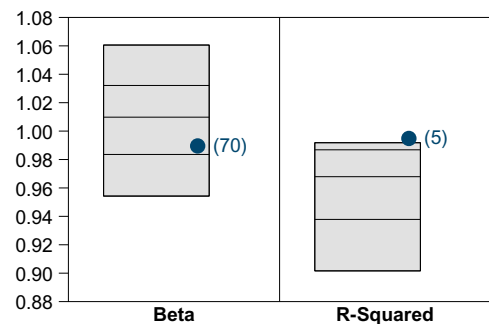
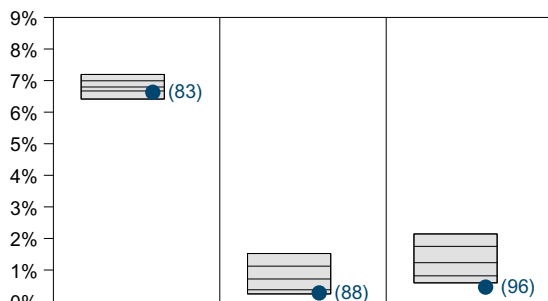
### Risk Analysis vs Callan Core Bond Fixed Income (Gross) Five Years Ended September 30, 2024



### 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 September 30, 2024



10th Percentile 7.19  
25th Percentile 6.99  
Median 6.80  
75th Percentile 6.67  
90th Percentile 6.41

10th Percentile 1.52  
25th Percentile 1.12  
Median 0.72  
75th Percentile 0.37  
90th Percentile 0.24

10th Percentile 2.14  
25th Percentile 1.75  
Median 1.23  
75th Percentile 0.82  
90th Percentile 0.59

10th Percentile 1.06  
25th Percentile 1.03  
Median 1.01  
75th Percentile 0.98  
90th Percentile 0.95

10th Percentile 0.99  
25th Percentile 0.99  
Median 0.97  
75th Percentile 0.94  
90th Percentile 0.90

Colorado Treasurer's Portfolio ● 6.63 0.27 0.46

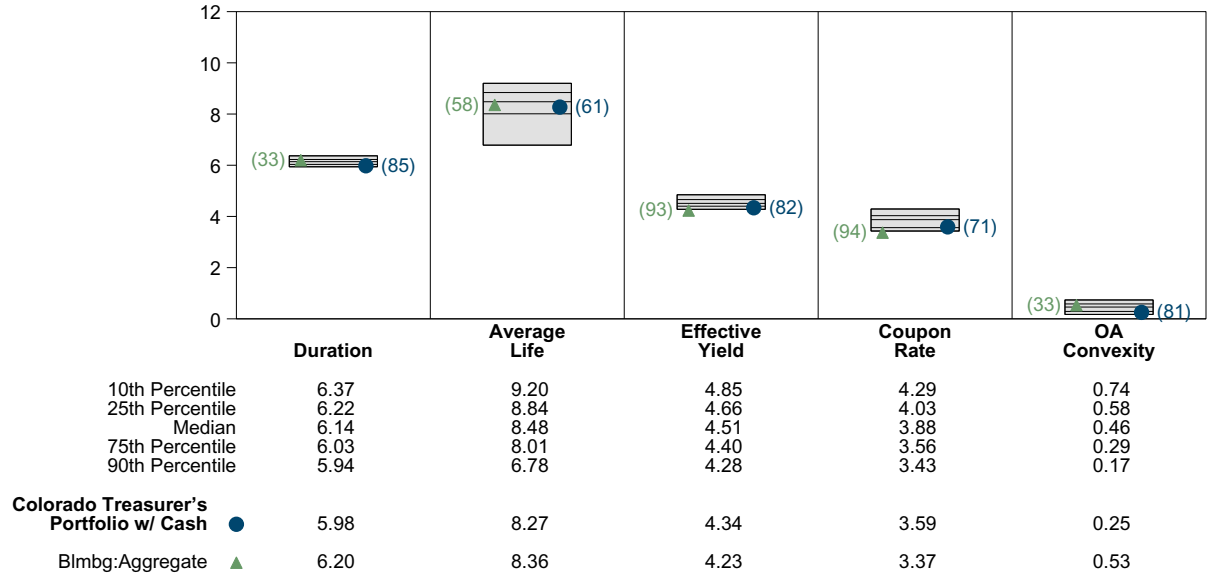
Colorado Treasurer's Portfolio ● 0.99 0.99

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

## Portfolio Characteristics

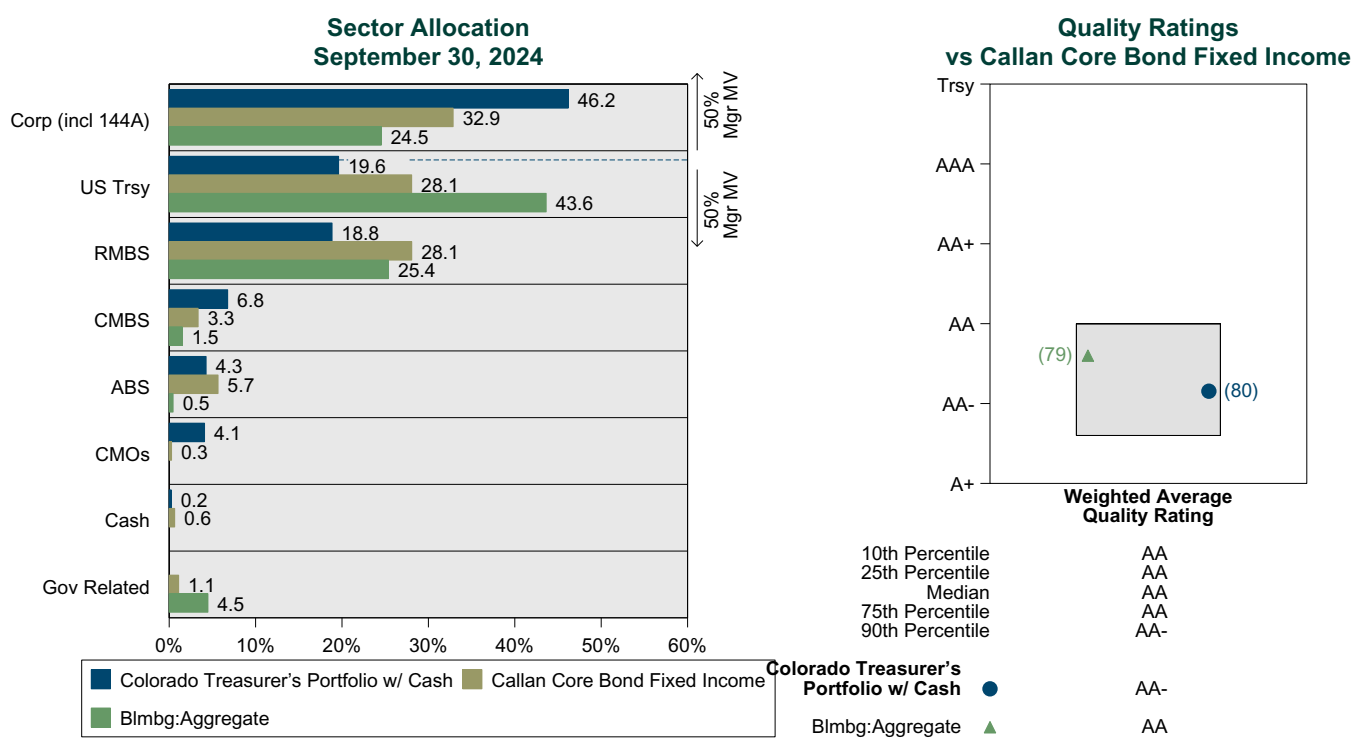
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan Core Bond Fixed Income as of September 30, 2024



## 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.

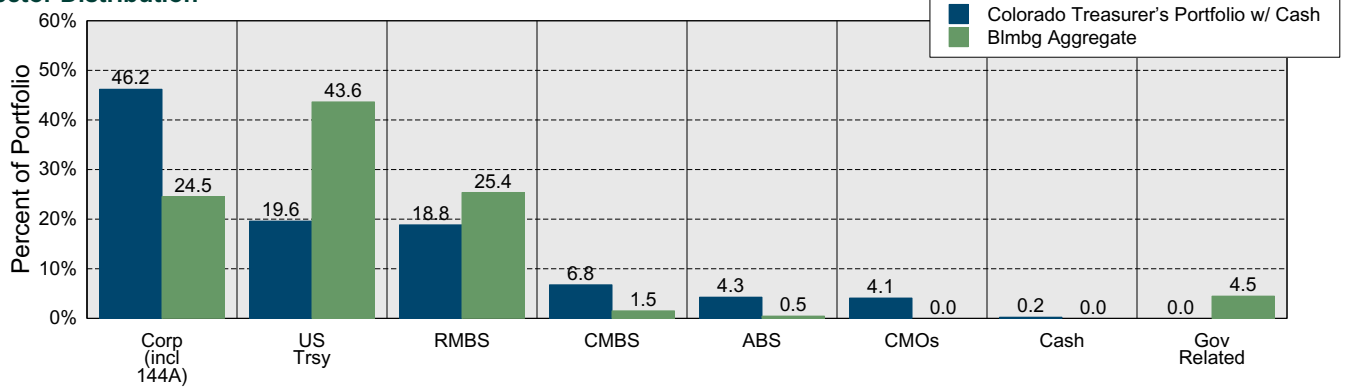


# Colorado Treasurer's Portfolio w/ Cash Portfolio Characteristics Summary As of September 30, 2024

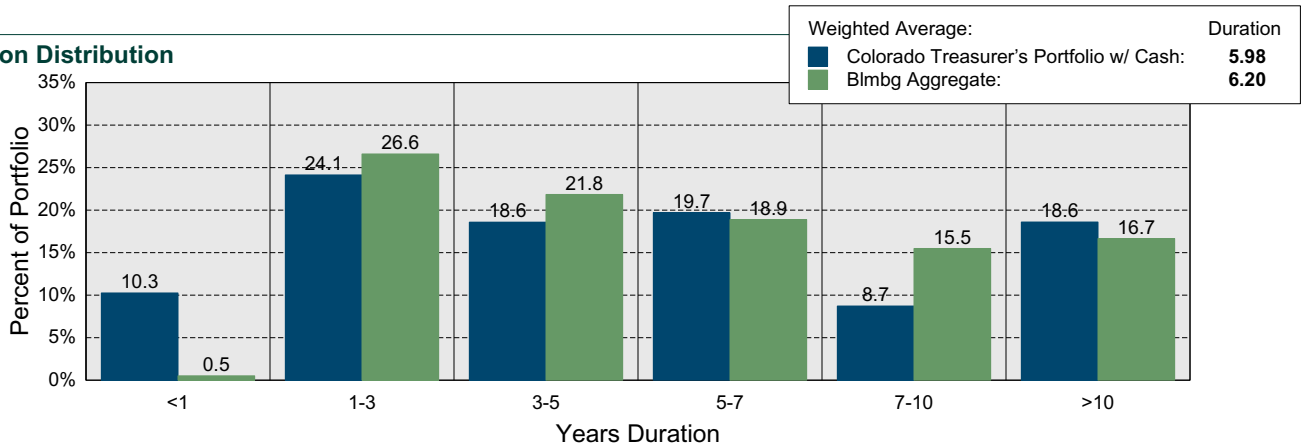
## Portfolio Structure Comparison

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.

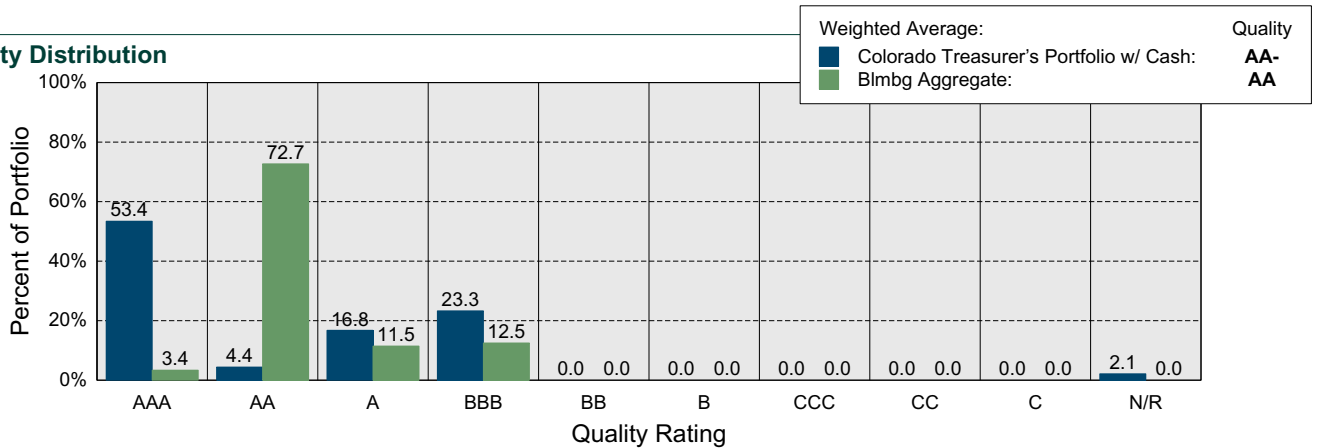
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Janus Henderson Short Duration Period Ended September 30, 2024

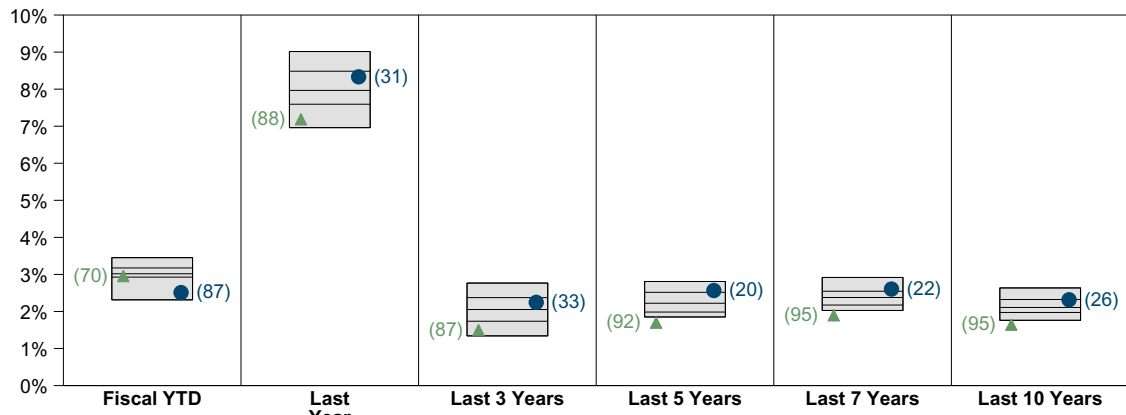
## Investment Philosophy

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

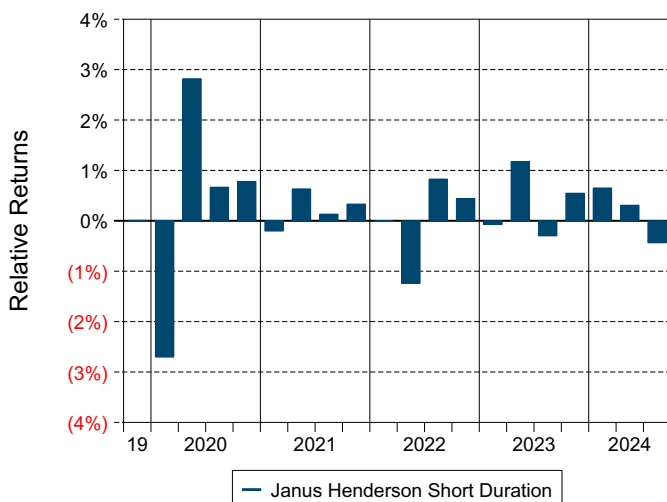
- Janus Henderson Short Duration's portfolio posted a 2.51% return for the quarter placing it in the 87 percentile of the Callan Short Term Fixed Income group for the quarter and in the 31 percentile for the last year.
- Janus Henderson Short Duration's portfolio underperformed the Blmbg Gov/Cred 1-3 Yr by 0.45% for the quarter and outperformed the Blmbg Gov/Cred 1-3 Yr for the year by 1.14%.

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

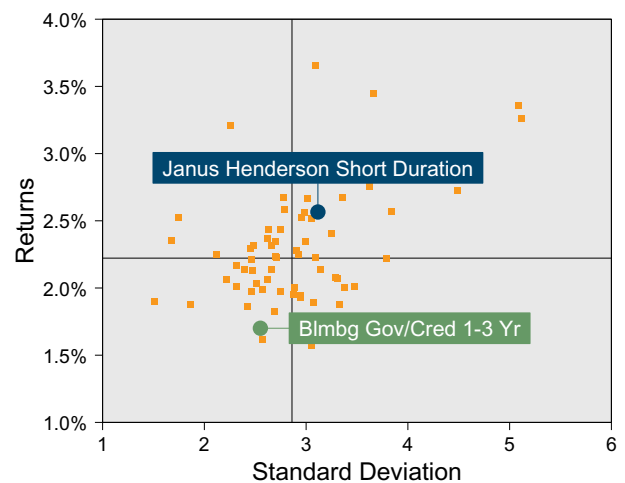


	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	3.45	9.02	2.77	2.81	2.92	2.64
25th Percentile	3.18	8.48	2.37	2.52	2.55	2.32
Median	3.02	7.97	2.05	2.22	2.38	2.11
75th Percentile	2.93	7.59	1.74	1.98	2.17	1.97
90th Percentile	2.31	6.96	1.34	1.85	2.03	1.76
<b>Janus Henderson Short Duration</b> ●	2.51	8.33	2.25	2.57	2.61	2.32
Blmbg Gov/Cred 1-3 Yr ▲	2.96	7.19	1.50	1.70	1.90	1.64

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



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

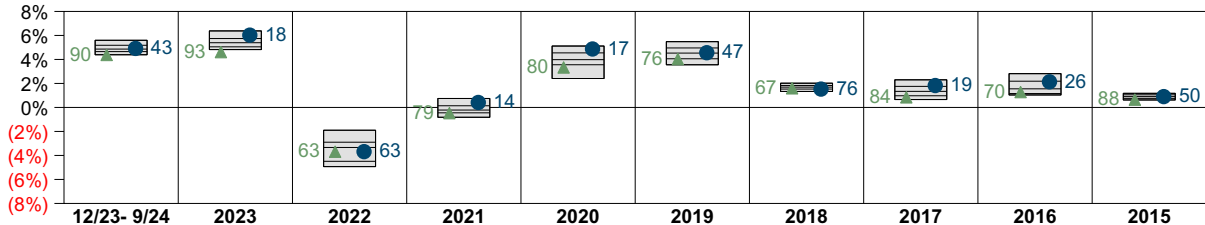


# Janus Henderson Short Duration Return Analysis Summary

## 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.

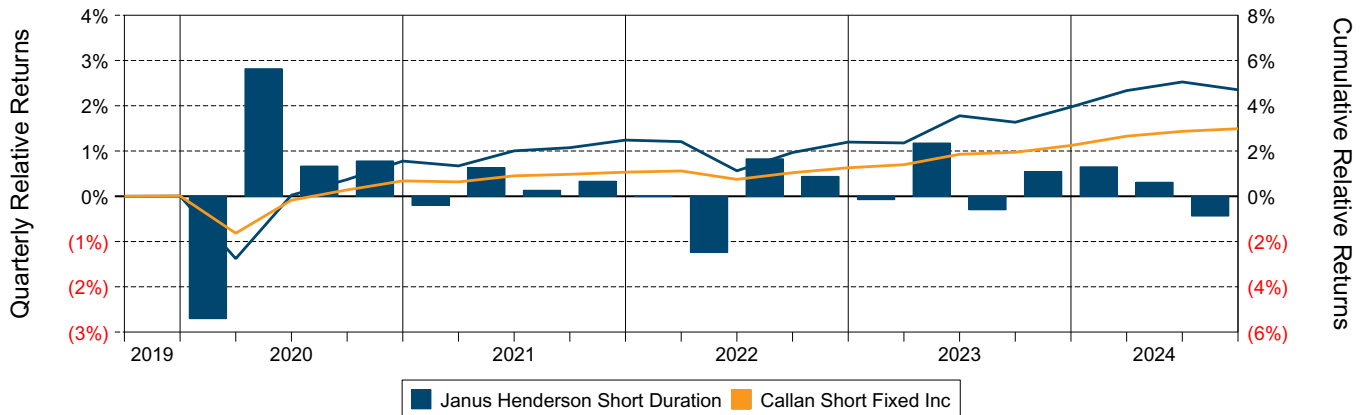
### Performance vs Callan Short Term Fixed Income (Gross)



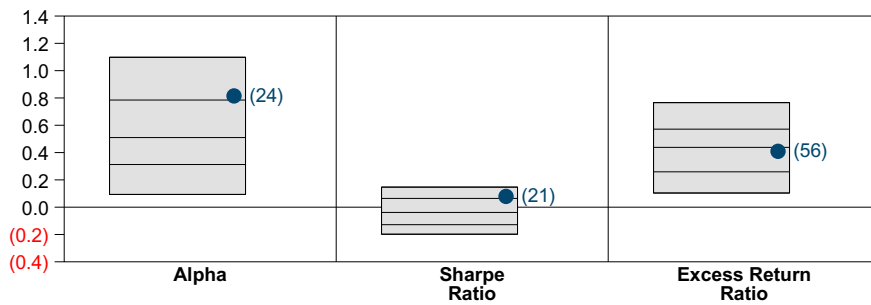
10th Percentile	5.60	6.38	(1.90)	0.75	5.12	5.48	2.02	2.30	2.81	1.18
25th Percentile	5.18	5.74	(2.90)	0.14	4.55	4.96	1.83	1.76	2.19	1.05
Median	4.86	5.39	(3.34)	(0.22)	3.98	4.53	1.69	1.34	1.55	0.90
75th Percentile	4.65	5.05	(4.49)	(0.45)	3.56	4.06	1.53	0.97	1.16	0.76
90th Percentile	4.39	4.82	(4.93)	(0.82)	2.41	3.56	1.33	0.66	1.04	0.62

<b>Janus Henderson Short Duration</b>	●	4.92	6.02	(3.68)	0.41	4.87	4.56	1.53	1.82	2.13	0.90
Blmbg Gov/Cred 1-3 Yr	▲	4.38	4.61	(3.69)	(0.47)	3.33	4.03	1.60	0.84	1.28	0.65

### 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 September 30, 2024



10th Percentile	1.10	0.15	0.77
25th Percentile	0.78	0.06	0.57
Median	0.51	(0.04)	0.44
75th Percentile	0.31	(0.13)	0.26
90th Percentile	0.09	(0.20)	0.10

<b>Janus Henderson Short Duration</b>	●	0.81	0.08	0.41
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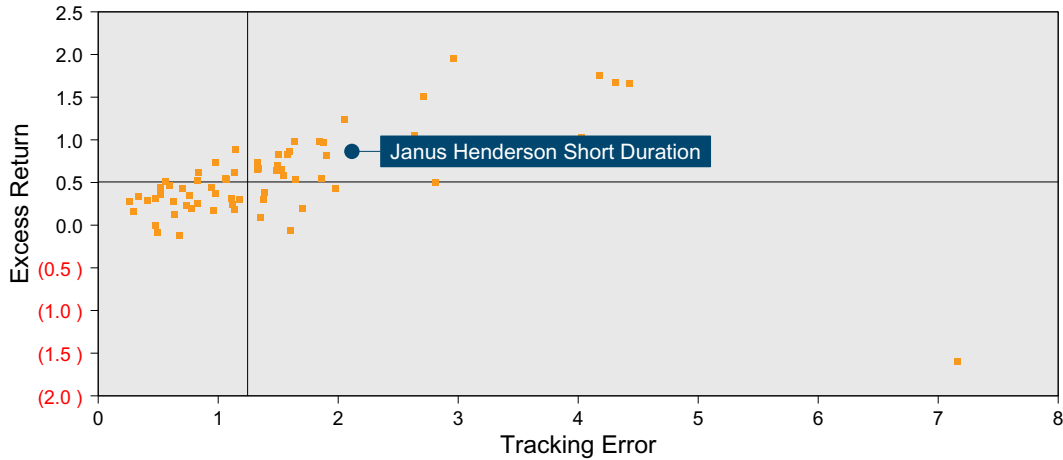


# Janus Henderson Short Duration Risk Analysis Summary

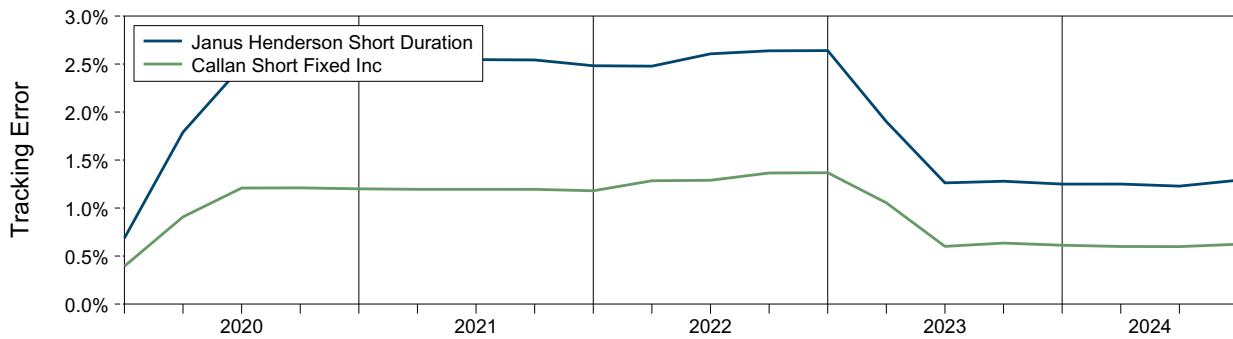
## Risk Analysis

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.

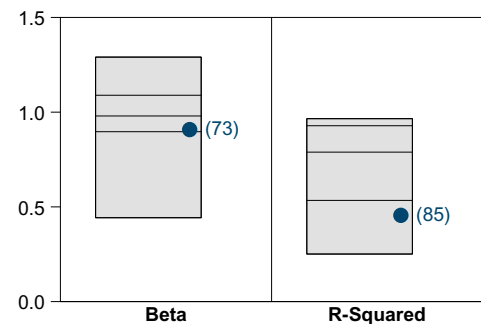
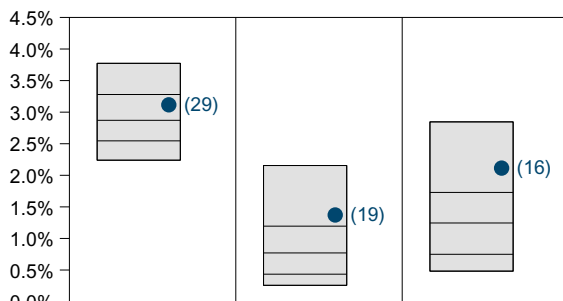
### Risk Analysis vs Callan Short Term Fixed Income (Gross) Five Years Ended September 30, 2024



### 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 September 30, 2024



	Standard Deviation	Downside Risk	Tracking Error	Beta	R-Squared
10th Percentile	3.77	2.16	2.85	1.29	0.97
25th Percentile	3.28	1.19	1.73	1.09	0.93
Median	2.87	0.77	1.25	0.98	0.79
75th Percentile	2.55	0.43	0.75	0.90	0.53
90th Percentile	2.24	0.26	0.48	0.44	0.25

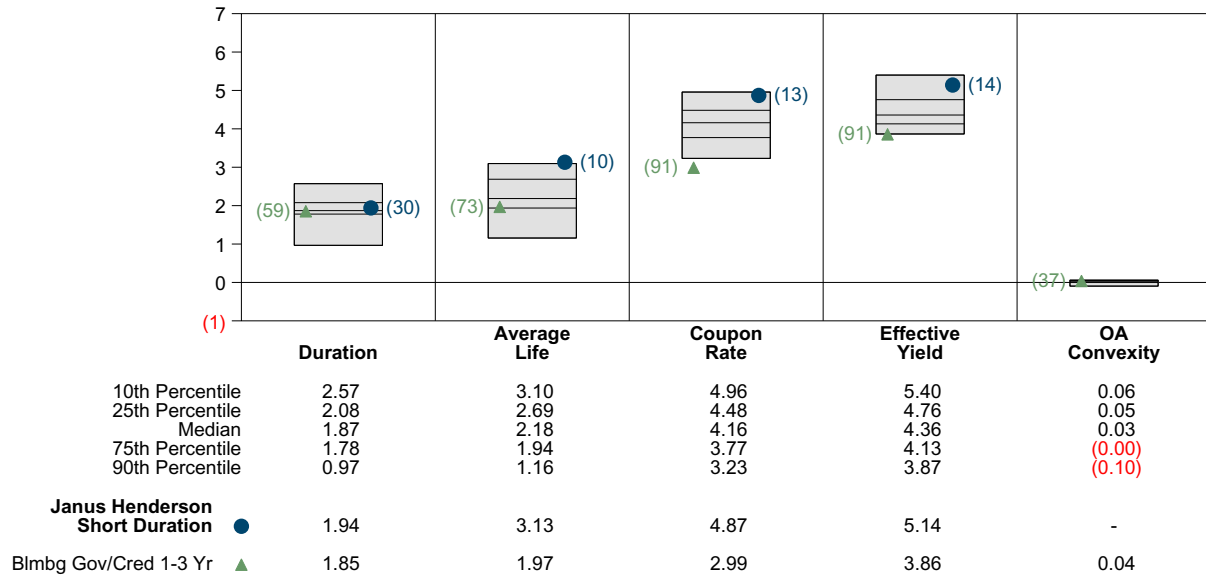
Janus Henderson Short Duration ● 3.12 1.37 2.11 Janus Henderson Short Duration ● 0.91 0.46

# Janus Henderson Short Duration Bond Characteristics Analysis Summary

## Portfolio Characteristics

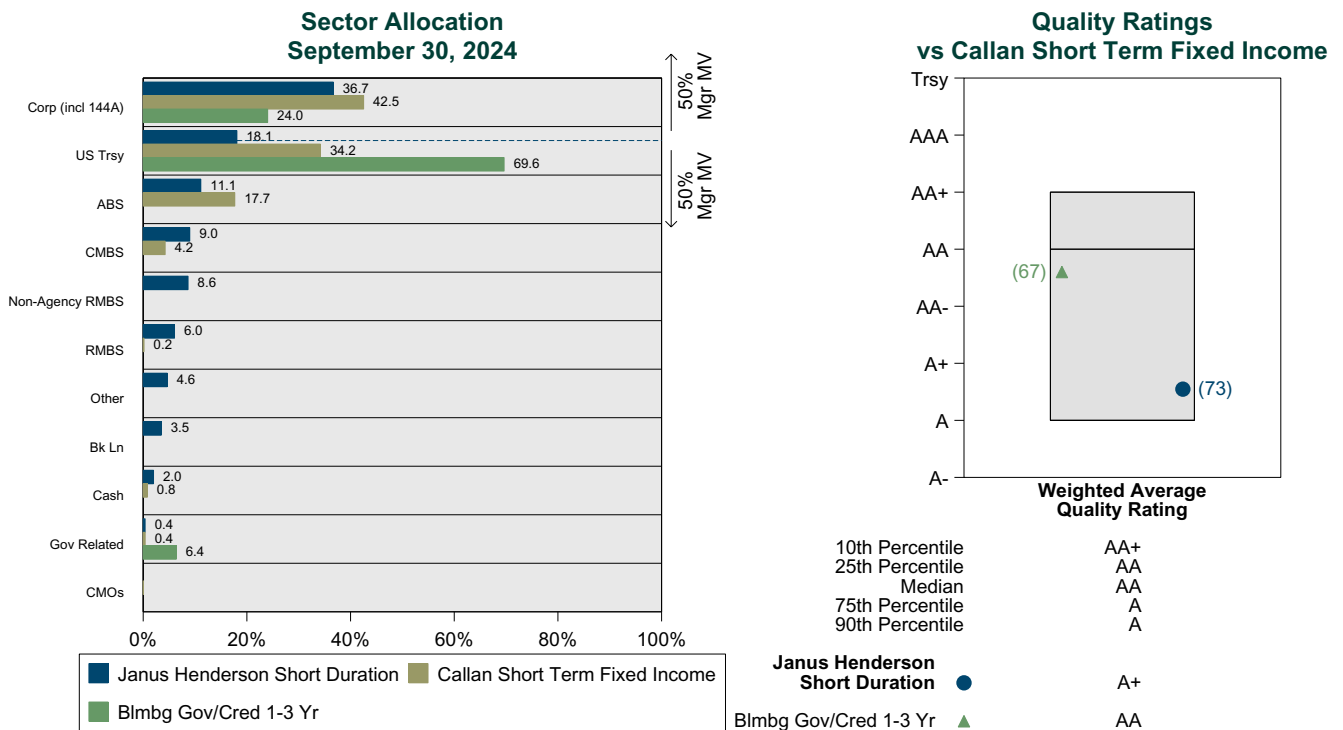
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan Short Term Fixed Income as of September 30, 2024



## 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.

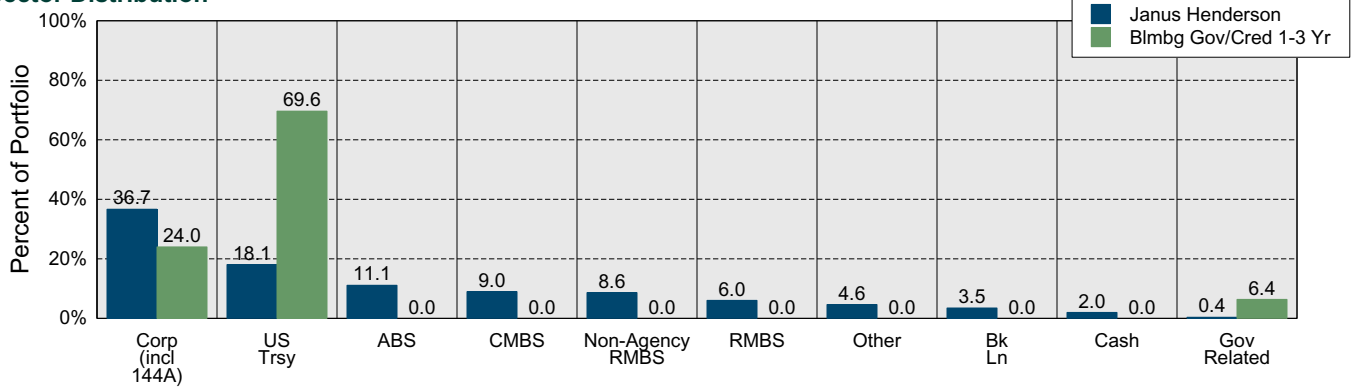


# Janus Henderson Portfolio Characteristics Summary As of September 30, 2024

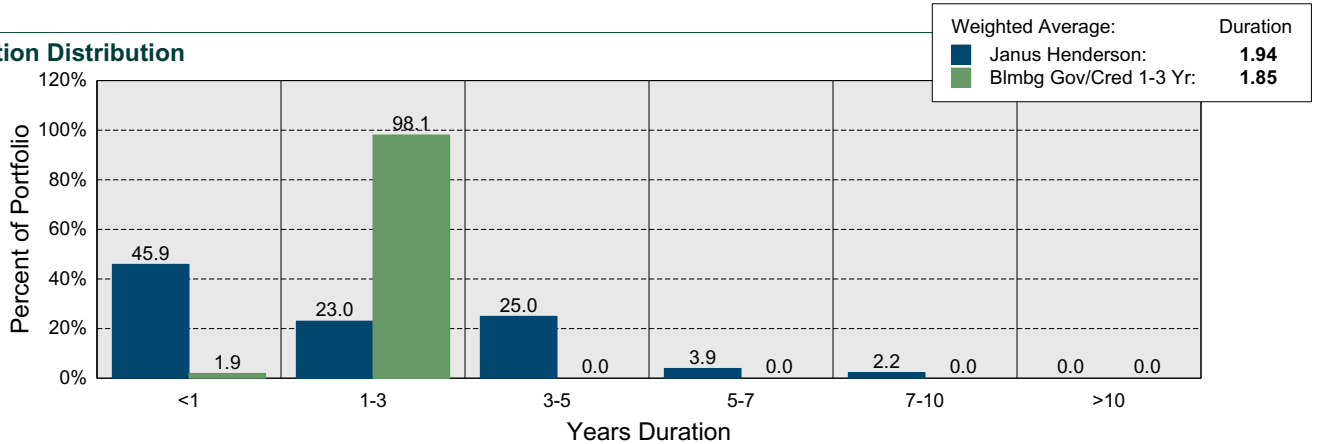
## Portfolio Structure Comparison

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.

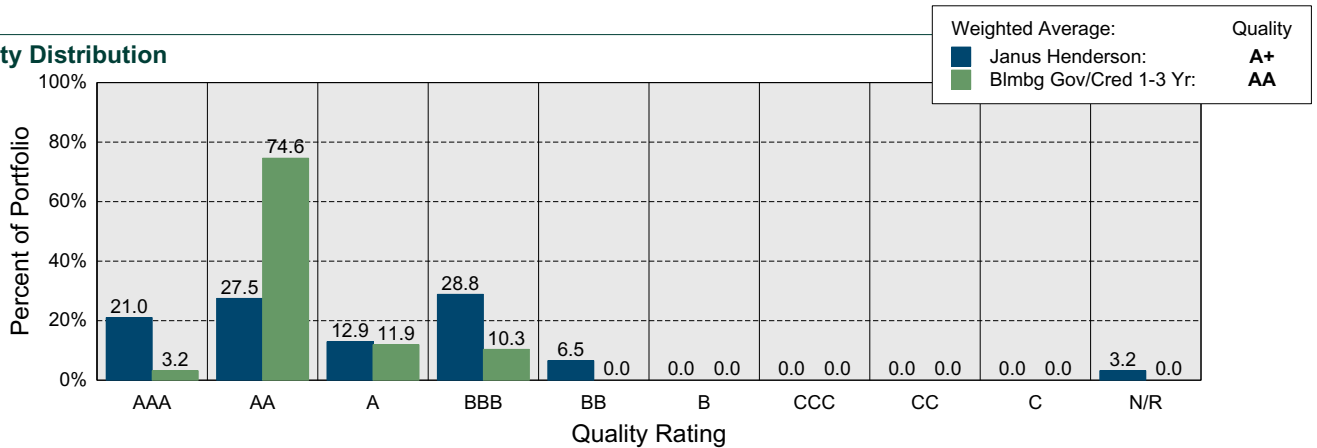
### Sector Distribution



### Duration Distribution



### Quality Distribution





# High Income Strategies Period Ended September 30, 2024

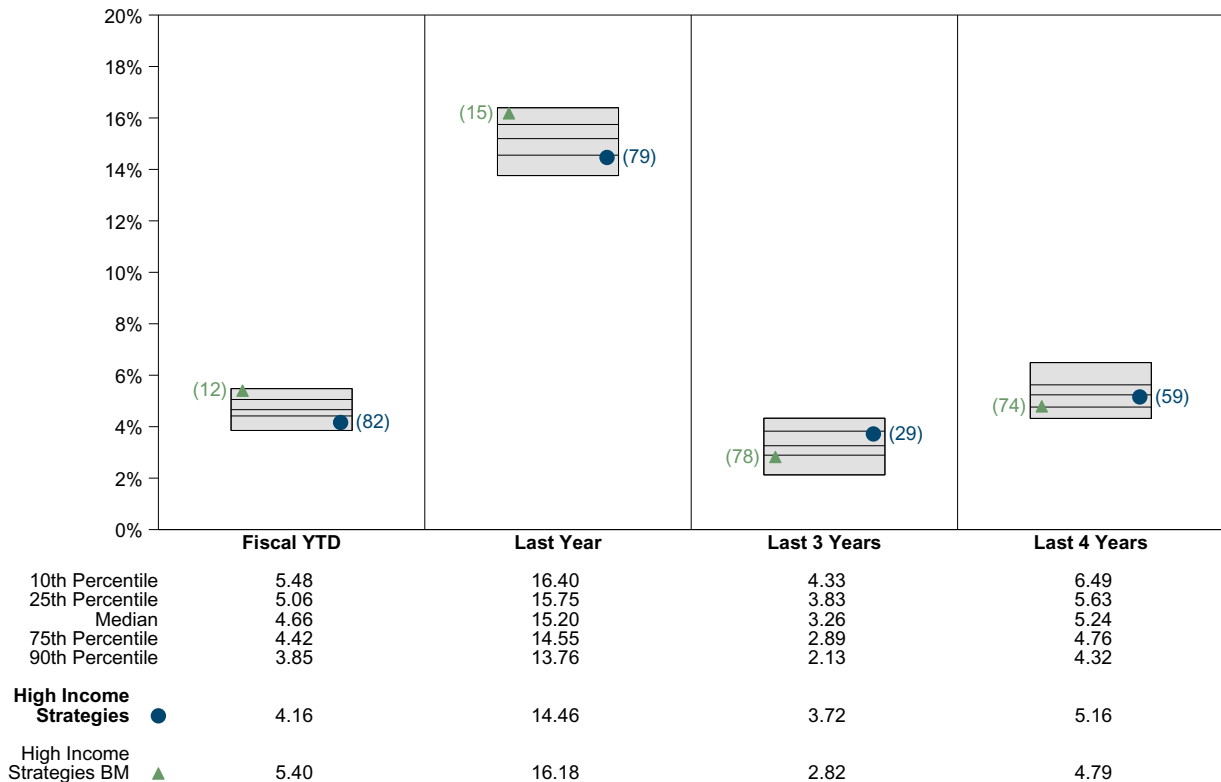
## Benchmark Definition

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

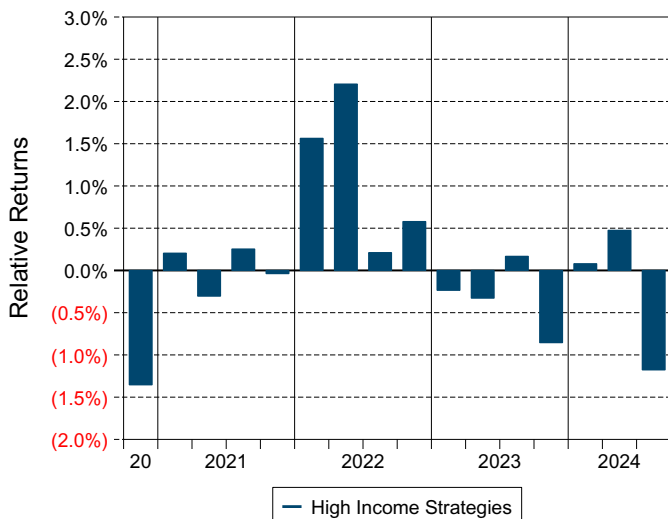
## Quarterly Summary and Highlights

- High Income Strategies's portfolio posted a 4.16% return for the quarter placing it in the 82 percentile of the Callan High Yield Fixed Income group for the quarter and in the 79 percentile for the last year.
- High Income Strategies's portfolio underperformed the High Income Strategies BM by 1.24% for the quarter and underperformed the High Income Strategies BM for the year by 1.72%.

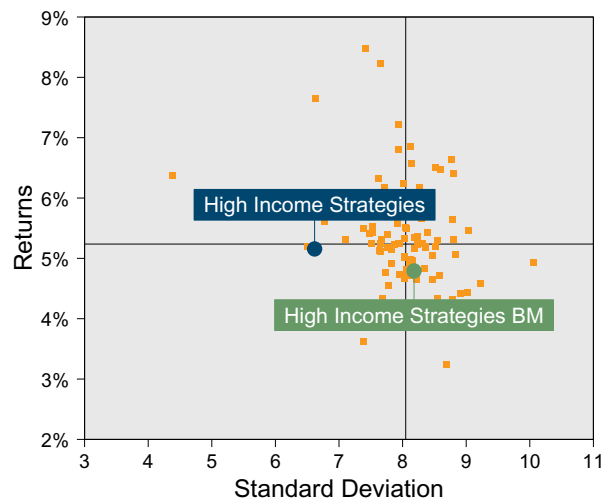
## Performance vs Callan High Yield Fixed Income (Gross)



## Relative Return vs High Income Strategies BM



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

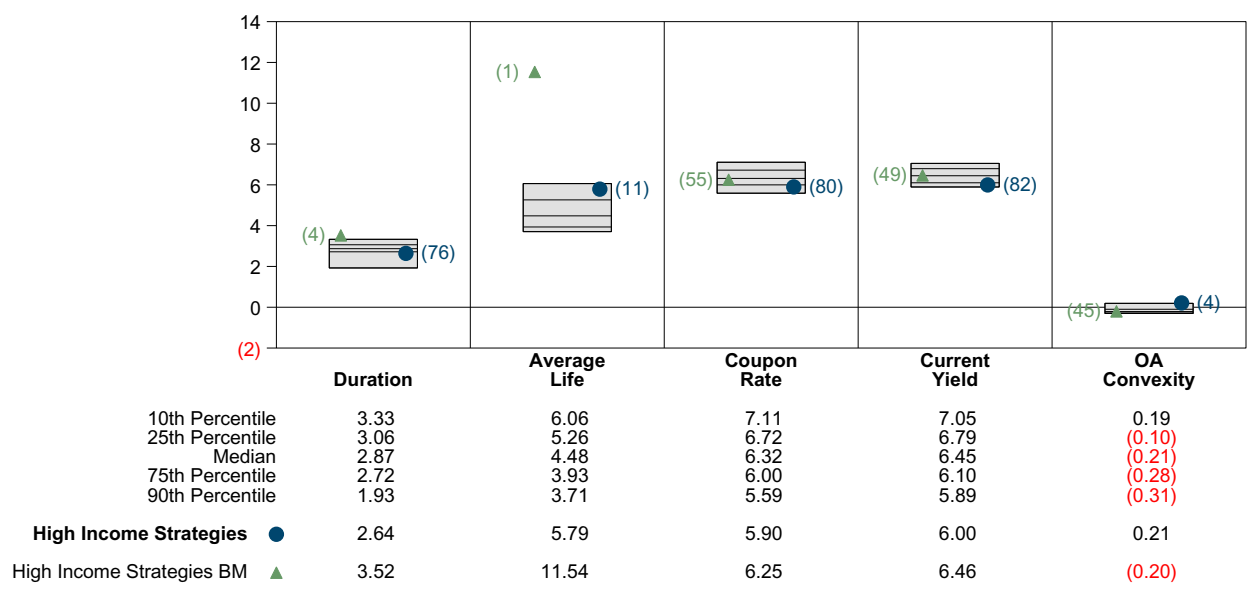


# High Income Strategies Bond Characteristics Analysis Summary

## Portfolio Characteristics

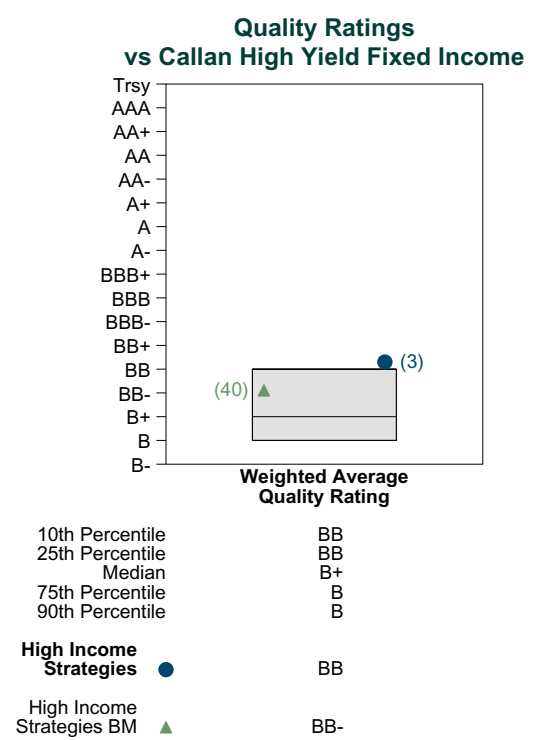
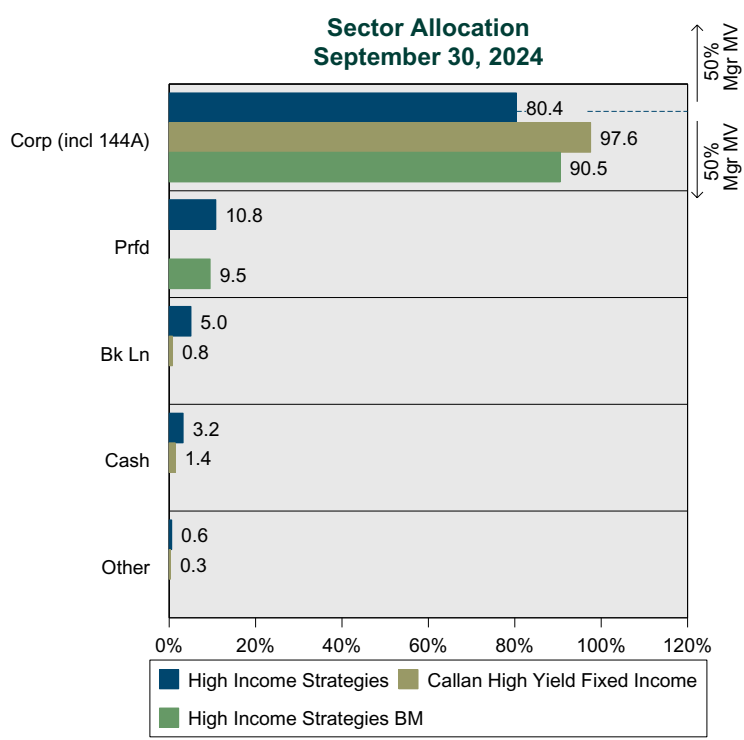
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan High Yield Fixed Income as of September 30, 2024



## 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.

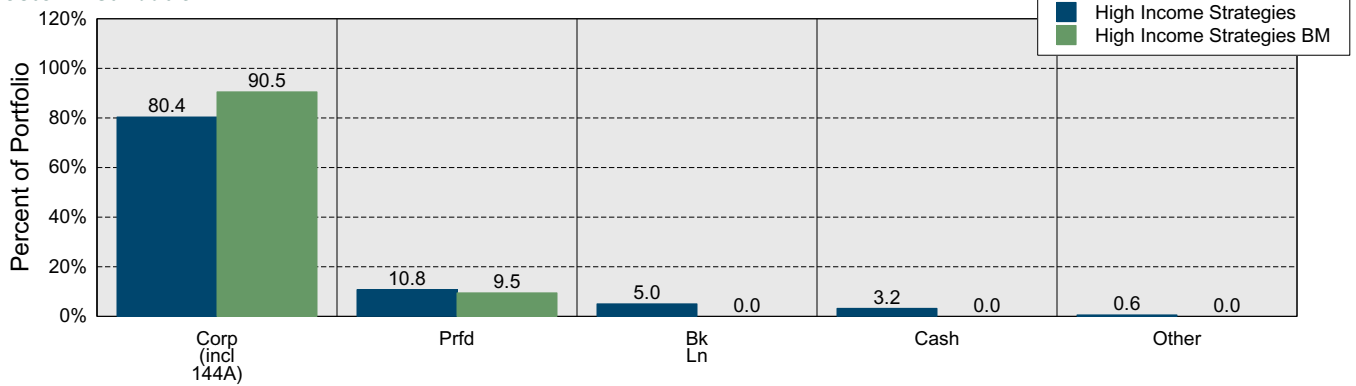


# High Income Strategies Portfolio Characteristics Summary As of September 30, 2024

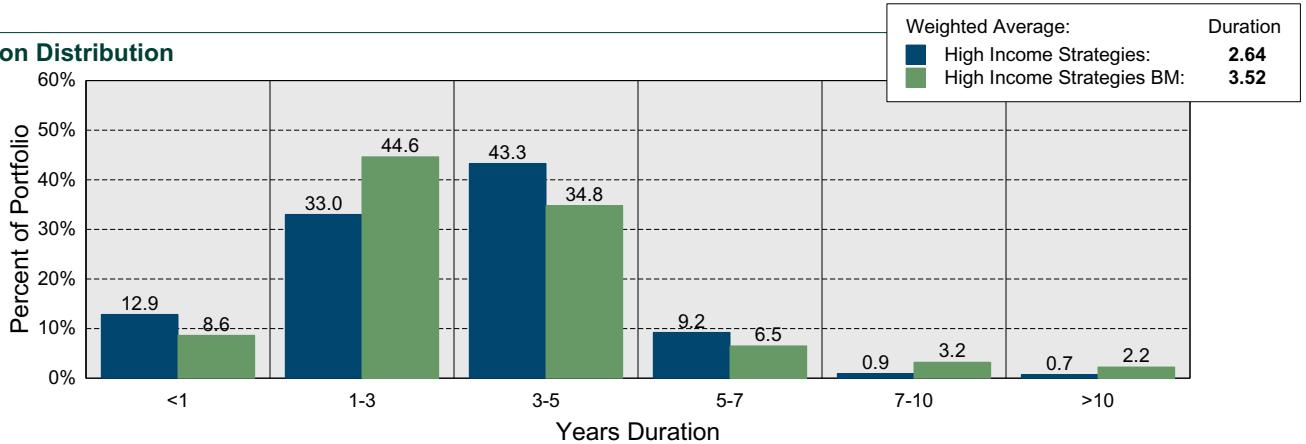
## Portfolio Structure Comparison

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.

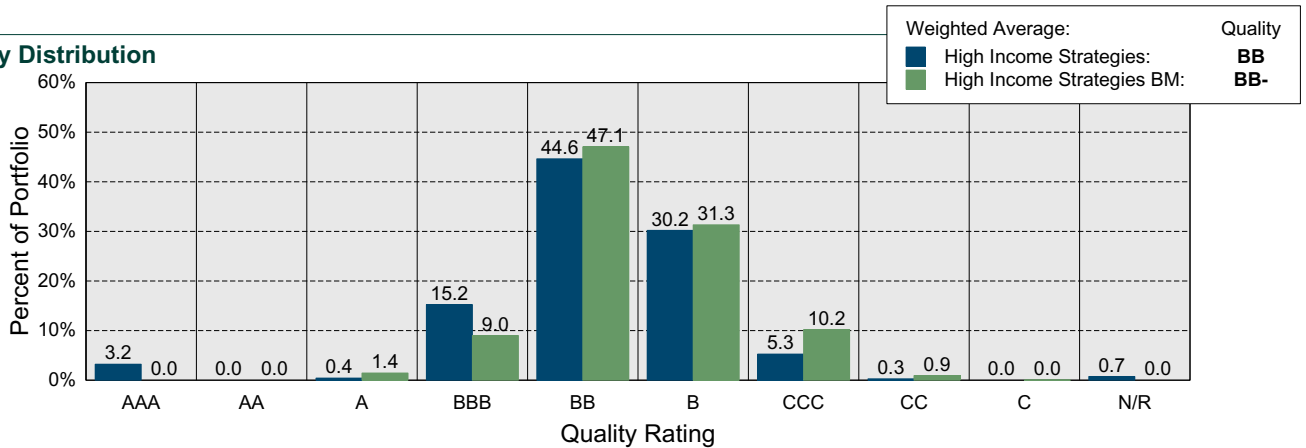
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Mackay Shield US High Yield Period Ended September 30, 2024

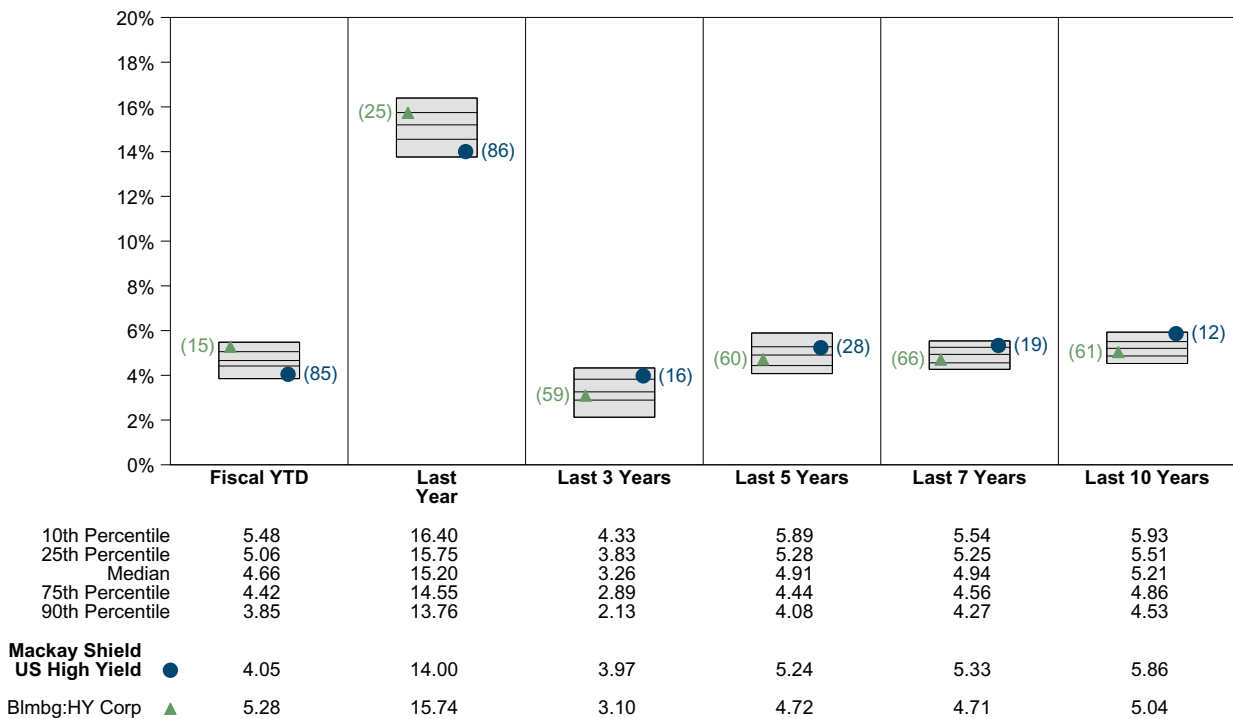
## Investment Philosophy

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.

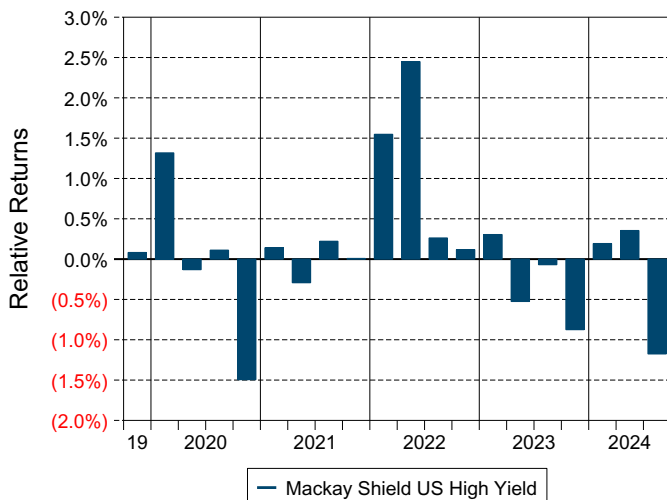
## Quarterly Summary and Highlights

- Mackay Shield US High Yield's portfolio posted a 4.05% return for the quarter placing it in the 85 percentile of the Callan High Yield Fixed Income group for the quarter and in the 86 percentile for the last year.
- Mackay Shield US High Yield's portfolio underperformed the Blmbg:HY Corp by 1.24% for the quarter and underperformed the Blmbg:HY Corp for the year by 1.74%.

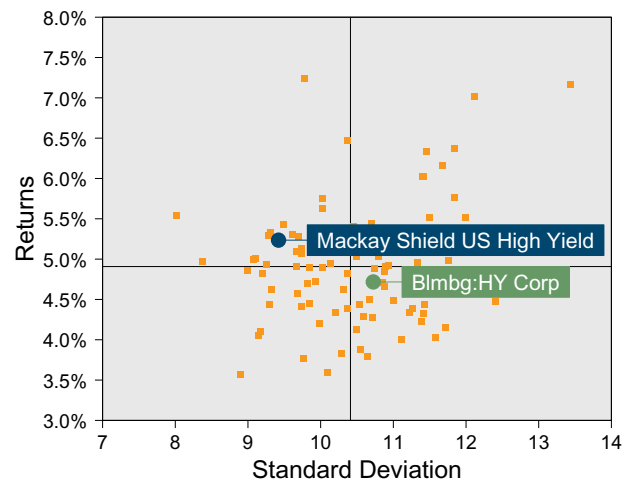
## Performance vs Callan High Yield Fixed Income (Gross)



## Relative Return vs Blmbg:HY Corp



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



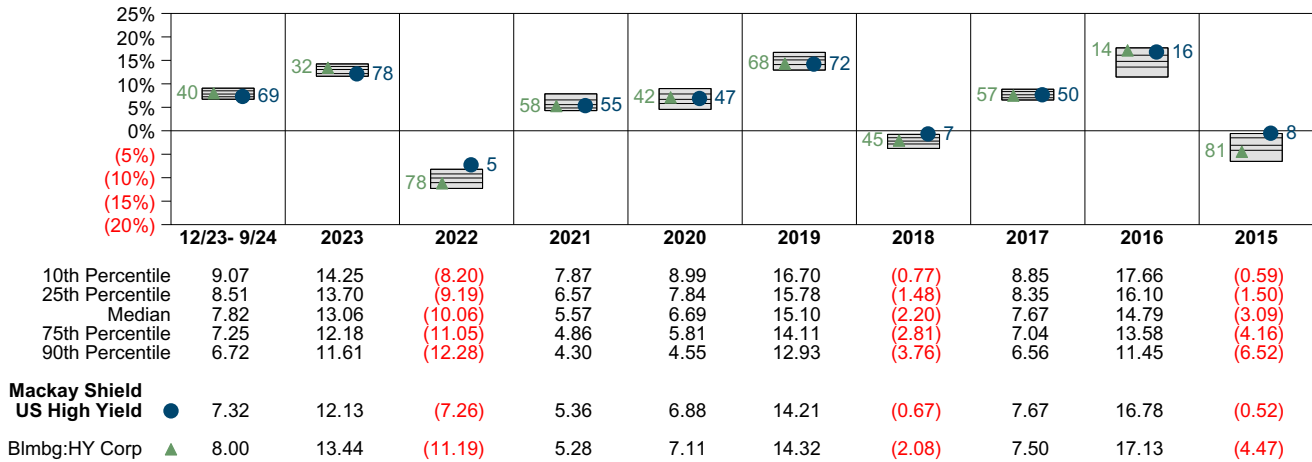


# Mackay Shield US High Yield Return Analysis Summary

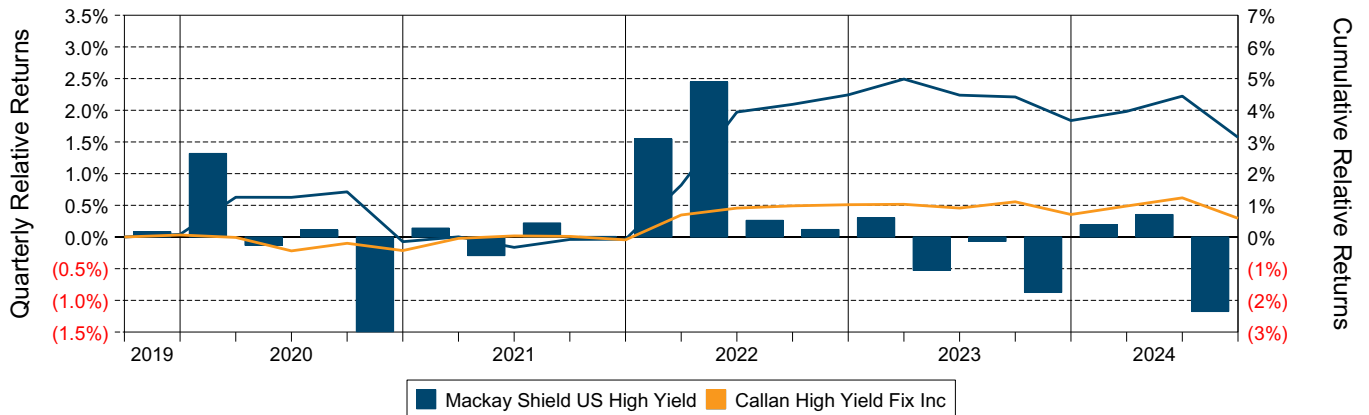
## Return Analysis

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.

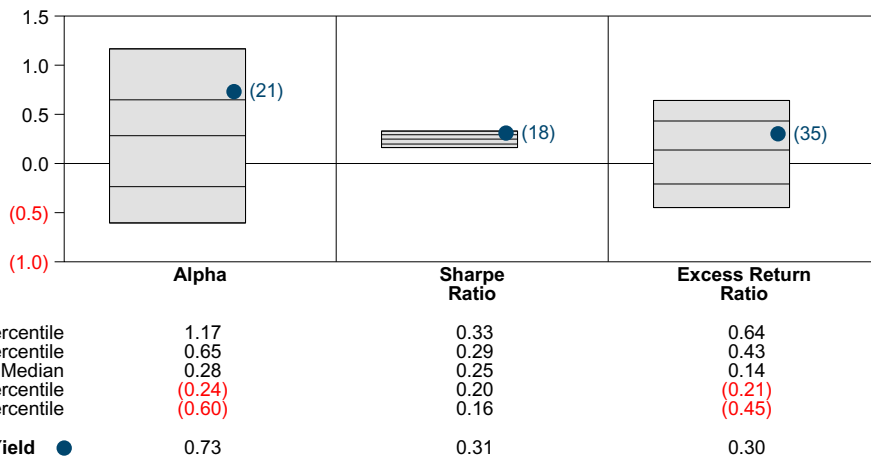
### Performance vs Callan High Yield Fixed Income (Gross)



### 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 September 30, 2024

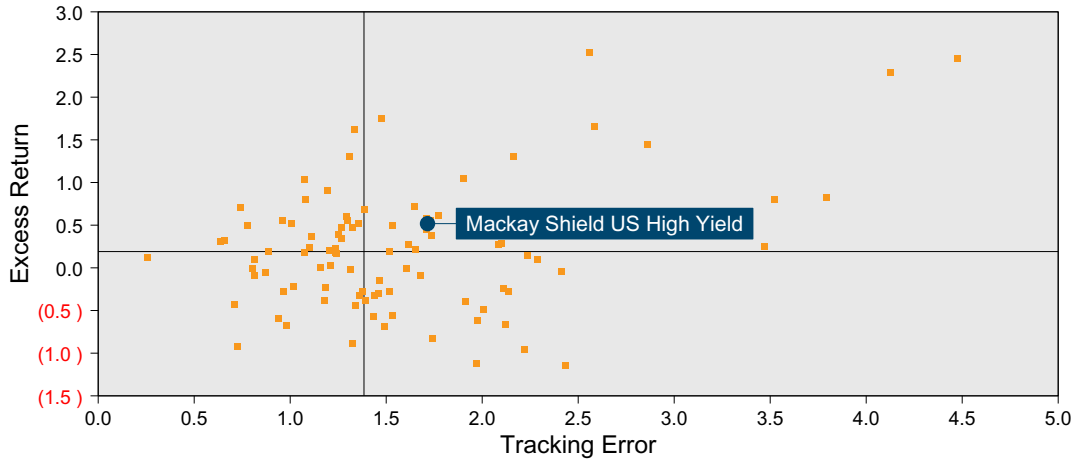


# Mackay Shield US High Yield Risk Analysis Summary

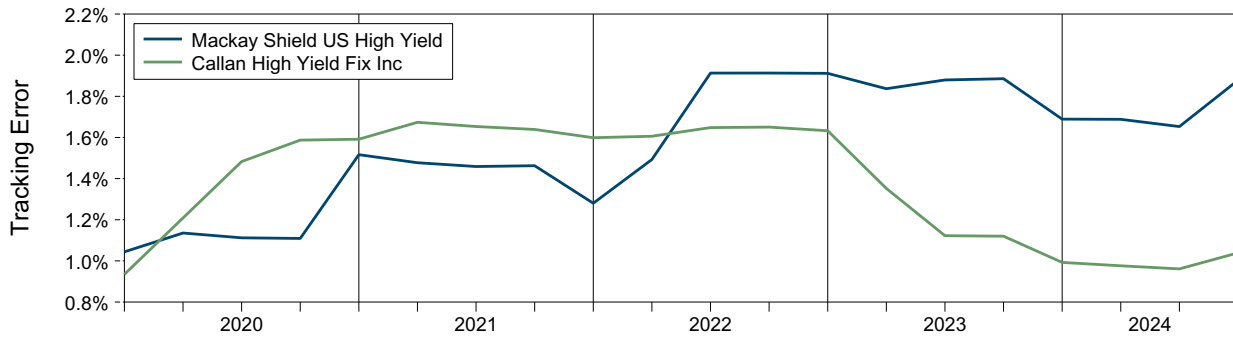
## Risk Analysis

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.

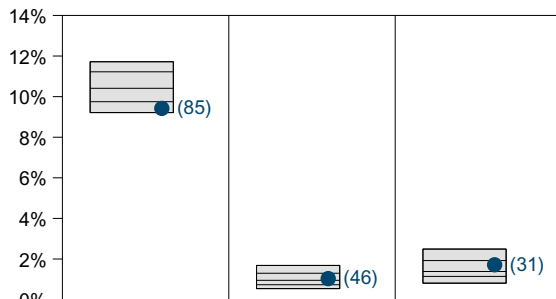
### Risk Analysis vs Callan High Yield Fixed Income (Gross) Five Years Ended September 30, 2024



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



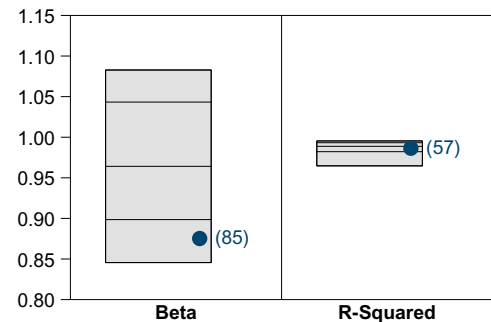
### Risk Statistics Rankings vs Blmbg:HY Corp Rankings Against Callan High Yield Fixed Income (Gross) Five Years Ended September 30, 2024



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	11.72	1.68	2.49
25th Percentile	11.22	1.30	1.92
Median	10.41	0.95	1.38
75th Percentile	9.75	0.73	1.14
90th Percentile	9.21	0.54	0.81

Mackay Shield US High Yield ●

9.42      1.03      1.72



	Beta	R-Squared
10th Percentile	1.08	1.00
25th Percentile	1.04	0.99
Median	0.96	0.99
75th Percentile	0.90	0.98
90th Percentile	0.85	0.96

Mackay Shield US High Yield ●

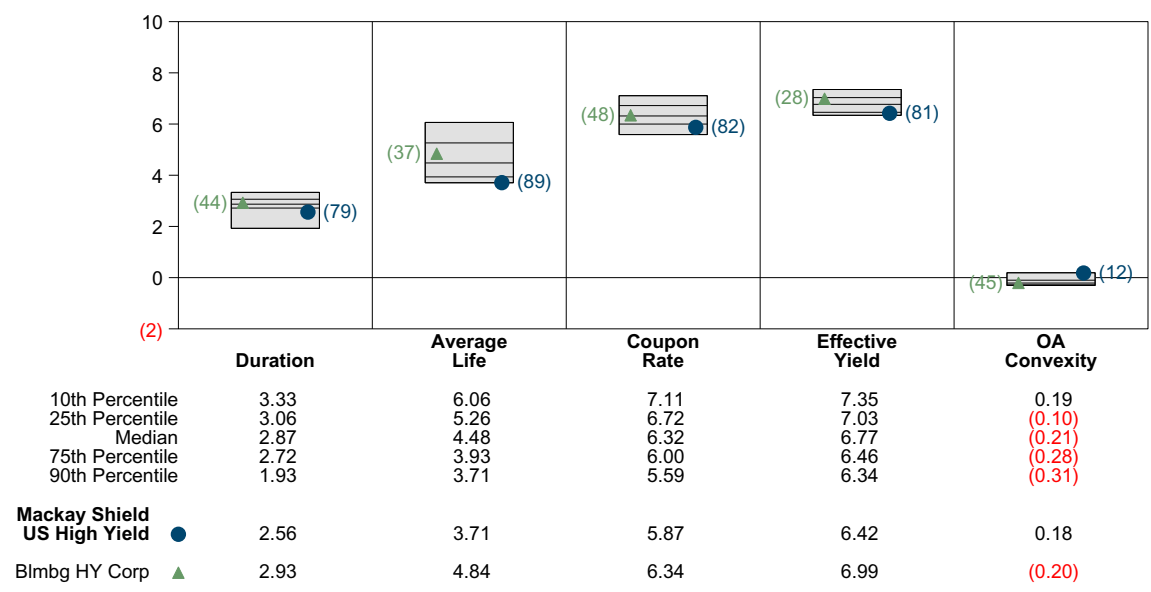
0.88      0.99

# Mackay Shield US High Yield Bond Characteristics Analysis Summary

## Portfolio Characteristics

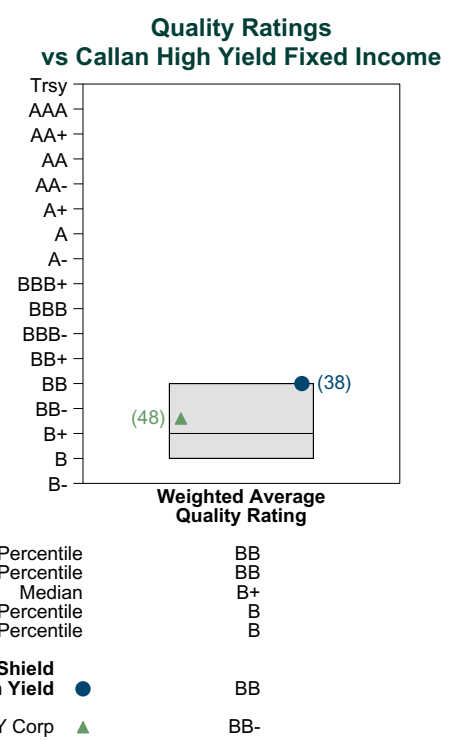
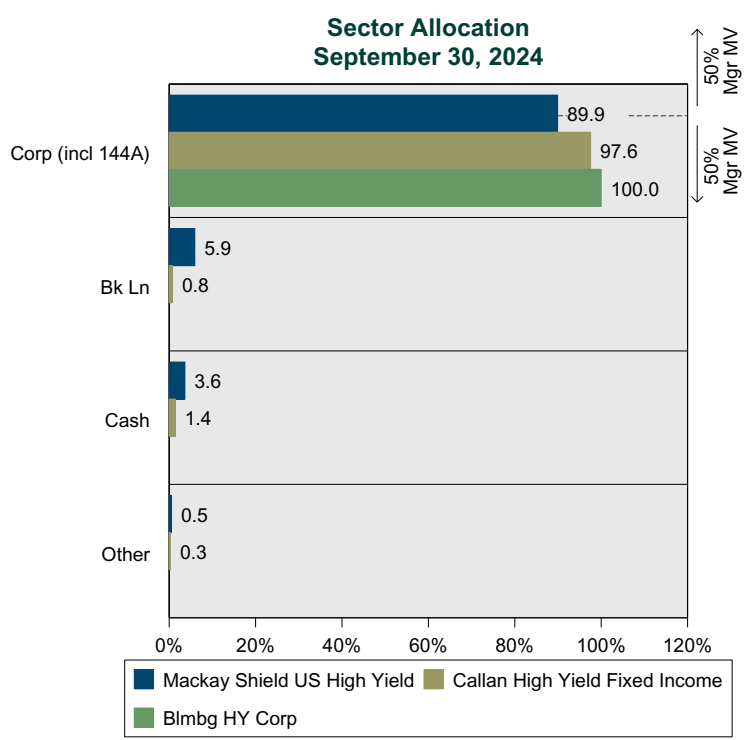
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio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

## Fixed Income Portfolio Characteristics Rankings Against Callan High Yield Fixed Income as of September 30, 2024



## 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.

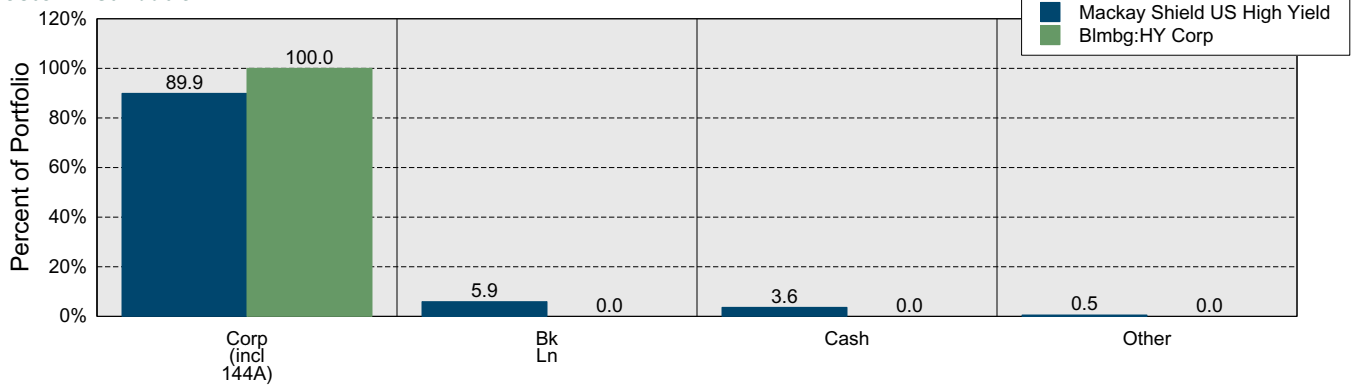


# Mackay Shield US High Yield Portfolio Characteristics Summary As of September 30, 2024

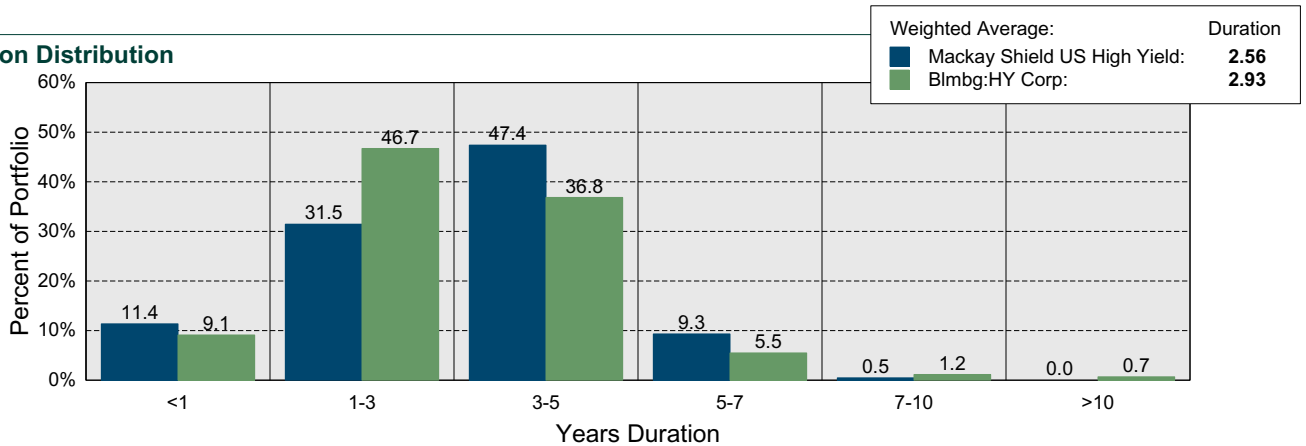
## Portfolio Structure Comparison

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.

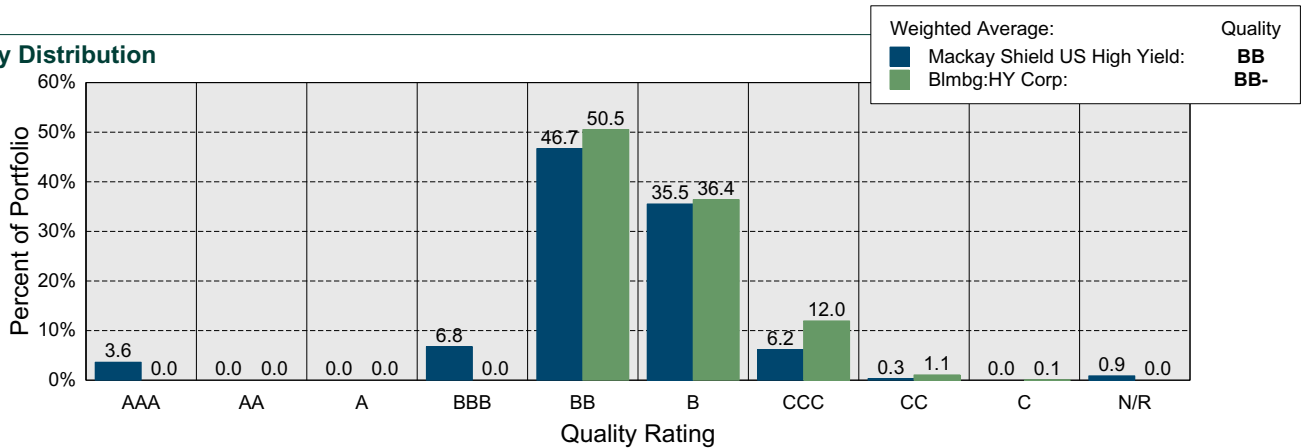
### Sector Distribution



### Duration Distribution



### Quality Distribution



# Principal Preferred Securities Period Ended September 30, 2024

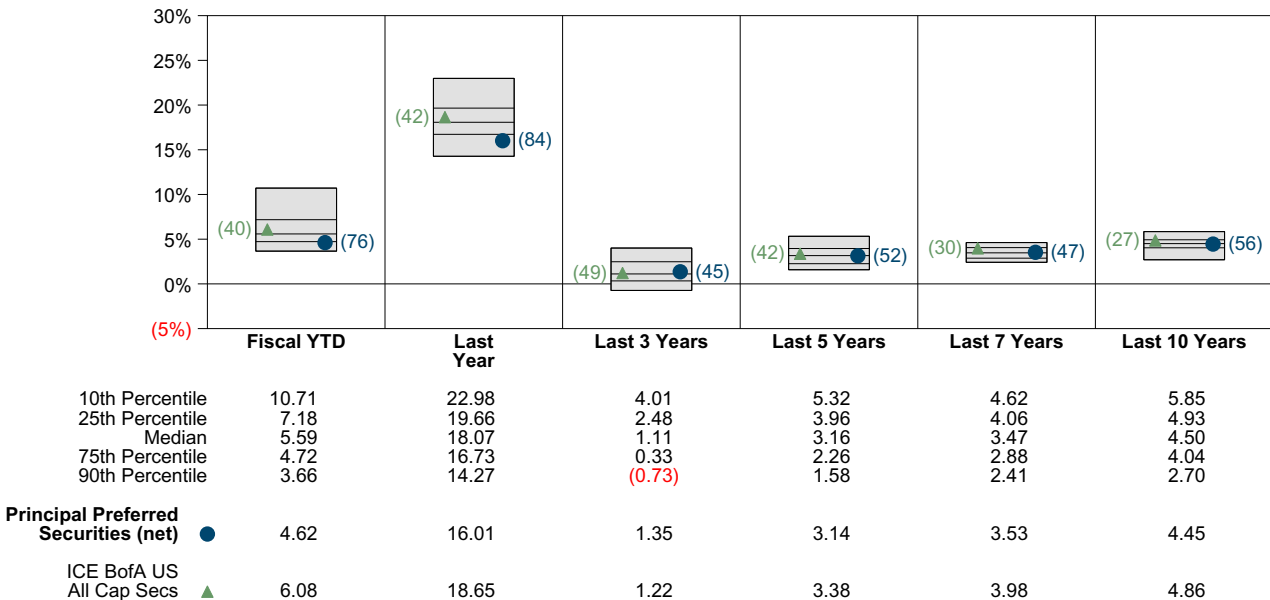
## Investment Philosophy

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. Calculated returns may include the impact of cash movements.

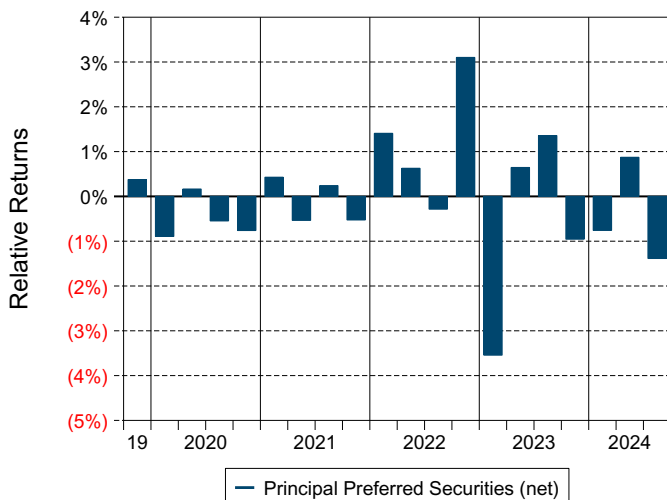
## Quarterly Summary and Highlights

- Principal Preferred Securities (net)'s portfolio posted a 4.62% return for the quarter placing it in the 76 percentile of the Morningstar Preferred Stock Funds group for the quarter and in the 84 percentile for the last year.
- Principal Preferred Securities (net)'s portfolio underperformed the ICE BofA US All Cap Secs by 1.47% for the quarter and underperformed the ICE BofA US All Cap Secs for the year by 2.64%.

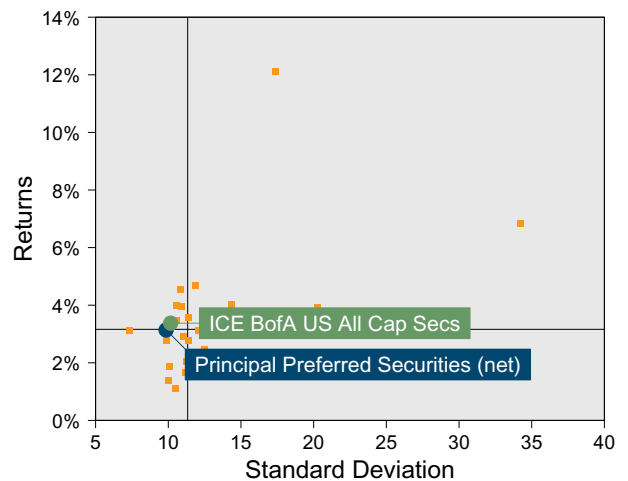
## Performance vs Morningstar Preferred Stock Funds (Net)



## Relative Return vs ICE BofA US All Cap Secs



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

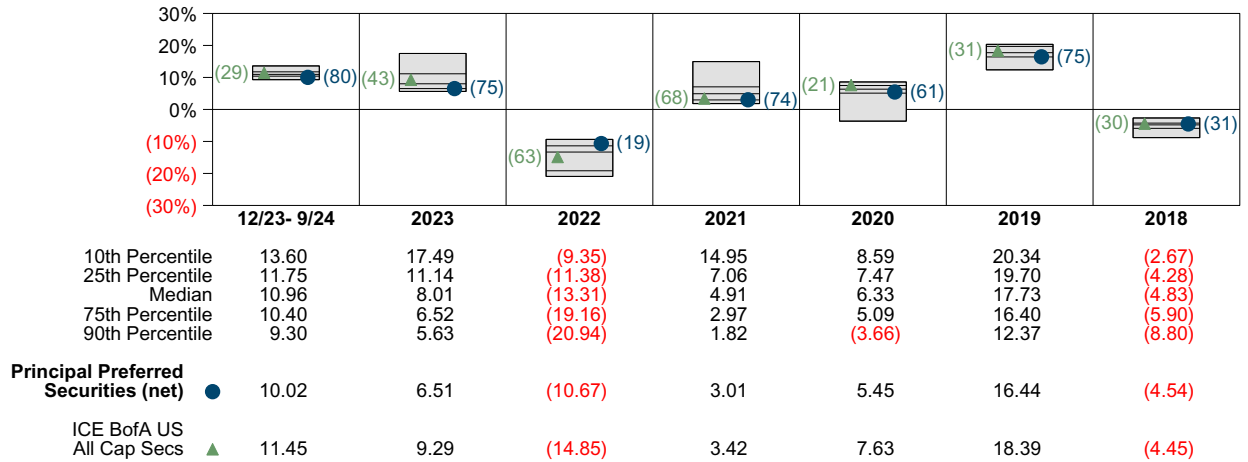


# Principal Preferred Securities Return Analysis Summary

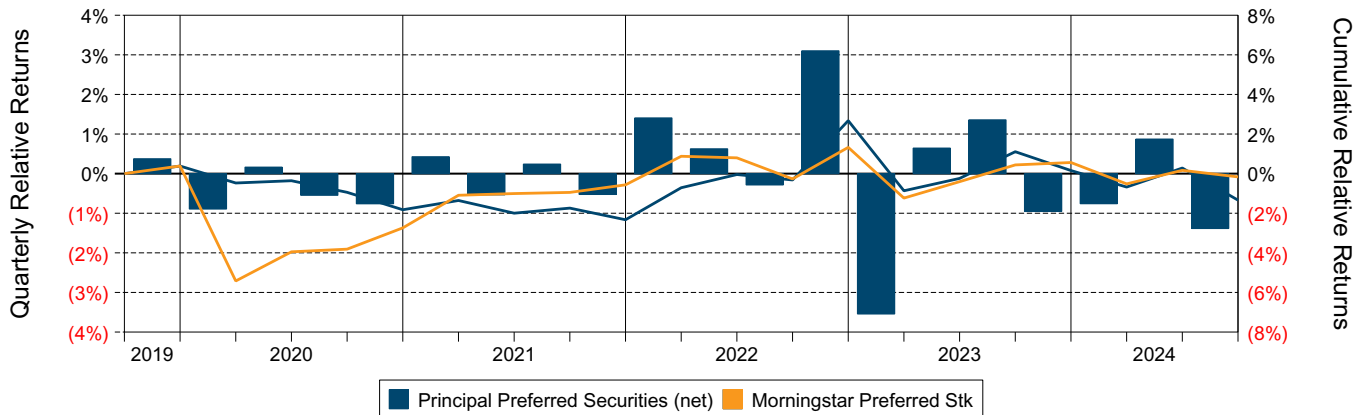
## Return Analysis

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.

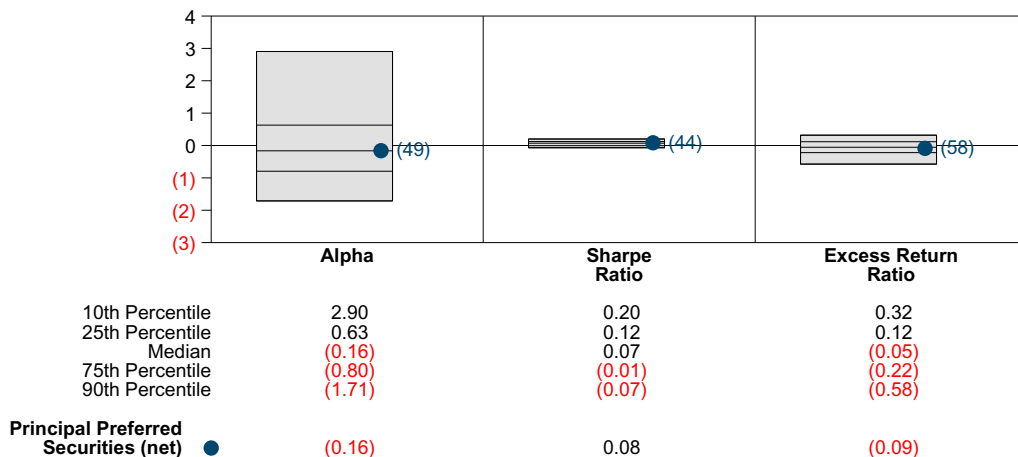
### Performance vs Morningstar Preferred Stock Funds (Net)



### 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 September 30, 2024



# Principal Preferred Securities Risk Analysis Summary

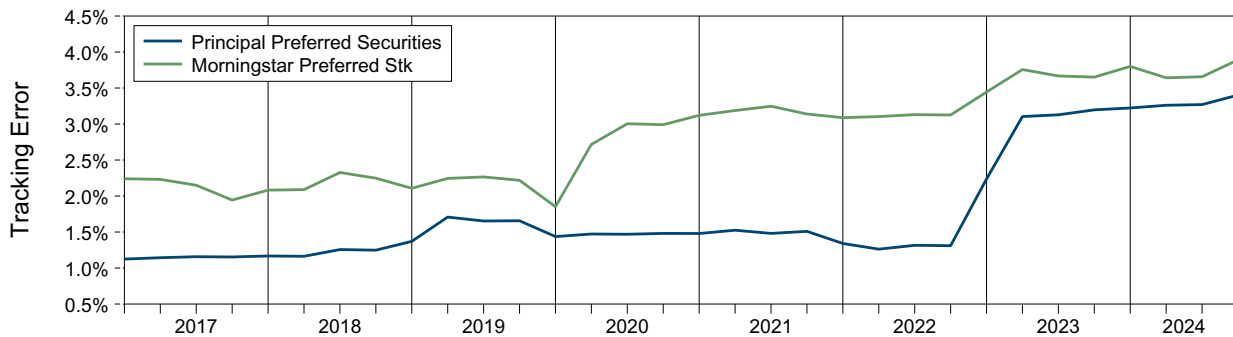
## Risk Analysis

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.

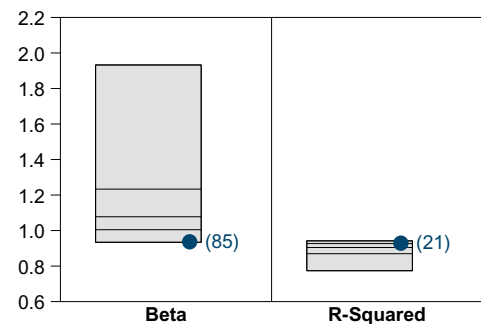
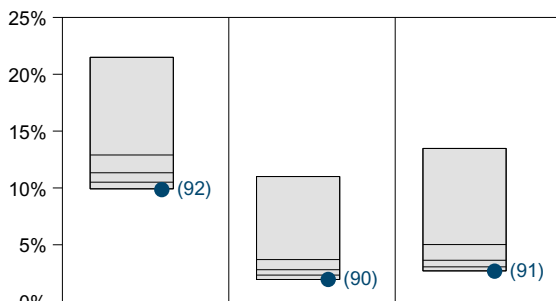
### Risk Analysis vs Morningstar Preferred Stock Funds (Net) Five Years Ended September 30, 2024



### 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 September 30, 2024



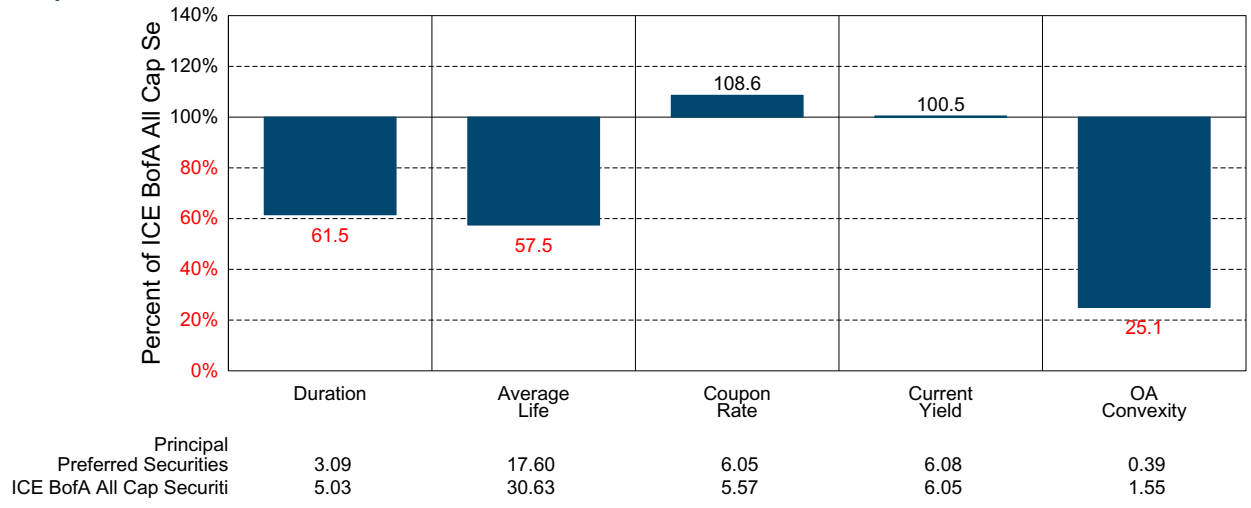
	Standard Deviation	Downside Risk	Tracking Error	Beta	R-Squared
10th Percentile	21.49	11.00	13.47	1.93	0.94
25th Percentile	12.90	3.70	5.02	1.23	0.93
Median	11.33	2.81	3.64	1.08	0.90
75th Percentile	10.51	2.33	3.06	1.00	0.87
90th Percentile	9.92	1.95	2.70	0.93	0.77
<b>Principal Preferred Securities</b>	<b>9.85</b>	<b>1.95</b>	<b>2.68</b>	<b>0.94</b>	<b>0.93</b>

# Principal Preferred Securities Bond Characteristics Analysis Summary

## Portfolio Characteristics

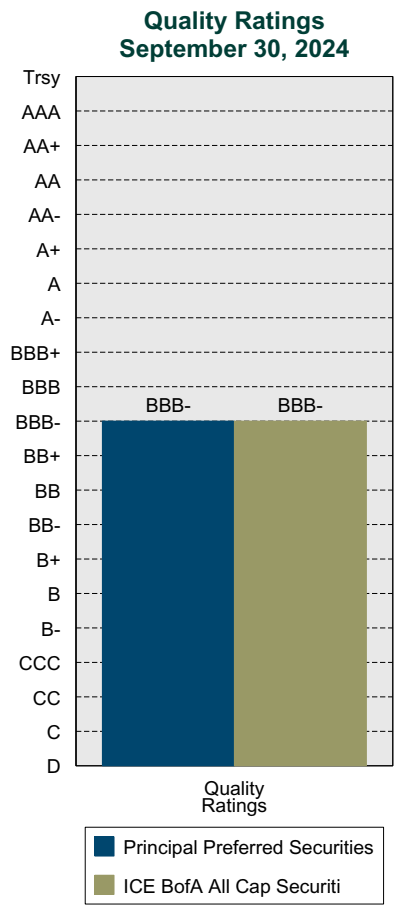
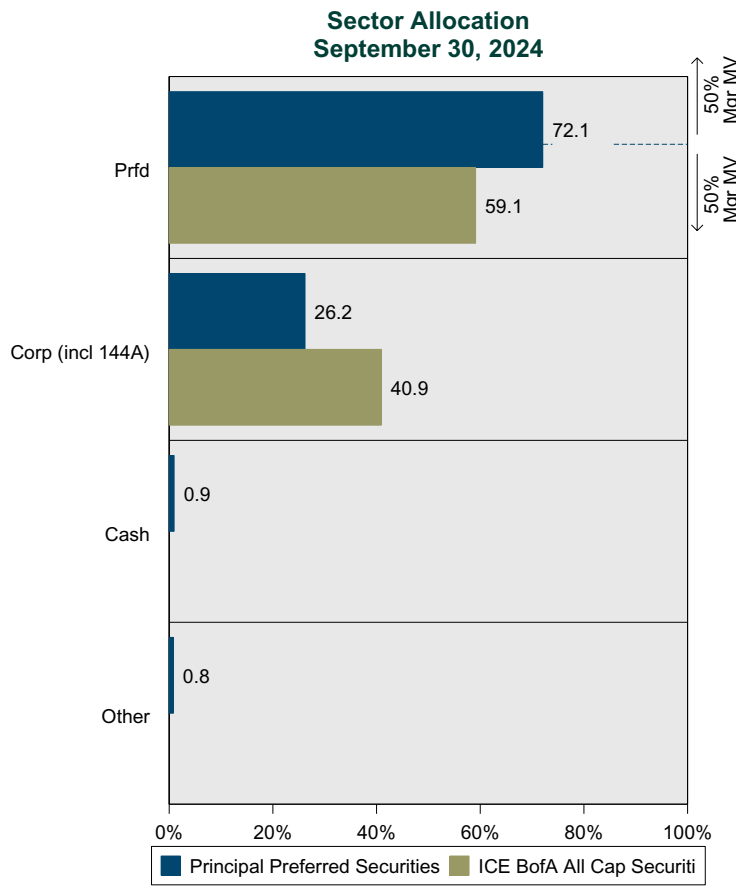
This graph compares the manager's portfolio characteristics with the range of characteristics for the portfolios which make up the manager's style group. This analysis illustrates whether the manager's current holdings are consistent with other managers employing the same style. Fixed Income Portfolio characteristics includes Cash Pool allocation. Characteristics shown reflects June 30, 2024.

## Portfolio Characteristics Relative to ICE BofA All Cap Securiti as of September 30, 2024



## 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.



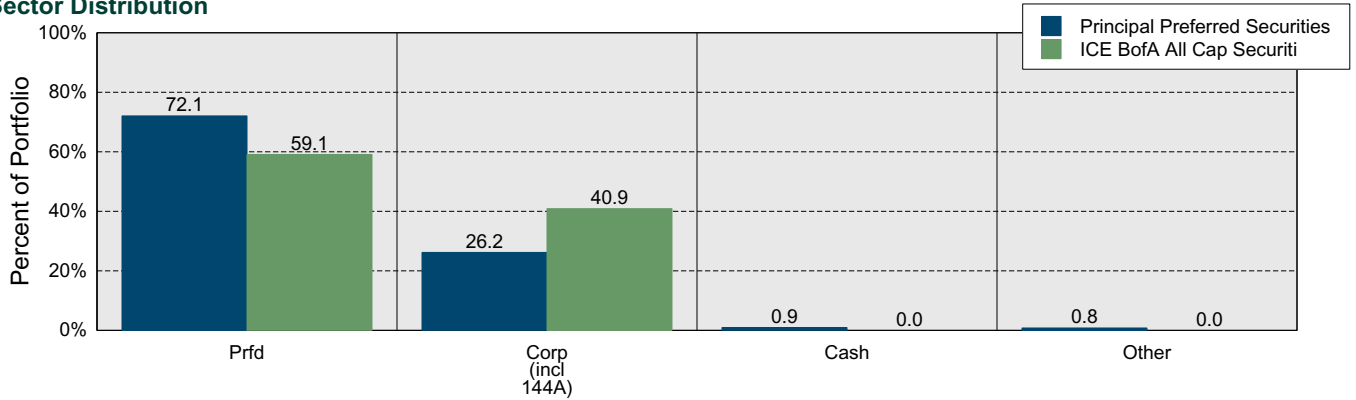


# Principal Preferred Securities Portfolio Characteristics Summary As of September 30, 2024

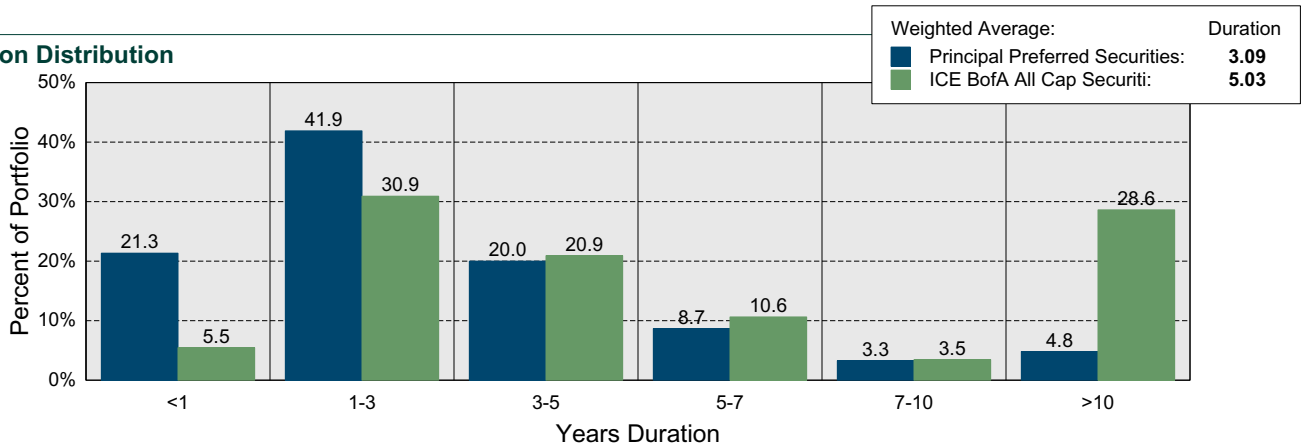
## Portfolio Structure Comparison

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. Characteristics shown reflects June 30, 2024.

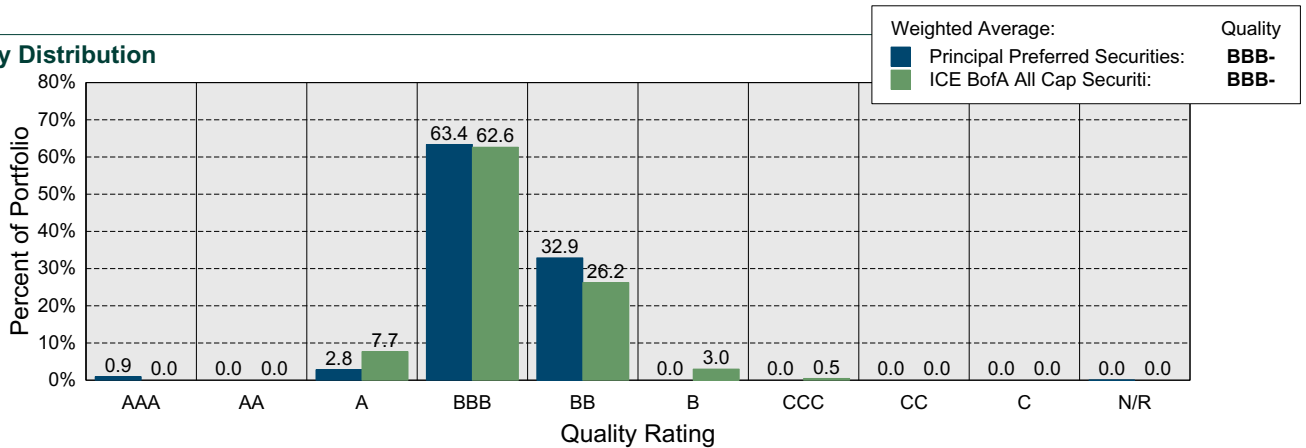
### Sector Distribution



### Duration Distribution



### Quality Distribution





## 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
abrdr Investments
Acadian Asset Management LLC
Adams Street Partners, LLC
Aegon Asset Management
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
ARGA Investment Management, LP
Ariel Investments, LLC
Aristotle Capital Management, LLC
Atlanta Capital Management Co., LLC
Audax Private Debt

Manager Name
AXA Investment Managers
Baillie Gifford International, LLC
Baird Advisors
Barings LLC
Baron Capital Management, Inc.
Barrow, Hanley, Mewhinney & Strauss, LLC
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
Brown Investment Advisory & Trust Company

**Manager Name**

Capital Group

CastleArk Management, LLC

Cercano Management LLC

CIBC Asset Management

CIM Group, LP

ClearBridge Investments, LLC

Cohen &amp; Steers Capital Management, Inc.

Columbia Threadneedle Investments

Comvest Partners

Crescent Capital Group LP

Dana Investment Advisors, Inc.

DePrince, Race &amp; Zollo, 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

Fisher Investments

Franklin Templeton

Fred Alger Management, LLC

GAMCO Investors, Inc.

GlobeFlex Capital, L.P.

Goldman Sachs

Golub Capital

GW&amp;K Investment Management

Harbor Capital Group Trust

Hardman Johnston Global Advisors LLC

Heitman LLC

Hotchkis &amp; Wiley Capital Management, LLC

HPS Investment Partners, LLC

IFM Investors

Impax Asset Management LLC

Income Research + Management

Insight Investment

Intercontinental Real Estate Corporation

**Manager Name**

Invesco

J.P. Morgan

Janus

Jennison Associates LLC

Jobs Peak Advisors

Kayne Anderson Rudnick Investment Management, LLC

King Street Capital Management, L.P.

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, Abnett &amp; Company

LSV Asset Management

MacKay Shields LLC

Macquarie Asset Management

Manulife Investment Management

Manulife | CQS Investment Management

Marathon Asset Management, L.P.

Mawer Investment Management Ltd.

MetLife Investment Management

MFS Investment Management

Mondrian Investment Partners Limited

Montag &amp; Caldwell, LLC

Morgan Stanley Investment Management

MUFG Bank, Ltd.

Natixis Investment Managers

Neuberger Berman

Newton Investment Management

Northern Trust Asset Management

Nuveen

Oaktree Capital Management, L.P.

Orbis Investment Management Limited

P/E Investments

Pacific Investment Management Company

Parametric Portfolio Associates LLC

Partners Group (USA) Inc.

Pathway Capital Management, LP

Peavine Capital

**Manager Name**

Peregrine Capital Management, LLC

PGIM DC Solutions

PGIM Fixed Income

PGIM Quantitative Solutions LLC

Pictet Asset Management

PineBridge Investments

Polen Capital Management, LLC

PPM America, Inc.

Pretium Partners, LLC

Principal Asset Management

Raymond James Investment Management

RBC Global Asset Management

Regions Financial Corporation

S&amp;P Dow Jones Indices

Sands Capital Management

Schroder Investment Management North America Inc.

Segall Bryant &amp; Hamill

SLC Management

Star Mountain Capital, LLC

State Street Global Advisors

Strategic Global Advisors, LLC

**Manager Name**

T. Rowe Price Associates, Inc.

TD Global Investment Solutions – TD Epoch

The D.E. Shaw Group

The TCW Group, Inc.

Thompson, Siegel &amp; Walmsley LLC

TPG Angelo Gordon

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.

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Past performance is no guarantee of future results.

# STATE OF COLORADO PUBLIC SCHOOL FUND

## INVESTMENT REVIEW

NOVEMBER 18, 2024

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### Representing MacKay Shields

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**JOSEPH MAIETTA, CFA**

Managing Director  
High Yield Team

**THERESE M. HERNANDEZ**

Managing Director  
Institutional Business Development

**ALEXANDRIA JONKE**

Associate  
Client Service Representative



---

Independent boutique founded in 1938

Acquired by New York Life Insurance Company in 1984

195 employees including 74 investment professionals in New York, Princeton, Los Angeles, London and Dublin

\$151 billion in AUM<sup>1</sup>

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## Separate and distinct investment groups within MacKay Shields



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### FIXED INCOME

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Municipal Managers	High Yield	Global Fixed Income	Global Credit & Emerging Markets Debt	Convertibles
\$82 Bn	\$32 Bn	\$20 Bn	\$13 Bn	\$4 Bn

Data as of September 30, 2024, includes MacKay Shields LLC and its subsidiaries. Figures may be rounded. Investment professionals include portfolio managers, analysts, traders and client portfolio managers.

# Mackay Shields High Yield Team Overview

Experienced and stable team of High Yield credit experts

Focused on High Yield and our clients' portfolios since inception in 1991

Transparent, repeatable, and disciplined investment process

Consistent return profile driven by security selection<sup>1</sup>

Proactive client partnership and access to senior investment team

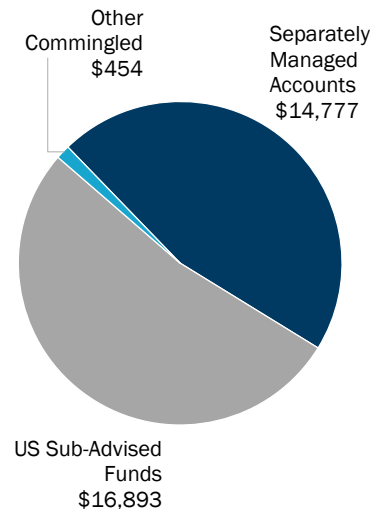
## High Yield Composite | As of September 30, 2024

### ESTVMENT PERCENTILE<sup>2</sup>

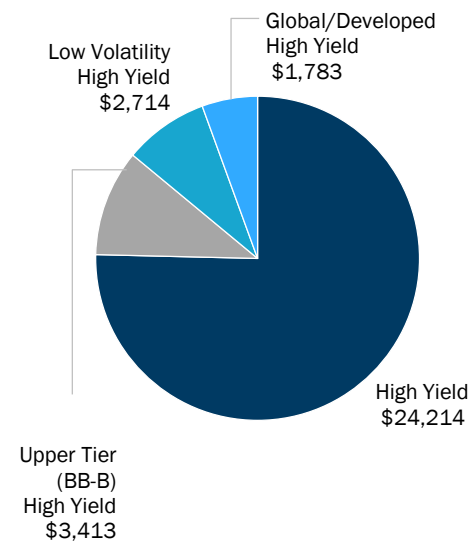


### AUM

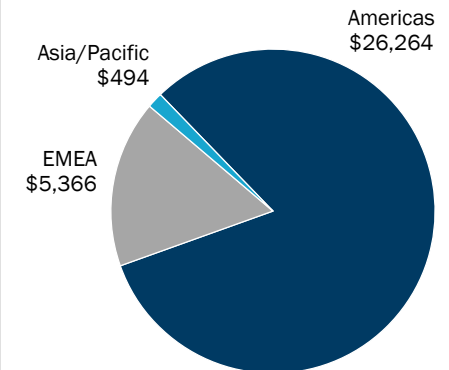
#### BY ACCOUNT<sup>3</sup>



#### BY STRATEGY<sup>3</sup> | \$31.9 BN



#### BY REGION<sup>3</sup>



1. Based on attribution and performance metrics. Not an indication of current or future profitability. **Past performance is not indicative of future results.**

2. Gross of fees, Source: eVestment Alliance; eVestment Universe: US High Yield Fixed Income. Run date October 25, 2024. Provided as supplemental to the GIPS reports in the Appendix

3. AUM and other data shown on this page is as of September 30, 2024. Due to rounding the sum of the items may not equal 100% or any expressed totals as applicable.

# Experienced Team and Ownership Culture

Investment Professional	Years of Experience	Years at Firm	Education & Investment Experience
<b>Andrew Susser</b> Lead Portfolio Manager	34	18	JD/MBA, UPenn Wharton GoldenTree, Salomon Brothers, BofA Securities
<b>Dohyun Cha, CFA</b> Energy	27	19	BS, Boston College Credit Suisse; CIBC World Markets
<b>Won Choi, CFA</b> Metals/Mining, Financials	28	22	BA, Yale University Fenway Partners, Salomon Smith Barney
<b>Nate Hudson, CFA</b> Automotive, Services	33	16	BA, Yale University BofA Securities, Nomura (NCRAM)
<b>Ryan Bailes, CFA</b> Healthcare, Homebuilders	29	9	BS, University of Kansas BofA Securities, Nomura (NCRAM)
<b>Thomas Metcalf, CFA</b> Retail, Consumer/Food, Leisure	14	13	MS, University of Durham
<b>Parul Miglani</b> Chemicals, Aerospace/Defense, Technology	18	3	MBA, Columbia University Muzinich & Co.; H.I.G. Bayside Capital
<b>John Pace, CFA</b> Airlines, Building Materials, Gaming, Manufacturing, Packaging, Paper	33	3	MBA, University of Chicago Symetra Investment Management
<b>Richard Lee, CFA</b> Utilities	10	10	BS, Georgetown University
<b>May Wong, CFA</b> Generalist Analyst	10	8	BA, Columbia University
<b>Gabriela Pérez, CFA</b> Generalist Analyst	9	9	MBA, Pace University
<b>Riley Osborn</b> Generalist Analyst	3	3	BA, University of Chicago
<b>J. Alex Leites</b> Trading	31	23	BS, New York University Lazard, Prudential
<b>Scott Mallek</b> Trading	28	22	BA, Fairfield University Salomon Smith Barney
<b>Debbie Akua Boadu</b> Trading	5	5	MS, Fairleigh Dickinson University
<b>Joseph Maietta, CFA</b> Client Portfolio Manager	16	10	MS, NYU/HKUST PIMCO, JPMorgan

## Team

Stable team with a cohesive, non-bureaucratic culture

27 years average investment experience across senior investment professionals

Supported by generalist analysts and dedicated HY traders

Longstanding relationships with high yield market participants

## Communication

Senior members are sector specialists with lead research responsibilities and accountability for specific sectors

Sector specialists present their research conclusions to lead PM & subset of the group; leads to efficient decision making process

Continuous daily discussions with weekly Investment Team meeting to review the portfolio, discuss risks, correlations, and potential changes to the high yield market

# Margin-of-Safety Analysis Is Key to Our Credit Selection

## High Yield Investment Process



All numbers and ranges referred to above are approximations only, assume normal market conditions and the application of MacKay Shields' standard investment guidelines and are subject to change without notice. There is no assurance that investment objectives will be met.

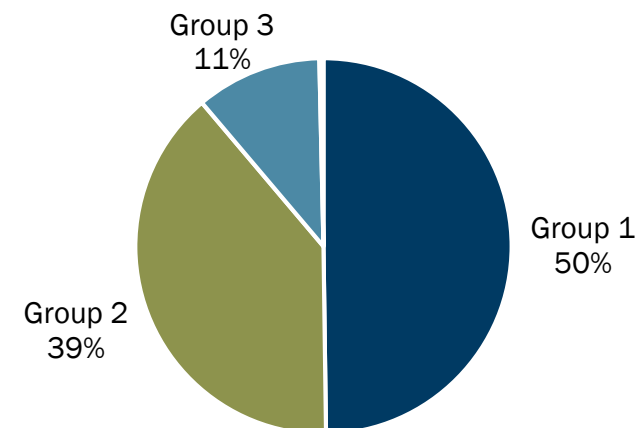
# Portfolio Construction — Proper Compensation for Risk

Every security is categorized into a Risk Group based on strength of asset coverage and potential for default

Portfolio construction is determined by the default-adjusted spread and relative value between Risk Groups

	Initial Spread		Default Adjustment		Required Minimum Spread
<b>Group 1 – Highest Quality</b>					
<ul style="list-style-type: none"> <li>Strongest credit profile</li> <li>Lowest volatility</li> </ul>	100 bps	+	100 bps <small>(1% Long Term Default Rate)</small>	=	<b>200 bps</b>
<b>Group 2 – Seasoned Issuers</b>					
<ul style="list-style-type: none"> <li>Significant equity value</li> <li>Strong credit statistics</li> </ul>	100 bps	+	200 bps <small>(2% Long Term Default Rate)</small>	=	<b>300 bps</b>
<b>Group 3 – Risk Credits</b>					
<ul style="list-style-type: none"> <li>Trading at discount</li> <li>More research intensive</li> </ul>	100 bps	+	400 bps <small>(4% Long Term Default Rate)</small>	=	<b>500 bps</b>
<b>Group 4 – Special Situations</b>					
<ul style="list-style-type: none"> <li>Significant discount to asset value</li> </ul>					

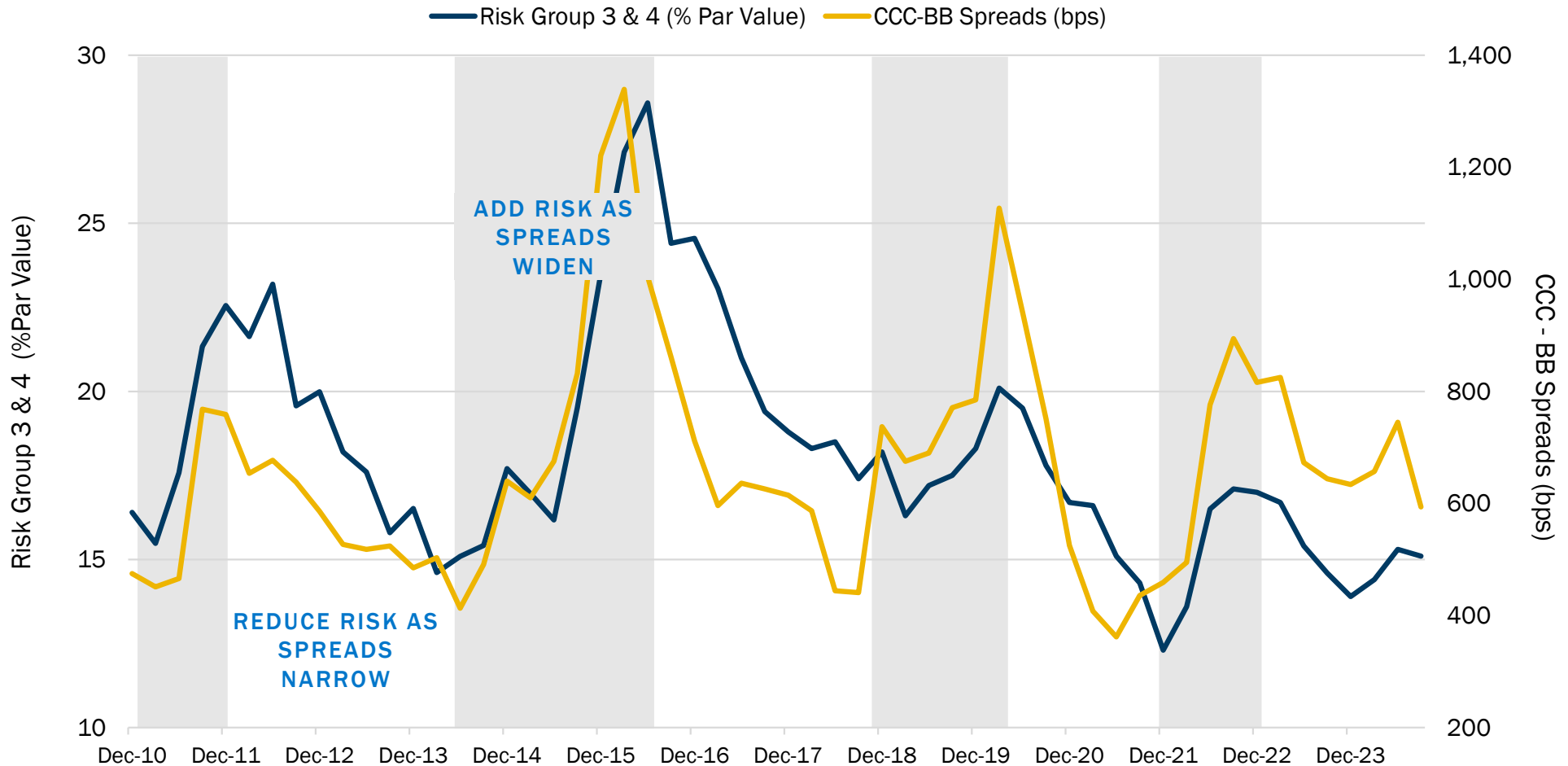
Current Risk Group Allocation<sup>1</sup> (%)



<sup>1</sup>Represents a breakdown of holdings in the portfolio as of September 30, 2024.

# Disciplined through Market Environments

The strategy seeks to opportunistically increase (decrease) exposure to Risk Groups 3 & 4 when credit risk becomes more (less) attractive



Represents a breakdown of the High Yield Strategy representative account. As of September 30, 2024.

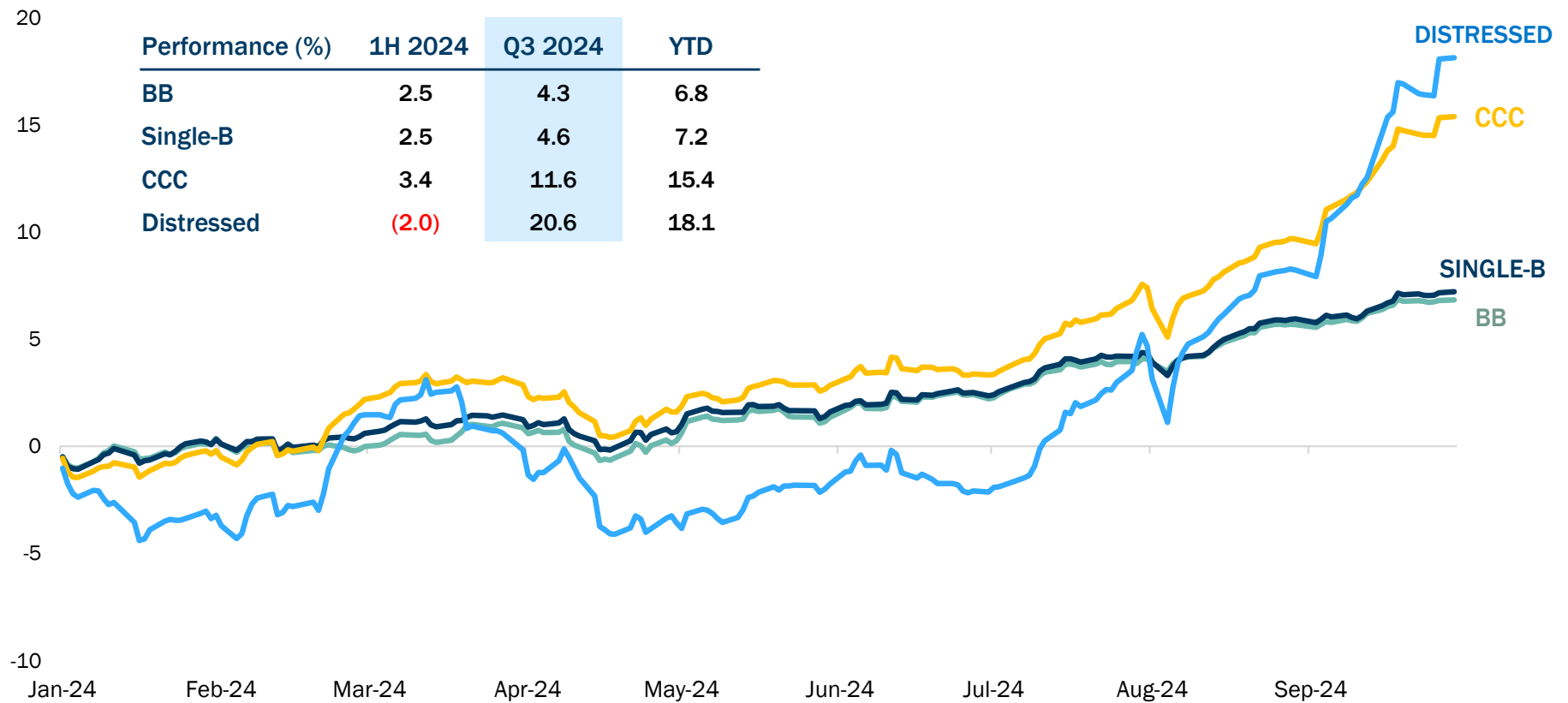
The representative portfolio was selected because it is the largest account in the High Yield Composite that has not experienced a significant change in assets under management due to recent client strategic rebalancing. The representative portfolio was not selected based on performance. The representative portfolio is actively managed and its portfolio characteristics are subject to change without notice.

Source: ICE BofA High Yield BB Index, ICE BofA High Yield CCC & Lower Index.

Please refer to the end of the presentation for a definition of each Risk Group. Please see disclosures pages for the ICE BofA Credit Rating Disclosure.

# Lower Quality & Distressed Issuers Spiked Higher

Performance by Credit Quality (%)



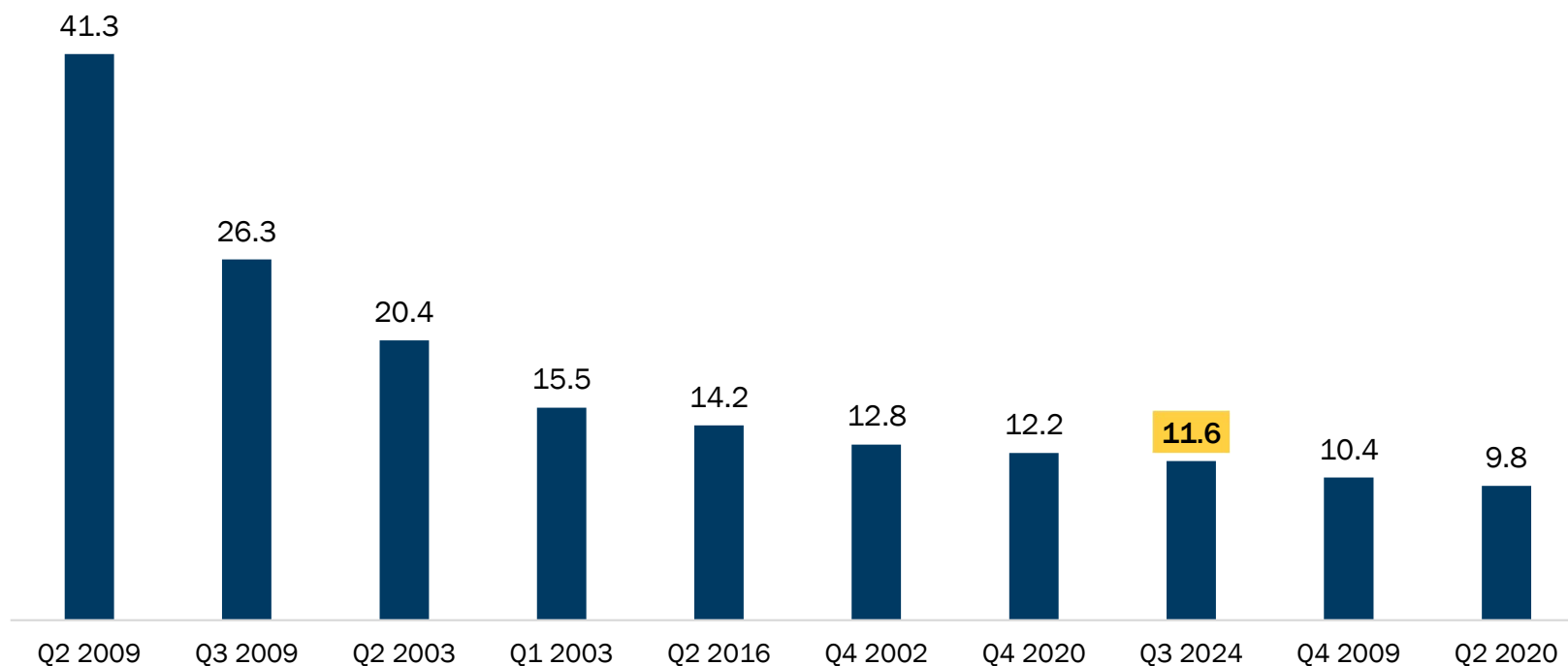
As of September 30, 2024

Source: ICE BofA Indices

It is not possible to invest directly into an index. Please see disclosures at the end of this presentation for important benchmark information, including disclosures related to comparisons to an index and index descriptions. **Past performance is not indicative of future performance.**

# Magnitude of CCC Performance Rare in Tight Spread Environment

## Top 10 Best CCC Return Quarters Since 1997



Starting ICE BofA  
US HY Spread-to-Worst

1,653	1,011	772	880	712	1,044	545	340	759	875
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As of September 30, 2024

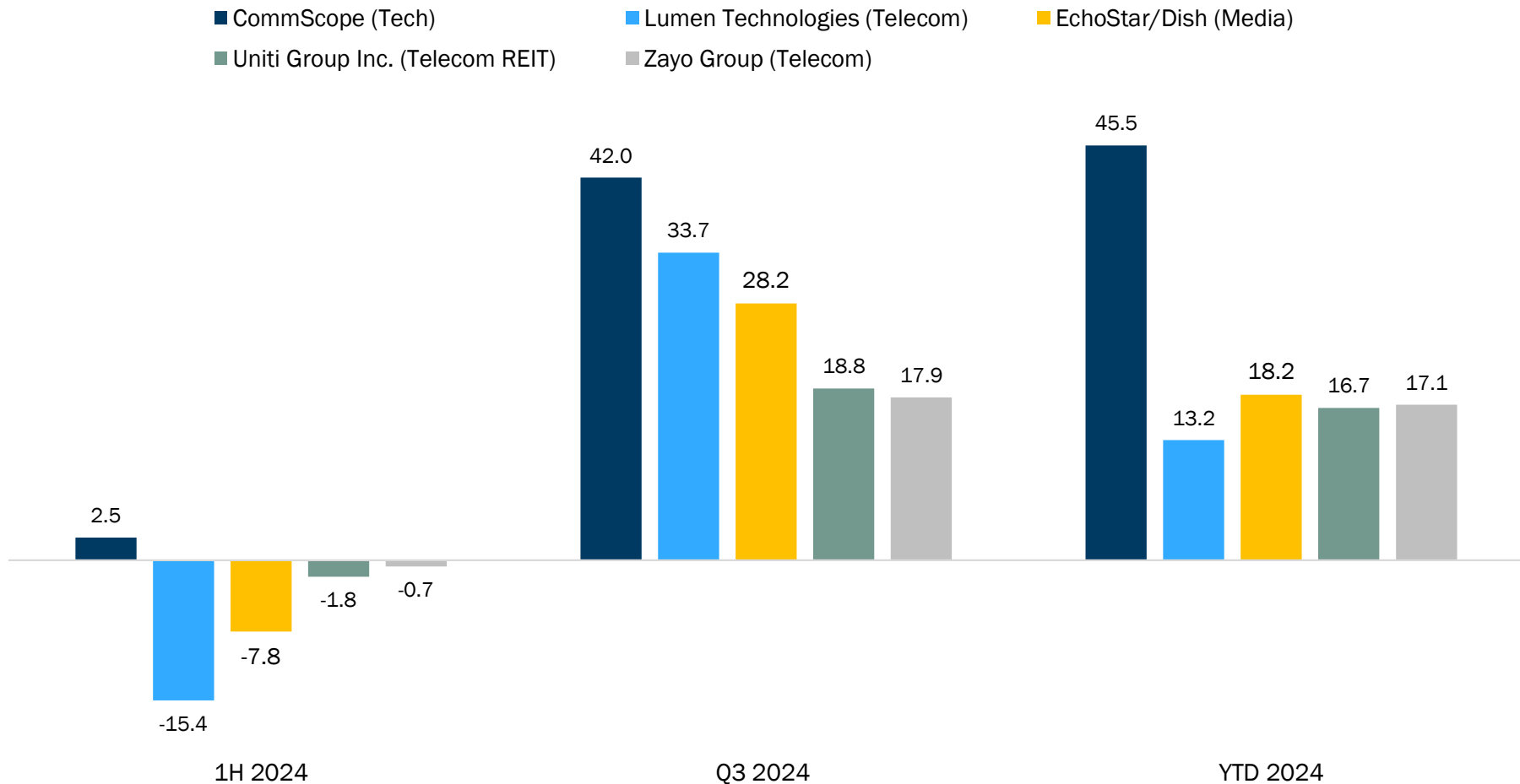
Source: ICE BofA Indices

It is not possible to invest directly into an index. Please see disclosures at the end of this presentation for important benchmark information, including disclosures related to comparisons to an index and index descriptions. **Past performance is not indicative of future performance.**



# Large TMT Issuers Led Distressed Rally

## Performance by Issuer (%)



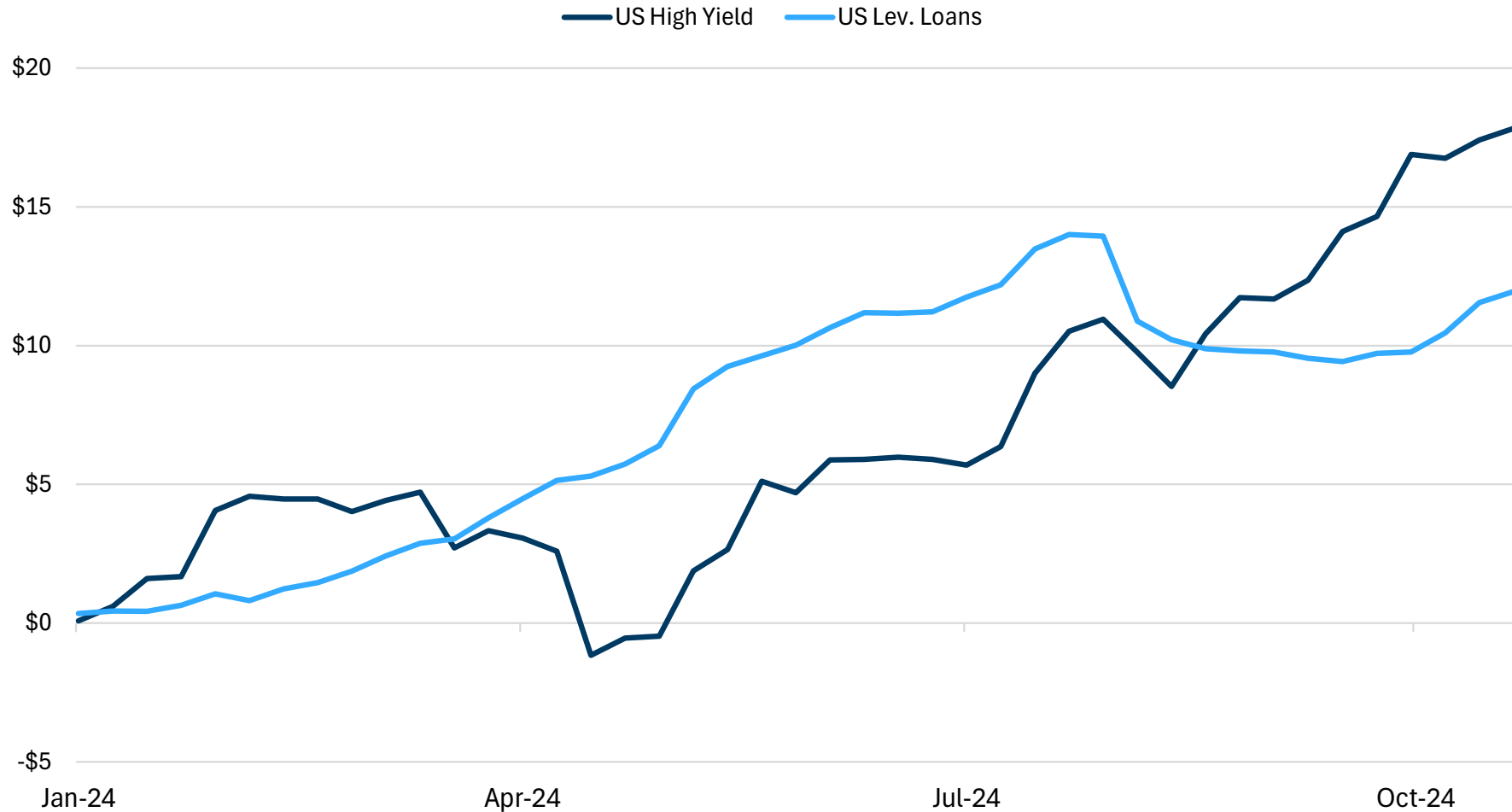
As of September 30, 2024

Source: ICE BofA Indices

It is not possible to invest directly into an index. Please see disclosures at the end of this presentation for important benchmark information, including disclosures related to comparisons to an index and index descriptions. **Past performance is not indicative of future performance.**

# Retail and Institutional Demand Supporting Market

### Cumulative Fund Flows ETF/Mutual Funds - 2024 (\$bn)

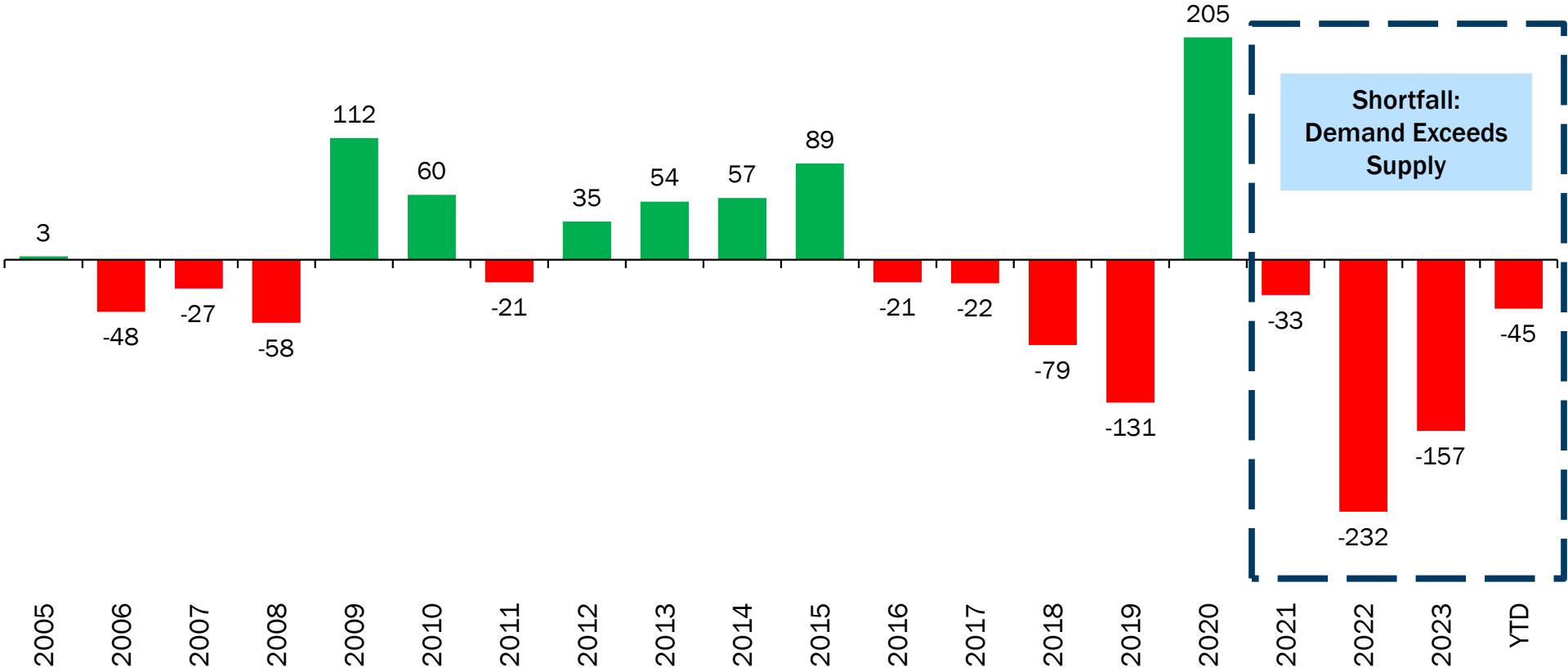


# Supply of New High Yield Bonds Has Been Modest

US High Yield Supply Statistics	Gross Volume (\$bn)	% Refinancings
2019	\$287	68%
2020	\$450	66%
2021	\$483	60%
2022	\$107	47%
2023	\$176	66%
<b>YTD 2024</b>	<b>\$234</b>	<b>78%</b>

# Technicals Are Still Supportive

**US High Yield Bond Supply vs. Demand  
Surplus / Shortfall (\$bn)**



As of September 30, 2024  
Source: JP Morgan

# State of Colorado Public School Fund

## Historical Rates of Return (%)

Periods Ending October 31, 2024

	State of Colorado Gross of Fees	State of Colorado Net of Fees	Bloomberg High Yield Index	Gross of Fees Excess Return
Year to Date	6.78	6.41	7.42	-0.64
One Year	14.09	13.62	16.47	-2.38
Three Years - <i>Annualized</i>	3.82	3.39	2.97	+0.85
Since Inception - <i>Annualized</i> (9/1/2020)	4.82	4.38	4.48	+0.34

	State of Colorado Gross of Fees	State of Colorado Net of Fees	Bloomberg High Yield Index	Gross of Fees Excess Return
2023	12.20	11.73	13.45	-1.25
2022	-7.36	-7.75	-11.19	+3.83
2021	5.36	4.92	5.28	+0.08

# State of Colorado Public School Fund

	3 Years Ending September 30, 2024	
	Portfolio <sup>1</sup>	Index <sup>2</sup>
Returns (%)	3.9	3.1
Standard Deviation (%)	7.2	8.7
Alpha (%)	0.6	0.0
Beta	0.8	1.0
Up Market Capture	91.9	100.0
Down Market Capture	75.6	100.0
Information Ratio	0.7	--

<sup>1</sup>Gross of fees

<sup>2</sup>The Bloomberg US High Yield Corporate Index.

Source: CAI PEP. Calculated using quarterly gross of fee returns.

# Portfolio Attribution - Sector

Portfolio	YTD October 31, 2024		
Sector	Allocation (bps)	Selection (bps)	Total (bps)
Banking	(0)	0	(0)
Basic Industry	0	16	16
Brokerage/Asset Managers	2	(17)	(15)
Capital Goods	2	0	2
Communications	2	(21)	(19)
Consumer Cyclical	(0)	(23)	(24)
Consumer Non-Cyclical	3	(5)	(2)
Electric	0	2	3
Energy	1	3	4
Finance Companies	(1)	1	(1)
Insurance	1	1	2
Other Industrial	(1)	(1)	(2)
REITS	(0)	2	2
Technology	(1)	(15)	(16)
Transportation	0	7	7
Cash			(22)
<b>Total</b>	<b>8</b>	<b>(50)</b>	<b>(64)</b>

# Portfolio Attribution — Credit Quality

Portfolio	YTD October 31, 2024		
Quality	Allocation (bps)	Selection (bps)	Total (bps)
BB & Higher	(37)	25	(12)
B	1	20	21
CCC & Lower	(55)	(1)	(56)
Not Rated		4	4
Cash/Other			(22)
<b>Total</b>	<b>(91)</b>	<b>48</b>	<b>(64)</b>



# State of Colorado Public School Fund

**Market Value: \$127,583,625**  
 (as of October 31, 2024)

## Statistics

	Portfolio	Index <sup>1</sup>
Current Yield (%)	6.15	6.63
Yield to Worst (%)	6.74	7.28
Modified Duration (years)	3.21	3.36
Average Credit Quality	BB-	B+

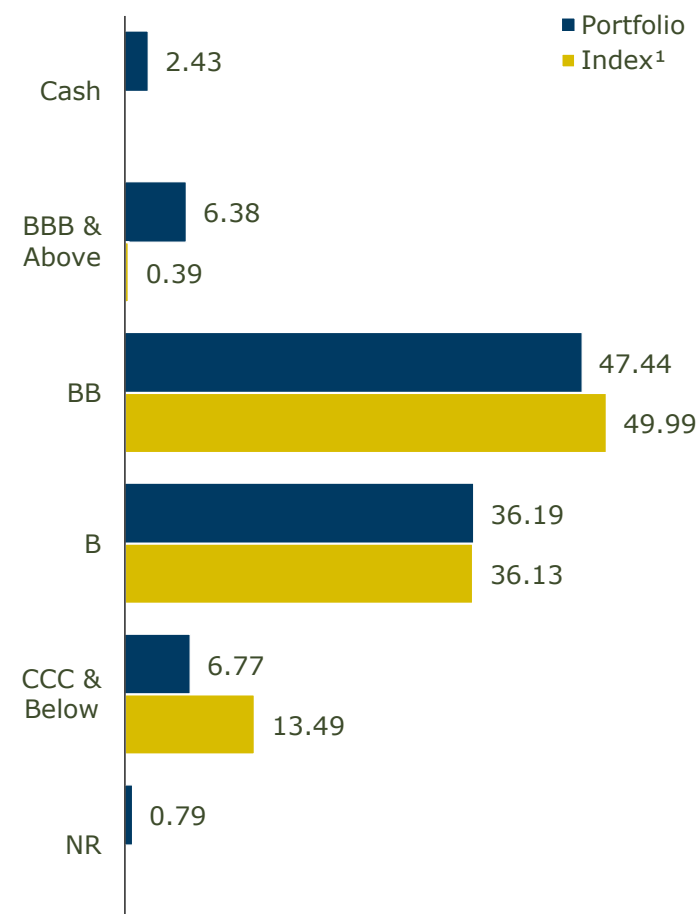
## Top Ten Issuers (%)

	Portfolio
TransDigm Group	2.33
Charter Communications	2.00
Yum! Brands	1.47
Clarivate	1.45
Churchill Downs	1.36
Hilton Worldwide	1.21
Carnival Corporation	1.18
Restaurant Brands International	1.07
Lamar Advertising Company	1.03
Mercer International	1.00

<sup>1</sup>Bloomberg US High Yield Corporate Index

<sup>2</sup>Using median rating of three. If only two are available, the lower rating (Bloomberg Rating Methodology) is used.

## Quality Exposure (%)<sup>2</sup>



# State of Colorado Public School Fund

As of October 31, 2024

## Duration to Worst (%)

	Portfolio	Index <sup>1</sup>
0 to 3	41.20	40.11
3 to 7	58.32	57.87
7 to 10	0.48	1.29
Greater than 10	0.00	0.72

## Sector (%)

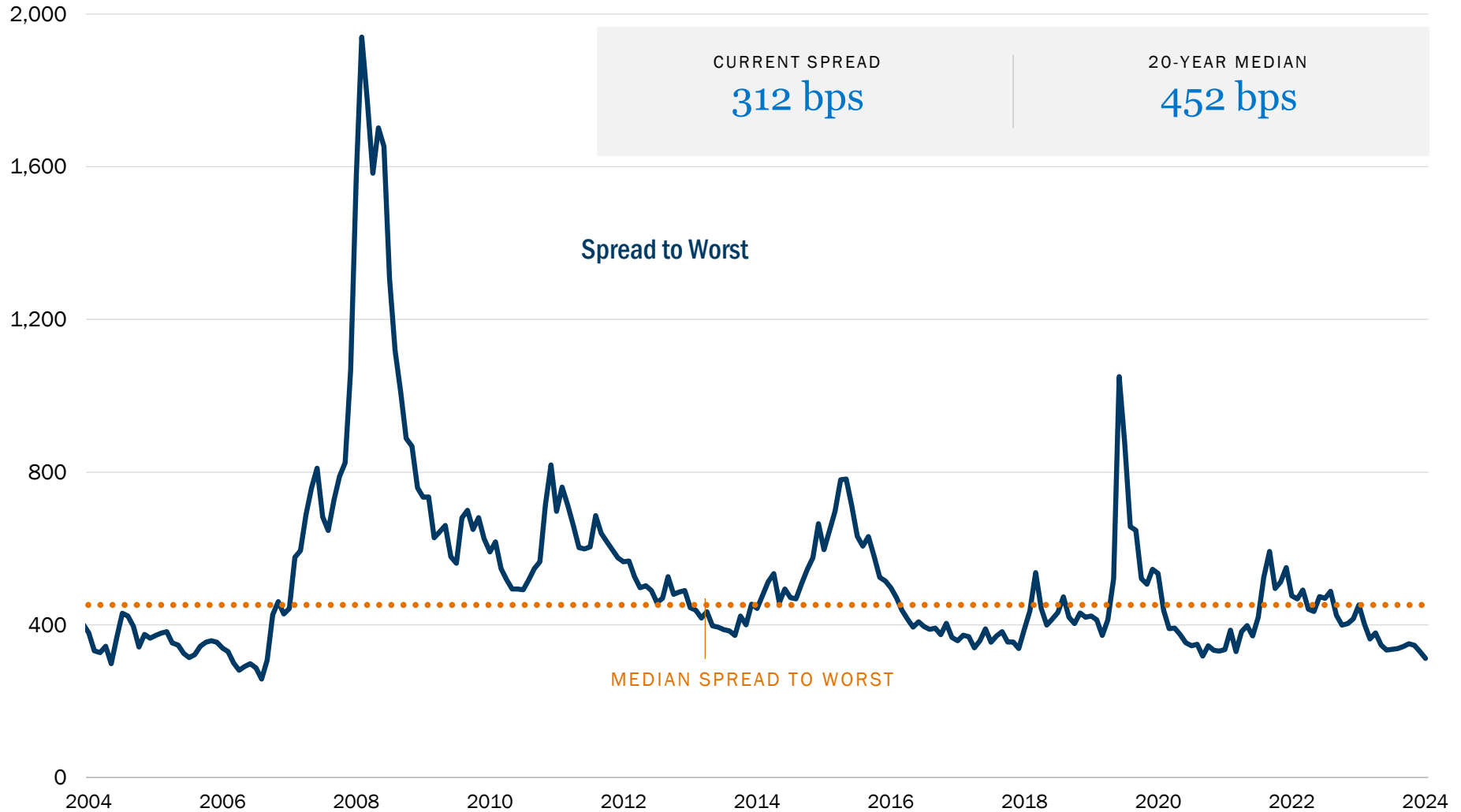
	Portfolio	Index <sup>1</sup>
Banking	0.00	0.89
Basic Industry	8.88	5.72
Brokerage/Asset Managers	3.39	0.92
Capital Goods	9.53	10.67
Communications	9.91	14.42
Consumer Cyclical	23.73	20.40
Consumer Non-Cyclical	13.19	11.36
Electric	2.99	2.69
Energy	11.76	11.71
Finance Companies	0.85	4.85
Insurance	1.32	2.87
Other Industrial	1.68	1.19
REITS	1.60	2.22
Technology	6.89	7.45
Transportation	1.84	2.65

<sup>1</sup>Bloomberg US High Yield Corporate Index  
Duration breakout excludes cash and stock.

# High Yield Market Overview



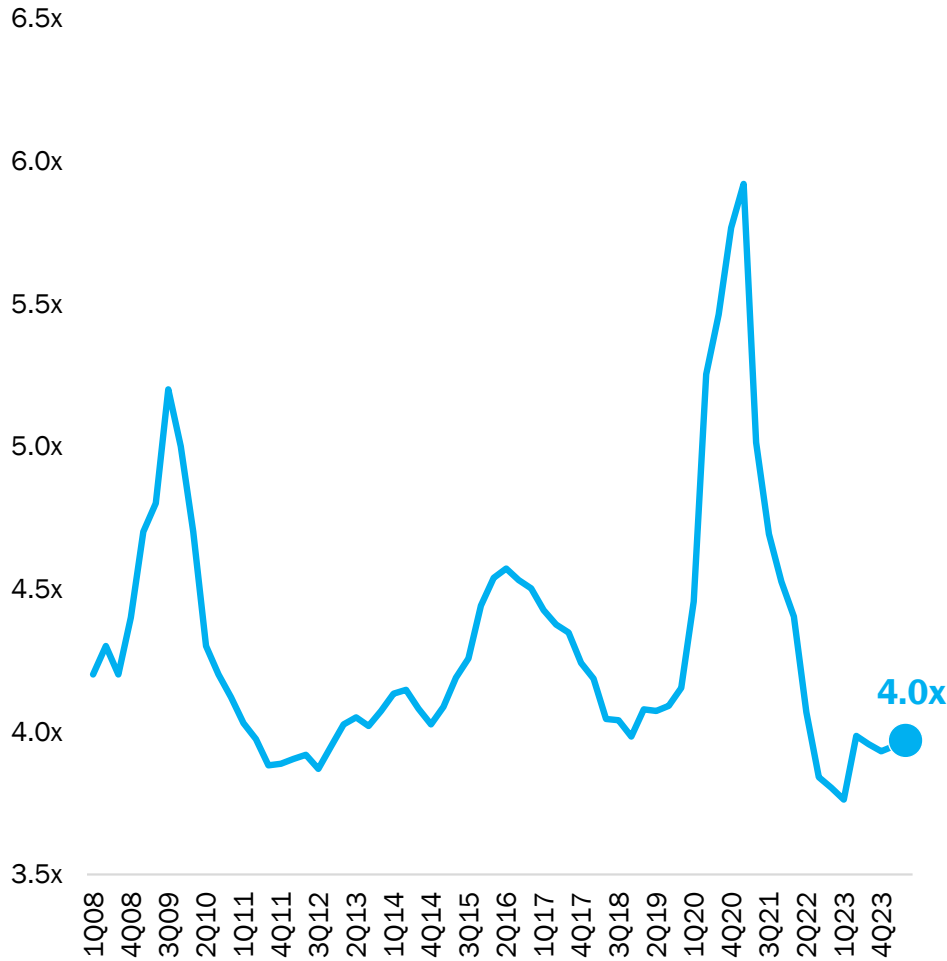
# US High Yield Market Spreads



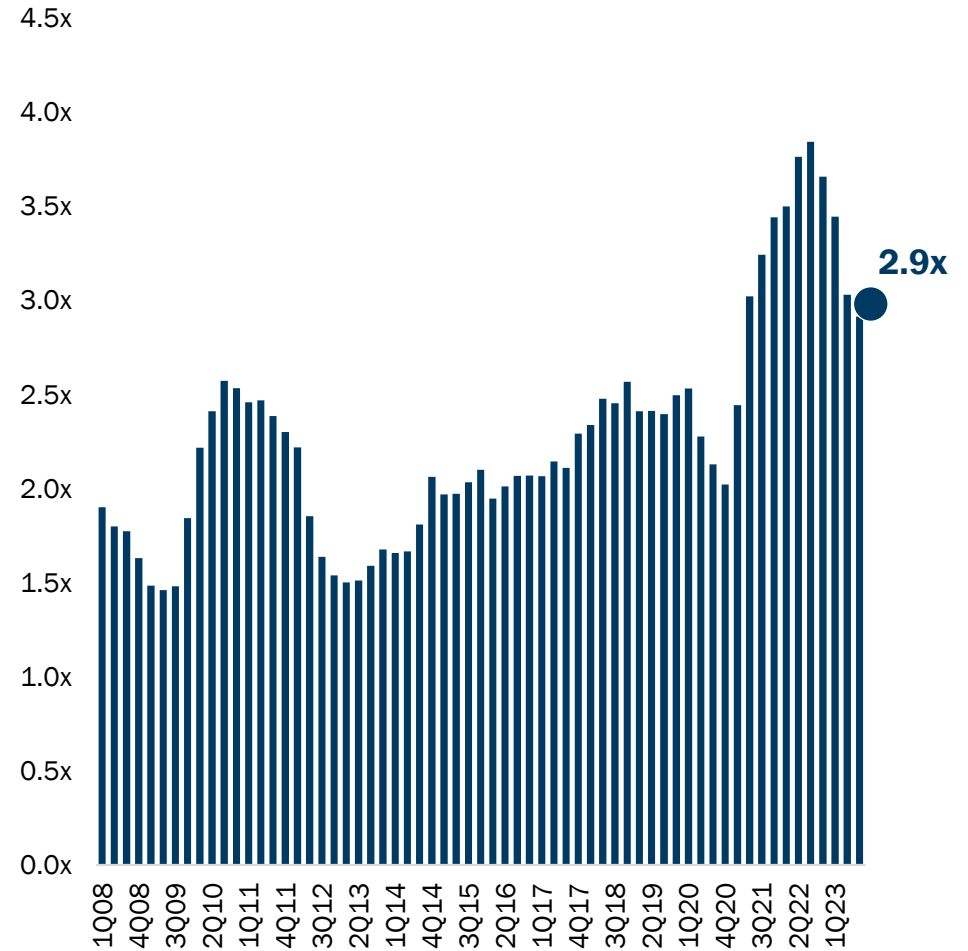
Source: ICE Data  
Index: ICE BofA US High Yield Index  
As of October 31, 2024

# High Yield Credit Fundamentals are Strong

## High Yield Leverage LTM Debt/EBITDA



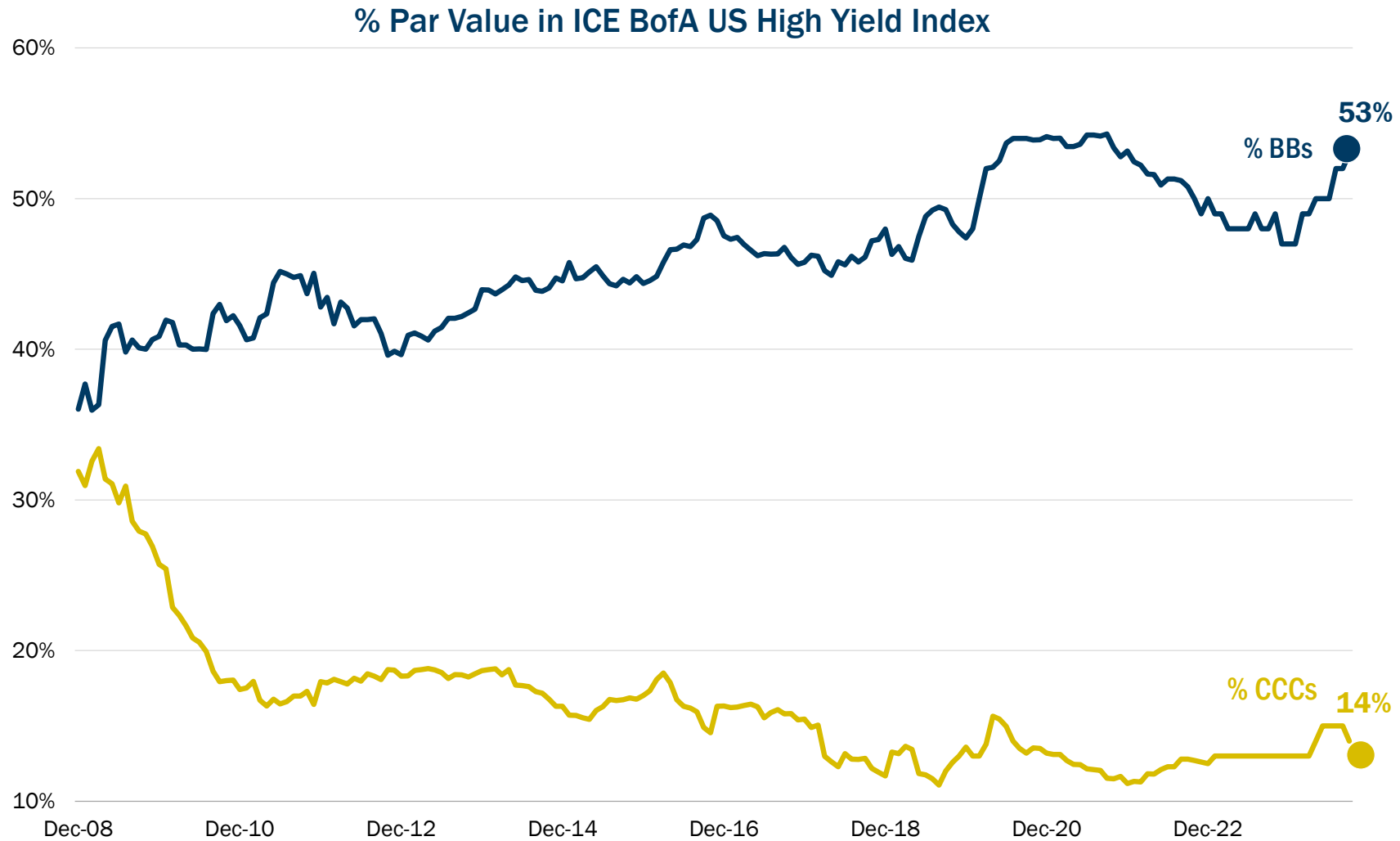
## High Yield Interest Coverage EBITDA-CapEx/Interest Expense



As of June 30, 2024  
Source: JP Morgan

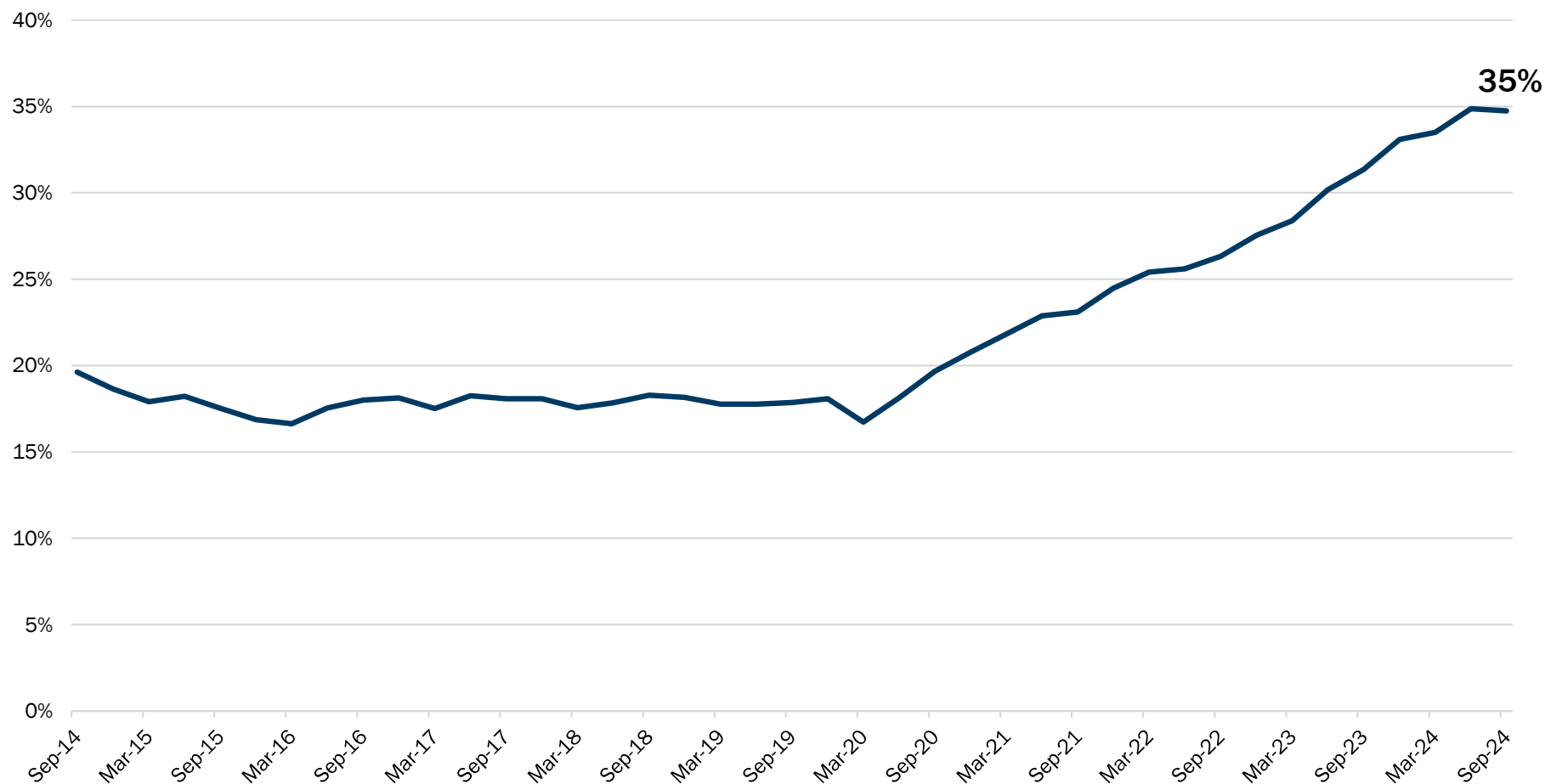
# US High Yield Has Trended Towards Higher Quality, Public Companies

67% of the US High Yield market is comprised of publicly traded companies



# Percentage of Secured Bonds in US HY Has Increased

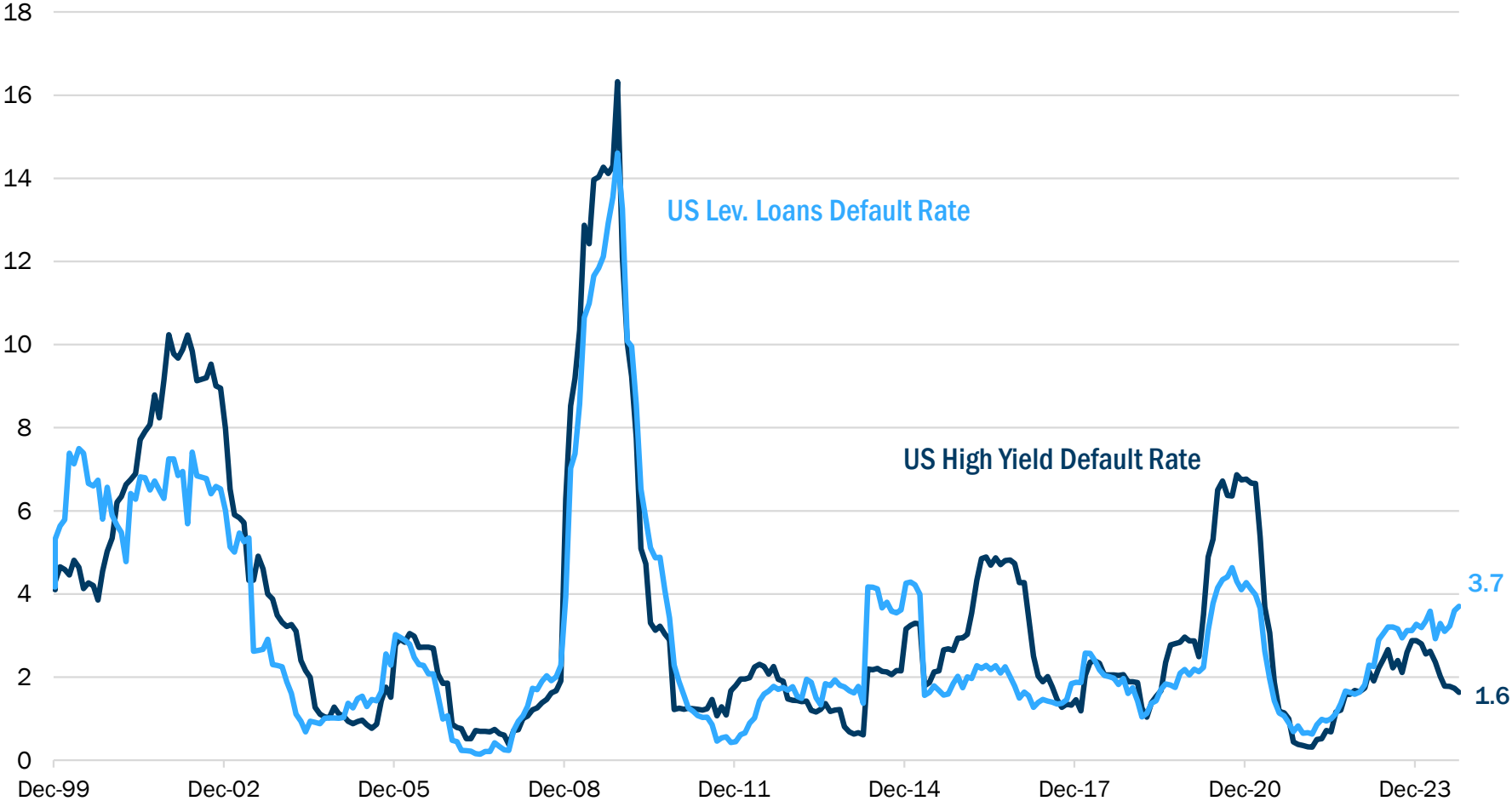
## Secured Bonds % of US High Yield Market



As of September 30, 2024  
Source: ICE Data

# Leveraged Loan Default Rate Higher Than High Yield

Par Weighted Default Rate (LTM) | %

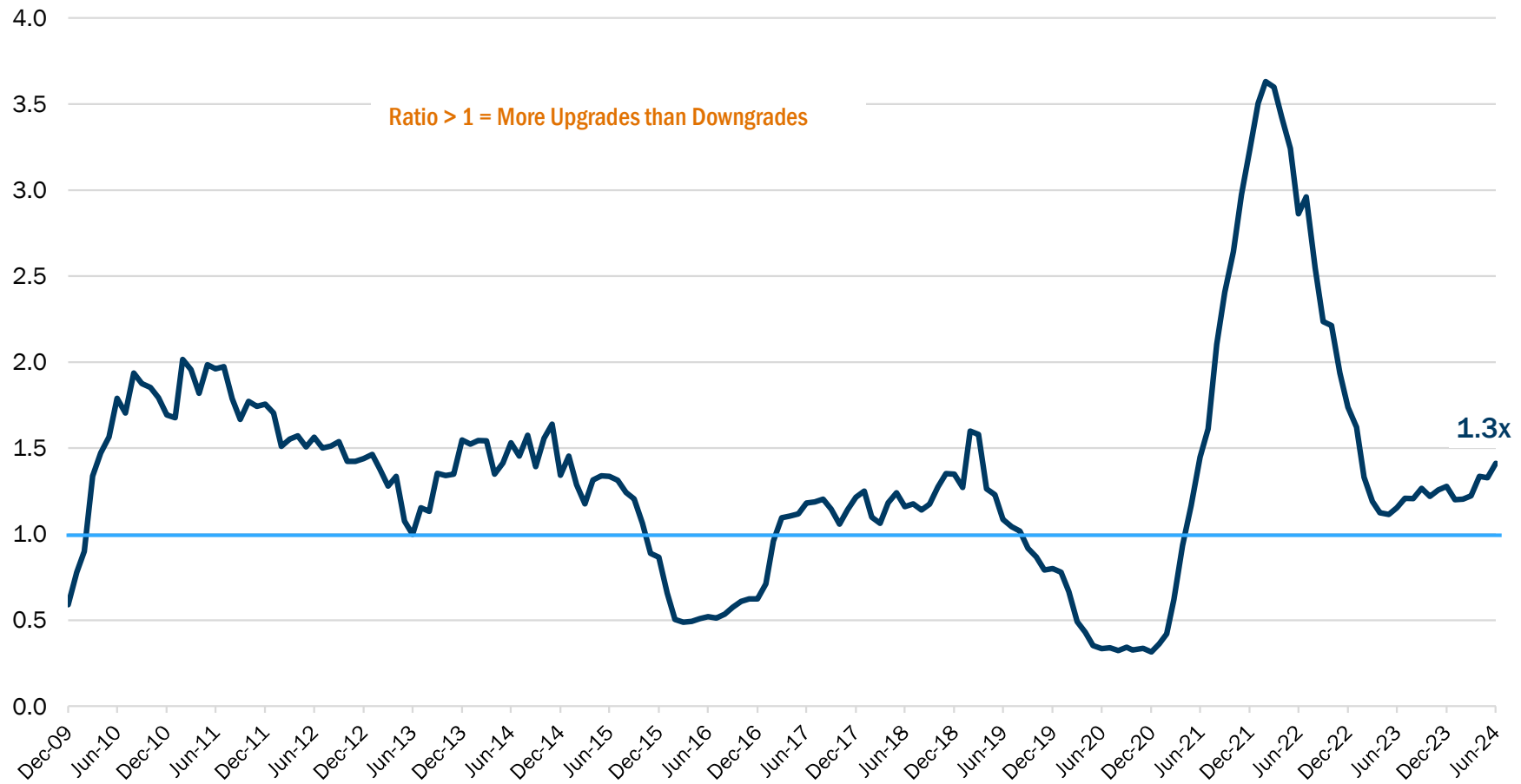


As of September 30, 2024  
Source: JP Morgan. Includes distressed exchanges.



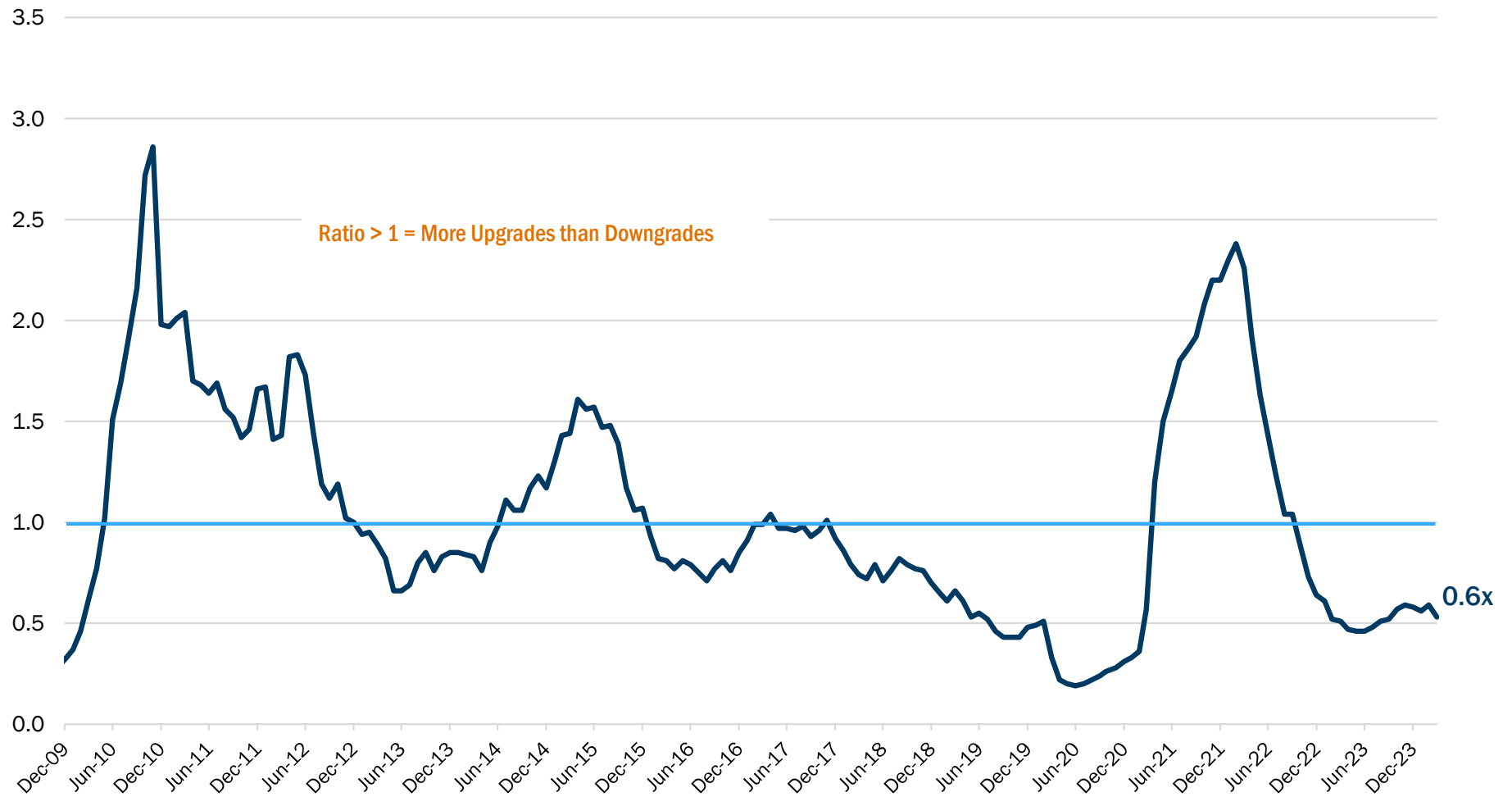
# High Yield Credit Trends Remain Strong

Last 12 Months US HY Upgrade to Downgrade Ratio (by Par)

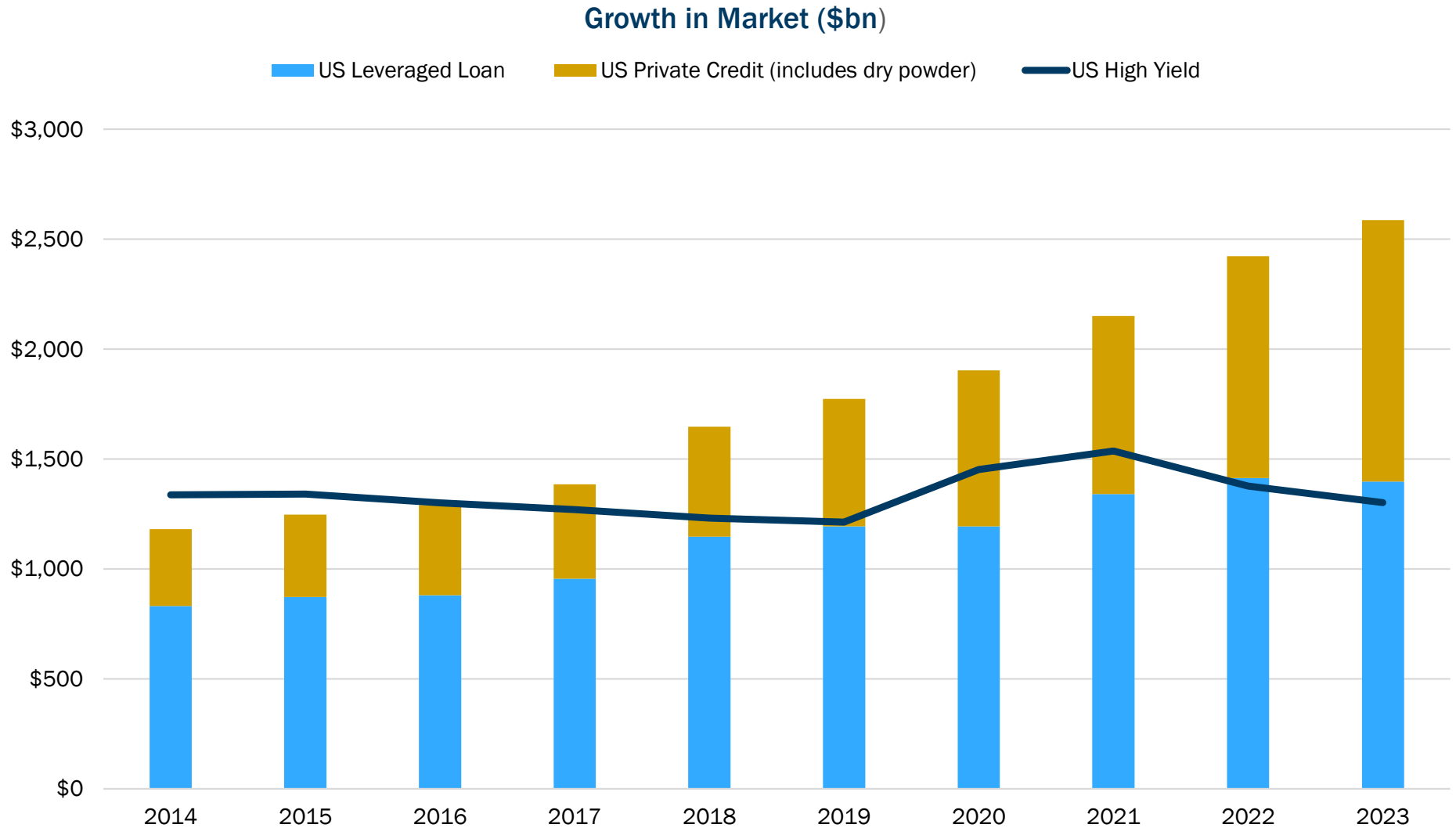


# However, Loans Continue to See Downgrades

Last 12 Months Leveraged Loans Upgrade to Downgrade Ratio (by Par)



# Loans and Private Credit Have Seen Significant Growth; HY Market Size Flat Over Last 10 Years



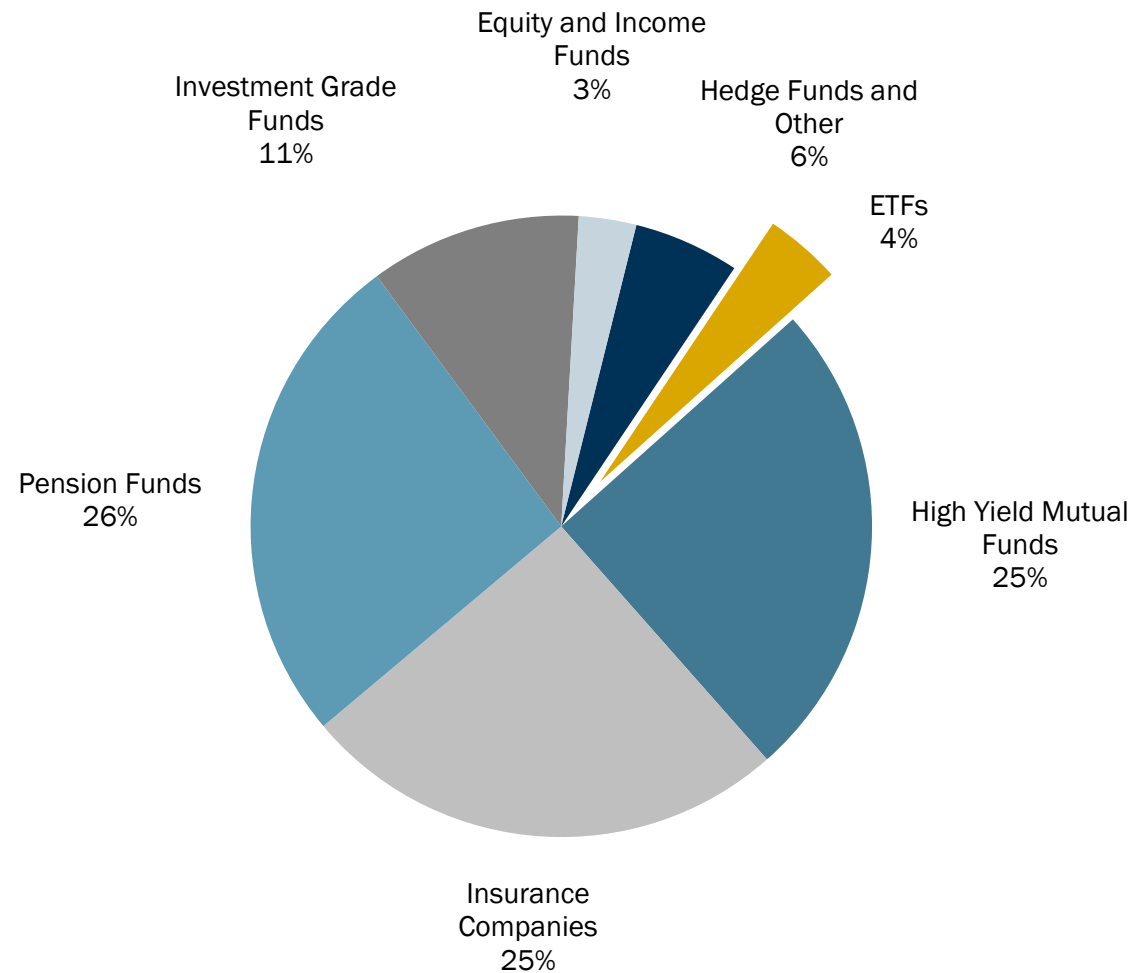
Source: Bloomberg, Prequin

Index: US High Yield = ICE BofA US High Yield Index; US Leveraged Loan = Morningstar LSTA Leveraged Loan Index. Based on par value outstanding.

As of December 31, 2023

# High Yield Investor Base Is Diverse and Unleveraged

## High Yield Investor Base 2023



Source: JP Morgan. Due to rounding, sum of items may not equal 100% or expressed totals as applicable.

# Appendix



## Investment Guidelines

### **Objective/Reference Benchmark**

The objective of this portfolio is to provide high yield fixed income exposure benchmarked against the Bloomberg US Corporate High Yield Index and to invest assets in a manner that complies with the INVESTMENT BOARD's Investment Policy Statement, the Uniform Prudent Investor Act ( § 15-1.1-101, et seq., C.R.S.), Colorado statutes and constitutional provisions governing the Fund ( § 22-41-101, et seq., C.R.S. & Colorado Constitution art. IX, § 3).

### **Realized Gain/Loss**

The Contractor will coordinate with the PSPF Portfolio Administrator, Investment Consultant, Colorado Treasurer's Office, and other third party service providers to aggregate and monitor realized and unrealized gains and losses to ensure that net realized losses are minimized and, when they do occur, immediately coordinate efforts to activate plans to offset such losses with realized gains from other aspects of the Fund, in order to ensure compliance with § 22-41-102 and 104, C.R.S.

### **Earned Income**

Earned income, not including capital gains, on the portfolio shall be swept from the account on a monthly basis. Sufficient liquidity must be maintained to ensure that all operational requirements are met and that the overall quality and marketability of the portfolio is maintained.

### **Credit Quality Guidelines**

Invest in a diversified portfolio of high yield debt securities which are primarily in the lower rating categories of recognized rating agencies:

Moody's: Baa1 to Caa3 or

S&P: BBB+ to CCC-

For temporary defensive and cash management purposes, the portfolio may invest in cash and debt securities (including cash equivalents) rated A- or higher.

Ratings for compliance purposes will be calculated on the middle rating of the available ratings by S&P, Moody's, and Fitch. If only two of the three agencies are available, the lower rating will be used (Bloomberg Rating Methodology). These ratings will be applied to both the portfolio and the benchmark.

### **Permitted Investments**

Debt securities in which the portfolio may invest include all types of debt obligations such as bonds, debentures, notes, bank debt, bank loan participations, commercial paper and US Government securities (including obligations, such as repurchase agreements, secured by such instruments).

Convertible bonds are considered as fixed income hybrids whose properties more closely resemble bonds subject to the limit below.

The portfolio may not hold single name common stock or preferred stock.

The portfolio may invest in public and private placement securities, including Rule 144As with and without registration rights.

The portfolio may invest in securities of non-US issuers if they are denominated in US dollars.

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## Investment Guidelines (continued)

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### **Concentration Limits**

Unrated securities must be considered to be of comparable quality by MacKay Shields and would not comprise more than 15% of the portfolio.

Securities rated CCC+ or below or of comparable quality will not exceed the greater of 1.5x the Index weight or 15% of the portfolio.

Foreign Securities will not exceed the greater of 2.0 times the Index weight or 25% of the portfolio. Emerging market securities, defined as those in which the issuer has a Country of Risk that is not included in the Developed Market countries list by the Bloomberg Indices, will not exceed 10% of the portfolio. Foreign Securities will be identified by the issuer's Country of Risk as defined by Bloomberg.

The portfolio may hold up to 5% in hybrid securities as described above.

The portfolio may participate, purchase, obtain, or exchange for a security (except for common stock and preferred stock) as part of a corporate action, reorganization, or workout.

The maximum holding for any single issuer will be 4% of the portfolio at the time of purchase (excluding government and agency issuers).

The maximum exposure to a single industry (measured on a Bloomberg Level 4 basis) will be the greater of 10% the portfolio's market value or 1.5x the Index weight.

### **Compliance**

If the portfolio is not in full compliance with (i) the Contract, (ii) the Statement of Work, (iii) the Investment Policy Statement for the INVESTMENT BOARD and (iv) these Investment Guidelines, the Contractor shall immediately notify the Chair of the INVESTMENT BOARD, the INVESTMENT BOARD's administrator, and investment consultant and provide plans to move into compliance. The Contractor shall work with the notified parties to establish a reasonable timeline for getting into compliance, keeping in mind the best interests of the Fund.

# Biographies





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## High Yield Team

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### Andrew Susser

*Executive Managing Director  
Head of High Yield*

Andrew Susser is an Executive Managing Director and Head of High Yield, responsible for the group's implementation of its investment process. Prior to joining MacKay Shields in 2006, he was a Portfolio Manager with GoldenTree Asset Management. Previously, he was a Managing Director and Head of High Yield Bond Research at Banc of America Securities covering the gaming, lodging and leisure sectors. From 1999 to 2004, Andrew was named to the Institutional Investor All-America Fixed Income Research Team; from 2002 to 2004, he was ranked by Institutional Investor as the No. 1 analyst in the high yield sector. Andrew also worked as a Fixed Income Analyst for Salomon Brothers, as a Senior Analyst at Moody's Investors Service and as a Market Analyst and Institutional Trading Liaison for Merrill Lynch Capital Markets. He began his career as a Corporate Finance and M&A Attorney at Shearman & Sterling in their New York office.

Andrew received a BA from Vassar College, an MBA from the Wharton Graduate School of Business and a JD from the University of Pennsylvania Law School. He has been working in the investment industry since 1986.

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### Ryan Bailes, CFA

*Managing Director*

Ryan Bailes is a Managing Director on the High Yield Team, where he follows the healthcare and home building. Prior to joining MacKay Shields in 2015, he was an Executive Director at Nomura Corporate Research and Asset Management where his research focus over time included the healthcare, forest products and home building sectors. Previously, Ryan was a Vice President at Banc of America Securities where he was ranked #3 in Institutional Investor Magazines' 2005 All American High Yield Fixed Income Research poll in the Metals and Mining sector. Ryan also worked as an analyst at Duma Capital and ING Barings Furman Selz.

Ryan received a BS from the University of Kansas and is a CFA Charterholder. He has been working in the investment industry since 1996.

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### Dohyun Cha, CFA

*Managing Director*

Dohyun Cha is a Managing Director on the High Yield Team, where he follows the energy sector. Prior to joining MacKay Shields in 2006, he was a Vice President at Credit Suisse, where he was an equity analyst covering the basic materials sector. Previously, he was a Financial Analyst in the Investment Banking Division of CIBC World Markets.

Dohyun received a BS from Boston College and is a CFA Charterholder. He has been working in the investment industry since 1997.

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#### Institutional Investor Award Disclosures

For more than 30 years, Institutional Investor has recognized people and firms in the financial service industry for excellence. Institutional Investor Research is the premier source of survey-based rankings, identifying top analysts covering equity and fixed-income markets in the United States, Europe, Asia, Japan and Latin America. Awards are determined by Institutional Investor using a proprietary methodology which incorporates polling leading asset management firms from around the world which are listed in Institutional Investor's proprietary database. Both individual-based rankings and team rankings are determined solely by numerical score. For additional information about Institutional Investor's rankings and awards, please visit: <https://www.institutionalinvestor.com/Research-FAQs#6>. Receipt of any award is not indicative of future performance and no representation is being made by MacKay Shields LLC that receipt of any award by one of more of its employees is representative of any client's experience. No fee was paid to be considered for an award. The analysts were not employed by MacKay Shields LLC at the time the awards were received.

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## High Yield Team

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### **Won Choi, CFA**

*Managing Director*

Won Choi is a Managing Director on the High Yield Team, where he follows the financials and metals & mining sectors. He is also the Team's ESG Coordinator. Prior to joining MacKay Shields in 2002, he was an Associate at Fenway Partners, Inc, a middle market private equity firm. Previously, he was a Financial Analyst in the Investment Banking Division of Salomon Smith Barney.

Won received a BA from Yale University and is a CFA Charterholder. He has been working in the investment industry since 1997.

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### **Nate Hudson, CFA**

*Managing Director*

Nate Hudson is a Managing Director on the High Yield Team, where he follows the automotive and services sectors. Prior to joining MacKay Shields in 2008, he was a Senior Analyst of High Yield Credit in Strategic Capital's (White Ridge Advisors) proprietary investment group at Banc of America Securities. Previously, he was a sell-side High Yield Analyst at Banc of America Securities and a High Yield Credit Analyst at Nomura Corporate Research & Asset Management (NCRAM).

Nate received a BA from Yale University and is a CFA Charterholder. He has been working in the investment industry since 1991.

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## High Yield Team

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### **Thomas Metcalf, CFA**

*Managing Director*

Tom Metcalf is a Managing Director on the High Yield Team, where he follows the retail, consumer/food, and leisure sectors. Prior to joining MacKay Shields in 2011, he was a Content Publisher at iO Global Ltd.

Tom received a BS and an MS from the University of Durham and is a CFA charterholder. He has been working in the investment industry since 2011.

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### **John Pace, CFA**

*Director*

John Pace is a Director on the High Yield Team, where he follows the airlines, building products, gaming, manufacturing, and paper sectors. Prior to joining MacKay Shields in 2021, John was a Partner at Stone Harbor Investment Partners and credit analyst within their Global High Yield and Leveraged Loan Team. Most recently, John served as a Director and credit analyst at Symetra Investment Management.

John earned a MBA from the University of Chicago and a BA from Kenyon College. He is a CFA Charterholder and has been in the investment management industry since 1997.

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### **Parul Miglani**

*Director*

Parul Miglani is a Director on the High Yield Team, where she follows the aerospace/defense, chemicals, and technology sectors. Prior to joining MacKay Shields in 2021, Parul was a Senior Credit Analyst at Muzinich & Co. for the firm's high yield, leveraged loans, and hedge fund strategies. Prior to Muzinich, she was a Senior Analyst at H.I.G. Bayside Capital focusing on stressed and distressed investments across the capital structure. Prior to H.I.G Bayside, she worked as an Associate in Leveraged Finance at Lehman Brothers (now Barclays Capital).

Parul earned a BS from the University of Mumbai and a MBA from Columbia University. She has been working in the investment industry since 2006.

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### **Richard Lee, CFA**

*Associate Director*

Richard Lee is an Associate Director on the High Yield Team where he follows the utilities sector. Prior to joining MacKay Shields in 2014, Richard was an Equity Derivatives intern at GFI Group. Richard received a BS in finance and accounting from Georgetown University's McDonough School of Business.

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### **May Wong, CFA**

*Associate Director*

May Wong is an Associate Director and generalist analyst on the High Yield Team. Prior to joining Mackay Shields, May was a Reconciliation Associate and worked on system analysis for client and product onboarding in Middle Office Solutions at BNY Mellon.

May received a BA in Economics from Columbia University. She is a CFA Charterholder and has been working in the investment industry since 2014.

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## High Yield Team

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### **Gabriela Pérez, CFA**

*Director*

Gabriela Pérez is a generalist analyst on the High Yield Team. Gabriela joined the firm in 2015 and previously served as a member of the firm's Client Service group and Investment Operations. Prior to joining MacKay Shields, Gabriela was an accountant at Nardello & Co.

Gabriela received a BA in Classical Philology from Bard College and an MBA in Financial Management from Pace University. She is a CFA Charterholder and has been in the investment industry since 2015.

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### **Riley Osborn**

*Associate*

Riley Osborn is a generalist analyst on the High Yield Team. Riley received a BA in economics and minor in computer science from the University of Chicago.

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### **J. Alex Leites**

*Managing Director*

Alex Leites is a Managing Director and trader on the High Yield Team. Prior to joining MacKay Shields in 2002, he was a Settlements Specialist at Credit Suisse First Boston. He previously worked at Kinexus, Inc., Bank of New York, Lazard Asset Management and Prudential Securities.

Alex received a BS from New York University's Stern School of Business and has been in the investment industry since 1993.

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### **Scott D. Mallek**

*Managing Director*

Scott Mallek is a Managing Director and trader on the High Yield Team. Prior to joining MacKay Shields in 2002, he was an Assistant Vice President involved with IFG High Yield Trading at Salomon Smith Barney.

Scott received a BA from Fairfield University and has been working in the investment industry since 1996.

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### **Debbie Boadu**

*Associate*

Debbie Boadu is a trading assistant on the High Yield Team. She received her Masters in Public Health Administration from Fairleigh Dickinson University and has been working in the investment industry since 2019.

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### **Joseph A. Maietta, CFA**

*Managing Director*

Joseph Maietta is a Managing Director and client portfolio manager on the High Yield Team. Prior to joining MacKay Shields in 2014, he was a Senior Associate in the Institutional Client Management Group at PIMCO and was previously an Associate in the Investment Analytics and Consulting area at JPMorgan Chase & Co.

He earned a B.S. in Finance from Hofstra University Honors College and holds a dual M.S. in Global Finance from New York University's Leonard N. Stern School of Business and Hong Kong University of Science and Technology. He is a CFA Charterholder and has been in the investment management industry since 2008.

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## Marketing & Client Service

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### **Therese M. Hernandez**

*Managing Director*

*Institutional Business Development*

Therese joined MacKay Shields as a Director of Institutional Business Development in 2000 and was promoted to Managing Director in 2007. Her primary area of responsibility is marketing the firm's capabilities to the Public Fund community. Prior to joining MacKay Shields, Therese was Vice President of Public Fund Sales at MFS Institutional Management. She was previously with Norwest as a Vice President of Sales and New Business Development and earlier in her career was with Northern Trust Company as an Assistant Vice President providing relationship management to endowment and foundation clients. Therese began her career with the Chicago Board of Trade as a clerk and trade checker. She attended the University of Alabama for two years, before transferring to the University of Denver where she earned her BSBA in Finance. Therese earned an athletic scholarship during her collegiate career. She has been in the industry since 1989.

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### **Mary Ellen Sadim**

*Director*

*Senior Client Manager*

Mary Ellen joined MacKay Shields in 2009 as an Associate Director and Portfolio Analyst in the High Yield Active Core Division. In July 2011, Mary Ellen moved into our Client Service division as a Client Representative focusing on Global Fixed Income clients while supporting our Product Specialists. She was previously a Director at AG Asset Management, formerly ForstmannLeff. Mary Ellen originally joined ForstmannLeff in 1997 as part of the ForstmannLeff lift-out of the UBS Fixed Income Group. The UBS Fixed Income Group contained the same senior level individuals who currently comprise the High Yield Active Core team at MacKay Shields. Over her career, she has been responsible for performance analysis, money market analysis, client relationships, and has also been a high yield account assistant. Mary Ellen received a B.B.A. in Finance from Cleveland State University and has been in the investment industry since 1987.

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### **Alexandria Jonke**

*Associate*

*Client Service Representative*

Alexandria joined MacKay Shields in March of 2022. Prior to joining the firm, she was with Bose Corporation on their Data Enablement Team, where she helped support their data literacy and governance practices, and with Deloitte, where she worked with their technology consulting team. Alexandria received her B.S. in Management with a concentration in Supply Chain and Operations, and a double minor in Information and Process Management, and Psychology from Bentley University and has been in the investment industry since 2022.

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## Risk Group Definitions

- Risk Group 1 – Highest Quality – Strongest Credit Profile and Lowest Volatility – (Initial Spread: 100 bps) + (Default Adjustment: 100 bps) = (Required Minimum Spread: 200 bps)
- Risk Group 2 – Seasoned Issuers – Significant Equity Value and Strong Credit Statistics – (Initial Spread: 100 bps) + (Default Adjustment: 200 bps) = (Required Minimum Spread: 300 bps)
- Risk Group 3 – Risk Credits – Trading At Discount and More Research Intensive – (Initial Spread: 100 bps) + (Default Adjustment: 400 bps) = (Required Minimum Spread: 500 bps)
- Risk Group 4 – Special Situations – Significant discount to asset value

## Morningstar Disclosures

The Morningstar Rating™ for funds, or "star rating", is calculated for managed products (including mutual funds, variable annuity and variable life subaccounts, exchange-traded funds, closed-end funds, and separate accounts) with at least a three-year history. Exchange-traded funds and open-ended mutual funds are considered a single population for comparative purposes. It is calculated based on a Morningstar Risk-Adjusted Return measure that accounts for variation in a managed product's monthly excess performance, placing more emphasis on downward variations and rewarding consistent performance. The top 10% of products in each product category receive 5 stars, the next 22.5% receive 4 stars, the next 35% receive 3 stars, the next 22.5% receive 2 stars, and the bottom 10% receive 1 star. The Overall Morningstar Rating for a managed product is derived from a weighted average of the performance figures associated with its three-, five-, and 10-year (if applicable) Morningstar Rating metrics. The weights are: 100% three-year rating for 36-59 months of total returns, 60% five-year rating/40% three-year rating for 60-119 months of total returns, and 50% 10-year rating/30% five-year rating/20% three-year rating for 120 or more months of total returns. While the 10-year overall star rating formula seems to give the most weight to the 10-year period, the most recent three-year period has the greatest impact because it is included in all three rating periods.

Morningstar percentile rank relative to all funds that have the same Morningstar Category. The highest (or most favorable) percentile rank is 1 and the lowest (or least favorable) percentile rank is 100. The top-performing fund in a category will always receive a rank of 1.

### MainStay HY Corporate Bond Fund

Morningstar Star Ratings as of 9/30/23: MainStay High Yield Corporate Bond Fund's Class I shares rated five stars overall among 629 high yield bond funds; four stars, four stars and five stars for the three-, five- and 10-year periods from among 629, 586 and 424 high yield bond funds, respectively. Ratings for other share classes may vary.

Morningstar Percentile as of 9/30/23: MainStay High Yield Corporate Bond Fund Class I for: one-year period – 48th (309/683), three-year period – 30th (180/629), five-year period – 22nd (93/586), and 10-year period – 11th (36/424) in the US High Yield Bond Funds category.

### MainStay Short Duration High Yield Fund

Morningstar Star Ratings as of 9/30/23: MainStay Short Duration High Yield Bond Fund's Class I shares rated five stars overall among 629 high yield bond funds; five stars, five stars and four stars for the three-, five- and 10-year periods from among 629, 586 and 424 high yield bond funds, respectively. Ratings for other share classes may vary.

Morningstar Percentile as of 9/30/23: MainStay Short Duration High Yield Fund Class I for: one-year period – 69th (451/683), three-year period – 10th (45/629), five-year period – 14th (55/586) and 10-year period – 17th (55/424) in the US High Yield Bond Funds category.

## Average Credit Quality Disclosure

Average credit quality figures provided for information purposes only and are based on internal calculations by MacKay Shields using data obtained from independent third party rating agencies and internal ratings assigned to securities that are unrated by third party rating agencies. The average credit quality of a portfolio or fund is not obtained from, nor calculated by, third party rating agencies. No representation or warranty is made as to the accuracy of such calculations, or the accuracy of information provided by third parties.

## Comparisons to an Index:

Comparisons to a financial index are provided for illustrative purposes only. Comparisons to an index are subject to limitations because portfolio holdings, volatility and other portfolio characteristics may differ materially from the index. Unlike an index, portfolios within the composite are actively managed and may also include derivatives. There is no guarantee that any of the securities in an index are contained in any managed portfolio. The performance of an index may assume reinvestment of dividends and income, or follow other index-specific methodologies and criteria, but does not reflect the impact of fees, applicable taxes or trading costs which, unlike an index, may reduce the returns of a managed portfolio. Investors cannot invest in an index. Because of these differences, the performance of an index should not be relied upon as an accurate measure of comparison.

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## The following indices may be referred to in this presentation:

### ICE BofA Corporates Cash Pay BB-B 1-5 Year Index

A subset of the ICE BofA U.S. Cash Pay High Yield Index including all securities with a remaining term to final maturity less than 5 years and rated BB1 through B3 inclusive. Index results assume the reinvestment of all capital gain and dividend distributions. An investment cannot be made directly into an index.

### ICE BofA US High Yield Index

The ICE BofA US High Yield Index tracks the performance of U.S. dollar denominated below investment grade corporate debt publicly issued in the U.S. domestic market. The ICE BofA US High Yield Index tracks the performance of U.S. dollar denominated below investment grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have a below investment grade rating (based on an average of Moody's, S&P and Fitch) and an investment grade rated country of risk (based on an average of Moody's, S&P and Fitch foreign currency long term sovereign debt ratings). In addition, qualifying securities must have at least one year remaining term to final maturity, a fixed coupon schedule and a minimum amount outstanding of \$100 million. Original issue zero coupon bonds, "global" securities (debt issued simultaneously in the eurobond and U. S. domestic bond markets), 144a securities and pay-in-kind securities, including toggle notes, qualify for inclusion in the Index. Callable perpetual securities qualify provided they are at least one year from the first call date. Fixed-to-floating rate securities also qualify provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transitions from a fixed to a floating rate security. DRD-eligible and defaulted securities are excluded from the Index.



## **ICE BofA High Yield CCC & Lower Index**

The ICE BofA High Yield CCC & Lower Index is a subset of the ICE BofA US High Yield Index including all securities rated CCC1 or lower.

## **ICE BofA US Fallen Angel High Yield Index**

The ICE BofA US Fallen Angel High Yield Index is comprised of below investment grade corporate debt instruments denominated in U.S. dollars that were rated investment grade at the time of issuance. Qualifying securities must be issued in the U.S. domestic market and have a below investment grade rating (based on an average of Moody's, Standard & Poor's Rating Services, or Fitch International Rating Agency).

## **ICE BofA US High Yield BB Index**

The ICE BofA High Yield BB Index is a subset of the ICE BofA US High Yield Index including all securities rated between BB1 and BB3.

## **JP Morgan Leveraged Loan Index**

The JP Morgan Leveraged Loan Index is designed to mirror the investable universe of U.S. dollar institutional leveraged loans, including U.S. and international borrowers.

## **Credit Suisse Leveraged Loan Index**

The Credit Suisse Leveraged Loan Index tracks the investable market of the U.S. dollar denominated leveraged loan market. It consists of issues rated "5B" or lower, meaning that the highest rated issues included in this index are Moody's/S&P ratings of Baa1/BB+ or Ba1/BBB+.

## **Bloomberg US Aggregate Index**

US Aggregate Bond Index Represents securities that are taxable, registered with the Securities and Exchange Commission, and US dollar-denominated. The index covers the US investment-grade fixed-rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities.

## **Bloomberg Global Aggregate Index**

The Bloomberg Global Aggregate Index measures the performance of the global investment grade, fixed-rate bond markets. The benchmark includes government, government-related and corporate bonds, as well as asset-backed, mortgage-backed and commercial mortgage-backed securities from both developed and emerging markets issuers.

## **ICE BofA US High Yield Constrained Index**

The ICE BofA US High Yield Constrained Index tracks the performance of U.S. dollar denominated below investment grade corporate debt publicly issued in the U.S. domestic market and caps issuer exposure at 2%. Qualifying securities must have a below investment grade rating (based on an average of Moody's, S&P and Fitch) and an investment grade rated country of risk (based on an average of Moody's, S&P and Fitch foreign currency long term sovereign debt ratings). In addition, qualifying securities must have at least one year remaining term to final maturity, a fixed coupon schedule and a minimum amount outstanding of \$100 million. Original issue zero coupon bonds, "global" securities (debt issued simultaneously in the eurobond and U. S. domestic bond markets), 144a securities and pay-in-kind securities, including toggle notes, qualify for inclusion in the Index. Callable perpetual securities qualify provided they are at least one year from the first call date. Fixed-to-floating rate securities also qualify provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transitions from a fixed to a floating rate security. DRD-eligible and defaulted securities are excluded from the Index.

## **S&P/LSTA Leveraged Loan Index**

The S&P/LSTA Leveraged Loan Index is a market value-weighted index designed to measure the performance of the U.S. leveraged loan market based upon market weightings, spreads and interest payments.

## **The ICE BofA BB-B US Non-Financial High Yield Constrained Index**

The ICE BofA BB-B US Non-Financial High Yield Constrained Index contains all securities in The ICE BofA US High Yield Index that are rated BB1 through B3, inclusive, except those of financial issuers, but caps issuer exposure at 2%. Index constituents are capitalization-weighted, based on their current amount outstanding, provided the total allocation to an individual issuer does not exceed 2%. Issuers that exceed the limit are reduced to 2% and the face value of each of their bonds is adjusted on a pro-rata basis. Similarly, the face values of bonds of all other issuers that fall below the 2% cap are increased on a pro-rata basis. In the event there are fewer than 50 issuers in the Index, each is equally weighted and the face values of their respective bonds are increased or decreased on a pro-rata basis.

## **ICE BofA US Emerging Markets External Debt Sovereign & Corporate Plus Index**

The ICE BofA US Emerging Markets External Debt Sovereign & Corporate Plus Index tracks the performance of US dollar (USD) and Euro denominated emerging markets non-sovereign debt publicly issued within the major domestic and Eurobond markets.

## **ICE BofA US Corporate Index**

The ICE BofA US Corporate Index tracks the performance of US dollar denominated investment grade rated corporate debt publicly issued in the US domestic market.

## CREDIT RATING DISCLOSURES (FOR INDEX)

### **ICE BofA Credit Ratings**

ICE BA utilizes its own composite scale, similar to those of Moody's, S&P and Fitch, when publishing a composite rating on an index constituent (eg. BBB3, BBB2, BBB1). Index constituent composite ratings are the simple averages of numerical equivalent values of the ratings from Moody's, S&P and Fitch. If only two of the designated agencies rate a bond, the composite rating is based on an average of the two. Likewise, if only one of the designated agencies rates a bond, the composite rating is based on that one rating.

### **Bloomberg Credit Ratings**

For rated securities, credit quality for index classification purposes is assigned as the middle rating of Moody's, S&P and Fitch; when a rating from only two agencies is available, the lower is used; when only one agency rates a bond, that rating is used.

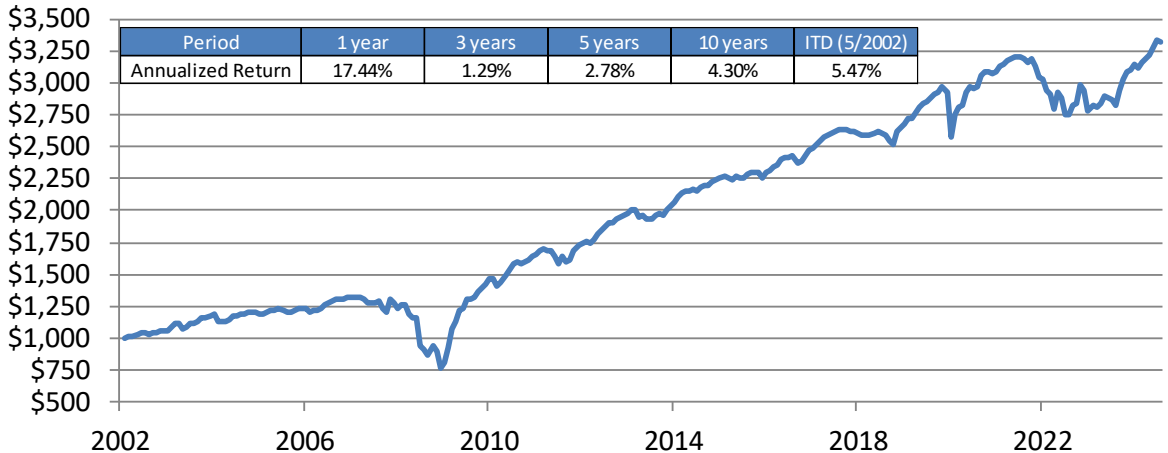
### **Credit Suisse Leveraged Loan Credit Ratings**

The Credit Suisse Leveraged Loan Index uses a single "blended" Moody/S&P rating to compute averages sorted by rating. There are nine blended ratings: Investment Grade (which, of course, is excluded from the index), Split BBB, BB, Split BB, B, Split B, CCC/Split CCC, Distressed/Default and Not Rated. Credit Suisse developed the blended ratings because Moody's and S&P do not always agree on equivalent ratings for a loan facility.

**Spectrum Preferred and Capital Securities Income Fund**  
 A U.S. Mutual Fund  
 October 2024 Overview

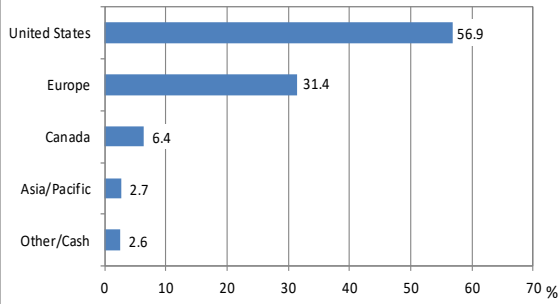
**Headline "I" Share Class**  
**ISIN: US74253Q4165 Bloomberg: PPSIX**

**Growth of \$1,000 Since Inception**

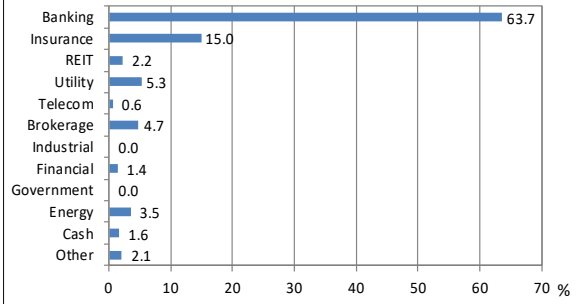


Past performance is not a reliable indicator of future performance and should not be relied upon to make investment decisions

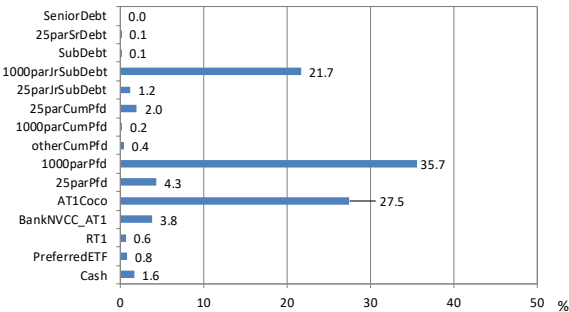
**Geographic Allocation**



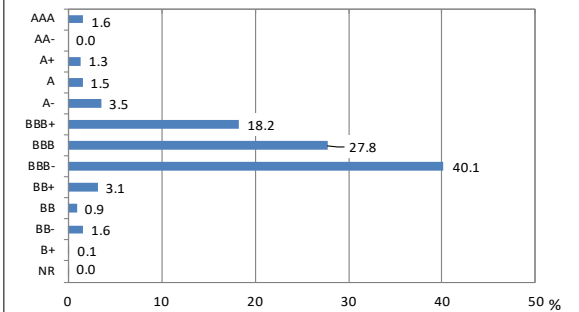
**Industry Sectors**



**Security Type**



**Credit Quality**



## Spectrum Preferred and Capital Securities Income Fund Snapshot October 2024 Overview

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2002					0.80%	0.20%	1.19%	1.76%	0.67%	-1.62%	1.07%	-0.10%	4.00%
2003	0.87%	1.05%	0.28%	1.69%	3.33%	0.45%	-4.19%	1.30%	2.57%	0.36%	0.80%	1.90%	10.72%
2004	1.18%	0.80%	1.15%	-4.82%	-0.37%	-0.09%	2.04%	1.81%	0.27%	0.71%	0.53%	1.25%	4.36%
2005	0.45%	0.18%	-1.83%	0.65%	0.83%	0.51%	0.37%	0.83%	-0.57%	-1.12%	0.09%	1.25%	1.62%
2006	0.57%	0.75%	-0.79%	-1.62%	0.19%	0.05%	2.15%	2.11%	0.95%	1.04%	1.40%	0.00%	6.94%
2007	0.19%	0.74%	0.02%	0.56%	-0.84%	-0.93%	-2.12%	-0.29%	0.54%	0.51%	-4.62%	-1.93%	-7.99%
2008	8.37%	-1.53%	-3.65%	1.78%	0.10%	-5.55%	-2.35%	0.36%	-19.28%	-3.48%	-4.53%	7.75%	-22.30%
2009	-3.67%	-15.31%	6.03%	14.00%	16.52%	4.59%	8.28%	1.43%	5.81%	0.59%	0.42%	3.88%	46.57%
2010	1.80%	1.68%	3.15%	0.36%	-3.83%	1.80%	4.53%	2.86%	2.56%	0.92%	-0.46%	0.25%	16.49%
2011	1.13%	1.71%	1.09%	1.48%	0.96%	-0.79%	-0.31%	-2.18%	-3.54%	3.46%	-2.64%	1.40%	1.53%
2012	4.14%	2.54%	1.08%	0.26%	-0.62%	1.92%	2.38%	1.74%	1.31%	1.87%	0.14%	0.99%	19.18%
2013	1.14%	0.82%	0.91%	1.35%	-0.16%	-2.79%	0.24%	-1.49%	0.22%	1.72%	0.33%	-0.41%	1.81%
2014	1.91%	1.96%	1.33%	1.79%	1.47%	0.68%	0.02%	1.08%	-0.79%	0.96%	0.85%	-0.25%	11.54%
2015	1.61%	0.80%	0.81%	0.23%	-0.33%	-0.92%	1.09%	-0.19%	-0.16%	1.60%	0.21%	0.21%	5.04%
2016	-0.37%	-1.47%	1.85%	0.92%	1.18%	0.39%	1.77%	0.96%	-0.19%	0.31%	-2.11%	0.51%	3.72%
2017	1.93%	1.60%	0.50%	1.52%	1.10%	1.07%	0.88%	0.27%	0.31%	0.69%	0.01%	0.16%	10.50%
2018	-0.47%	-0.37%	-0.28%	-0.36%	-0.47%	0.13%	0.72%	0.52%	-0.35%	-0.94%	-1.54%	-1.20%	-4.54%
2019	3.94%	1.34%	1.03%	1.44%	0.12%	1.94%	1.29%	0.90%	0.77%	1.26%	0.53%	0.83%	16.44%
2020	1.32%	-1.27%	-12.28%	7.06%	1.95%	0.90%	3.13%	1.83%	-0.49%	0.39%	2.88%	1.10%	5.45%
2021	-0.06%	-0.25%	0.34%	1.30%	0.44%	0.91%	0.43%	0.43%	0.00%	-0.34%	-1.02%	0.83%	3.03%
2022	-1.69%	-2.75%	-0.66%	-2.93%	-0.77%	-3.91%	4.49%	-1.65%	-4.13%	-0.02%	2.31%	0.83%	-10.67%
2023	5.00%	-1.35%	-5.48%	1.24%	-0.17%	0.89%	2.18%	-0.38%	-0.64%	-1.69%	4.28%	2.86%	6.46%
2024	1.89%	0.41%	1.42%	-0.91%	1.54%	0.75%	1.19%	1.64%	1.69%	-0.46%			9.50%

### Portfolio Characteristics:

Annualized return (since 5/2002):	5.5%
Approx. income:	5.8%
Approx. capital gain:	-0.3%
Standard deviation (3 years):	8.0%
Sharpe Ratio:	-0.3
Percentage of positive months:	69.6%
Best month (05/2009):	16.5%
Worst month (09/2008):	-19.3%
Largest runup (02/28/09 to 09/30/24):	337.4%
Largest drawdown (04/30/07 to 02/28/09):	-42.5%
Number of holdings:	330
Number of issuers:	110
Modified Duration:	3.6
Average Dollar Price:	\$99.8
Average Coupon:	6.0
Current Yield:	5.9
QDI:	65.6
Yield to Maturity:	7.4
Yield to Call Annualized:	6.4
Yield To Worst:	5.7
OAS:	219
Average Credit Rating (best of 3):	BBB
Annual Turnover:	27.6%
Fixed to Floating	14.5%
Fixed to Variable	73.6%
Fixed Rate	7.5%
Floating	2.0%
Cash	1.6%
Options and Futures	0.0%

### Top 10 Holdings:

Holding	Percentage
J P Morgan Chase & Co 3.65 06/26 perp DRI	1.95%
Dominion Energy 4.65 12/24 perp DRD	1.93%
Wells Fargo 3.9 3/26 perp DRD	1.84%
PNC Financial 6.25 3/30-perp DRD	1.80%
Charles Schwab 4 6/26 perp DRD	1.64%
Intesa SanPaolo SPA 7.70 9/25-49 144A	1.59%
Huntington Bancshares 4.45 10/27 perp DR	1.40%
Liberty Mutual Group 7.8 3/37-87 144a	1.38%
Nationwide Financial 6.75 5/37-67	1.24%
Nordea Bank 6.625 3/26-49 144a	1.22%

### Top 10 Issuer Concentrations:

Issuer	Percentage
Wells Fargo	4.24%
BNP Paribas	3.78%
Citigroup	3.72%
MetLife	3.22%
JP Morgan	2.86%
Truist Financial	2.86%
Dominion Energy	2.80%
Charles Schwab	2.54%
Citizens Financial Group	2.26%
Ing Groep	2.17%

Sources: Bloomberg, Moody's, S&P, Fitch, Spectrum. Data from outside sources is believed to be reliable but has not been verified.

Disclaimers: This document contains general information and is for discussion purposes only. It should not be considered a comprehensive statement on any matter and should not be relied upon as such. Past performance is not a reliable indicator of future performance and should not be relied upon as a significant basis for an investment decision.

## Investment Manager

Founded in 1987, Spectrum Asset Management Inc. ("Spectrum") - headquartered in Stamford, CT - is a specialty manager focused on the preferred and subordinated debt securities – a segment of the global corporate fixed income market.

Principal Global Investors, LLC has been appointed as Investment Advisor to the Fund, and has appointed Spectrum Asset Management, Inc. as the Sub-Investment Advisor.

## Fund Managers

Mark A. Lieb, Founder & CEO  
 L. Phillip Jacoby, CIO & Sr. PM  
 Manu Krishnan, PM  
 Robert Giangregorio, PM  
 Fred Diaz, PM  
 Kevin Nugent, PM  
 Al Tunnera, PM  
 Satomi Yarnell, PM

## Fund Facts

- Spectrum Total Firm AUM: US \$20.26B
- Spectrum Founded: 1987
- Fund AUM: \$6.19B
- Fund Launch Date: May 2002
- Fund Base Currency: USD
- Min Investment : "I" Share US\$2M
- TER: "I" Shares 0.81% pa
- Subscriptions: Daily
- Redemptions: Daily
- Administrator : Principal Global Investors
- Custodian: BNY Mellon
- Auditor: Ernst & Young LLP
- Target Avg. Credit Quality: Investment Grade
- Target Mod. Duration: Intermediate

## Investment Objective

The Fund is an actively managed 40 Act Mutual which seeks to provide enhanced income return as well as capital appreciation, whilst attentive to capital preservation and volatility.

The Fund primarily invests in Preferred, Jr. Subordinated Debt, Subordinated Debt and Contingent Capital Securities (CoCos) securities; issued by major US, European and Asian Banks, Insurance Companies, Utilities, Telcoms, Reits, Industrials and other corporate issuers.

Security selection is based upon analysis of credit quality, relative value and securities structure.

There are several other share classes in addition to the Institutional I Share Class, including PPSAX and PPSPX. The Fund is available from broad range of leading Broker/Dealer throughout the U.S.

## Benchmark

ICE BofA US All Capital Securities Index  
 (Bloomberg Ticker IOCS)



## Contact

Steven Solmonson  
 Sr. Vice President  
 Spectrum Asset Management Inc.  
 Institutional Investment Services  
 T. 203-321-1133  
[ssolmonson@samipfd.com](mailto:ssolmonson@samipfd.com)  
[www.samipfd.com](http://www.samipfd.com)

Name	TCKR	YTD returns	1 yr	3 yr	5 yr	10 yr	Since inception	Inception date
Principal Spectrum Preferred and Capital Securities Income Fund	PPSIX	9.49%	17.44%	1.29%	2.78%	4.30%	5.52%	05/01/2002

Fixed Income - I

# SPECTRUM

## Asset Management

### Nov. 2024 Update Overview For Discussion with Professional / Institutional Investors (Colorado PSB)

Steven J. Solmonson  
Managing Director  
[ssolmonson@samipfd.com](mailto:ssolmonson@samipfd.com)  
M. +1.646.321.2305

SPECTRUM ASSET MANAGEMENT INC.  
*A member of the Principal Financial Group*  
2 High Ridge Park, Stamford, CT 06905

- Spectrum is a leading investment manager specifically focused on the Capital Securities market. The universe of capital securities (which includes Baby Bonds, Subordinated Debt, Jr. Subordinated Debt, Preferred Securities and COCOs) is a specialty segment of the broader corporate fixed-income market.
- Capital Securities are primarily issued by regulated banks and other financial services firms, insurance companies and utilities as well as some telecoms, real estate investment trusts, industrials and other corporate issuers.
- Spectrum was founded in 1987 and has operated as wholly owned and member of the Principal Financial Group®, since 2001. Spectrum has twenty-five dedicated professional is headquartered in Stamford, Connecticut. As of Sept 2024, Spectrum's firm AUM totaled approximately \$20 Billion.
- Spectrum manages a broad range of portfolio products to meet the needs of our investors. All portfolios are managed by a cohesive team, utilizing similar investment processes and drawing upon client directed portfolio guidelines.
- Products include: 1) U.S. 40 Act mutual funds, 2) Irish UCITS funds, 3) active ETFs 4) Institutional REG D fund, 5) customized institutional separately managed accounts 5) four SMA models for high-net-worth investors sponsored by leading broker-dealer and RIA Platforms.
- Spectrum has produced a record of strong performance by consistently employing an investment process that emphasizes comprehensive credit analysis and portfolio construction focused on relative-value analytics.

# PPSIX Portfolio – Key Characteristics - Past Year Snapshot

Fund Ticker: PPSIX	As of Oct 2024	as of Oct 31 2023
Portfolio NAV	\$6.19 Bil	\$5.43 Bil
Price (ex cash)	99.03	90.47
Price	97.41	90.04
CY	5.93	6.65
YTM	7.41	8.91
YTC	6.44	10.66
YTW	5.74	8.21
Eff Dur	3.30	2.85
Mod Dur	3.61	3.33
Call Years	3.45	3.57
OAS	228	396
% negative YTC	0	0
# of Securities	331	301
# of Issuers	111	111
Fix To Float	9.32%	15.98%
Fix to Variable	73.38%	68.86%
Floater	1.74%	1.66%
FixedForLife	13.93%	13.02%
\$25 Par %	7.44%	6.19%
\$1000 Par %	62.80%	61.92%
\$1000 Par %	28.13%	31.42%
\$1000 Par %	1.63%	0.48%
Avg. Credit ( best of 3)	BBB	BBB
YTD 2024 Total Return	9.44%	
LTM 2024 Total Return	17.44%	
<i>Past Performance is no guarantee of future returns</i>		

**2023**  
**Fed Rate Hikes and**  
**Wider Credit Spreads**

**2024**  
**Fed Rate Pause & Cuts and**  
**Tightening of Credit Spreads**

Recent economic data continues to point towards the “soft landing” scenario. We are well positioned in terms of duration as the cure normalizes. We anticipate that returns in 2025 will be generated by coupon income.

# Portfolio Positioning over Q3 2024

- We added to our Canadian Bank LRCN holdings this quarter, given their high coupons and current income. The LRCN concentration increased from 2.15% to 2.64% over the quarter. We added new issue Bank of Montreal 7.7 5/29-84 and Toronto Dominion 7.25 7/29-84.
- The weight of the AT1 Cocos in the portfolio went from 26.33% to 27.30% an increase of 97 bps. We added new issue AT1 Cocos such as HSBC 6.95, HSBC 6.875, Nordea 6.30, UBS 6.85 and Lloyds 6.75. We added high coupon bonds such as Santander 8, BNP 7.75, Intesa 7.70, Barclays 9.625 and Socgen 10.
- Utilities were net issuers of hybrids this quarter. We increased the weight of Utility hybrids in the portfolio from 2.32% to 2.64% over the course of the quarter. We added to new issues from NiSource, Nextera and Duke Energy.
- We increased the weight of Insurance hybrids in the portfolio from 12.03% to 12.52% an increase of 49 bps. We added new issues from Allianz, Meji Yasuda, Corebridge and SwissRe.
- We sold out of our Senior debt positions in the portfolio given valuations.
- We sold out of Vodafone in the portfolio given concerns around the trajectory of the name.



# Market outlook: Corporate Jr. Sub Hybrids

Q4 2024

- Utilities are in a growth phase due to unprecedented demand for power from data centers. Increased electricity demand should bode well for Utility equities and Corporate hybrids.
- The risk profile of Corporate hybrids have improved over the past few years:
- Large and well diversified investor base – insurance companies to real money. Corporate hybrids have a place in investor portfolios as a means to add alpha.
- Issuers are fundamentally sound and are committed to preserving their IG ratings.
- Changes to Moody’s rating methodology has allowed for the issuance of 30nc5 structures that have 50% equity credit at all three rating agencies. This allows for a wider investor base relative to a 60+ or Perpetual maturity.
- In the US, the changes to Moody’s methodology have prompted issuers to liability manage their Perpetual Preferreds and issue dated Junior. Subordinated Debt in its place. This increases the universe of bonds that are eligible for inclusion in NRA portfolios that could not buy the Preferreds due to withholding taxes but will be able to add the dated Junior Subordinated Debt.
- Solid IG issuers: These companies are committed to hybrid capital as a means of managing their capital structure, rating stability and market reputation.

# Market outlook:USD

Q4 2024

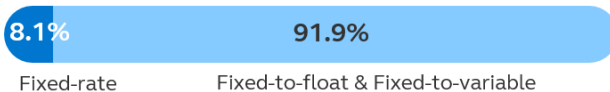
**Outlook: We would expect coupon income in our strategies to continue to be elevated despite a central bank easing regime**

- Capital security issuance has become standardized with fixed-to-fixed reset coupon structures. This reduces duration risk in our asset class, given the ability for the portfolio to earn higher coupon income in rising rate environments. Discounted fixed-to-fixed reset bonds can move up in price as coupons get reset higher. Coupons on the IIPS index have gone from about 6.75% to a low of 5.25% in early 2022 as central banks kept rates low. Since then, the coupon has climbed to about 6% today. This time around the Fed is cutting rates while the economy is not in a recession. The US economy remains resilient, and this has resulted in a steepening of the yield curve. The expectation for intermediate rates in the future are higher as per the forward curve. Back in late 2021 and early 2022 rates were very low, and bonds were typically issued as long dated NC5 or PerpNC5. These bonds issued in a lower rate environment have coupons with 3 and 4 handles which will either get called away in 2026 and 2027 or get reset higher. This should be constructive for coupon income in our asset class and will put Preferreds and Capital Securities in the unique position of being able to increase coupon income in a central bank easing cycle.
- The investment universe has grown because of issuance from Utility and Energy companies given the increased demand for power as an offshoot of the AI boom. This is constructive from an income perspective because spreads on Non-Financial hybrids are typically wider than their Financial counterparts. It also allows for diversification benefits investment universe has also grown given Tier1 issuance from Canadian Banks.
- Recently issued Corporate hybrids are structured as 30nc10 bonds that have a strong incentive to be called at the first call date given that equity credit from S&P falls off then. Additionally, European and Japanese 30nc10 Insurance issuance have 100 bps step-ups which makes extension a more remote possibility.
- Credit conditions in Banks & Insurance companies continue to be healthy.
- Nominal yields are at decade long highs despite the recent spread tightening. This bodes well for the asset class as investors are reaching for yield in anticipation of further Fed rate cuts. A steep yield curve will be constructive for total return as we would expect capital to exit the short end of the curve and look for yield in strategies such as ours.

# Market Universe

## \$1,000 par Preferred Securities (CIPS & HIPS)

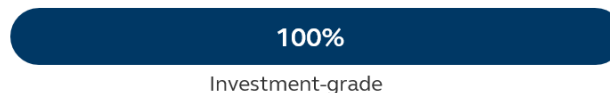
Market size \$190.2 billion



Current yield	5.7%
Yield to worst	6.7%
Effective duration	3.5
Volatility	8.1
Percent callable next 12 months	18.5% <sup>1</sup>

## EUR IG All Capital Securities (EBSU & ENSU)

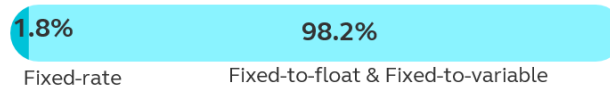
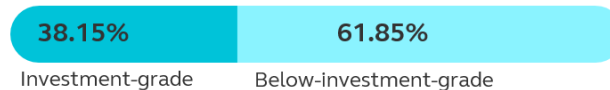
Market size \$289.4 billion



Current yield	3.4%
Yield to worst	4.5%
Effective duration	3.8
Volatility	7.0
Percent callable next 12 months	18.6%

## Contingent Convertible Securities (COCO)

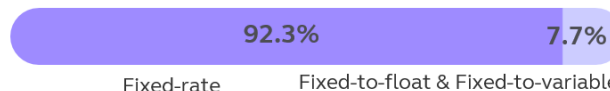
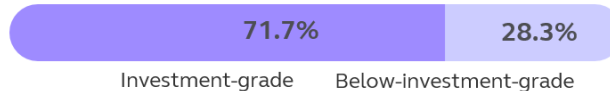
Market size \$249.5 billion



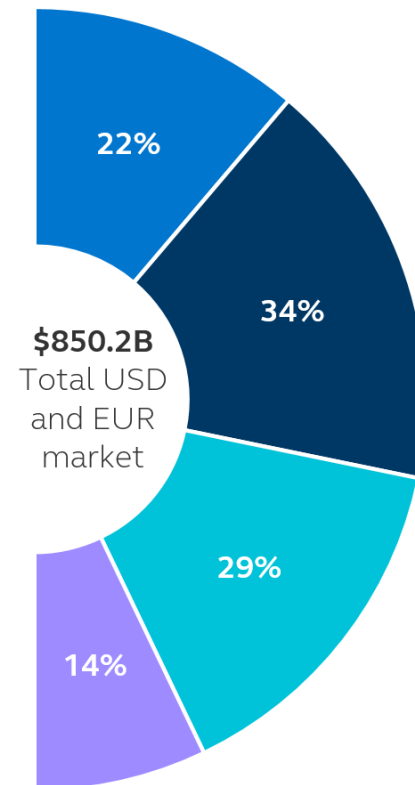
Current yield	6.5%
Yield to worst	7.4%
Effective duration	3.0
Volatility	11.0
Percent callable next 12 months	12.7%

## \$25 par Preferred Securities (POP4)

Market size \$121.1 billion



Current yield	6.3%
Yield to worst	6.1%
Effective duration	7.2
Volatility	15.0
Percent callable next 12 months	50.4%



As of March 31, 2024. Source: Bloomberg, Spectrum Asset Management. <sup>1</sup>The CIPS and HIPS index definitions exclude all securities callable within the next 12 months. The data presented “Percent callable next 12 months” was calculated by adjusting the indices to include all otherwise applicable securities that are callable within the next 12 months. Index performance information reflects no deduction for fees, expenses, or taxes. Indices are unmanaged and individuals cannot invest directly in an index. Past performance is not indicative of future results. See important information for index descriptions.

# Spectrum's Investment Process: Credit and Portfolio Management

## One Team, One Process Through the Life of All Funds

### Credit Selection

- Fundamentals-based, defensive approach to credit selection
- Research process comprises many inputs including company financials and management engagement
- Macro view of geopolitical, macroeconomic, sovereign and industry challenges
- ESG assessments integrated in credit analysis
- Forward looking view of credit profile leading to an issuer recommendation

### Portfolio Construction

- "Bottom-Up" approach to issuer selection, security selection and portfolio design
- Emphasis on issuer, geographic, industry, market sector diversification and security structure characteristics
- Relative value with respect to capital securities of comparable issuers in the same industry
- Relative value with respect to senior debt and the capital securities stack of the same issuer

### Trading

- "Top-Down" approach as to market sector - \$25 par market v. \$1,000 par market
- Granular approach as to individual security selection in the context of credit selection and portfolio construction
- Seek to take advantage of inefficiencies and structural value differences in the \$25 par retail market
- Seek to optimize structural value differences between the capital securities sectors

### Compliance

- Pre- and post-trade review and testing of all trades and trade allocations
- Portfolio guidelines
- Internal credit guidelines
- Ongoing monitoring and review of trading for best execution

# Spectrum Asset Management Team



Mark Lieb



L. Philip Jacoby IV



Manu Krishnan



Fred Diaz



Roberto Giangregorio

Team Overview	Responsibilities	Education	Industry Start Date	Experience with Firm	Experience on Product
Mark Lieb	Founder & CEO	BA/MBA	1977	1987	1982
Phillip Jacoby	CIO & Sr. PM	BSBA	1982	1995	1982
Matthew Byer, JD	COO	BS/JD	1991	2007	1998
Joseph Urciuoli	Director Credit Research	BA/MBA	1980	1998	1993
John Kriz	Analyst Credit Research	BA/MA/MBA	1985	2008	2008
Chad Stogel	Analyst Credit Research	BS/MBA	2008	2011	2011
Victoria Cai	Analyst ESG / Credit Research	BA/MIA	2020	2021	2021
Fred Diaz	Portfolio Management	US Military	1992	2000	2000
Roberto Giangregorio	Portfolio Management	BS/MBA	2003	2003	2003
Manu Krishnan, CFA	Portfolio Management	BS/MBA	2004	2004	2004
Kevin Nugent	Portfolio Management	BA	1984	2012	1984
Albano Tunnera	Portfolio Management	AB	1996	1997	1997
Satomi Yarnell, CFA	Portfolio Management	MA	2006	2018	2013
Andrew Zint	Portfolio Admin & Client Services	BS	2012	2018	2018
Garrett Lieb	Portfolio Admin & Client Services	BS/MBA	2015	2018	2018
Andrew Purdy	Portfolio Admin & Client Services	BABA	1992	2024	2001
Joseph Hanczor, J.D.	Compliance, Regularity & Risk Mgt,	BA/JD	1987	2009	1987
Steven Solmonson, JD	Product Specialist – Institutional Investors	BA/JD	1978	2012	1982
Dave Reichart, CFA CAIA	Product Specialist – Institutional Investors	BBA	1991	2021	2008
James Hodapp	Product Specialist – Retail Investors	BSBA	1981	2015	2015
Jean Orlando	CFO & Operations Manager	BBA	1980	1987	1987
Jennifer Simpson	Controller & Operations	BA/MS	2003	2017	2017
Thomas Kuna	Operations	BA	2011	2015	2011
Nancy Dray	Compliance & Regulatory	BA	1981	1987	1987
Patty Tyler	General Office Admin	N/A	1999	1999	1999