

## Investment Board Meeting Agenda

Thursday, September 28, 2023

Conference Telephone #: 309-205-3325

Meeting ID: 859 9688 9062

8:30 a.m. - 12:30 p.m.

- 8:30 a.m. Call to Order / Roll Call of Members**
- 8:35 p.m. Approval of Minutes from the June 15, 2023, Board Meeting**
- 8:40 a.m. CEO Report – Greg Samorajski**
- 8:55 a.m. FY2025 IPERS Budget**  
Tara Hagan and Greg Samorajski, *IPERS*
- 9:30 a.m. CY2022 CEM Investment Benchmarking Review**  
Christopher Doll, *CEM Benchmarking, Inc.*
- 10:00 a.m. Break**
- 10:15 a.m. FY2023 Investment Performance Review**  
Thomas Toth and Ali Kazemi, *Wilshire*
- 10:45 a.m. Annual Asset Allocation Review**  
Thomas Toth and Ali Kazemi, *Wilshire*
- 11:15 a.m. Annual Review of Investment Policy and Goal Statement**  
Sriram Lakshminarayanan, *IPERS*
- 11:30 a.m. Absolute Return Search Manager Hiring Recommendations**  
Sriram Lakshminarayanan, *IPERS*
- 11:45 a.m. IPERS Investment Staff Reports**
- Beta Report – Sriram Lakshminarayanan
  - Alpha Report – Investment Team
  - Private Market Program – Investment Team
  - Risk Report – Sriram Lakshminarayanan
  - CIO Updates
- 12:15 p.m. Election of Chair and Vice Chair**
- 12:20 p.m. Public Comments**
- 12:25 p.m. Other Business**
- Confirm Next Meeting – December 7, 2023
  - Next BAC Meeting – October 23, 2023
  - Confirm Meeting Dates for Calendar Year 2024
- 12:30 p.m. Adjourn**



## INVESTMENT BOARD MEETING MINUTES

IPERS Headquarters

7401 Register Drive, Des Moines, Iowa

June 15, 2023

The following people participated in the IPERS Investment Board Meeting held on Thursday, June 15, 2023.

### Members of the Board – Present

Justin Kirchhoff, Chair

Bill Bemis

Tami Loge

Kris Rowley

Treasurer Roby Smith

Matt Watters

Representative Amy Nielsen

Representative Martin Graber

Senator Mark Lofgren

Senator Pam Jochum

### Members of the Board – Absent

None

### Administration and Staff

Greg Samorajski, CEO

Sriram Lakshminarayanan, CIO

John Fujiwara, Head of Strategy

Sheldon Lien, Senior Investment Officer

Pat Reinhardt, Senior Investment Officer

Keith Scholten, Senior Investment Officer

Marcus Dong, Retirement Investment Officer

Kate Fishman, Retirement Investment Officer

Kevin Terdal, Retirement Investment Officer

Melinda McElroy, Executive Assistant

Elizabeth Hennessey, General Counsel

Shawna Lode, Director of Communications

Tara Hagan, Chief Financial Officer

Linda Guffey, Deputy Chief Operations Officer

### Wilshire Associates

Thomas Toth

Ali Kazemi

Marc Friedberg

## **Proceedings**

Justin Kirchhoff, chair, called the meeting to order at 8:30 a.m.

## **Approval of Minutes of Previous Meeting**

Kris Rowley made the motion to approve the March 24, 2023, Investment Board meeting minutes. Bill Bemis seconded. The minutes were approved by unanimous voice vote.

## **CEO Report**

Greg Samorajski introduced the new Board members: Matt Watters, Representative Amy Nielsen and Representative Martin Graber. He next reported on the disaster recovery exercise IPERS recently completed where IPERS successfully transitioned mission-critical applications from the IPERS headquarters to the disaster recovery site and back without any loss of data or functionality. Shawna Lode reported on the 2023 Legislative session and the bills impacting IPERS.

## **Contribution Rate Funding Policy**

Greg Samorajski reported that a COLA working group consisting of Investment Board and Benefits Advisory Committee (BAC) members met and reviewed the history of the Favorable Experience Dividend (FED) and the Supplemental Accounts for Active Members (SAAM) programs. At their May 22, 2023, meeting, BAC members voted to recommend to the legislature eliminating the FED/SAAM programs and replacing them with a possible expansion of the November Dividend program. To address the expected liabilities the FED/SAAM could create prior to legislation being enacted, the Investment Board approved revising the Contribution Rate Funding Policy. For the purposes of calculating potential transfers to member FED/SAAM accounts the term fully funded as specified in Iowa Code and Administrative Rules shall mean: the funding percentage, not less than 100%, determined by the System's actuary when calculating transfers to FED/SAAM accounts will not result in a material probability that the System will fall below 100% funded. Kris Rowley made the motion to approve the policy change. Matt Watters seconded. The motion carried by unanimous roll call vote.

**Ayes:** Justin Kirchhoff, Bill Bemis, Treasurer Smith, Tami Loge, Kris Rowley and Matt Watters

**Nays:** None

**MOTION PASSED**

## **IPERS Investment Staff Reports**

### ***Beta Report***

Sriram Lakshminarayanan reviewed the Fund's asset allocation and stated that all asset classes were within policy ranges as of June 9, 2023. The Total Fund market value estimate on that date was \$40.7 billion.

### ***Alpha Report***

The Investment staff reviewed the alpha report, noting minor performance and process concerns with international equity manager Columbia.

### ***Private Markets Program***

Pat Reinhardt reviewed the three private markets investment management firms currently being monitored for performance issues: Clarion Partners, Forest Investment Associates and UBS Farmland.

### ***Risk Report***

Sriram Lakshminarayanan presented IPERS' risk monitoring report, noting plan-level total active risk remained unchanged at 0.32%. Active risk is expected to remain range-bound for the new few months.

### ***CIO Updates***

Sriram Lakshminarayanan introduced Kate Fishman who was recently hired as a quantitative investment officer. He also discussed his plans to fill the six additional investment staff positions the legislature recently approved and reorganizing the team into three functional areas: operations, private markets and public markets. He updated the Board on the status of the three open RFPs which include absolute return strategies, non-core real asset equity products and FCM and Margin Management services.

### **Private Markets Overview and Outlook**

Marc Friedberg of Wilshire provided the Board with a general overview and outlook for private markets.

### **Private Markets Program Annual Review**

Pat Reinhardt presented the annual review of IPERS' private markets program. The program consists of three main portfolios: private equity, private credit and private real assets; no changes were recommended to the portfolios. Pat concluded his report by noting portfolio structuring decisions around the private real assets portfolio will be part of the calendar year 2024 investment plan that will be presented to the Board in December.

### **Private Market Co-Investment Programs**

Sriram Lakshminarayanan and Pat Reinhardt presented the advantages of and the next steps to introduce a co-investment program in the IPERS portfolio. In September, investment staff plan to recommend changes to the private markets investment policy. If service providers can be secured, a small internal co-investment allocation will be incorporated into the calendar year 2024 commitments that will be presented to the Board in December.

### **Securities Litigation Report**

Elizabeth Hennessey reported on the status of each case in which IPERS is serving in an active role and provided the total funds recovered from monitored cases from June 2, 2022, through April 30, 2023.

**Public Comments**

Public comments were heard from former Senator Pat Deluhery.

**Other Business**

None

**Confirm Next Meeting Dates**

The next regularly scheduled meetings of the Investment Board are Wednesday, September 27 and Thursday, September 28, 2023.

**Adjourn**

With no further business to come before the Investment Board, Kris Rowley made a motion to adjourn. Treasurer Smith seconded. The motion was approved by unanimous voice vote. The meeting adjourned at 12:05 p.m.

# IPERS' FY2025 Budget Request

IPERS' budget is funded exclusively from its members' IPERS Trust Fund. IPERS does not request or receive any money from the general fund or any other state fund. More than 99% of IPERS' budget is not subject to an annual legislative appropriation. Funds for the following costs are not subject to appropriation: payment of claims for benefits, payment of refunds and investment management expenses. Crucially, however, the administrative component of IPERS' budget is subject to an annual appropriation. This is true even though the state does not provide any of those administrative funds. The administrative component is vital. Though it represents less than 1% of the budget, it provides the resources IPERS' Investment Board and staff need to act as responsible fiduciaries by earning investment returns and providing service and data security to its members.

During the 2023 legislative session IPERS received permission to increase its administrative budget by just more than \$2 million to strengthen its Investments and Benefits Divisions. For FY2025 IPERS seeks additional resources to achieve emerging organizational goals:

1. Bolster IPERS' cybersecurity program.
2. Enhance member engagement through communication and education.
3. Modernize service delivery.
4. Improve traditional service through appropriate staffing.

<b>GOAL: Bolster IPERS' cybersecurity program.</b>	
<b>Operations Division</b>	<b>Annual Cost</b>
Policy Technical Writer	\$77,183
Technical Support Specialist/Payroll Auditor	\$86,274
Change & Configuration Control Manager	\$79,161
Fraud & Risk Analyst	\$79,161
<b>Total</b>	<b>\$321,779</b>
<b>GOALS: 1. Enhance member engagement through communication and education. 2. Modernize service delivery.</b>	
<b>Strategy Division</b>	<b>Annual Cost</b>
Chief Strategy Officer	\$118,934
Chief Learning Officer	\$98,427
Digital Experience Program Manager	\$98,427
<b>Total</b>	<b>\$315,789</b>
<b>GOAL: Improve traditional service through appropriate staffing.</b>	
<b>Benefits Division</b>	<b>Annual Cost</b>
Retirement Benefits Officer (Due Diligence)	\$64,705
Retirement Benefits Officer – SSDD	\$64,705
Retirement Compliance Officer – ERAM	\$64,705
Retirement Benefits Technician	\$55,450
<b>Legal Division</b>	<b>Annual Cost</b>
Pension System Attorney	\$129,869
<b>Total</b>	<b>\$379,432</b>
<b>Total Enhancement Request</b>	<b>\$1,017,000</b>

<b>Budget Summary</b>	<b>FTEs</b>	<b>Appropriation</b>
FY2025 Status Quo Budget	98	\$20,629,084
FY2025 Budget Enhancement Requests	12	\$1,017,000
	<b>110</b>	<b>\$21,646,084</b>

## IPERS' COSTS VERSUS SERVICE

Annually, IPERS engages CEM Benchmarking, an industry-leading benchmarking service, to compare administrative and investment costs to its peers in the public pension industry. CEM's FY2022 report included these key takeaways that indicate both a need to increase staffing and assurance that even with a budget increase, IPERS will remain among the lowest-cost retirement plans.

### COST

IPERS' total pension administration cost of \$46 per active member and annuitant was \$58 below the peer average of \$104 and was the lowest in IPERS' peer universe.

	You	Peer Avg	
Fewer front office FTE per 10,000 members	1.4 FTE	3.5 FTE	
CEM Category	IPERS' Cost Per Active Member & Annuitant	Peer Avg Per Active Member & Annuitant	Difference (%)
FRONT OFFICE			
Member Transactions	\$5	\$14	-64.29%
Member Communications	\$8	\$15	-46.67%
Collections and Data Maintenance	\$6	\$8	-25.00%
GOVERNANCE & SUPPORT			
Governance & Financial Control	\$3	\$8	-62.50%
Major Projects	\$0	\$12	-100.00%
Information Technology	\$17	\$26	-34.62%
Building	\$3	\$7	-57.14%
Legal	\$1	\$4	-75.00%
HR, Actuarial, Audit, Other	\$3	\$12	-75.00%
	<b>\$46</b>	<b>\$104</b>	<b>-55.77%</b>

### SERVICE

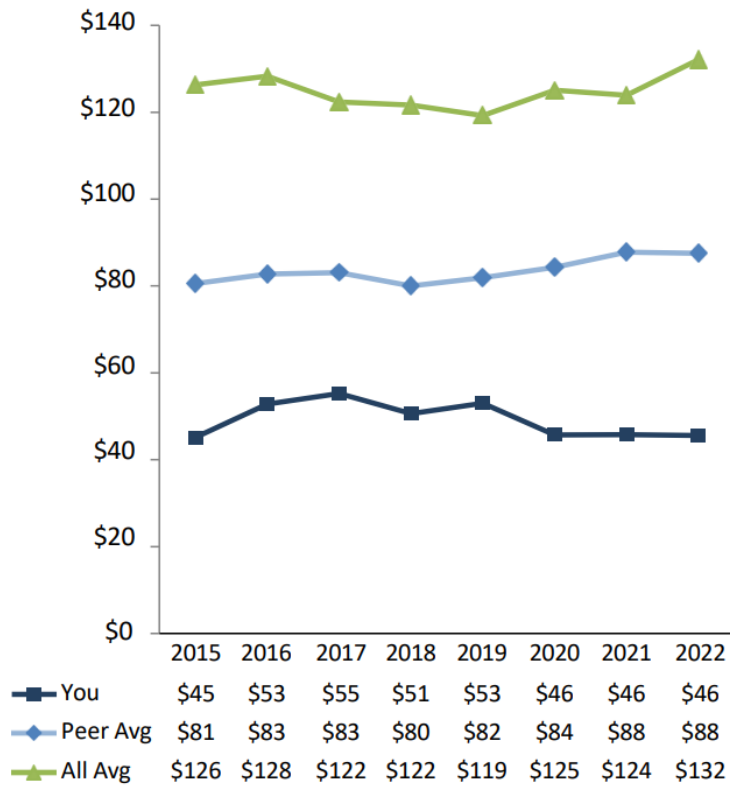
IPERS' total service score was 77. This was below the peer median of 81.

#### SERVICE SCORES BY ACTIVITY

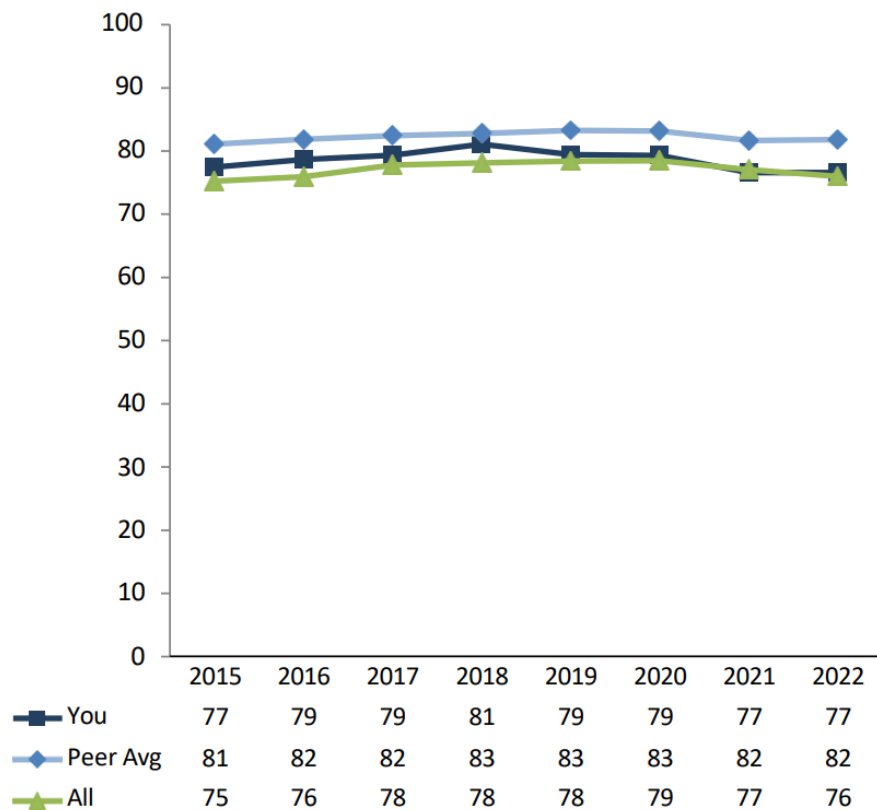
Activity	You	Peer Median
Call Center	55	66
Member Presentations	45	100
Online Member Self-Service	75	85



### Trend in Total Pension Administration Costs



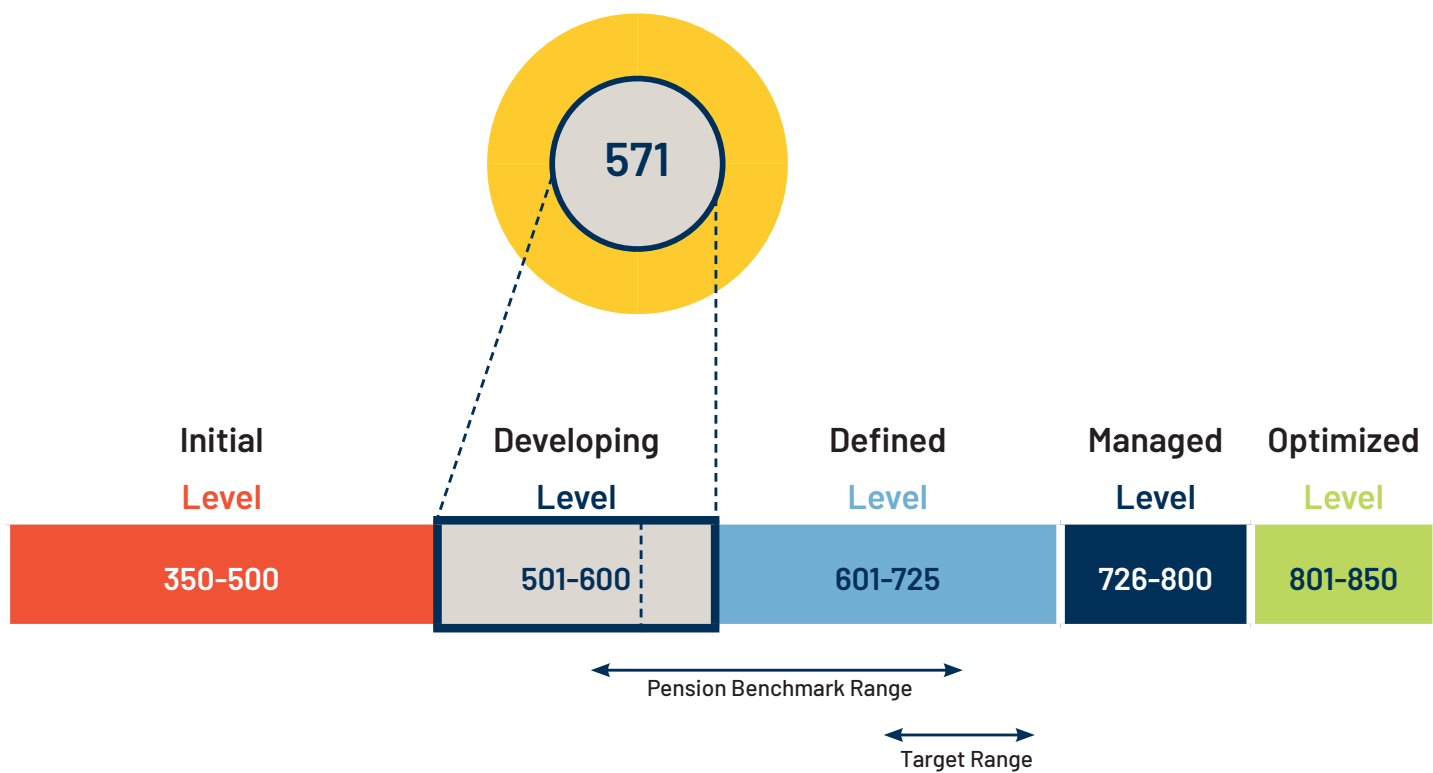
### Trends in Total Service Scores



# LINEA OVERVIEW

In early 2023, IPERS commissioned Linea Solutions, a cybersecurity and risk management firm, to examine IPERS’ current operating environment and identify risks to it. Linea’s report suggested more than 100 operational enhancements, many of which will require additional staff to achieve.

Linea defines a “Developing” cybersecurity program as one that scores between 501 and 600. IPERS’ cybersecurity program scored 571. With better staffing and prgram improvement, Linea suggests IPERS could obtain a target score of 650-725, which represent a “Defined” program.



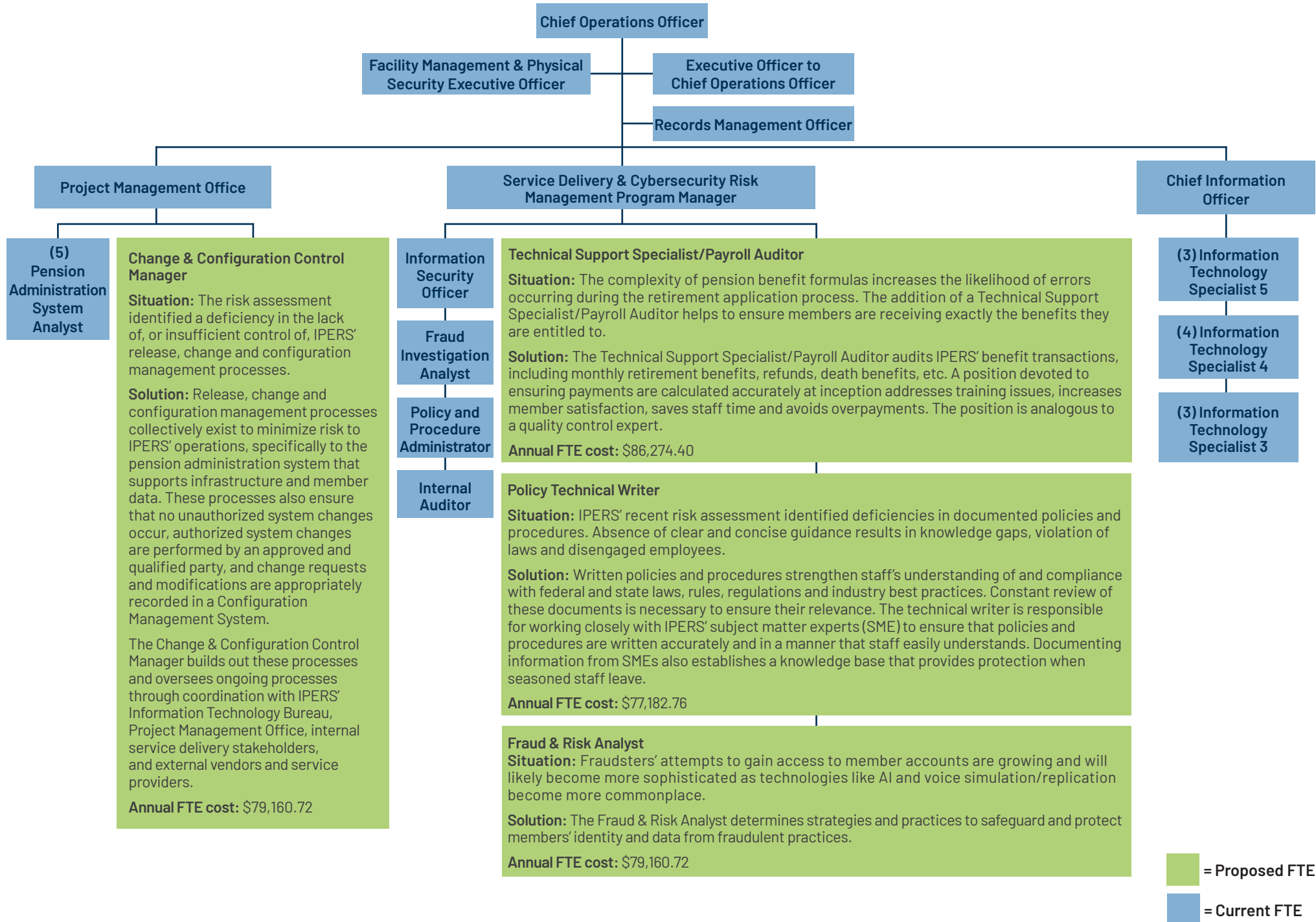
The following page shows the needs of highest priority, a tentative timeline to complete them and the new and current FTEs who could be assigned to each.

# Roadmap to Secure Service Delivery and Cybersecurity Programs

	First Fiscal Year												Second Fiscal Year												Third Fiscal Year																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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= Proposed FTE  = Current FTE

# Operations Division



= Proposed FTE

= Current FTE

# Strategy Division

## Chief Strategy Officer

**Situation:** IPERS recognizes a need to modernize important program areas, including technology-based member service delivery and member engagement.

**Solution:** IPERS is proposing a new division to engage staff, employers and members to identify and recommend opportunities to implement transformational service delivery initiatives. The Chief Strategy Officer is an executive-level employee who serves on IPERS' leadership team and stays abreast of cutting-edge programs in the national pension administration industry that could be implemented at IPERS to benefit various audiences. This position oversees three work areas that support the development and execution of IPERS' strategic initiatives: Education Program Office, Digital Experience Program Office and Strategic Communications Office.

**Annual FTE cost:** \$118,934.08

## Chief Learning Officer

**Situation:** IPERS' Retirement Benefit Officers (RBO) receive six months of intensive training before they may assist members and retirees. However, other employees receive no formal training to understand IPERS' organizational framework and goals, and the fundamental components of the benefits and investment programs. Likewise, IPERS mails educational materials to new members and provides facilitated, online training to near retirees. But IPERS should provide relevant education to targeted groups throughout their career and life journeys.

**Solution:** The Chief Learning Officer creates comprehensive learning programs for staff, members, retirees and employers. This position evaluates the needs of each group, identifies their preferred information-delivery methods and creates a plan to execute enhanced educational outreach. The Chief Learning Officer continually evaluates and amends the program to meet the evolving needs of each audience.

**Annual FTE cost:** \$98,427.40

## Digital Experience Program Manager

**Situation:** Many of IPERS' service delivery processes are completed on paper, including mailing millions of letters to members annually, which annually costs IPERS nearly \$1 million in paper and postage fees. IPERS seeks to convert these and other processes from paper to digital means wherever possible.

**Solution:** The Digital Experience Program Manager is responsible for overseeing all facets of this work, including gathering qualitative and quantitative data about the members' digital experience and using that information to inform strategic priorities. This position's work streamlines the member's experience, generates a cost- and materials-savings for IPERS and follows pension industry best practices to establish IPERS as a national leader in digital service delivery.

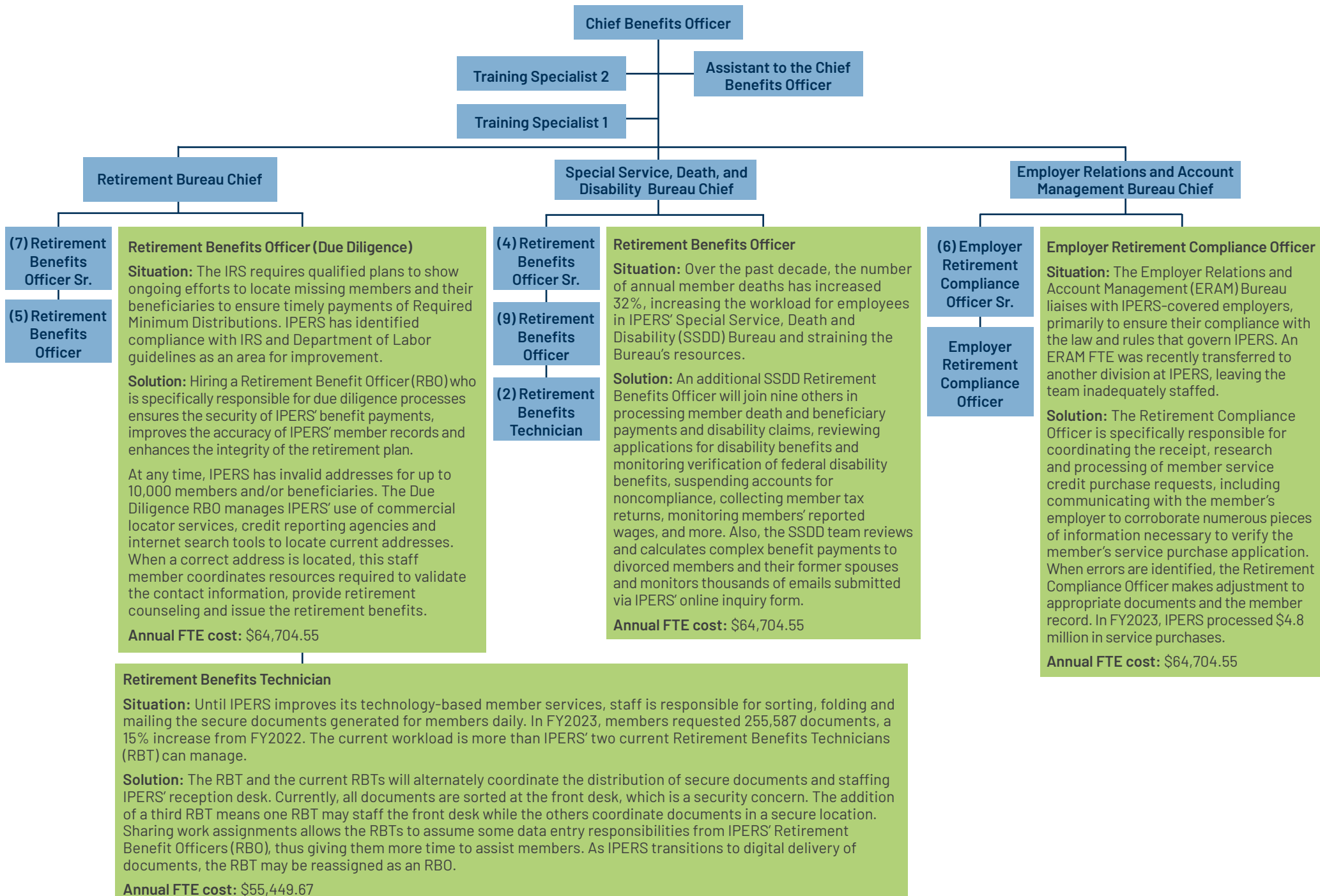
**Annual FTE cost:** \$98,427.40

Communications Director/  
Legislative Liaison

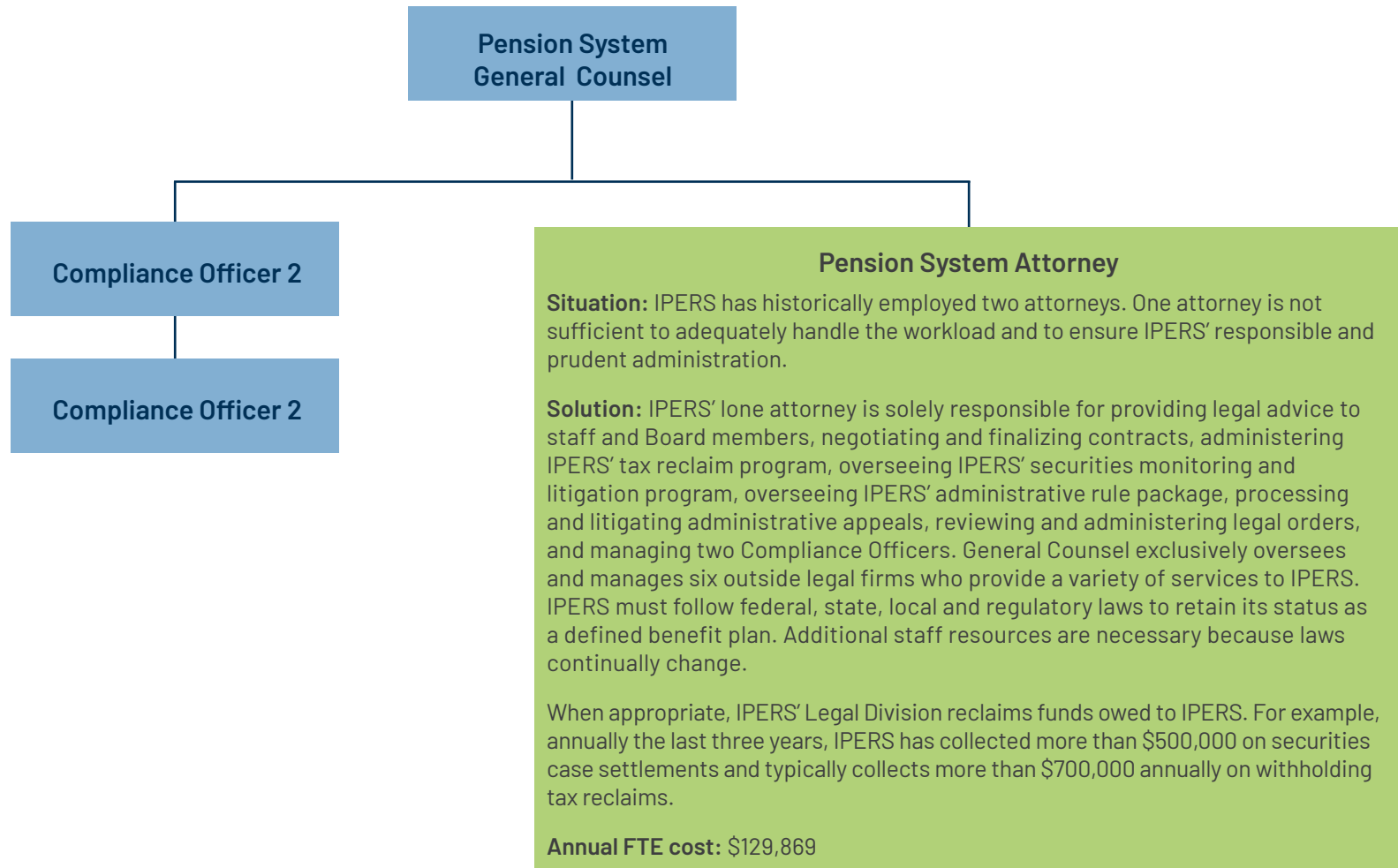
Communications  
Specialist

Communications  
Specialist

# Benefits Division



# Legal Division







## Iowa Public Employees' Retirement System

# CEM Investment Benchmarking Report - 2022

September 2023



# Key Takeaways

## Returns

- Your 5-year net total return was 7.0%. This was above both the U.S. Public median of 5.9% and the peer median of 5.7%.
- Your 5-year policy return was 5.3%. This was above both the U.S. Public median of 4.6% and the peer median of 4.8%.

## Value added

- Your 5-year net value added was 1.7%. This was above both the U.S. Public median of 1.1% and the peer median of 0.8%.

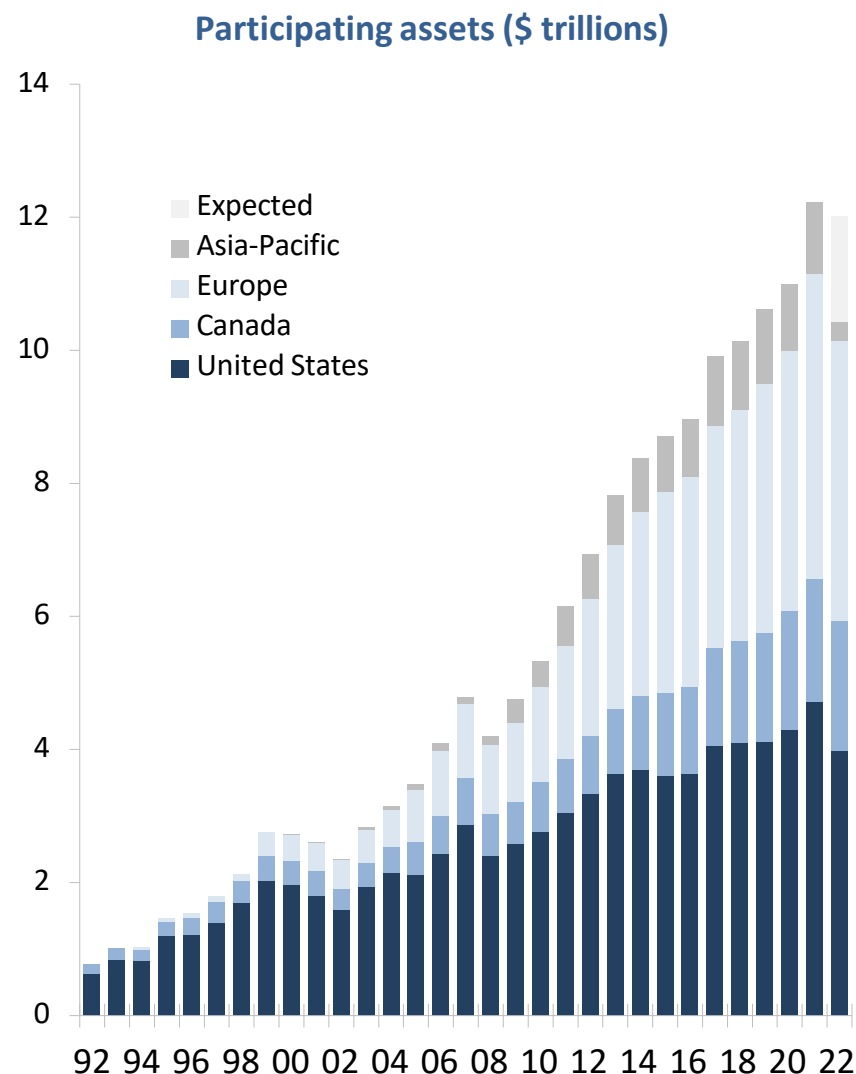
## Cost

- Your investment cost of 44.3 bps was below your benchmark cost of 57.7 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because it paid less than peers for similar services and it had a lower cost implementation style.
- Your costs increased by 5.4 bps, from 38.9 bps in 2018 to 44.3 bps in 2022, primarily because you had a higher cost asset mix. This was partly offset by paying less in total for similar investment styles.

## This benchmarking report compares your cost and return performance to the 258 funds in CEM's extensive pension database.

- 140 U.S. pension funds participate. The median U.S. fund had assets of \$9.4 billion and the average U.S. fund had assets of \$28.5 billion. Total participating U.S. assets were \$4.0 trillion.
- 68 Canadian funds participate with assets totaling \$2.0 trillion.
- 45 European funds participate with aggregate assets of \$4.2 trillion. Included are funds from the Netherlands, Norway, Sweden, Finland, Ireland, Denmark and the U.K.
- 4 Asia-Pacific funds participate with aggregate assets of \$276.0 billion. Included are funds from Australia, New Zealand, China and South Korea.
- 1 funds from other regions participate.

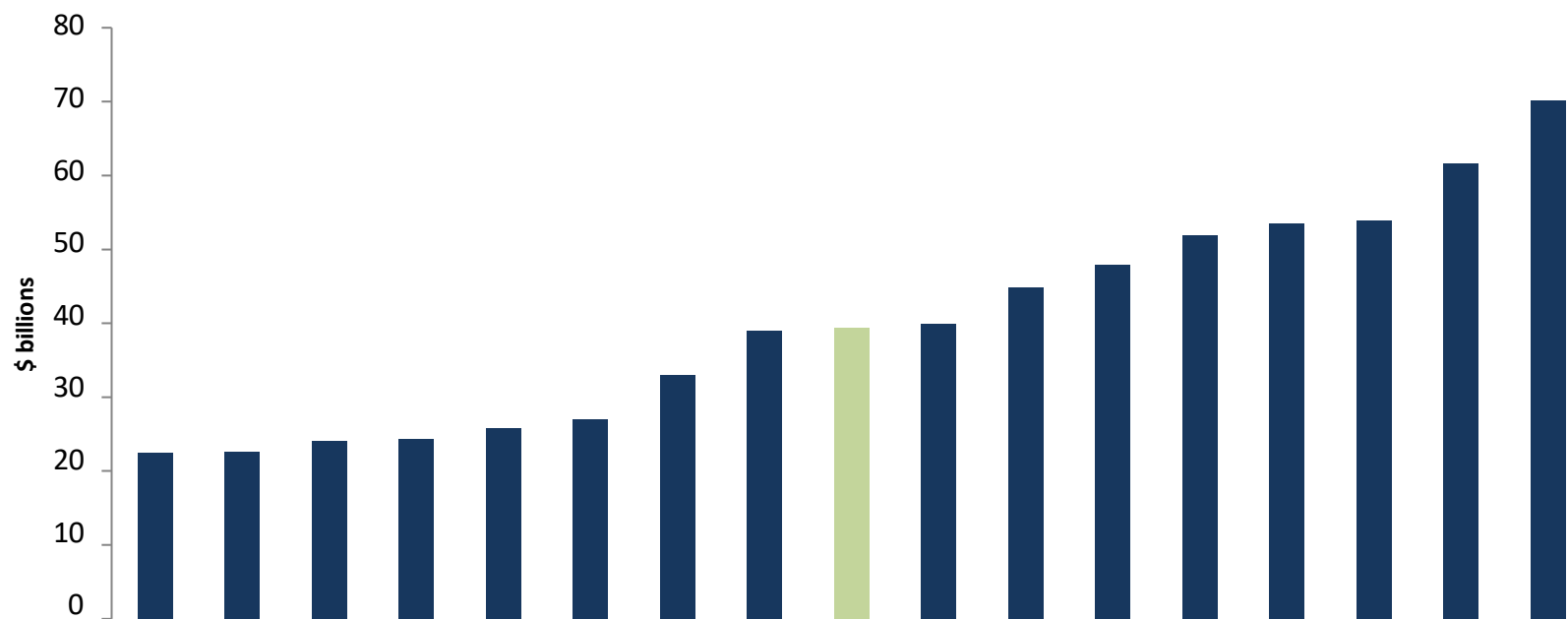
The most meaningful comparisons for your returns and value added are to the U.S. Public universe, which consists of 37 funds.



The most valuable comparisons for cost performance are to your custom peer group because size impacts costs.

Peer group for Iowa Public Employees' Retirement System

- 17 U.S. Public sponsors from \$22.5 billion to \$70.1 billion
- Median size of \$39.3 billion versus your \$39.3 billion



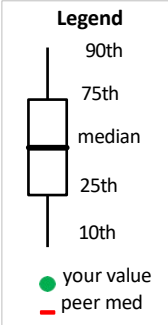
To preserve client confidentiality, given potential access to documents as permitted by the Freedom of Information Act, we do not disclose your peers' names in this document. For some of the peers, 2021 cost data was used as a proxy for 2022.

# Your 5-year net total return of 7.0% was above both the U.S. Public median of 5.9% and the peer median of 5.7%.

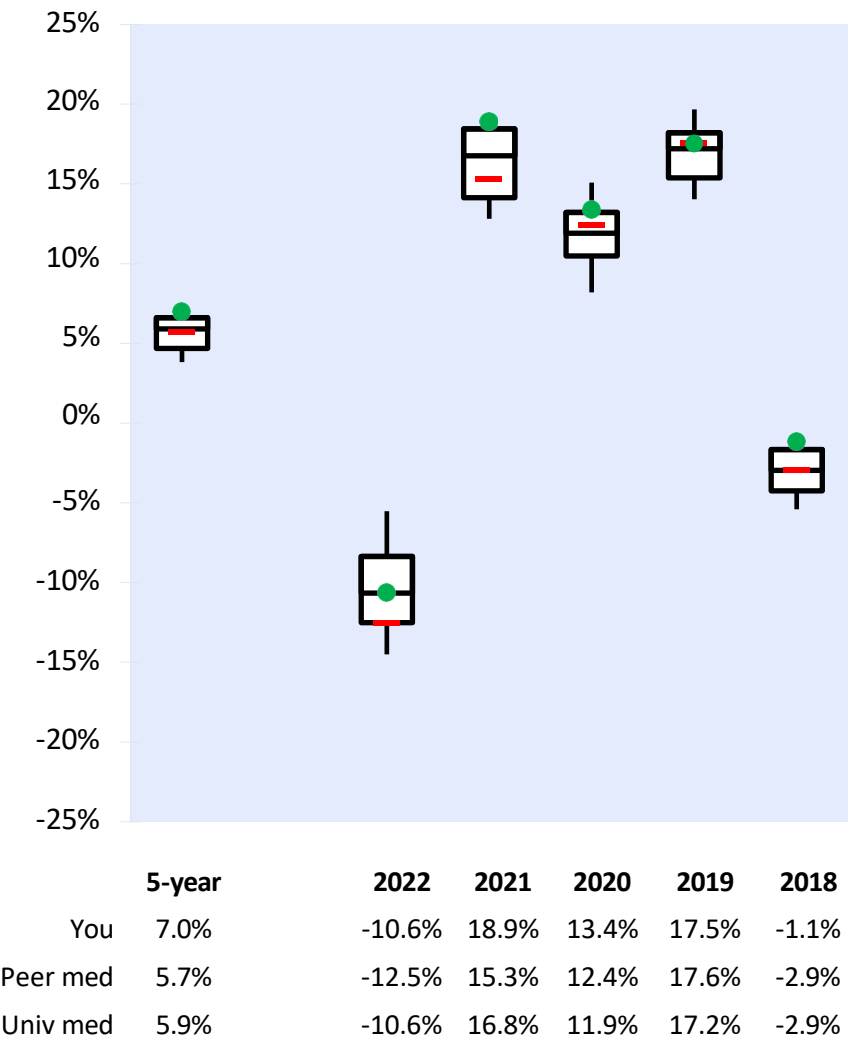
Total returns, by themselves, provide little insight into the reasons behind relative performance. Therefore, we separate total return into its more meaningful components: policy return and value added.

	Your 5-year
Net total fund return	7.0%
- Policy return	5.3%
= Net value added	1.7%

This approach enables you to understand the contribution from both policy mix decisions (which tend to be the board's responsibility) and implementation decisions (which tend to be management's responsibility).



U.S. Public net total returns - quartile rankings



# Your 5-year policy return of 5.3% was above both the U.S. Public median of 4.6% and the peer median of 4.8%.

Your policy return is the return you could have earned passively by indexing your investments according to your policy mix.

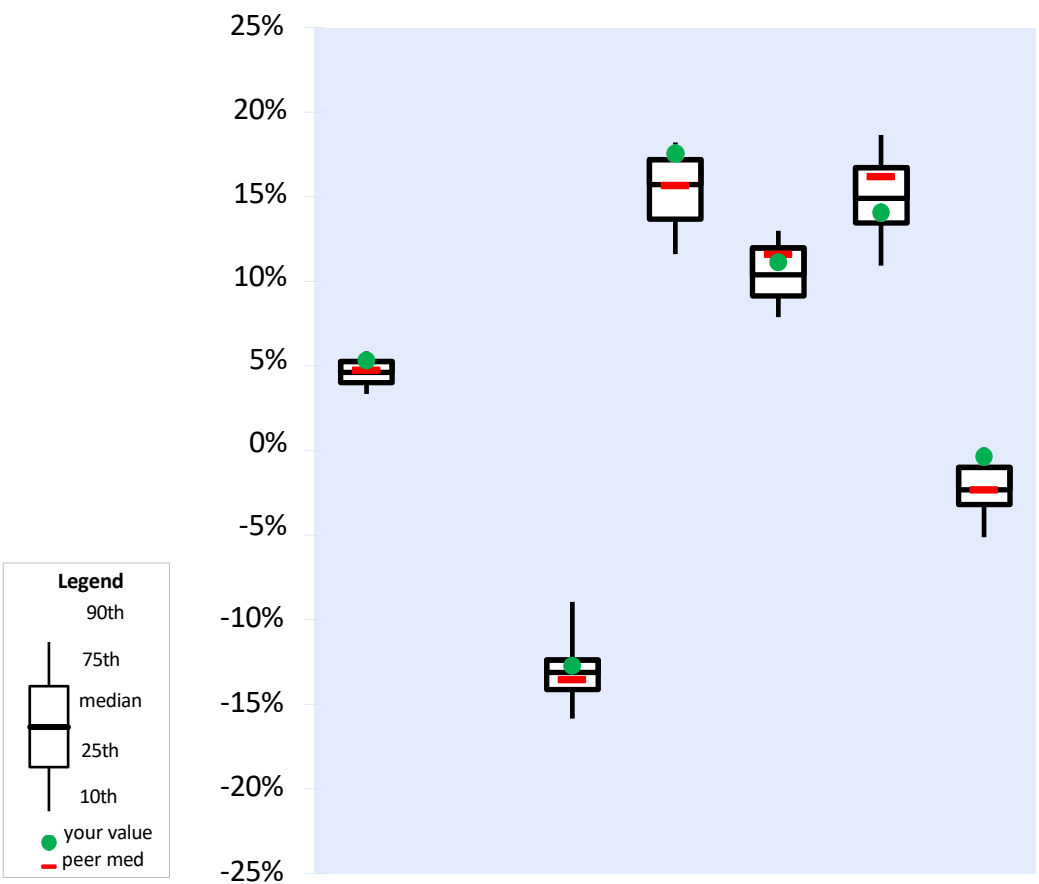
Having a higher or lower relative policy return is not necessarily good or bad. Your policy return reflects your investment policy, which should reflect your:

- Long term capital market expectations
- Liabilities
- Appetite for risk

Each of these three factors is different across funds. Therefore, it is not surprising that policy returns often vary widely between funds.

To enable fairer comparisons, the policy returns of all participants, including your fund, were adjusted to reflect private equity benchmarks based on lagged, investable, public-market indices. Prior to this adjustment, your 5-year policy return was 7.0%, 1.6% higher than your adjusted 5-year policy return of 5.3%. Mirroring this, your 5-year total fund net value added would be 1.6% lower.

U.S. Public policy returns - quartile rankings



	5-year	2022	2021	2020	2019	2018
You	5.3%	-12.7%	17.6%	11.1%	14.0%	-0.4%
Peer med	4.8%	-13.5%	15.7%	11.6%	16.2%	-2.3%
Univ med	4.6%	-13.1%	15.7%	10.4%	14.9%	-2.3%

## Your 5-year policy return of 5.3% was above the U.S. Public median of 4.6% primarily because of:

- Your higher allocation to U.S. Stock (your 25% 5-year average weight versus a U.S. Public average of 18%), which was one of the better performing asset classes over the past 5 years.
- This was partly offset by your higher allocation to Fixed Income - U.S. (your 26% 5-year average weight versus a U.S. Public average of 17%), which was one of the poorer performing asset classes over the past 5 years.

	5-year average policy mix <sup>1</sup>			5-year benchmark return	
	Your Fund	U.S. Publ Avg.	More/ Less	Your Fund	U.S. Publ Avg.
Stock - U.S.	25%	18%	7%	9.0%	8.6%
Stock - EAFE	0%	5%	-5%	n/a <sup>3</sup>	1.8%
Stock - ACWI x U.S.	18%	6%	12%	0.9%	1.8%
Stock - Global	0%	14%	-14%	n/a <sup>3</sup>	5.4%
Other Stock <sup>2</sup>	0%	5%	-5%	n/a <sup>3</sup>	n/a <sup>3</sup>
Total Stock	43%	47%	-4%	5.6%	5.4%
Fixed income - U.S.	26%	17%	9%	0.2%	0.2%
Fixed income - Long bonds	0%	2%	-2%	n/a <sup>3</sup>	-1.7%
Fixed income - Inflation indexed	2%	3%	-1%	n/a <sup>3</sup>	1.6%
Cash	1%	-1%	2%	1.3%	1.2%
Other Fixed Income <sup>2</sup>	4%	5%	-1%	n/a <sup>3</sup>	n/a <sup>3</sup>
Total Fixed Income	33%	26%	6%	0.3%	0.3%
Hedge funds	0%	3%	-3%	n/a <sup>3</sup>	4.0%
Natural resources	1%	1%	1%	8.8%	5.4%
REITs	1%	1%	0%	n/a <sup>3</sup>	2.6%
Real estate ex-REITs	6%	8%	-2%	7.7%	8.3%
Other Real Assets <sup>2</sup>	1%	2%	-2%	n/a <sup>3</sup>	n/a <sup>3</sup>
Private equity	13%	10%	3%	6.5%	6.5%
Private debt	3%	2%	1%	7.0%	4.7%
Total	100%	100%			

1. 5-year weights are based only on plans with 5 years of continuous data.

2. Other stock includes: Stock - Emerging. Other fixed income includes: Fixed income - U.S. gov't and Fixed income - U.S. credits. Other real assets include: Commodities and Infrastructure.

3. A value of 'n/a' is shown if asset class returns are not available for the full 5 years or if they are broad and incomparable.

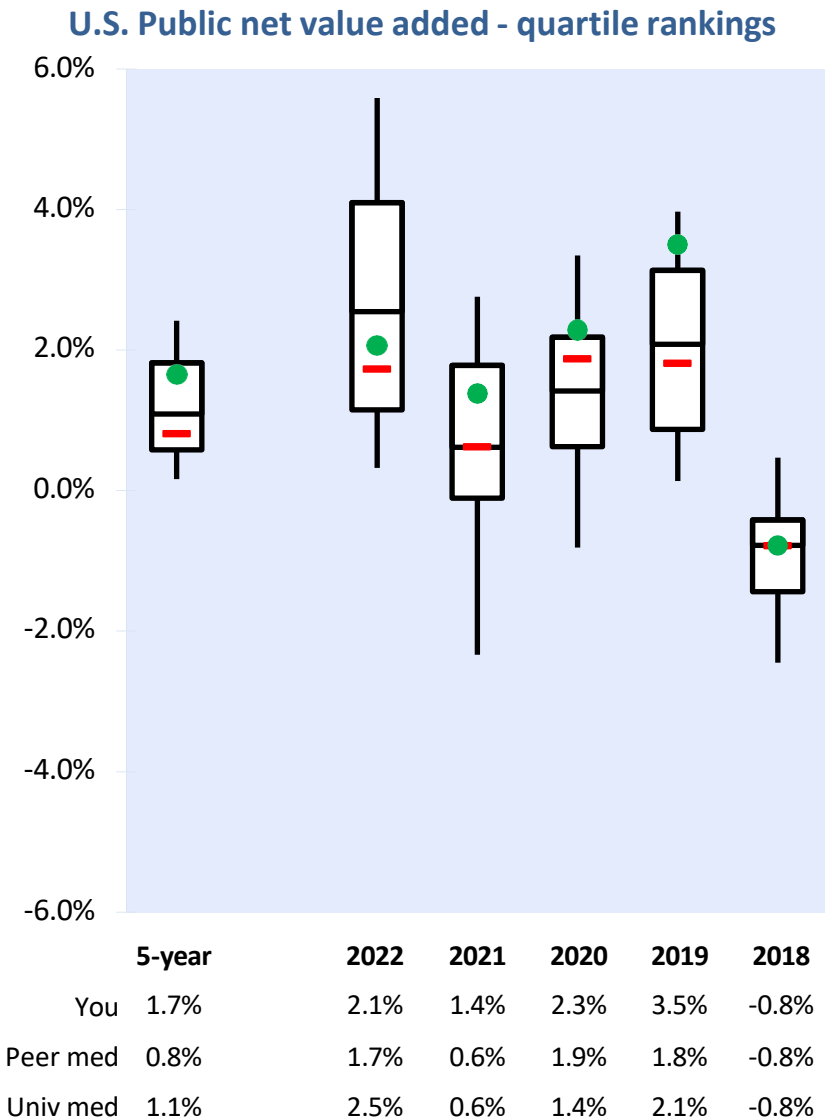
# Net value added is the component of total return from active management. Your 5-year net value added was 1.7%.

Net value added equals total net return minus policy return.

Value added for Iowa Public Employees' Retirement System			
Year	Net return	Policy return	Net value added
2022	-10.6%	-12.7%	2.1%
2021	18.9%	17.6%	1.4%
2020	13.4%	11.1%	2.3%
2019	17.5%	14.0%	3.5%
2018	-1.1%	-0.4%	-0.8%
5-Year	7.0%	5.3%	1.7%

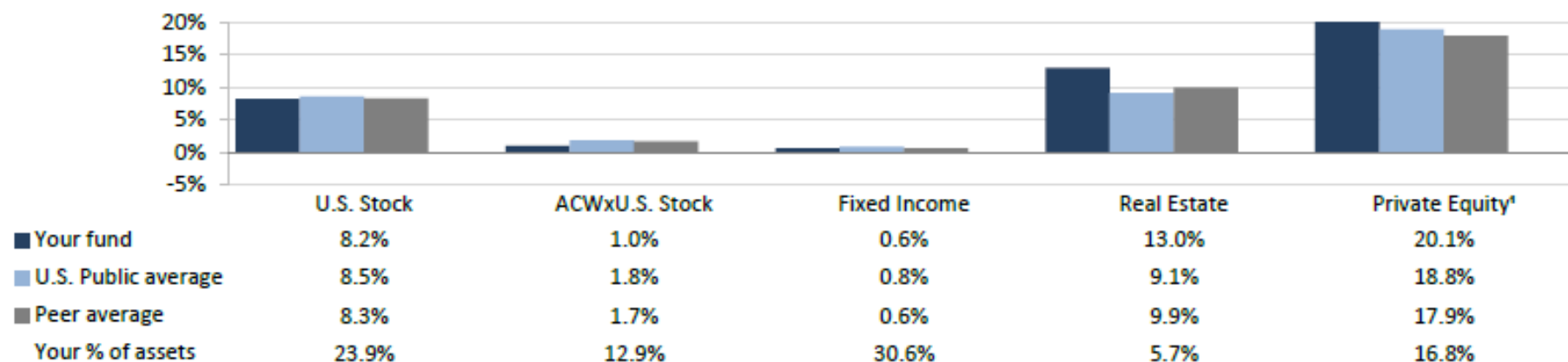
Your 5-year net value added of 1.7% compares to a median of 0.8% for your peers and 1.1% for the U.S. Public universe.

To enable fairer comparisons, the value added for each participant including your fund was adjusted to reflect private equity benchmarks based on lagged, investable public market indices. Prior to this adjustment, your fund's 5-year total fund net value added was 0.0%.

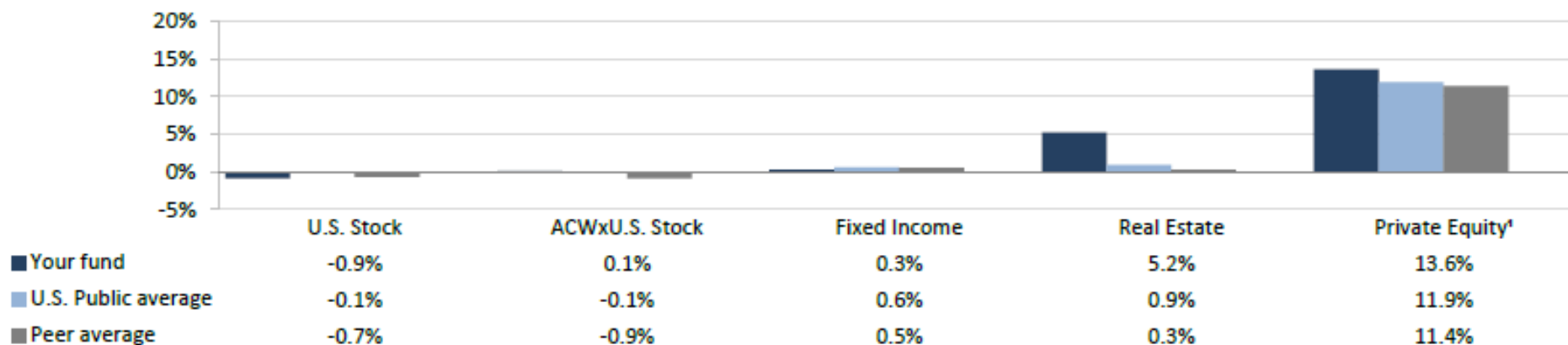


## Comparisons of your 5-year net return and net value added by major asset class:

5-year average net return by major asset class



5-year average net value added by major asset class



1. To enable fairer comparisons, the private equity benchmarks of all participants, including your fund were adjusted to reflect lagged, investable, public-market indices. Prior to this adjustment, your fund's 5-year private equity net value added was -1.2%.



## Your investment costs, excluding private asset performance fees, were \$190.9 million or 44.3 basis points in 2022.

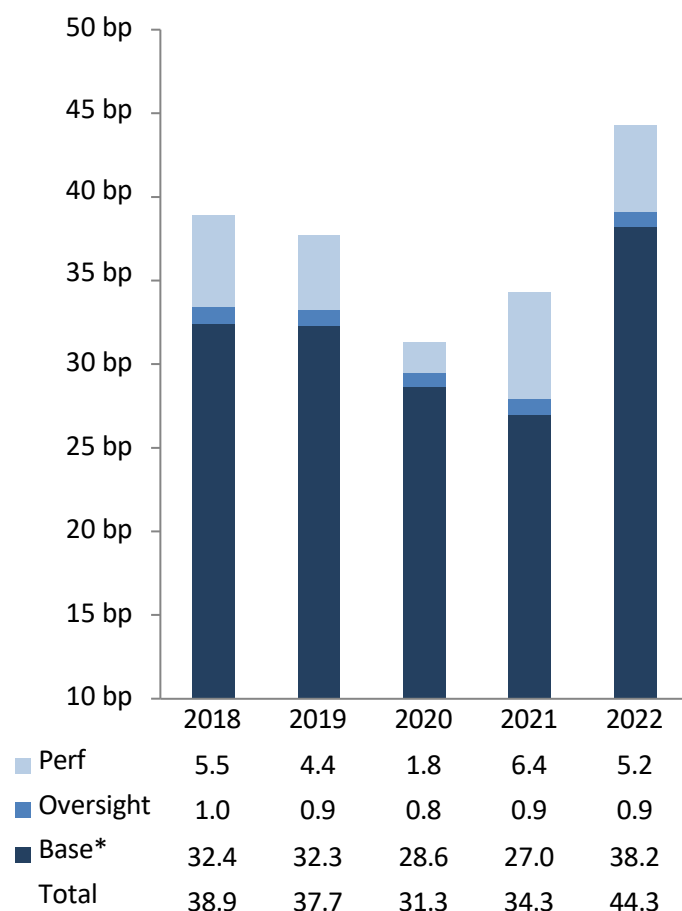
Asset management costs by asset class and style (\$000s)	Internal Overseeing of external	External Management			Total
		Passive fees	Active base fees	Perform. fees <sup>2</sup>	
Stock - U.S. broad/all		288	324	387	999
Stock - Emerging		39	1,361	671	2,070
Stock - ACWI x U.S.		621	757	288	1,667
Fixed income - U.S.		31	1,723	3,121	4,874
Fixed income - High yield			570	1,522	2,092
Cash			234		234
Infrastructure <sup>2</sup>			1,095	1,194	1,095
Natural resources <sup>2</sup>			1,971	1,958	1,971
Real estate ex-REITs <sup>2</sup>			12,200	9,706	12,200
Private equity - Diversified - LP <sup>1 2</sup>	9,792		121,321	126,047	131,113
Private equity - Diversified - Co-invest. <sup>2</sup>	1,088				1,088
Private credit - Evergreen <sup>2</sup>			10,596		10,596
Derivatives/Overlays	340	239	6	16,217	16,802
Total excluding private asset performance fees					186,801 43.3bp
<b>Oversight, custodial and other costs <sup>3</sup></b>					
Oversight of the fund					2,263
Trustee & custodial					809
Consulting and performance measurement					480
Audit					164
Other					345
Total oversight, custodial & other costs					4,061 0.9bp
Total investment costs (excl. transaction costs & private asset performance fees)					190,862 44.3bp

### Footnotes

1. Default base fees were added:  
Private equity - Diversified - LP 154 bp.  
Refer to Appendix A for full details regarding defaults.
2. Total cost excludes carry/performance fees for real estate, infrastructure, natural resources and private equity. Performance fees are included for the public market asset classes and hedge funds.
3. Excludes non-investment costs, such as benefit insurance premiums and preparing cheques for retirees.

Your costs increased by 5.4 bps, from 38.9 bps in 2018 to 44.3 bps in 2022, primarily because you had a higher cost asset mix. This was partly offset by paying less in total for similar investment styles.

Trend in cost



Reasons why your costs increased by 5.4 bps

			Impact in bps
1. Higher cost asset mix			
• More Private equity: 2018 13% vs 2022 20%			12.5
• More Private debt: 2018 2% vs 2022 3%			1.6
• All other mix changes			(1.1)
			<u>13.1</u>
2. Lower cost implementation style			
• More passive, less active			(3.1)
• All other implementation style changes			0.2
			<u>(2.9)</u>
3. Paid less in total for similar investment styles	<u>2018 cost</u>	<u>2022 cost</u>	
• Lower Private Equity LP base fees	186.1 bp	166.4 bp	(3.6)
• Lower external active U.S. Broad/All Stock costs	34.8 bp	3.0 bp	(1.8)
• Lower Private Credit base fees	91.1 bp	72.7 bp	(0.6)
• Lower external active ACWI X U.S. Stock costs	11.9 bp	3.7 bp	(0.5)
• Higher costs for overlays and unfunded strategies	1.0 bp	3.9 bp	2.9
• All other differences			(1.2)
			<u>(4.8)</u>
<b>Total increase</b>			<u><u>5.4</u></u>

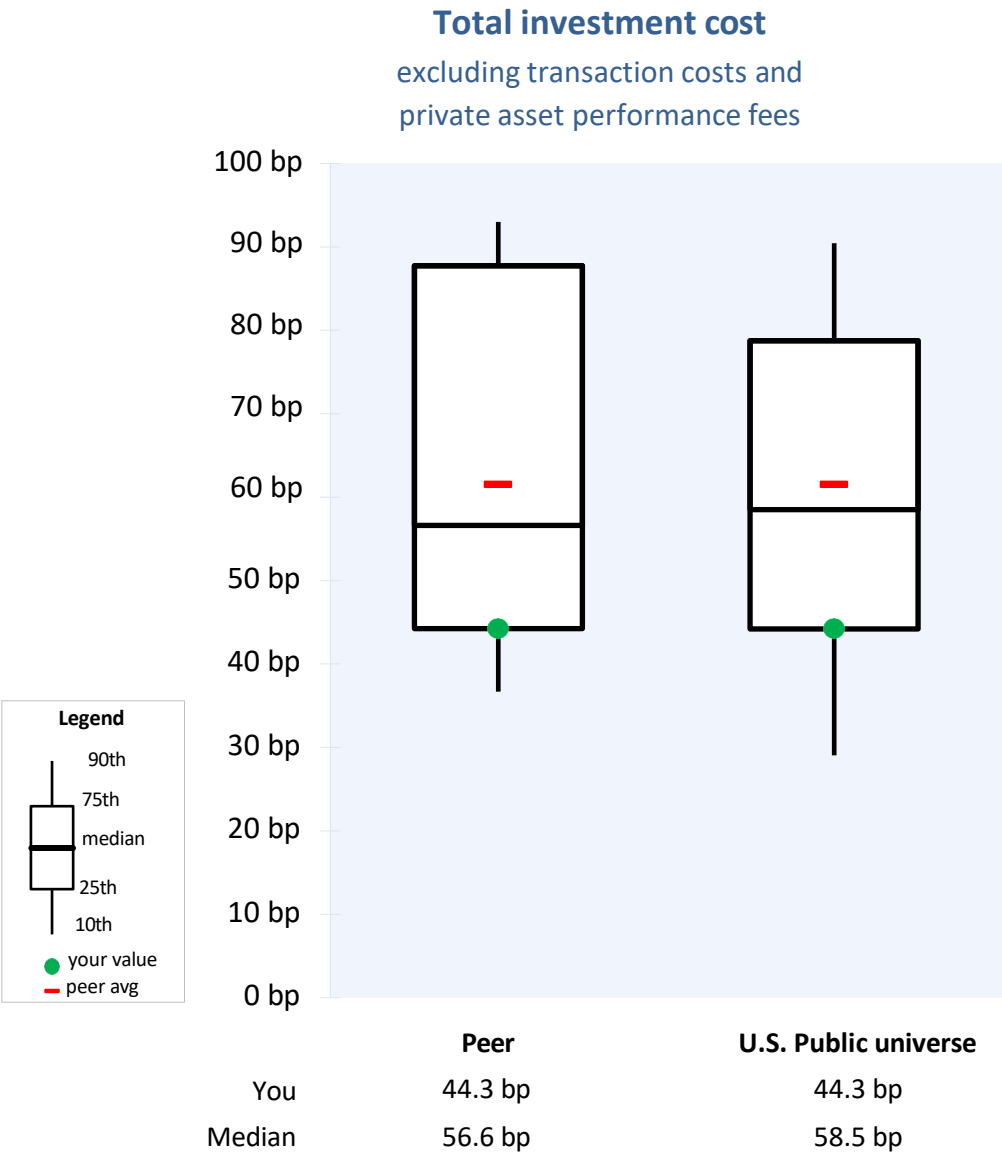
\*Includes fees for managing internal assets and internal costs of monitoring external programs, where allocated.

# Your total investment cost of 44.3 bps was below the peer median of 56.6 bps.

Differences in total investment cost are often caused by two factors that are often outside of management's control:

- Asset mix, particularly holdings of the highest cost asset classes: real estate (excl. REITs), infrastructure, hedge funds, private equity and private credit. These high cost assets equaled 33% of your assets at the end of 2022 versus a peer average of 28%.
- Fund size. Bigger funds have advantages of scale.

Therefore, to assess whether your costs are high or low given your unique asset mix and size, CEM calculates a benchmark cost for your fund. This analysis is shown on the following page.



**Benchmark cost analysis suggests that, after adjusting for fund size and asset mix, your fund was low cost by 13.4 basis points in 2022.**

Your benchmark cost is an estimate of what your cost would be given your actual asset mix and the median costs that your peers pay for similar services. It represents the cost your peers would incur if they had your actual asset mix.

Your total cost of 44.3 bp was below your benchmark cost of 57.7 bp. Thus, your cost savings were 13.4 bp.

**Your cost versus benchmark**

	\$000s	basis points
Your total investment cost	190,862	44.3 bp
Your benchmark cost	248,792	57.7 bp
Your excess cost	(57,930)	(13.4) bp

Your fund was low cost because it paid less than peers for similar services and it had a lower cost implementation style.

#### Reasons for your low cost status

	Excess Cost/ (Savings)	
	\$000s	bps
1. Lower cost implementation style		
• Less active management, more lower cost passive	(6,027)	(1.4)
• More external management, less lower cost internal	1,820	0.4
• Less LPs as a percentage of external	(8,474)	(2.0)
• Less fund of funds	(11,380)	(2.6)
• More co-investment as a percentage of LP/Co	(6,075)	(1.4)
• More overlays	13,633	3.2
	(16,503)	(3.8)
2. Paying less than peers for similar services		
• External investment management costs	(35,745)	(8.3)
• Oversight, custodial & other costs	(5,682)	(1.3)
	(41,427)	(9.6)
Total savings	(57,930)	(13.4)

## Your implementation style was 3.8 bps lower cost than the peer average.

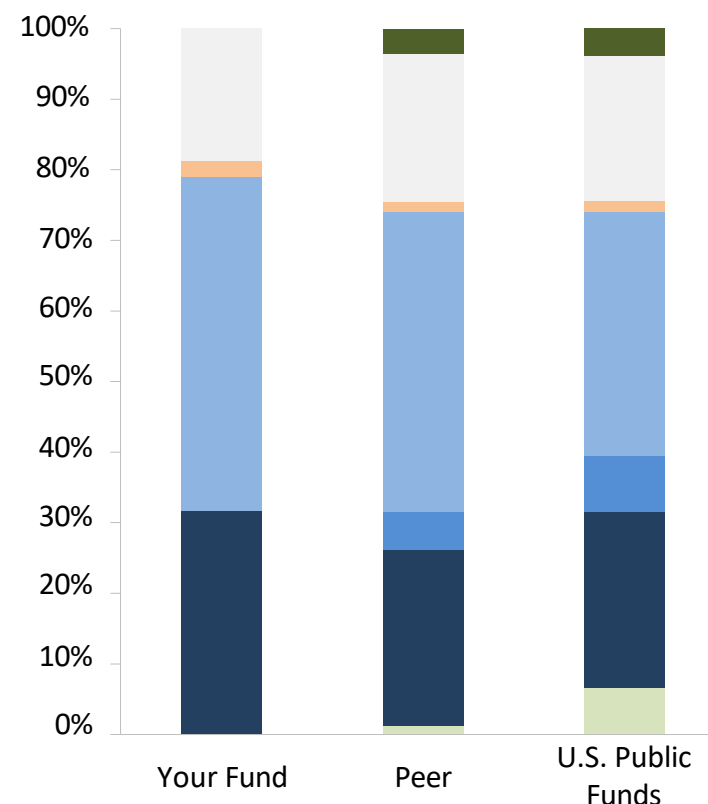
Implementation style is the way in which your fund implements asset allocation. Each implementation choice has a cost. Your first choice is how much to implement passively or actively. The table below summarizes your aggregate choices versus peers and their cost impact.

Implementation choices	Impact
More passive, less active	(1.4) bp
Less internal as a % of passive	(0.0) bp
Less internal as a % of active	0.4 bp
More evergreen % in private assets, excl. PE	(2.0) bp
Less fund of funds % of LP/Co/FoF	(2.6) bp
More co-investment % of LP/Co	(1.4) bp
More overlays	3.2 bp
<b>Total impact</b>	<b>(3.8) bp</b>

1. Implementation style is shown as a % of total fund fee basis because the fee basis is the primary driver of cost for private assets (e.g., new private equity LP commitments increase costs before LP NAV increases). Style weights are based on average holdings. Cash and derivatives are excluded.

The peer and universe style was adjusted to match your asset mix. It equals their average style for each asset class weighted by your fee basis for the asset class. It shows how the average peer would implement your asset mix.

Implementation style<sup>1</sup>



Fund of funds	0.0%	3.5%	3.9%
LP	18.8%	21.0%	20.6%
Co-investment	2.2%	1.3%	1.5%
External active	47.3%	42.6%	34.5%
Internal active	0.0%	5.4%	7.8%
External passive	31.7%	25.0%	25.1%
Internal passive	0.0%	1.2%	6.5%

## The table below summarizes why your fund is high/low cost relative to the peer-median by asset class.

### Why are you high/(low) cost by asset class?

Asset class/category	Style weighted cost			Your average assets (or fee basis) <sup>2</sup>	Due to impl. style	Due to paying more/(less) <sup>3</sup>	Total more/(less)
	Your cost	Peer median <sup>1</sup> = Benchmark	More/(less)				
<b>Asset management costs</b>	(A)	(B)	(C = A - B)	(D)			(C x D)
Stock - U.S. broad/all	1.0 bp	6.7 bp	(5.7) bp	9,999	(833)	(4,866)	(5,699)
Stock - Emerging	9.8 bp	36.6 bp	(26.8) bp	2,121	(941)	(4,746)	(5,687)
Stock - ACWI x U.S.	3.0 bp	29.2 bp	(26.2) bp	5,557	(3,738)	(10,802)	(14,540)
Fixed income - U.S.	5.0 bp	8.0 bp	(3.0) bp	9,684	846	(3,727)	(2,880)
Fixed income - Emerging	0.0 bp	32.7 bp	(32.7) bp	463	138	(1,653)	(1,514)
Fixed income - High yield	22.4 bp	28.8 bp	(6.5) bp	935	73	(679)	(606)
Real estate ex-REITs	48.0 bp	100.5 bp	(52.5) bp	2,539	(4,017)	(9,309)	(13,326)
Infrastructure	73.1 bp	78.7 bp	(5.6) bp	150	(228)	144	(85)
Natural resources	74.1 bp	89.8 bp	(15.8) bp	266	(420)	0	(420)
Private equity - Diversified	149.9 bp	169.9 bp	(19.9) bp	8,817	(17,455)	(107)	(17,562)
Private credit	72.7 bp	97.1 bp	(24.4) bp	1,458	(3,561)	0	(3,561)
Derivatives/Overlays	3.9 bp	0.7 bp	3.2 bp	43,093	13,633	0	13,633
Total asset management	43.3 bp	55.5 bp	(12.1) bp	43,093	(16,503)	(35,745)	(52,247)
<b>Oversight, custody and other costs<sup>4</sup></b>							
Oversight of the Fund	0.5 bp	0.8 bp	(0.3) bp				
Trustee & Custodial	0.2 bp	0.4 bp	(0.2) bp				
Consulting	0.1 bp	0.2 bp	(0.0) bp				
Audit	0.0 bp	0.1 bp	(0.0) bp				
Other	0.1 bp	0.2 bp	(0.1) bp				
Total oversight, custody & other	0.9 bp	2.3 bp	(1.3) bp	43,093	n/a	(5,682)	(5,682)
<b>Total</b>	<b>44.3 bp</b>	<b>57.7 bp</b>	<b>(13.4) bp</b>	<b>43,093</b>	<b>(16,503)</b>	<b>(41,427)</b>	<b>(57,930)</b>

1. The weighted peer median cost for asset management is the style-weighted average of the peer median costs for all implementation styles (e.g., internal passive, external active, fund of fund, etc.). It excludes performance fees on private assets.

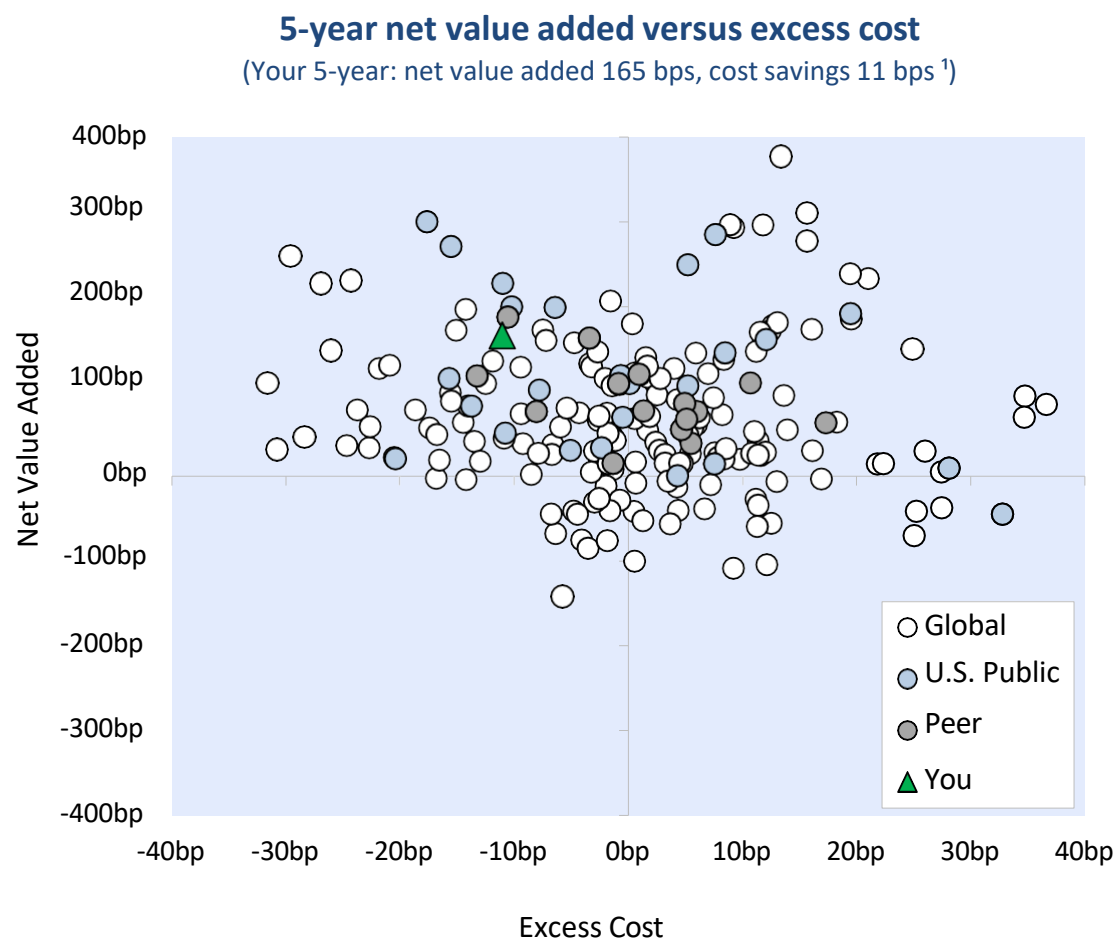
2. Total fund average holdings is used as the base when calculating the relative cost impact of the overlay programs.

3. Total more/less differences include the impact of performance fees, which are not shown separately on this page.

Refer to section 4 for a comprehensive breakdown of your differences.

4. Benchmarks for oversight total and individual lines are based on peer medians. Sum of the lines may be different from the total.

Your 5-year performance placed in the positive value added, low cost quadrant of the cost effectiveness chart.



1. Your 5-year savings of 11.0 basis points is the average of your peer-based savings for the past 5 years.

	2022	2021	2020	2019	2018	5-year
Net value added	206.7bp	138.4bp	228.7bp	349.9bp	(78.0) bp	165.3bp
Excess cost	(13.4) bp	(9.0) bp	(14.0) bp	(10.3) bp	(8.4) bp	(11.0) bp



# Summary of key takeaways

## Returns

- Your 5-year net total return was 7.0%. This was above both the U.S. Public median of 5.9% and the peer median of 5.7%.
- Your 5-year policy return was 5.3%. This was above both the U.S. Public median of 4.6% and the peer median of 4.8%.

## Value added

- Your 5-year net value added was 1.7%. This was above both the U.S. Public median of 1.1% and the peer median of 0.8%.

## Cost and cost effectiveness

- Your investment cost of 44.3 bps was below your benchmark cost of 57.7 bps. This suggests that your fund was low cost compared to your peers.
- Your fund was low cost because it paid less than peers for similar services and it had a lower cost implementation style.
- Your costs increased by 5.4 bps, from 38.9 bps in 2018 to 44.3 bps in 2022, primarily because you had a higher cost asset mix. This was partly offset by paying less in total for similar investment styles.

# Thank you



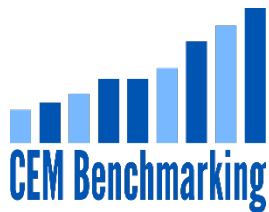
**Christopher Doll**

**Director, Client Coverage**

—

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CEMbenchmarking.com





**Wilshire**

# Iowa Public Employees' Retirement Fund

Fiscal Year 2023 Investment Summary

# Quarterly Market Review

June 30, 2023

# Market Commentary

## U.S. Equity

The U.S. stock market was up 8.43% for the second quarter and is up 19.03% for the past 12 months. The best performing sectors were information technology (+17.2%), consumer discretionary (+14.6) and communication services (+13.1%). The worst performing sector was utilities (-2.5%). From a size perspective, large-cap outperformed small-cap by 331 basis points. Growth stocks vastly outperformed value for the second straight quarter and now lead meaningfully for the one-year return.

Large-cap growth stocks are outperforming value stocks by an astonishing margin this year. While growth tends to lead during bull markets, the current 6-month return difference is the largest in 25 years at +29.4%. This can be dissected further to find that just a few stocks are contributing a vast majority of the overall market return through June. Additionally, most of these names are technology sector stocks – Amazon, Apple, Google and Meta. It is worth noting that these companies are highly dependent on the consumer's ability to spend. U.S. real personal consumption's steady growth during the past 1.5 years will need to continue to support not just economic growth but also current stock prices.

## Non-U.S. Equity

Economic growth within the United Kingdom has been positive enough this year to barely escape a technical recession. Inflation has been trending downward within Britain but at a much slower pace versus other regions, with annual changes being twice as high in the U.K. as in the U.S., as of the end of May. In China, several economic indicators have fallen short of expectations during the past few weeks, including measurements of industrial production, retail sales and trade.

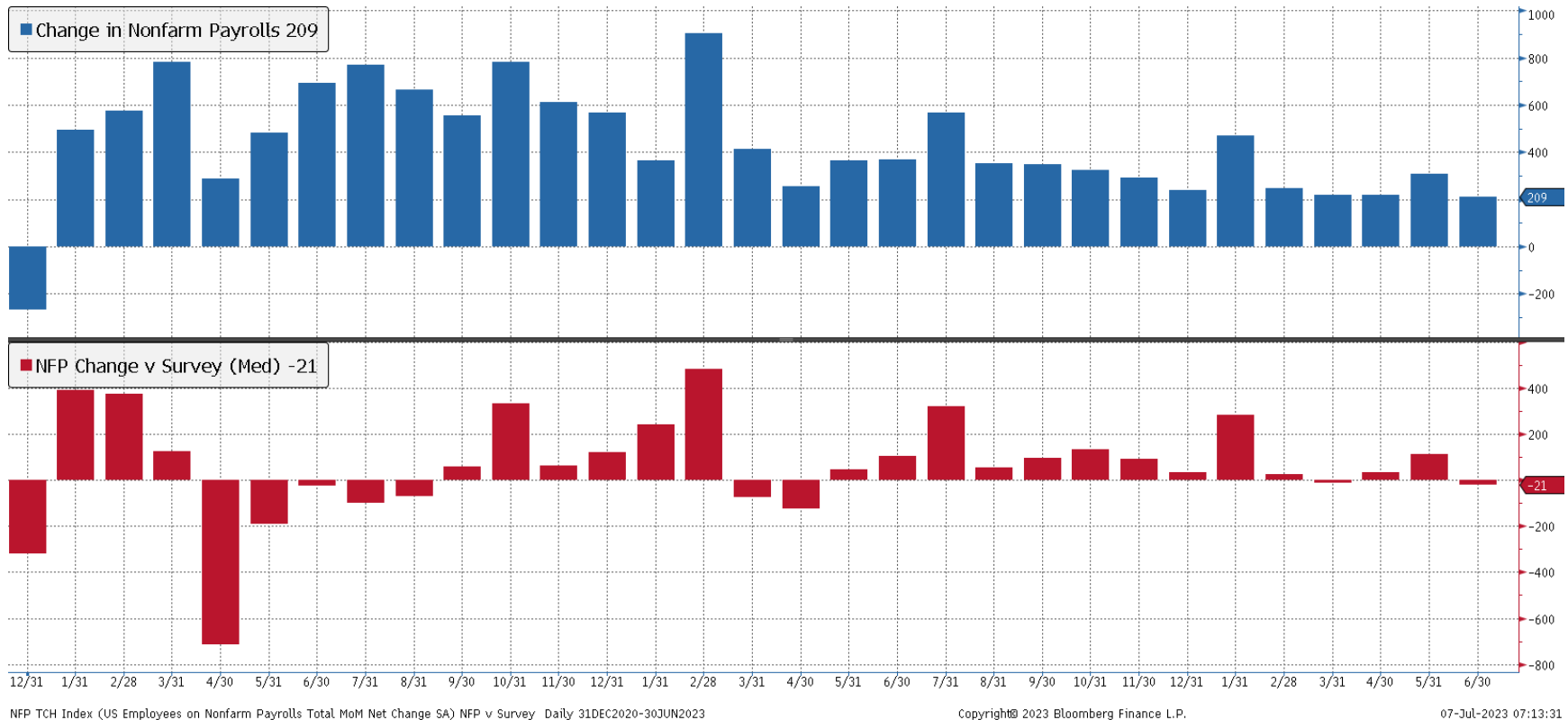
## Fixed Income

The 10-year Treasury yield ended the quarter at 3.84%, up 37 basis points. Credit spreads were noticeably down during the quarter with high yield spreads down 69 basis points. The FOMC increased the overnight rate by 0.25% in May, targeting a range of 5.00% to 5.25%, before pausing increases in June. The Fed's "dot plot" is messaging that the current expectation is for another 50 basis point in increases before the end of 2023. In late June, Fed Chair Jerome Powell said that central bank policy "may not be restrictive enough and it has not been restrictive for long enough.

# June 2023 Asset Class Assumptions

	Equity						Fixed Income						Real Assets						
	US Stock	Dev ex-US Stock	Emg Stock	Global ex-US Stock	Global Stock	Private Equity	Cash	Core Bond	LT Core Bond	TIPS	High Yield	Private Credit	Dev ex-US Bond (Hdg)	US RES	Global RES	Private RE	Cmdty	Real Assets	US CPI
Compound Return (%)	5.50	6.50	6.75	6.85	6.15	9.00	3.85	4.85	4.80	4.05	6.20	8.35	3.05	5.75	5.90	6.00	6.10	6.60	2.25
Expected Risk (%)	17.00	18.00	26.00	19.05	17.10	29.65	0.75	4.70	9.85	6.00	10.00	12.75	4.00	17.50	16.45	13.90	16.00	12.35	1.75
Cash Yield (%)	1.50	3.10	2.60	2.95	2.05	0.00	3.85	4.95	5.15	4.35	9.40	5.00	3.60	4.05	4.05	2.30	3.85	3.25	0.00
Growth Exposure	8.00	8.00	8.00	8.00	8.00	14.00	0.00	-0.95	-2.40	-3.00	4.00	5.10	-1.00	6.00	6.00	3.50	0.00	2.70	0.00
Inflation Exposure	-3.00	0.00	5.00	1.45	-1.30	-3.75	0.00	-2.50	-6.80	2.50	-1.00	-1.50	-3.00	1.00	1.80	1.00	12.00	5.25	1.00
Correlations																			
US Stock	1.00																		
Dev ex-US Stock (USD)	0.81	1.00																	
Emerging Mkt Stock	0.74	0.74	1.00																
Global ex-US Stock	0.84	0.95	0.89	1.00															
Global Stock	0.95	0.91	0.84	0.94	1.00														
Private Equity	0.72	0.63	0.61	0.67	0.73	1.00													
Cash Equivalents	-0.05	-0.09	-0.05	-0.08	-0.06	0.00	1.00												
Core Bond	0.28	0.13	0.00	0.08	0.20	0.30	0.18	1.00											
LT Core Bond	0.31	0.15	0.01	0.11	0.24	0.31	0.11	0.94	1.00										
TIPS	-0.05	0.00	0.15	0.06	-0.01	-0.03	0.20	0.60	0.48	1.00									
High Yield Bond	0.54	0.39	0.49	0.46	0.53	0.31	-0.10	0.24	0.32	0.05	1.00								
Private Credit	0.68	0.55	0.58	0.60	0.68	0.44	0.00	0.24	0.30	0.00	0.76	1.00							
Dev ex-US Bond (Hdg)	0.16	0.25	-0.01	0.16	0.17	0.26	0.10	0.68	0.66	0.39	0.26	0.22	1.00						
US RE Securities	0.58	0.47	0.44	0.49	0.57	0.49	-0.05	0.17	0.22	0.10	0.56	0.62	0.05	1.00					
Global RE Securities	0.64	0.57	0.54	0.60	0.65	0.55	-0.05	0.17	0.21	0.11	0.61	0.68	0.04	0.96	1.00				
Private Real Estate	0.55	0.45	0.45	0.49	0.54	0.50	-0.05	0.19	0.25	0.09	0.58	0.63	0.05	0.79	0.78	1.00			
Commodities	0.25	0.34	0.39	0.38	0.32	0.28	0.00	-0.03	-0.03	0.25	0.29	0.29	-0.10	0.25	0.28	0.25	1.00		
Real Assets	0.62	0.63	0.65	0.69	0.67	0.57	-0.03	0.22	0.24	0.30	0.64	0.69	0.04	0.78	0.84	0.76	0.64	1.00	
Inflation (CPI)	-0.10	-0.15	-0.13	-0.15	-0.13	-0.10	0.10	-0.12	-0.12	0.15	-0.08	0.00	-0.08	0.05	0.04	0.05	0.44	0.22	1.00

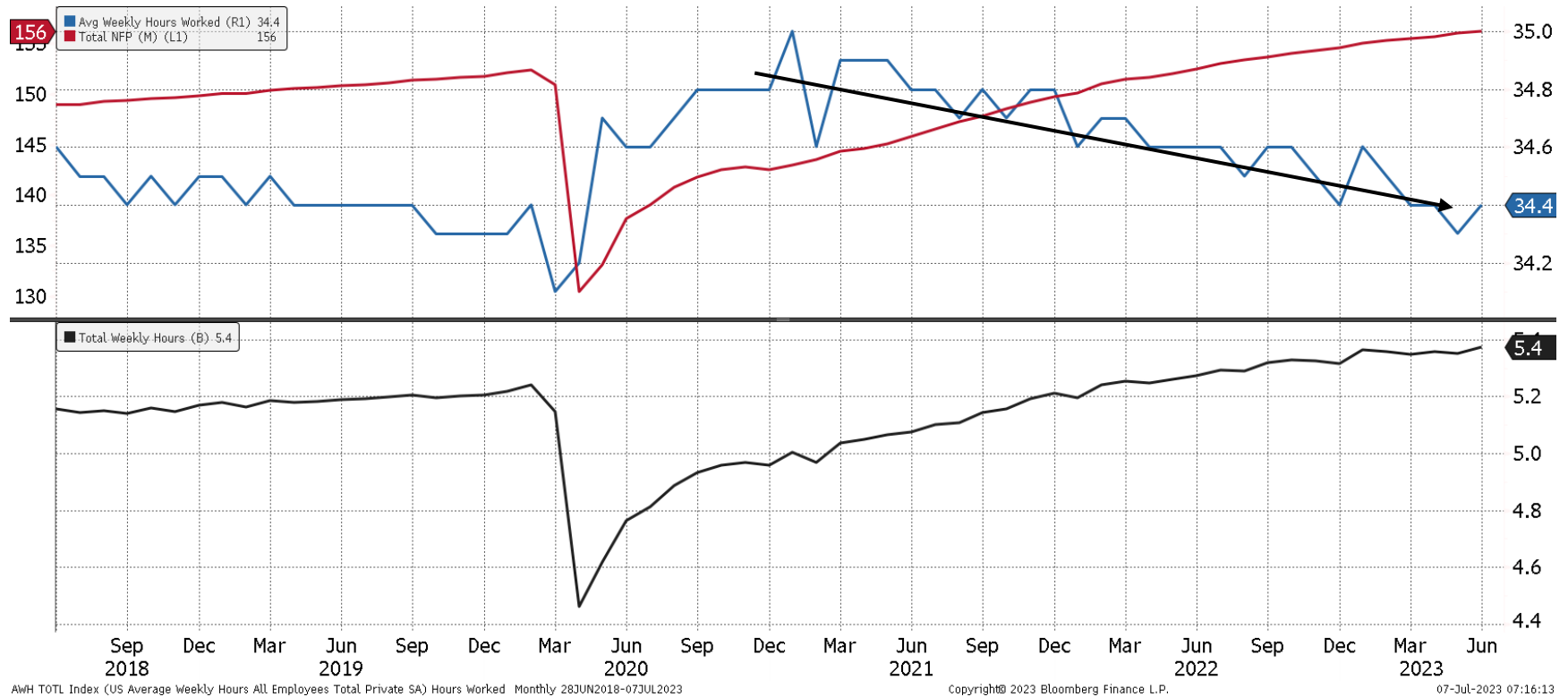
# Job Market Looks Strong (and exceeding expectations)...



Data Source: Bloomberg

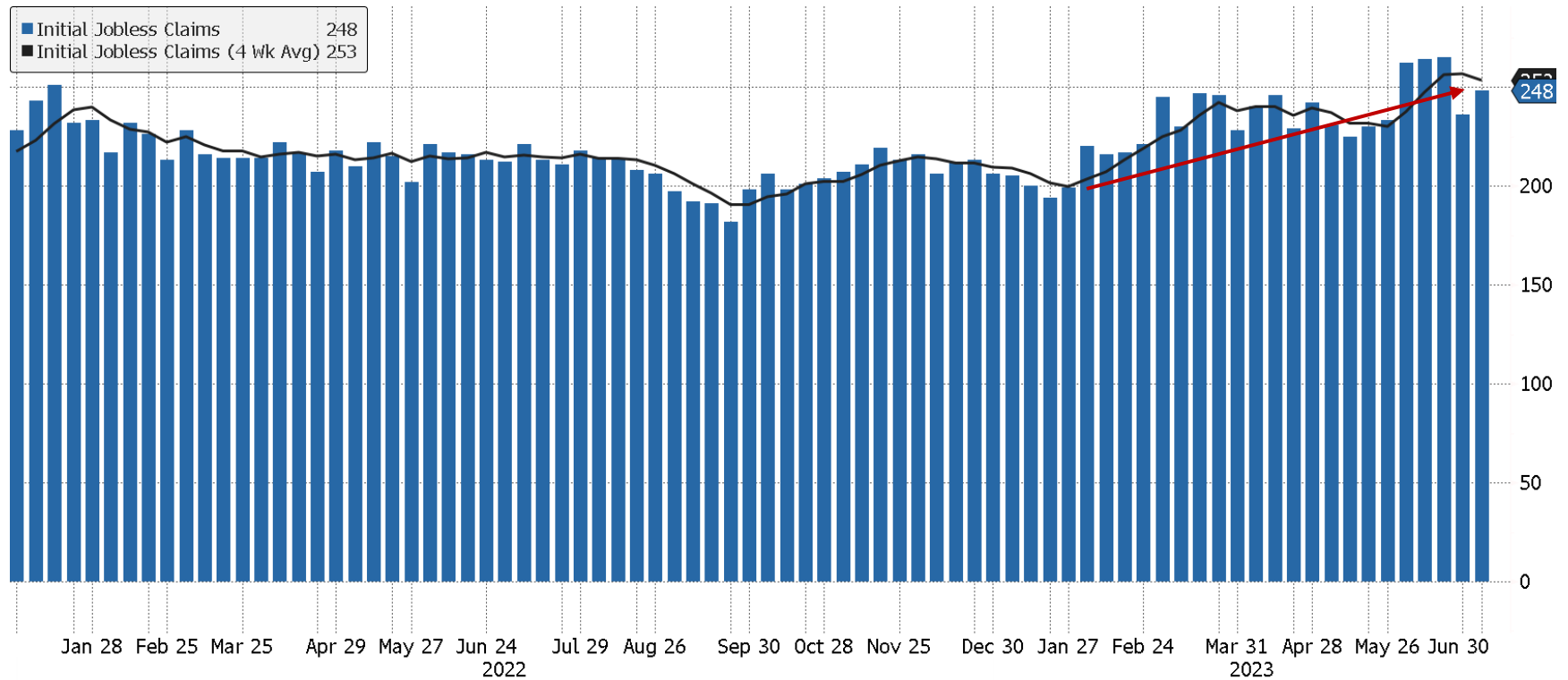


# Early Signs of Slowing: Plateau in Hours Worked



Data Source: Bloomberg

# Early Signs of Slowing: Increase in Claims



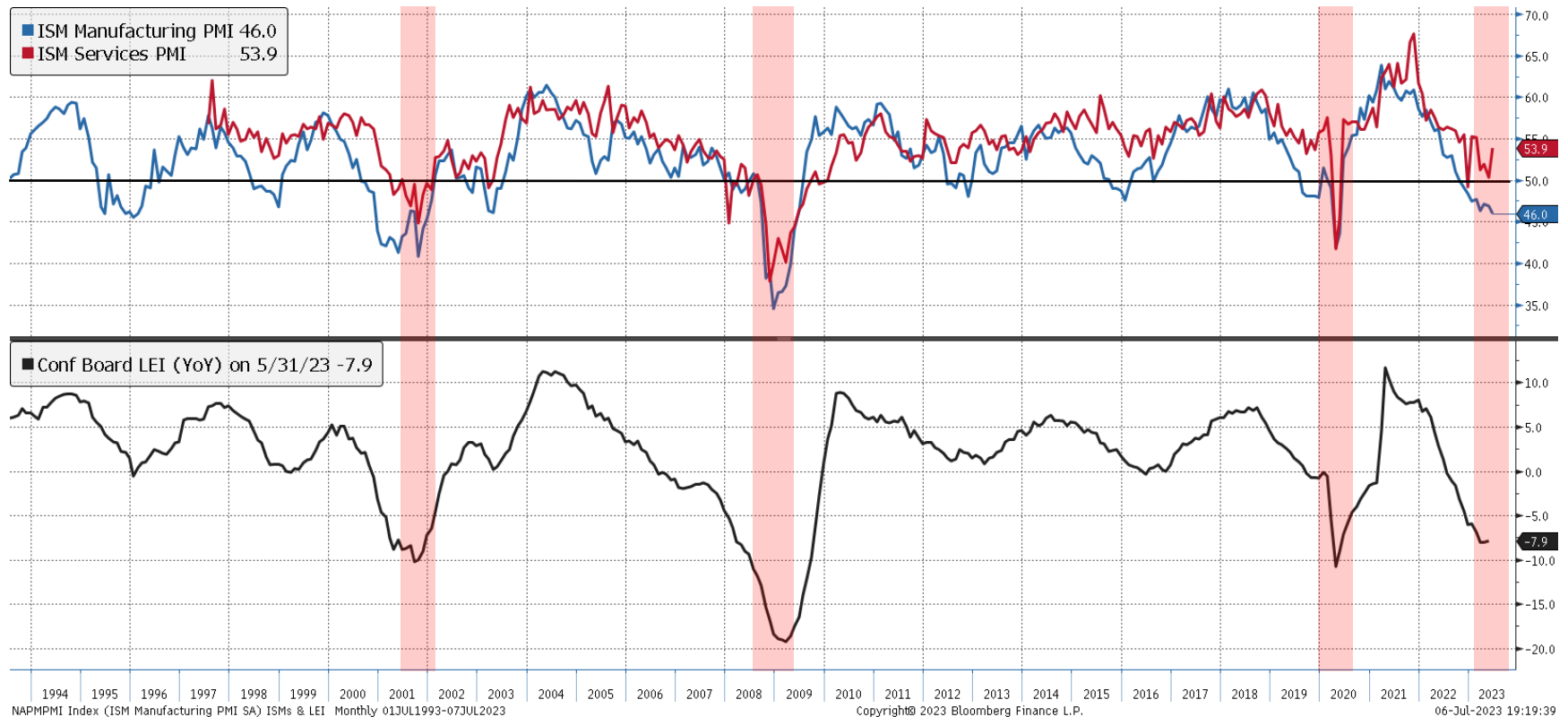
INJCJC Index (US Initial Jobless Claims SA) Claims Daily 31DEC2021-07JUL2023

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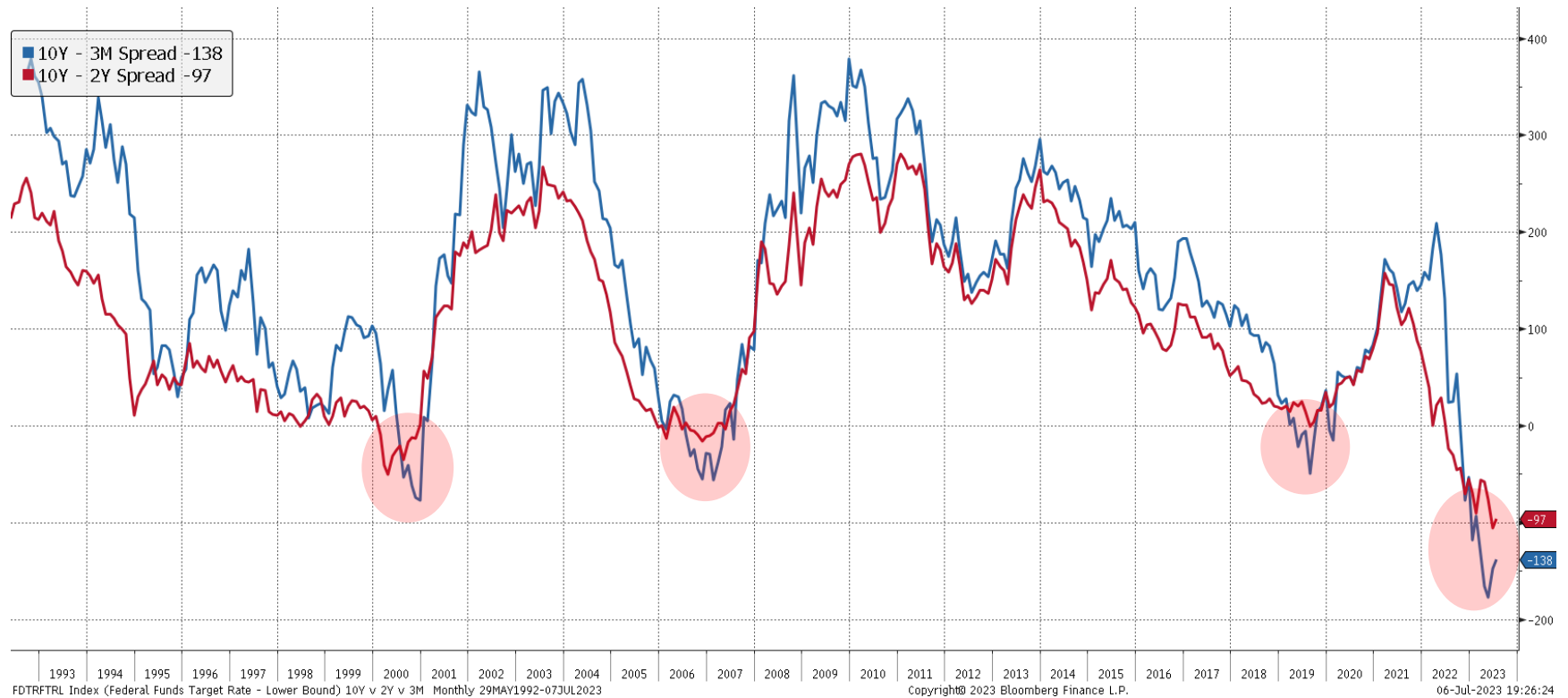
Data Source: Bloomberg

# ISM Surveys & Leading Indicators Pointing Down...



Data Source: Bloomberg

# Yield Curve Flashing Red



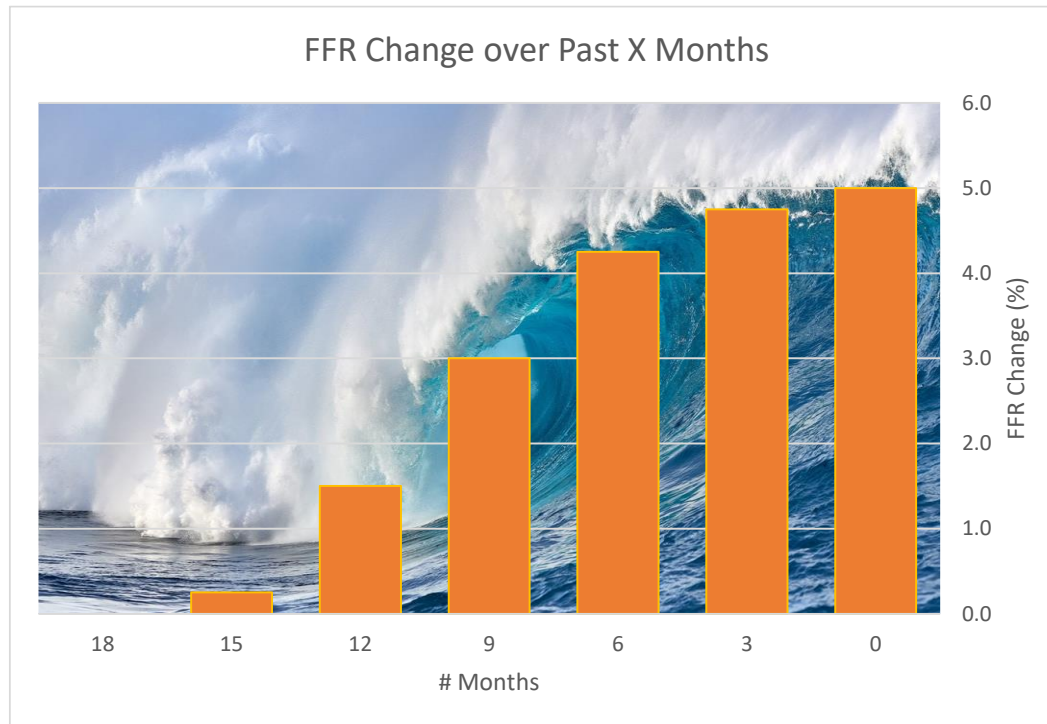
Data Source: Bloomberg

# Are We There Yet?: Fed Journey Towards the “Neutral Rate”



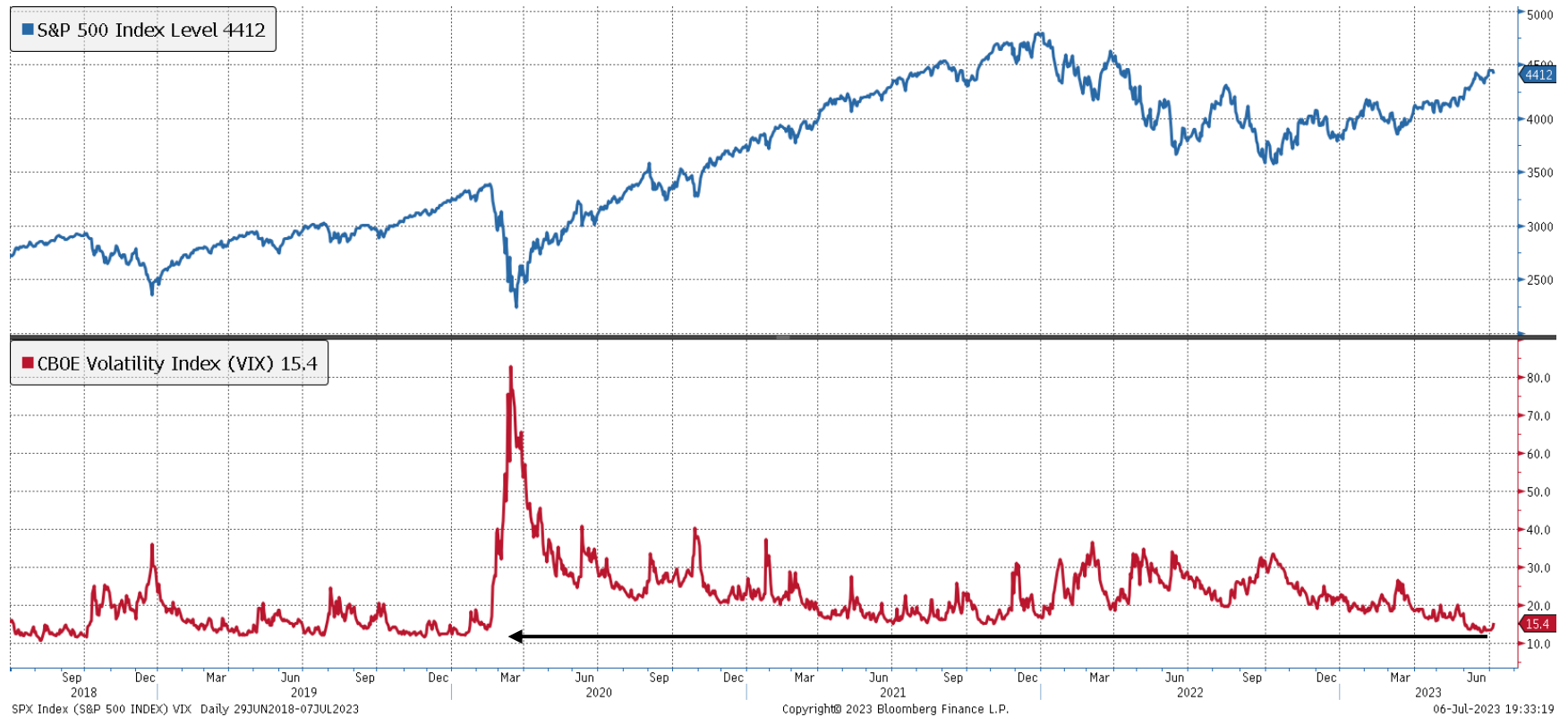
Data Source: Bloomberg

# The Tightening Wave: Unpredictable but Building



Arguably less than a year since the overnight rate has been meaningfully higher, with a sizeable lag between rate changes and when they hit the real economy

# U.S. Stock Markets Showing No Fear...



Data Source: Bloomberg

# Asset Class Performance

## Asset Class Returns - Best to Worst

2018	2019	2020	2021	2022	2023 YTD	Annualized 5-Year as of 6/23
T-Bills 1.9%	U.S. Equity 31.0%	U.S. Equity 20.8%	REITs 46.2%	Commodities 16.1%	U.S. Equity 16.3%	U.S. Equity 11.7%
Core Bond 0.0%	REITs 25.8%	Emrg Mrkts 18.7%	Commodities 27.1%	T-Bills 1.3%	Developed 12.1%	Developed 4.9%
U.S. TIPS -1.3%	Developed 22.7%	U.S. TIPS 11.0%	U.S. Equity 26.7%	High Yield -11.2%	REITs 6.7%	Commodities 4.7%
High Yield -2.1%	Emrg Mrkts 18.9%	Developed 8.3%	Developed 11.8%	U.S. TIPS -11.8%	High Yield 5.4%	REITs 4.4%
REITs -4.8%	High Yield 14.3%	Core Bond 7.5%	U.S. TIPS 6.0%	Core Bond -13.0%	Emrg Mrkts 5.1%	High Yield 3.4%
U.S. Equity -5.3%	Core Bond 8.7%	High Yield 7.1%	High Yield 5.3%	Developed -14.0%	T-Bills 2.3%	U.S. TIPS 2.5%
Commodities -11.2%	U.S. TIPS 8.4%	T-Bills 0.7%	T-Bills 0.0%	U.S. Equity -19.0%	Core Bond 2.1%	T-Bills 1.5%
Developed -13.4%	Commodities 7.7%	Commodities -3.1%	Core Bond -1.5%	Emrg Mrkts -19.7%	U.S. TIPS 1.9%	Emrg Mrkts 1.3%
Emrg Mrkts -14.2%	T-Bills 2.3%	REITs -7.9%	Emrg Mrkts -2.2%	REITs -26.8%	Commodities -7.8%	Core Bond 0.8%

Data Sources: Bloomberg      Note: Developed asset class is developed equity markets ex-U.S., ex-Canada



# Total Fund

## Executive Summary (as of 6/30/2023)

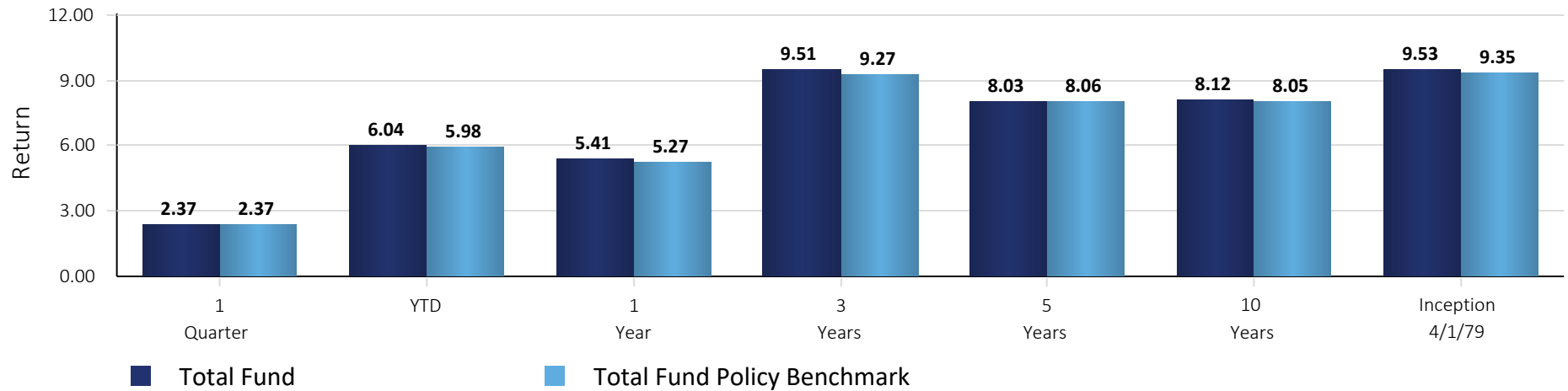
- Total Fund returned 5.4% during FY 2023, outperforming the Total Fund Policy Benchmark<sup>1</sup> (“policy”) return of 5.3% over the same period
- Manager alpha across public markets was mixed for the year. U.S. Equity, Core Fixed Income, and Public Credit trailed their policies, while International Equity outperformed their respective index
- 10-year annualized returns were 8.1% for Total Fund, slightly outpacing the policy return
- IPERS ranks very favorably versus peers across all time horizons. Total Fund return has ranked top decile against all public plans with greater than \$1 billion in assets over 5-, and 10-years
- IPERS’ 5-year risk-adjusted returns remain top-decile relative to all public plans greater than \$1 billion in Total Fund assets—outpacing 91% of peers

# Total Fund Summary

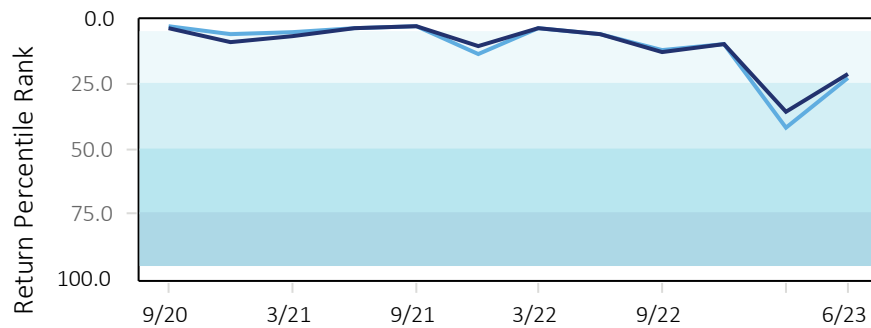
## Total Fund

Periods Ended June 30, 2023

### Comparative Performance

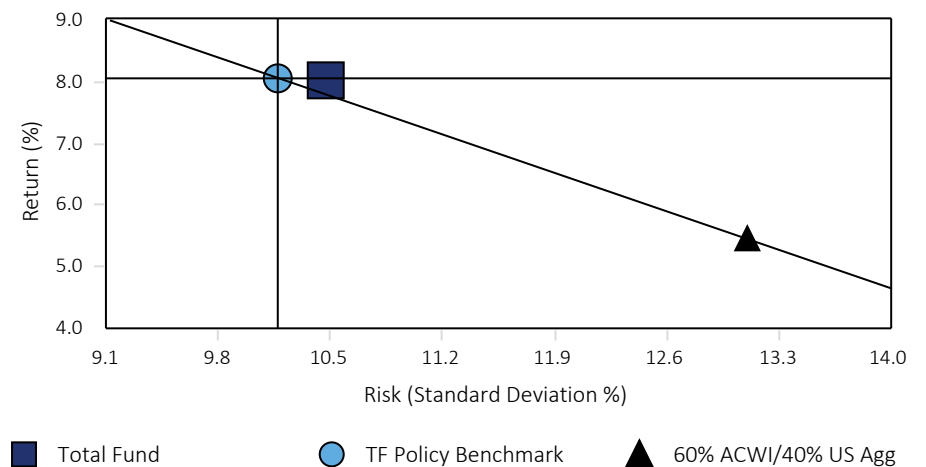


### Rolling Percentile Rank: All Public Plans >\$1B-Total Fund



	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
— Total Fund	12	11 (92%)	1 (8%)	0 (0%)	0 (0%)
— Benchmark	12	11 (92%)	1 (8%)	0 (0%)	0 (0%)

### Risk and Return (5-year)



# Asset Allocation & Performance

## Total Fund

Periods Ended June 30, 2023

	Performance (%) net of fees										Market Value \$	%
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date		
<b>Total Fund</b>	<b>2.37</b>	<b>5.41</b>	<b>5.41</b>	<b>9.51</b>	<b>8.03</b>	<b>8.12</b>	<b>7.95</b>	<b>8.36</b>	<b>9.53</b>	<b>4/1/1979</b>	<b>41,128,970,614</b>	<b>100.00</b>
Total Fund Policy Benchmark	2.37	5.27	5.27	9.27	8.06	8.05	8.06	8.08	9.35			
Public Markets Reference Index	3.06	9.25	9.25	5.01	5.29	6.19	6.70					
CPI + 3%	1.83	6.06	6.06	8.95	7.02	5.79	5.65	5.60	6.49			
All Public Plans > \$1B-Total Fund Median	2.59	7.57	7.57	8.30	6.25	6.95	7.03	7.48				
Actuarial Rate	1.71	7.00	7.00	7.00	7.00	7.15	7.33	7.33	7.07			
<b>Public Markets Composite</b>	<b>3.22</b>	<b>10.20</b>	<b>10.20</b>	<b>5.86</b>	<b>5.49</b>				<b>6.07</b>	<b>10/1/2016</b>	<b>27,836,355,032</b>	<b>67.68</b>
Public Markets Reference Index	3.06	9.25	9.25	5.01	5.29				6.02			
<b>U.S. Equity Composite</b>	<b>8.03</b>	<b>18.51</b>	<b>18.51</b>	<b>14.21</b>	<b>11.34</b>	<b>12.39</b>	<b>9.67</b>	<b>9.89</b>	<b>11.29</b>	<b>4/1/1975</b>	<b>8,560,186,945</b>	<b>20.81</b>
U.S. Equity Composite Benchmark	8.39	18.95	18.95	14.24	11.67	12.51	10.20	9.98				
<b>International Equity Composite</b>	<b>3.08</b>	<b>14.30</b>	<b>14.30</b>	<b>7.99</b>	<b>3.65</b>	<b>5.09</b>	<b>6.77</b>	<b>5.66</b>	<b>5.27</b>	<b>10/1/1989</b>	<b>6,606,408,943</b>	<b>16.06</b>
International Equity Policy Index	2.44	12.72	12.72	7.22	3.53	5.00	7.03	5.46	5.17			
<b>Core Fixed Income Composite</b>	<b>-0.94</b>	<b>-0.20</b>	<b>-0.20</b>	<b>-3.38</b>	<b>1.07</b>	<b>1.94</b>	<b>3.51</b>	<b>4.84</b>	<b>6.34</b>	<b>7/1/1985</b>	<b>8,958,450,555</b>	<b>21.78</b>
Core Plus Fixed Income Policy Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	4.60	5.95			
<b>Public Credit Composite</b>	<b>1.77</b>	<b>8.10</b>	<b>8.10</b>	<b>2.11</b>	<b>2.62</b>	<b>3.65</b>	<b>5.71</b>		<b>5.52</b>	<b>4/1/1998</b>	<b>1,185,088,014</b>	<b>2.88</b>
Public Credit Policy Index	1.68	8.38	8.38	1.19	2.50	3.69	5.86		5.44			
<b>Global Smart Beta Composite</b>	<b>3.66</b>	<b>13.65</b>	<b>13.65</b>	<b>11.42</b>	<b>6.55</b>				<b>6.83</b>	<b>8/1/2017</b>	<b>2,041,666,498</b>	<b>4.96</b>
Global Smart Beta Policy Index	3.68	13.86	13.86	11.60	6.65				6.93			
MSCI AC World Index (Net)	6.18	16.53	16.53	10.99	8.10				8.16			

# Asset Allocation & Performance

Total Fund

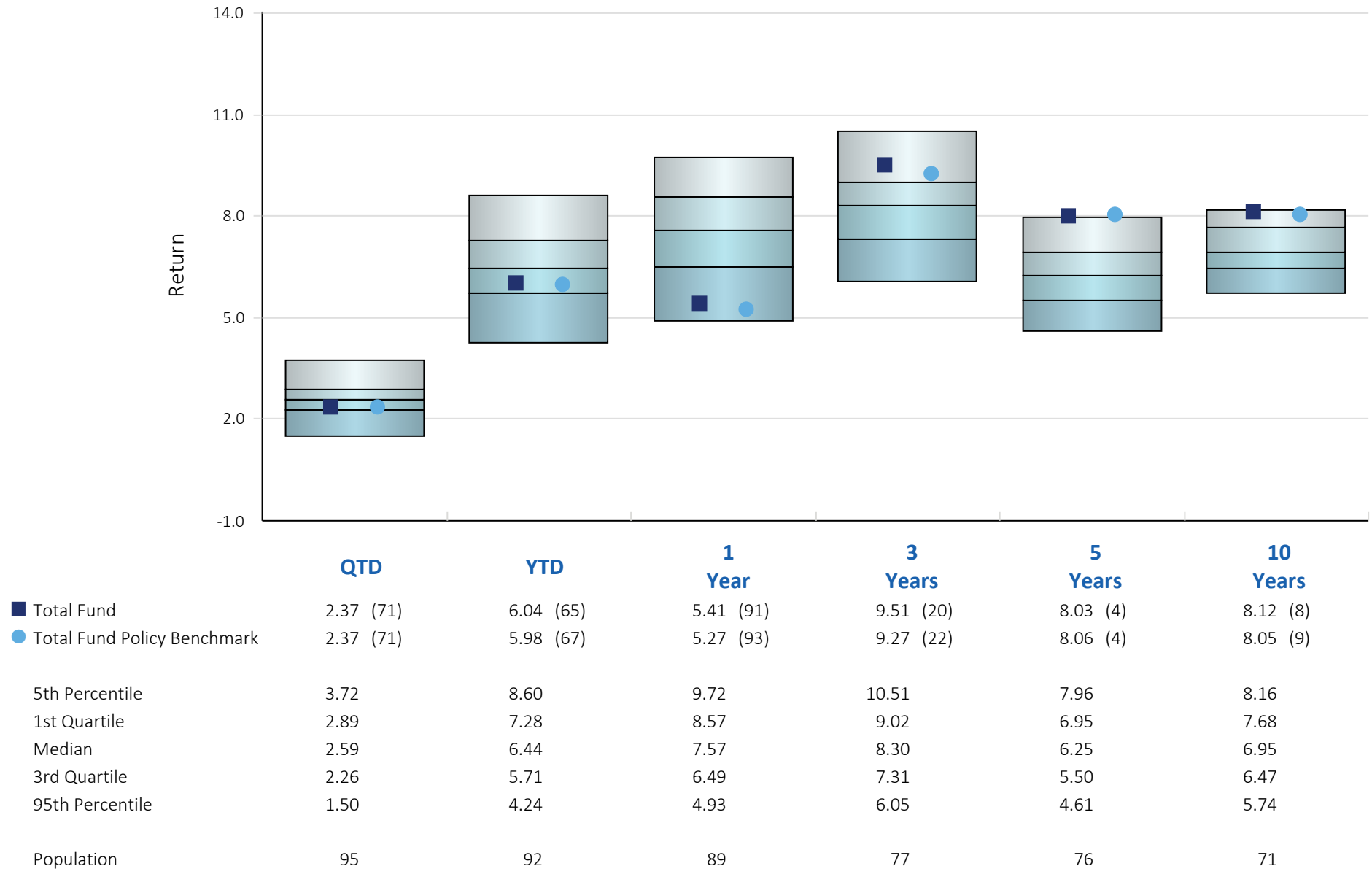
Periods Ended June 30, 2023

	Performance (%) net of fees										Market Value \$	%
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	30 Years	Since Inception	Inception Date		
<b>LARS</b>	<b>6.32</b>	<b>-0.51</b>	<b>-0.51</b>	<b>18.70</b>	<b>11.91</b>				<b>8.45</b>	<b>1/1/2017</b>	<b>225,019,160</b>	<b>0.55</b>
LIBOR 3 Month	1.34	4.58	4.58	1.79	1.89				1.82			
<b>Cash Composite</b>	<b>2.76</b>	<b>1.76</b>	<b>1.76</b>	<b>6.02</b>	<b>5.54</b>	<b>3.31</b>	<b>2.79</b>		<b>3.41</b>	<b>7/1/1995</b>	<b>484,554,077</b>	<b>1.18</b>
90 Day U.S. Treasury Bill	1.17	3.59	3.59	1.27	1.55	0.97	1.32		2.23			
<b>Private Markets Composite</b>	<b>0.51</b>	<b>-3.85</b>	<b>-3.85</b>	<b>20.55</b>	<b>15.86</b>				<b>15.67</b>	<b>10/1/2016</b>	<b>13,292,615,582</b>	<b>32.32</b>
<b>Private Equity/Debt</b>	<b>1.60</b>	<b>-5.67</b>	<b>-5.67</b>	<b>25.14</b>	<b>19.26</b>	<b>17.47</b>	<b>16.48</b>	<b>15.04</b>	<b>13.07</b>	<b>10/1/1985</b>	<b>7,864,812,474</b>	<b>19.12</b>
Private Equity Policy Index	1.60	-5.67	-5.67	25.14	19.26	17.29	14.11	13.67	14.71			
<b>Private Credit Composite</b>	<b>1.85</b>	<b>5.45</b>	<b>5.45</b>	<b>7.94</b>	<b>6.75</b>				<b>7.30</b>	<b>10/1/2016</b>	<b>2,178,537,557</b>	<b>5.30</b>
Private Credit Policy Index	1.85	5.45	5.45	7.94	6.75				7.30			
<b>Private Real Assets Composite</b>	<b>-2.86</b>	<b>-4.54</b>	<b>-4.54</b>	<b>13.47</b>	<b>9.91</b>				<b>9.74</b>	<b>10/1/2016</b>	<b>3,249,265,551</b>	<b>7.90</b>
Private Real Assets Policy Index	-2.86	-4.54	-4.54	13.47	9.91				9.74			

# Plan Sponsor Peer Group Analysis

Total Fund vs All Public Plans > \$1B-Total Fund

Periods Ended June 30, 2023

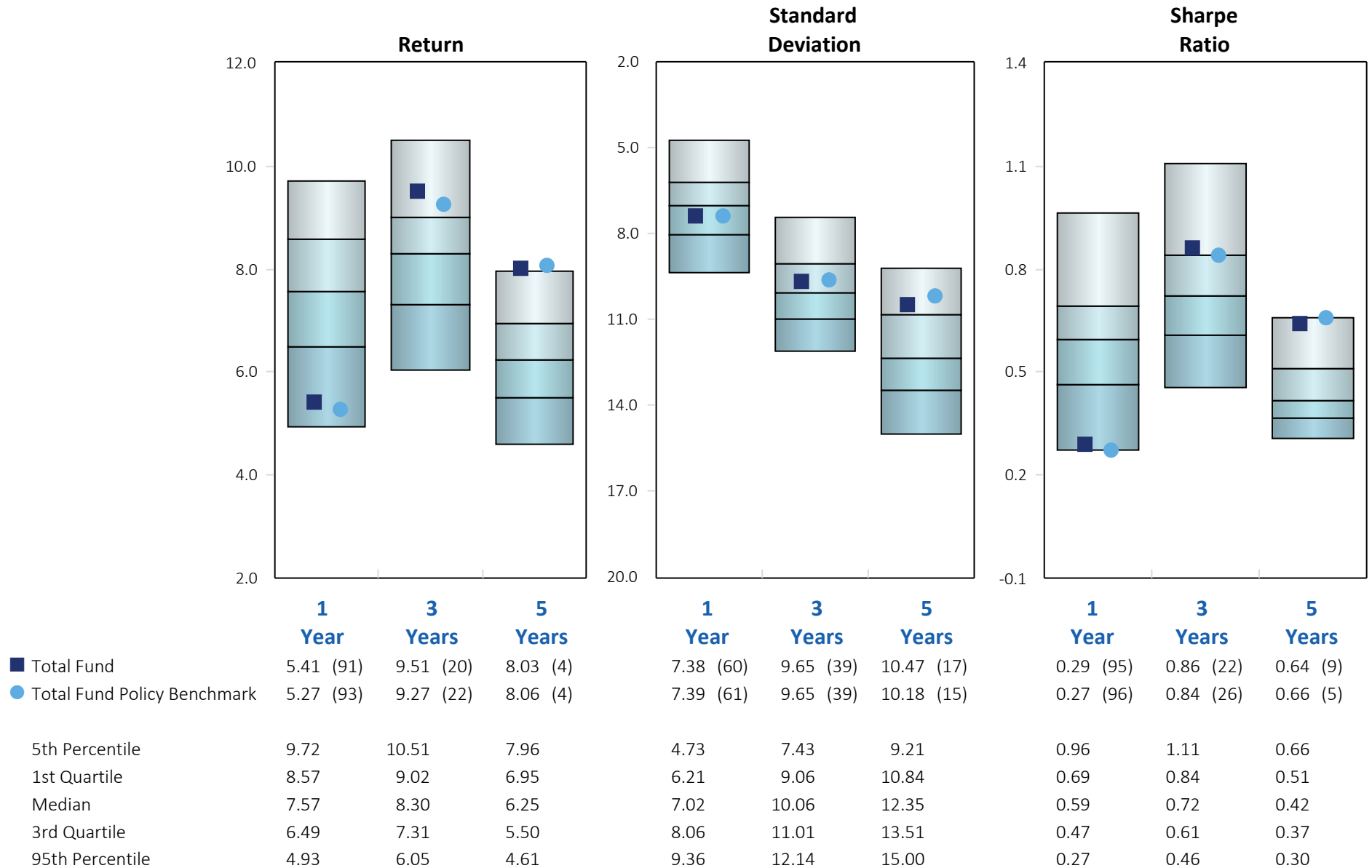


Parenteses contain percentile rankings.  
Calculation based on quarterly periodicity.

# Plan Sponsor Peer Group Analysis - Multi Statistics

Total Fund vs All Public Plans > \$1B-Total Fund

Periods Ended June 30, 2023

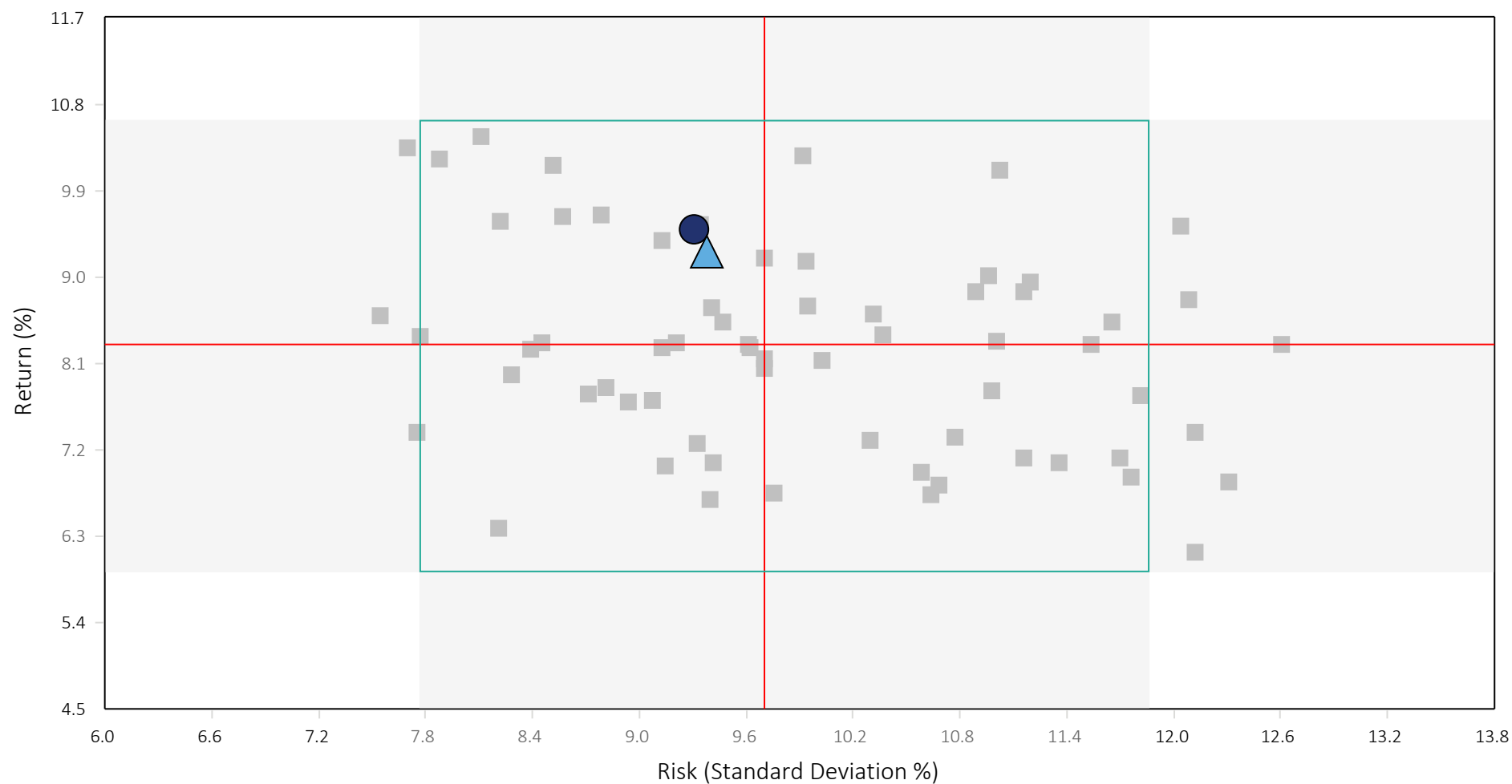


Parenteses contain percentile rankings.  
Calculation based on quarterly periodicity.

# Plan Sponsor Scattergram

Total Fund vs All Public Plans > \$1B-Total Fund

Periods Ended July 1, 2020 To June 30, 2023



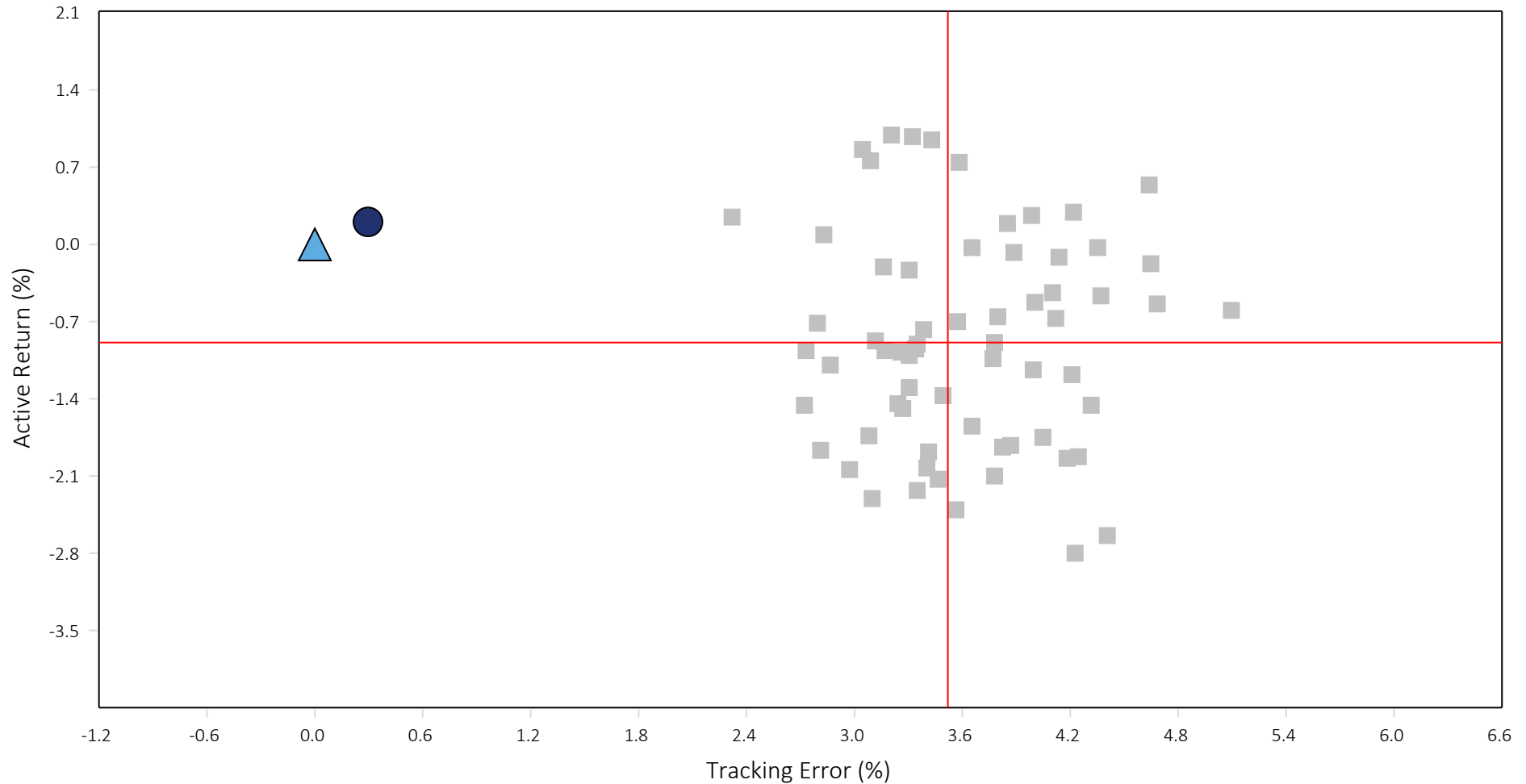
	Return	Standard Deviation
● Total Fund	9.51	9.31
▲ Total Fund Policy Benchmark	9.27	9.38
— Median	8.30	9.70



# Plan Sponsor Scattergram

Total Fund vs All Public Plans > \$1B-Total Fund

Periods Ended July 1, 2020 To June 30, 2023



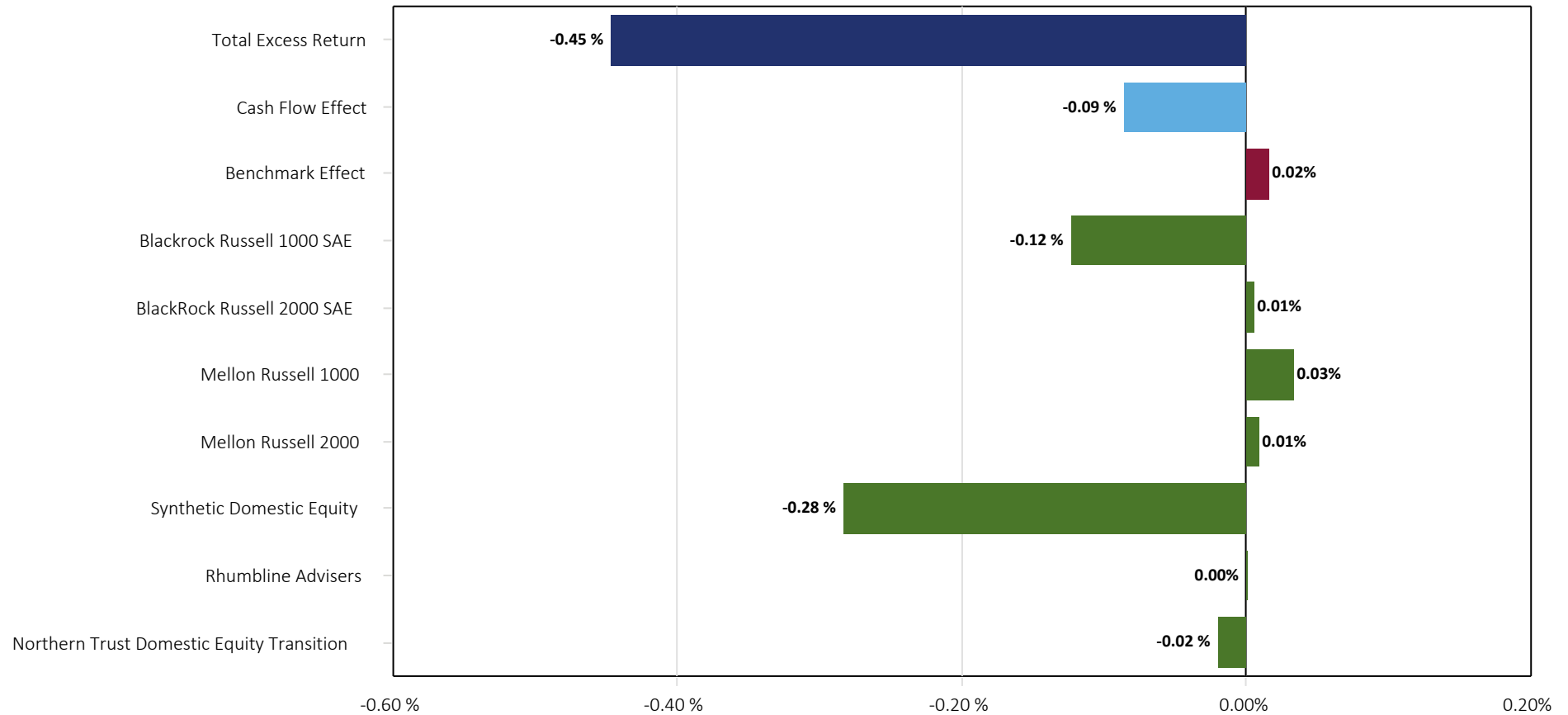
	Active Return	Tracking Error
● Total Fund	0.21	0.30
▲ Total Fund Policy Benchmark	0.00	0.00
— Median	-0.89	3.52

# Asset Class Attribution

U.S. Equity Composite

Periods Ended 1 Year Ending June 30, 2023

1 Year

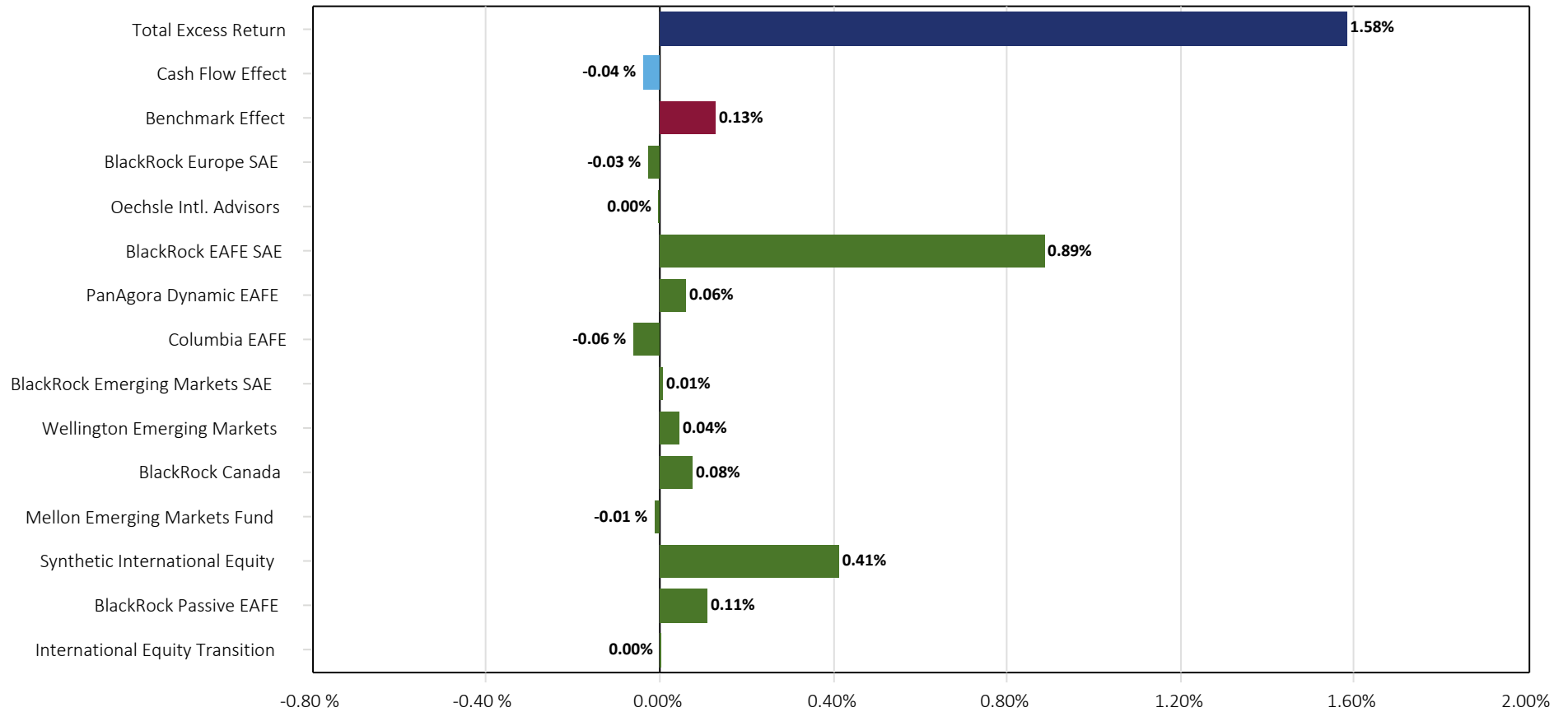


# Asset Class Attribution

## International Equity Composite

Periods Ended 1 Year Ending June 30, 2023

1 Year

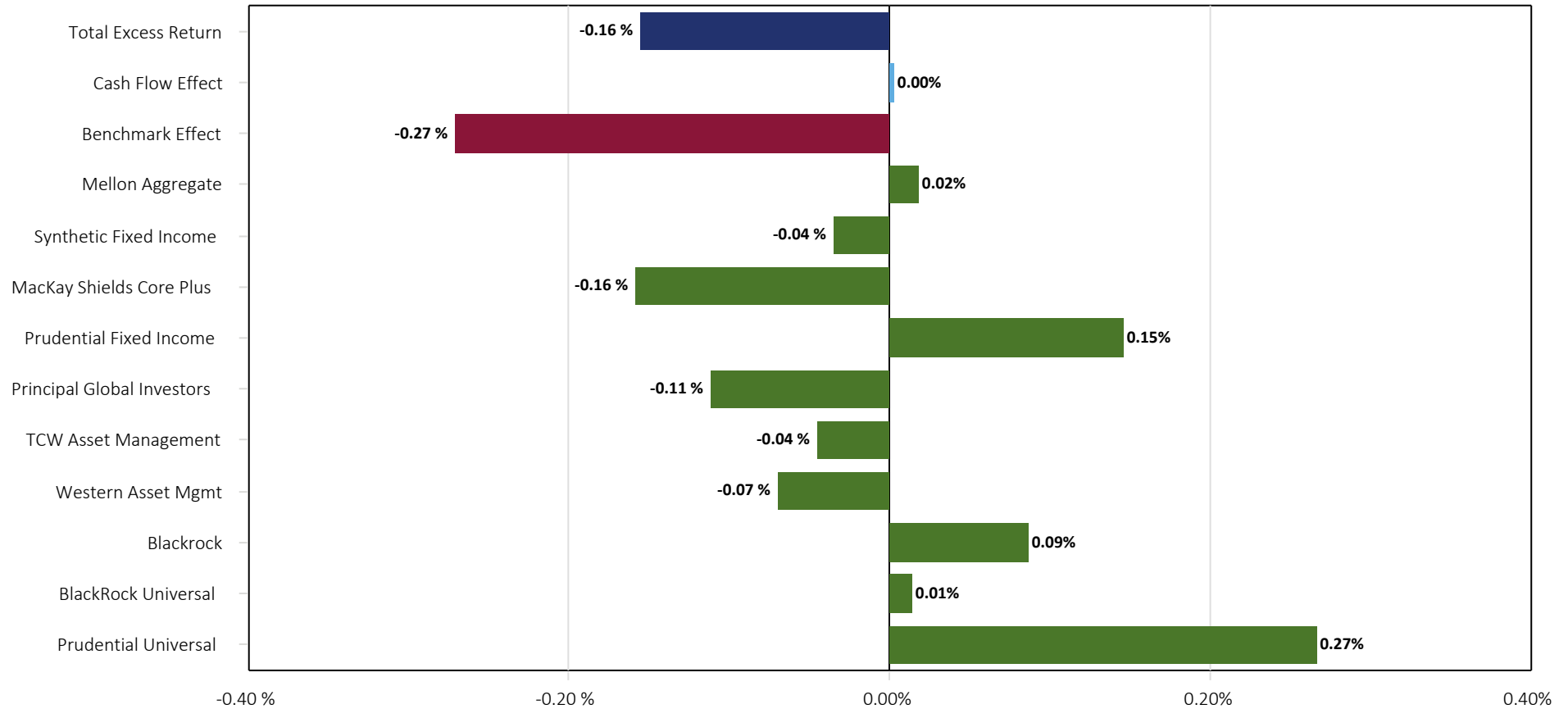


# Asset Class Attribution

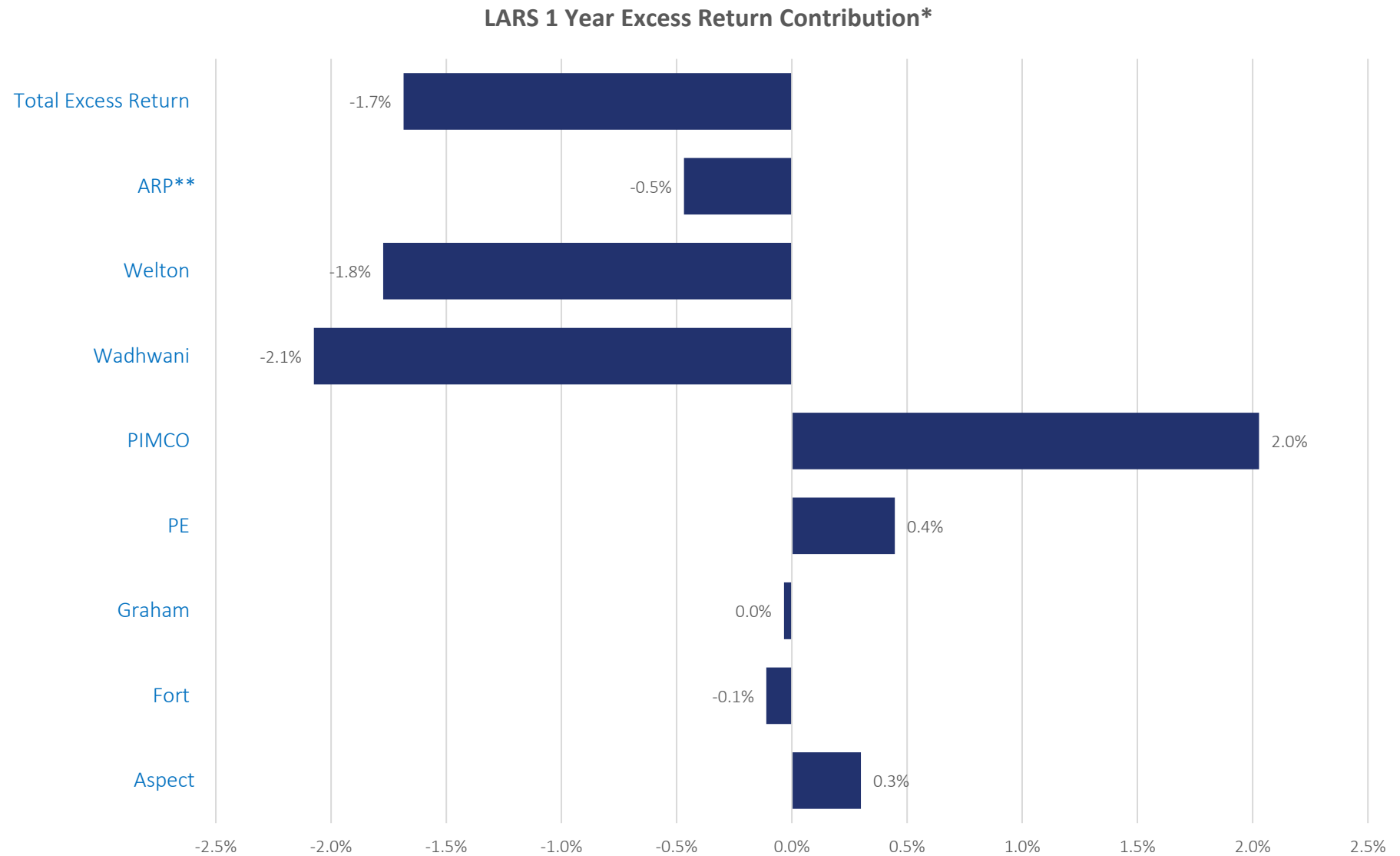
## Core Fixed Income Composite

Periods Ended 1 Year Ending June 30, 2023

1 Year



# LARS Program Attribution



# Public Markets Composite

# Asset Allocation & Performance

## U.S. Equity Composite

Periods Ended June 30, 2023

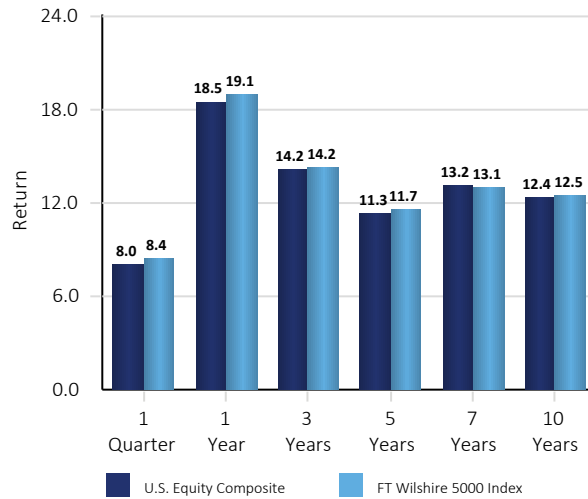
	Performance (%) net of fees									Market Value \$	%
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date		
<b>U.S. Equity Composite</b>	<b>8.03</b>	<b>18.51</b>	<b>18.51</b>	<b>14.21</b>	<b>11.34</b>	<b>12.39</b>	<b>9.67</b>	<b>11.29</b>	<b>4/1/1975</b>	<b>8,560,186,945</b>	<b>100.00</b>
U.S. Equity Composite Benchmark	8.39	18.95	18.95	14.24	11.67	12.51	10.20				
<b>Active Equity Composite</b>	<b>7.55</b>	<b>18.22</b>	<b>18.22</b>	<b>11.88</b>	<b>9.35</b>	<b>11.53</b>	<b>8.43</b>	<b>6.42</b>	<b>1/1/1999</b>	<b>2,467,109,384</b>	<b>28.82</b>
<b>Blackrock Russell 1000 SAE</b>	<b>7.99</b>	<b>18.84</b>	<b>18.84</b>					<b>7.62</b>	<b>5/1/2022</b>	<b>2,240,473,640</b>	<b>26.17</b>
Russell 1000 Index	8.58	19.36	19.36					7.84			
<b>BlackRock Russell 2000 SAE</b>	<b>3.40</b>	<b>12.37</b>	<b>12.37</b>	<b>11.09</b>				<b>6.99</b>	<b>5/1/2019</b>	<b>226,635,744</b>	<b>2.65</b>
Russell 2000 Index	5.21	12.31	12.31	10.82				5.60			
<b>Passive Equity Composite</b>	<b>8.27</b>	<b>18.75</b>	<b>18.75</b>	<b>13.37</b>	<b>11.44</b>	<b>12.16</b>	<b>10.45</b>	<b>8.06</b>	<b>1/1/1999</b>	<b>6,093,077,561</b>	<b>71.18</b>
<b>Mellon Russell 1000</b>	<b>8.59</b>	<b>19.41</b>	<b>19.41</b>					<b>7.89</b>	<b>5/1/2022</b>	<b>5,788,072,541</b>	<b>67.62</b>
Russell 1000 Index	8.58	19.36	19.36					7.84			
<b>Mellon Russell 2000</b>	<b>5.24</b>	<b>12.59</b>	<b>12.59</b>					<b>3.00</b>	<b>5/1/2022</b>	<b>242,926,942</b>	<b>2.84</b>
Russell 2000 Index	5.21	12.31	12.31					2.76			
<b>Synthetic Domestic Equity</b>	<b>-7.79</b>	<b>-11.15</b>	<b>-11.15</b>	<b>25.67</b>	<b>41.65</b>			<b>36.15</b>	<b>4/1/2017</b>	<b>62,078,078</b>	<b>0.73</b>
<b>Northern Trust Domestic Equity Transition</b>											<b>0.00</b>
All Public Plans > \$1B-US Equity Segment Median	6.93	17.29	17.29	13.41	10.03	11.26	9.60				
Russell 3000 Index	8.39	18.95	18.95	13.89	11.39	12.34	10.05	11.83	1/1/1979		
Wilshire 4500 Completion Index	6.60	15.82	15.82	11.84	7.54	10.36	10.42	10.42	1/1/1984		
FT Wilshire 5000 Index	8.44	19.06	19.06	14.24	11.67	12.51	10.20	10.83	1/1/1971		

# Performance Summary

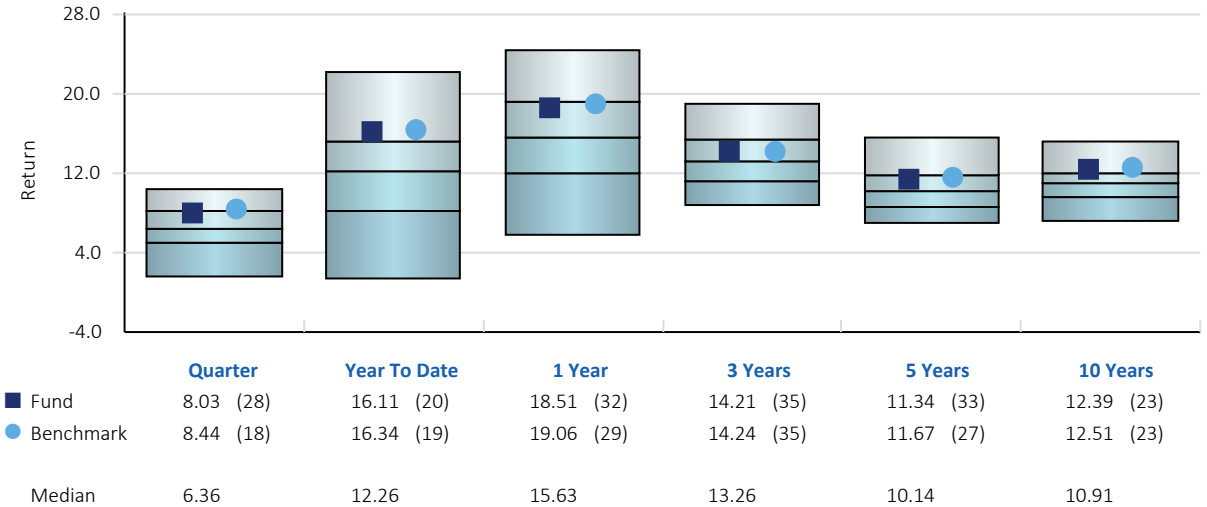
## U.S. Equity Composite

Periods Ended June 30, 2023

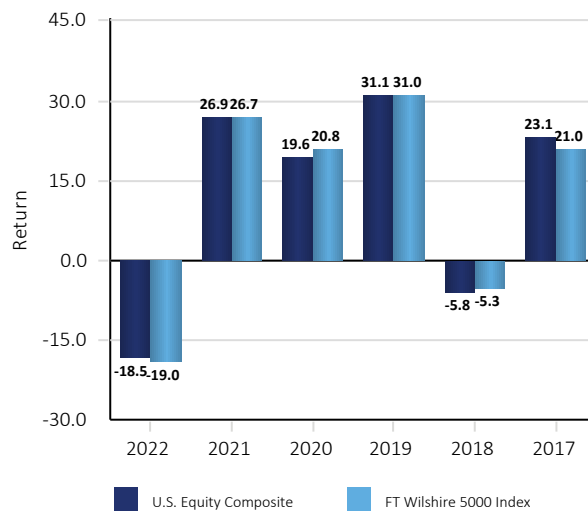
### Comparative Performance



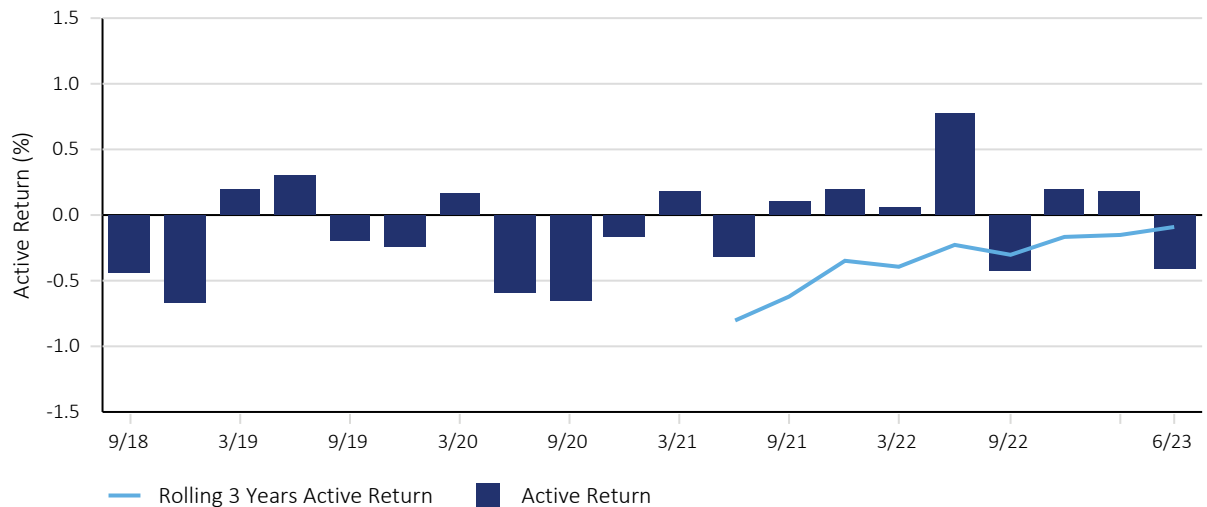
### Peer Group Analysis: IM U.S. All Cap Core Equity (SA+CF)



### Comparative Performance



### Rolling 3 Years Performance





# Asset Allocation & Performance

## International Equity Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$	%
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date		
<b>International Equity Composite</b>	<b>3.08</b>	<b>14.30</b>	<b>14.30</b>	<b>7.99</b>	<b>3.65</b>	<b>5.09</b>	<b>6.77</b>	<b>5.27</b>	<b>10/1/1989</b>	<b>6,606,408,943</b>	<b>100.00</b>
International Equity Policy Index	2.44	12.72	12.72	7.22	3.53	5.00	7.03	5.17			
<b>BlackRock Canada</b>	<b>3.87</b>	<b>7.86</b>	<b>7.86</b>	<b>13.72</b>	<b>7.22</b>	<b>6.01</b>	<b>8.50</b>	<b>6.95</b>	<b>12/1/2000</b>	<b>510,785,203</b>	<b>7.73</b>
MSCI Canada (Net)	3.69	6.95	6.95	12.81	6.36	5.22	7.82	6.28			
<b>BlackRock Passive EAFE</b>	<b>3.20</b>	<b>19.34</b>	<b>19.34</b>	<b>9.41</b>				<b>6.27</b>	<b>4/1/2019</b>	<b>1,273,199,668</b>	<b>19.27</b>
MSCI EAFE (Net)	2.95	18.77	18.77	8.93				5.81			
<b>BlackRock EAFE SAE</b>	<b>4.29</b>	<b>22.51</b>	<b>22.51</b>	<b>10.79</b>				<b>6.49</b>	<b>5/1/2019</b>	<b>1,758,007,768</b>	<b>26.61</b>
MSCI EAFE (Net)	2.95	18.77	18.77	8.93				5.23			
<b>BlackRock Emerging Markets SAE</b>	<b>-0.34</b>	<b>1.84</b>	<b>1.84</b>	<b>1.53</b>				<b>-0.17</b>	<b>5/1/2019</b>	<b>505,666,802</b>	<b>7.65</b>
MSCI Emerging Markets (Net)	0.90	1.75	1.75	2.32				0.47			
<b>Columbia EAFE</b>	<b>3.71</b>	<b>17.87</b>	<b>17.87</b>	<b>7.29</b>				<b>3.43</b>	<b>5/1/2019</b>	<b>582,723,159</b>	<b>8.82</b>
MSCI EAFE (Net)	2.95	18.77	18.77	8.93				5.23			
<b>PanAgora Dynamic EAFE</b>	<b>3.63</b>	<b>19.40</b>	<b>19.40</b>	<b>10.97</b>				<b>5.53</b>	<b>5/1/2019</b>	<b>630,161,201</b>	<b>9.54</b>
MSCI EAFE (Net)	2.95	18.77	18.77	8.93				5.23			
<b>Wellington Emerging Markets</b>	<b>3.02</b>	<b>2.49</b>	<b>2.49</b>	<b>2.29</b>	<b>2.16</b>	<b>4.33</b>		<b>7.75</b>	<b>3/1/2009</b>	<b>411,597,691</b>	<b>6.23</b>
Wellington EM Custom Benchmark	0.90	1.75	1.75	2.32	0.93	2.95		7.63			
<b>Mellon Emerging Markets Fund</b>	<b>0.70</b>	<b>1.63</b>	<b>1.63</b>	<b>2.22</b>	<b>0.89</b>			<b>2.64</b>	<b>7/1/2015</b>	<b>833,725,964</b>	<b>12.62</b>
MSCI Emerging Markets (Net)	0.90	1.75	1.75	2.32	0.93			2.66			
<b>Synthetic International Equity</b>	<b>8.08</b>	<b>57.85</b>	<b>57.85</b>	<b>28.21</b>	<b>-122.46</b>			<b>-129.78</b>	<b>4/1/2017</b>	<b>88,432,225</b>	<b>1.34</b>
<b>Active International Equity</b>	<b>3.33</b>	<b>15.46</b>	<b>15.46</b>	<b>7.71</b>	<b>3.39</b>	<b>5.04</b>		<b>5.23</b>	<b>1/1/2004</b>	<b>3,899,949,746</b>	<b>59.03</b>
<b>Passive International Equity</b>	<b>2.74</b>	<b>12.64</b>	<b>12.64</b>	<b>8.47</b>	<b>3.99</b>	<b>5.11</b>		<b>5.79</b>	<b>1/1/2004</b>	<b>2,706,143,059</b>	<b>40.96</b>
All Public Plans > \$1B-Intl. Equity Segment Median	3.14	14.20	14.20	8.30	4.78	6.01	8.08				

# Asset Allocation & Performance

## International Equity Composite

*Periods Ended June 30, 2023*

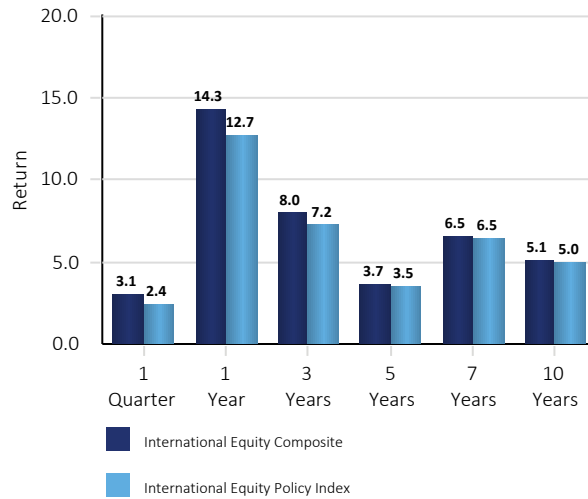
	Performance (%) net of fees									Market Value \$	%
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date		
MSCI AC World ex USA (Net)	2.44	12.72	12.72	7.22	3.52	4.75	6.67	4.64	1/1/1999		
MSCI EAFE (Net)	2.95	18.77	18.77	8.93	4.39	5.41	6.53	8.36	1/1/1970		
MSCI Emerging Markets (Net)	0.90	1.75	1.75	2.32	0.93	2.95	8.18	7.50	1/1/1999		

# Performance Summary

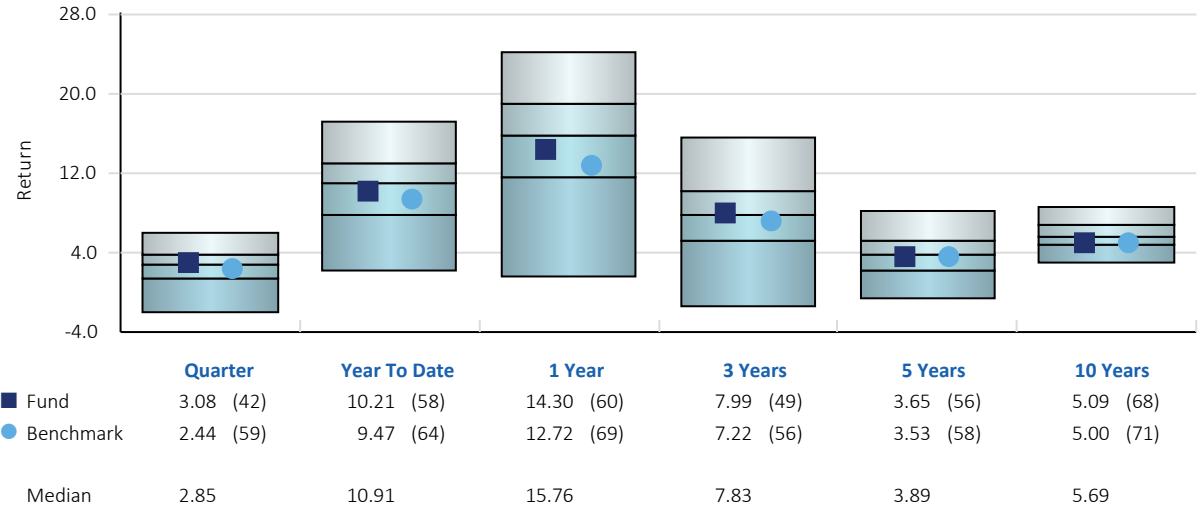
## International Equity Composite

Periods Ended June 30, 2023

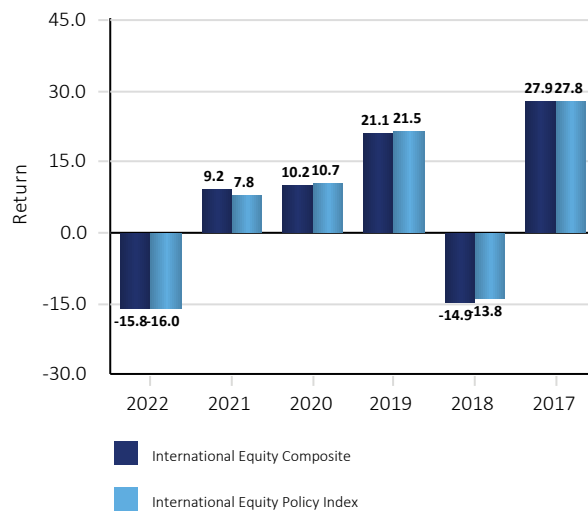
### Comparative Performance



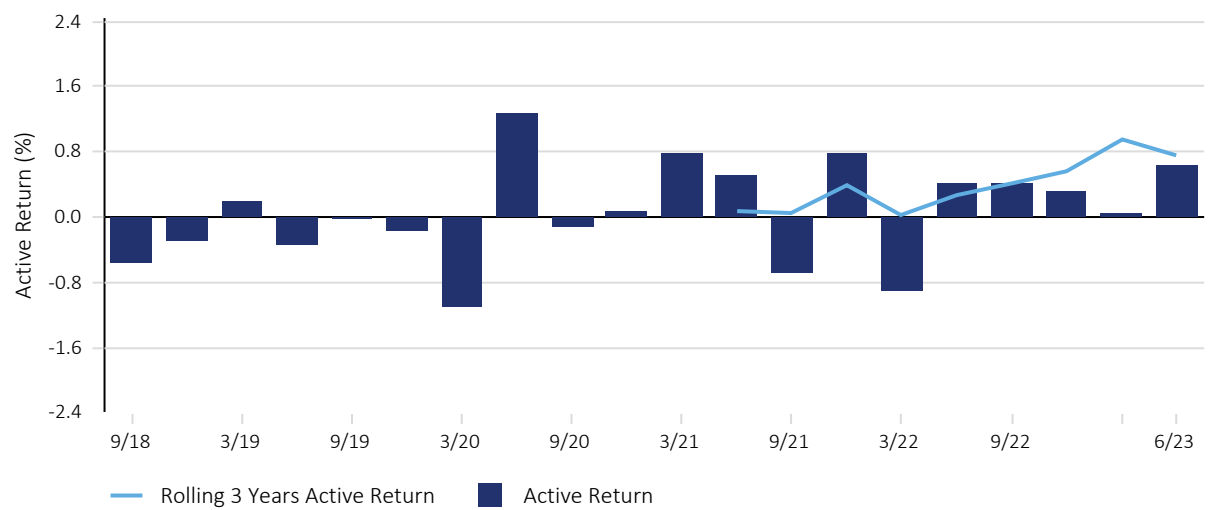
### Peer Group Analysis: IM International Equity (SA+CF)



### Comparative Performance



### Rolling 3 Years Performance



# Asset Allocation & Performance

## Total Fixed Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
<b>Total Fixed Composite</b>	<b>-0.63</b>	<b>0.84</b>	<b>0.84</b>	<b>-2.69</b>	<b>1.30</b>	<b>2.19</b>	<b>3.79</b>	<b>6.54</b>	<b>7/1/1985</b>	<b>10,143,538,569</b>
Fixed Income Policy Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	5.95		
<b>Total US Fixed Income Composite</b>	<b>-0.74</b>	<b>0.51</b>	<b>0.51</b>	<b>-2.73</b>	<b>1.30</b>	<b>2.17</b>	<b>3.79</b>	<b>6.52</b>	<b>7/1/1985</b>	<b>9,744,053,752</b>
Fixed Income Policy Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	5.95		
<b>Core Fixed Income Composite</b>	<b>-0.94</b>	<b>-0.20</b>	<b>-0.20</b>	<b>-3.38</b>	<b>1.07</b>	<b>1.94</b>	<b>3.51</b>	<b>6.34</b>	<b>7/1/1985</b>	<b>8,958,450,555</b>
Core Plus Fixed Income Policy Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	5.95		
<b>Active Core Plus Fixed Composite</b>	<b>-0.78</b>	<b>-0.04</b>	<b>-0.04</b>	<b>-3.09</b>	<b>1.34</b>	<b>2.12</b>	<b>3.74</b>	<b>3.99</b>	<b>9/1/1995</b>	<b>1,138,024,884</b>
<b>Blackrock</b>	<b>-1.22</b>	<b>-0.26</b>	<b>-0.26</b>	<b>-3.36</b>	<b>1.04</b>	<b>1.90</b>	<b>3.56</b>	<b>4.48</b>	<b>1/1/2000</b>	<b>449,087</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	4.23		
<b>Principal Global Investors</b>	<b>0.24</b>	<b>-0.18</b>	<b>-0.18</b>	<b>-2.83</b>	<b>1.65</b>	<b>2.16</b>		<b>3.34</b>	<b>7/1/2005</b>	<b>1,034,374</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80		3.21		
<b>MacKay Shields Core Plus</b>	<b>-6.86</b>	<b>-6.44</b>	<b>-6.44</b>	<b>-4.68</b>	<b>0.11</b>	<b>1.46</b>		<b>1.90</b>	<b>12/1/2011</b>	<b>556,137</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80		1.92		
<b>Prudential Fixed Income</b>	<b>2.38</b>	<b>3.64</b>	<b>3.64</b>	<b>-1.92</b>	<b>2.00</b>			<b>2.40</b>	<b>7/1/2015</b>	<b>7,867,542</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98			1.41		
<b>TCW Asset Management</b>	<b>-0.68</b>	<b>-0.28</b>	<b>-0.28</b>	<b>-2.91</b>	<b>1.53</b>			<b>1.82</b>	<b>7/1/2015</b>	<b>3,245,609</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98			1.41		
<b>Western Asset Mgmt</b>	<b>-0.46</b>	<b>-0.17</b>	<b>-0.17</b>	<b>-3.49</b>	<b>1.32</b>	<b>2.31</b>	<b>4.04</b>	<b>5.05</b>	<b>1/1/2000</b>	<b>4,159,746</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04	-3.43	0.98	1.80	3.31	4.23		
<b>Passive Fixed Composite</b>	<b>-0.97</b>	<b>-0.71</b>	<b>-0.71</b>	<b>-4.49</b>	<b>0.12</b>	<b>1.20</b>	<b>2.87</b>	<b>5.01</b>	<b>7/1/1990</b>	<b>7,820,425,671</b>
<b>Mellon Aggregate</b>	<b>-0.83</b>	<b>-0.87</b>	<b>-0.87</b>	<b>-3.96</b>	<b>0.79</b>	<b>1.53</b>	<b>3.04</b>	<b>5.13</b>	<b>7/1/1990</b>	<b>7,791,711,302</b>
Blmbg. U.S. Aggregate Index	-0.84	-0.94	-0.94	-3.97	0.77	1.52	3.01	5.07		

# Asset Allocation & Performance

## Total Fixed Composite

Periods Ended June 30, 2023

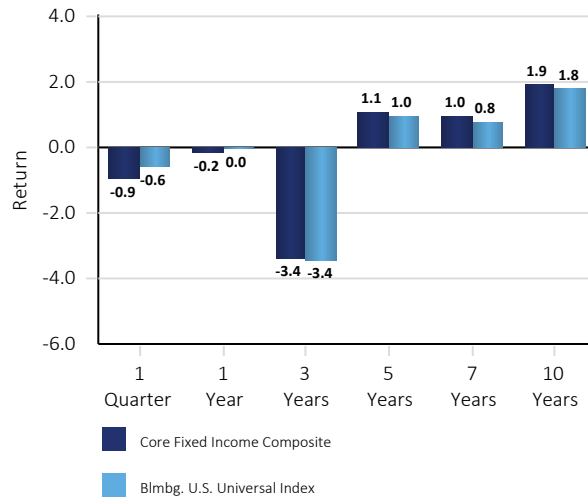
	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
<b>Synthetic Fixed Income</b>	<b>-21.14</b>	<b>-9.06</b>	<b>-9.06</b>	<b>-34.26</b>	<b>-21.22</b>			<b>-17.44</b>	<b>4/1/2017</b>	<b>28,714,369</b>
<b>Relative Value Composite</b>	<b>-0.62</b>	<b>2.29</b>	<b>2.29</b>					<b>-3.86</b>	<b>11/1/2020</b>	<b>1,120,712,389</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04					-4.07		
<b>BlackRock Universal</b>	<b>-0.96</b>	<b>0.24</b>	<b>0.24</b>					<b>-3.17</b>	<b>11/1/2020</b>	<b>613,961,840</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04					-4.07		
<b>Prudential Universal</b>	<b>-0.21</b>	<b>4.85</b>	<b>4.85</b>					<b>-4.50</b>	<b>3/1/2021</b>	<b>506,750,549</b>
Blmbg. U.S. Universal Index	-0.59	-0.04	-0.04					-4.52		
<b>Public Credit Composite</b>	<b>1.77</b>	<b>8.10</b>	<b>8.10</b>	<b>2.11</b>	<b>2.62</b>	<b>3.65</b>	<b>5.71</b>	<b>5.52</b>	<b>4/1/1998</b>	<b>1,185,088,014</b>
Public Credit Policy Index	1.68	8.38	8.38	1.19	2.50	3.69	5.86	5.44		
<b>High Yield Composite</b>	<b>1.65</b>	<b>7.52</b>	<b>7.52</b>	<b>4.01</b>	<b>3.44</b>	<b>4.24</b>	<b>6.18</b>	<b>5.89</b>	<b>4/1/1998</b>	<b>785,603,198</b>
High Yield Policy Index	1.75	9.07	9.07	3.12	3.30	4.20	6.28	5.78		
<b>Aegon</b>	<b>1.62</b>	<b>7.07</b>	<b>7.07</b>	<b>3.71</b>	<b>3.15</b>	<b>4.41</b>		<b>5.11</b>	<b>2/1/2012</b>	<b>388,055,720</b>
High Yield Policy Index	1.75	9.07	9.07	3.12	3.30	4.20		4.81		
<b>Prudential High Yield</b>	<b>1.63</b>	<b>7.61</b>	<b>7.61</b>	<b>4.23</b>				<b>2.99</b>	<b>7/1/2019</b>	<b>396,760,344</b>
Blmbg. U.S. High Yield - 2% Issuer Cap	1.75	9.07	9.07	3.12				2.33		
<b>Emerging Market Debt Composite</b>	<b>2.02</b>	<b>9.18</b>	<b>9.18</b>	<b>-1.85</b>	<b>0.85</b>	<b>2.38</b>		<b>1.60</b>	<b>10/1/2012</b>	<b>399,484,816</b>
JPM EMBI Global Index (USD)	1.53	6.85	6.85	-2.68	0.82	2.60		1.92		
<b>Prudential Emerging Markets Debt</b>	<b>2.02</b>	<b>9.18</b>	<b>9.18</b>	<b>-1.85</b>	<b>0.85</b>			<b>2.10</b>	<b>5/1/2016</b>	<b>399,484,816</b>
JPM EMBI Global Index (USD)	1.53	6.85	6.85	-2.68	0.82			1.45		
<b>Active Fixed Composite</b>	<b>0.20</b>	<b>1.76</b>	<b>1.76</b>	<b>-2.12</b>	<b>1.72</b>	<b>2.44</b>	<b>3.96</b>	<b>6.67</b>	<b>7/1/1985</b>	<b>2,323,112,898</b>

# Performance Summary

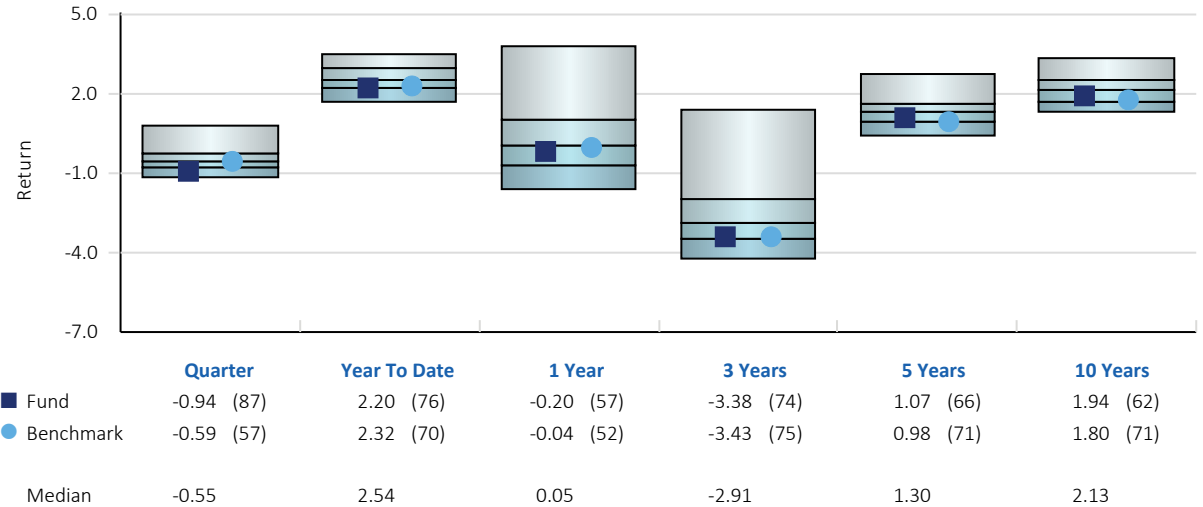
## Core Fixed Income Composite

Periods Ended June 30, 2023

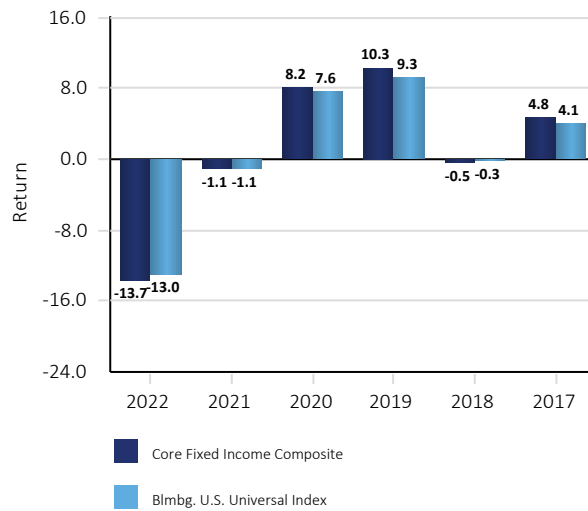
### Comparative Performance



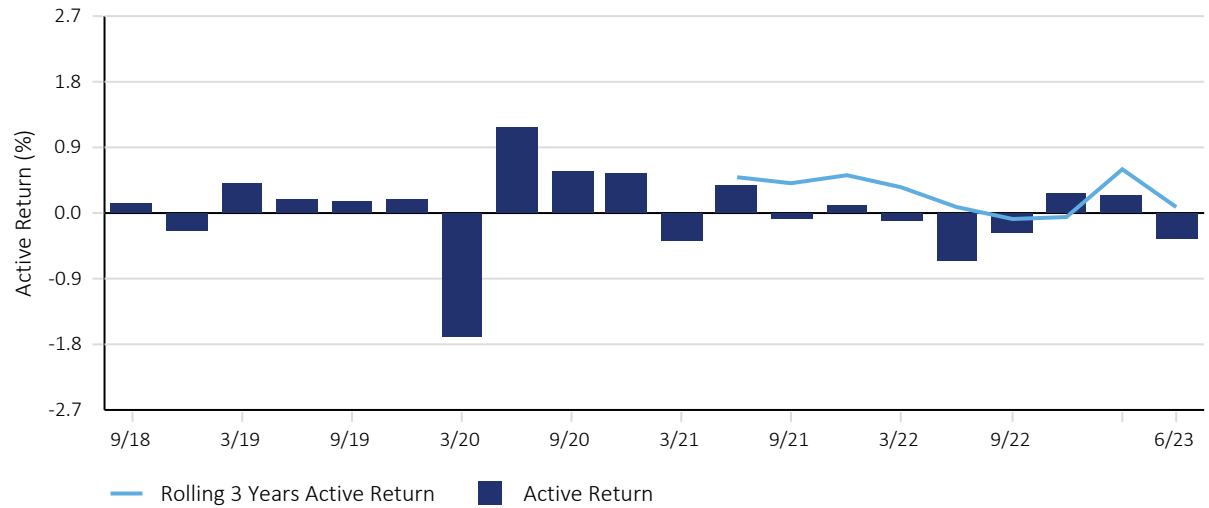
### Peer Group Analysis: IM U.S. Broad Market Core+ Fixed Income (SA+CF)



### Comparative Performance



### Rolling 3 Years Performance

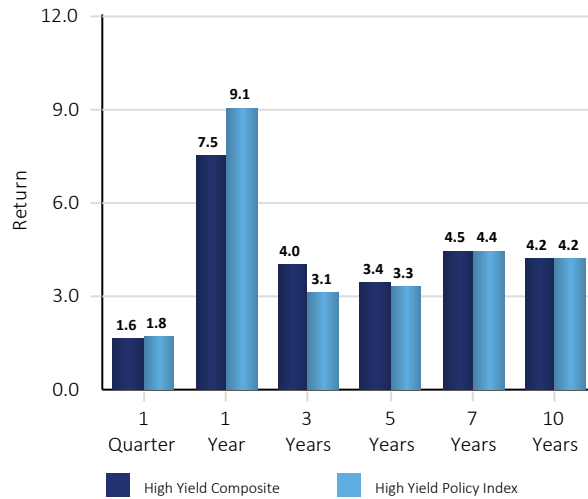


# Performance Summary

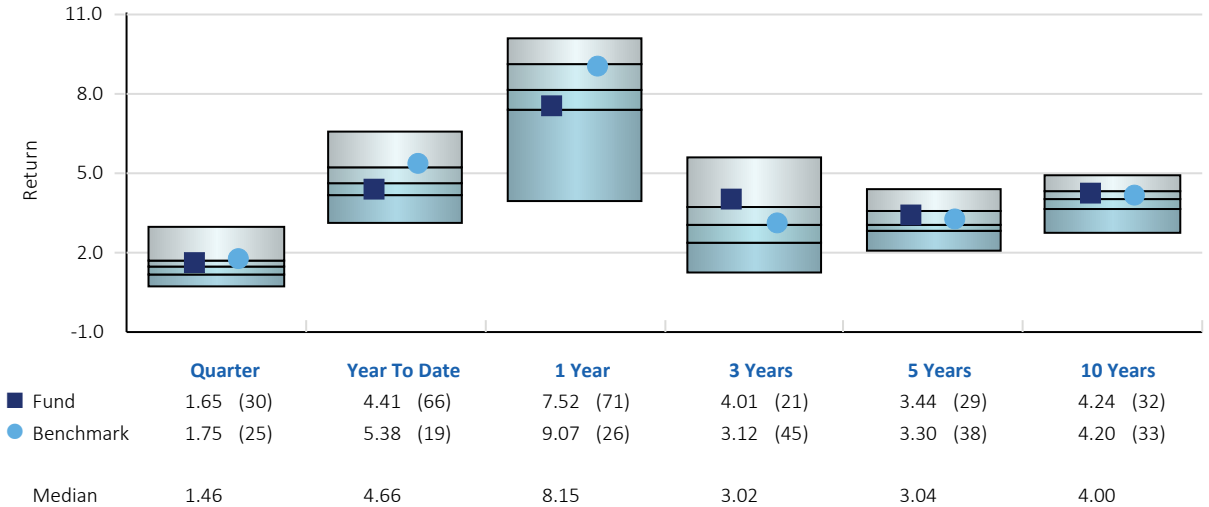
## High Yield Composite

Periods Ended June 30, 2023

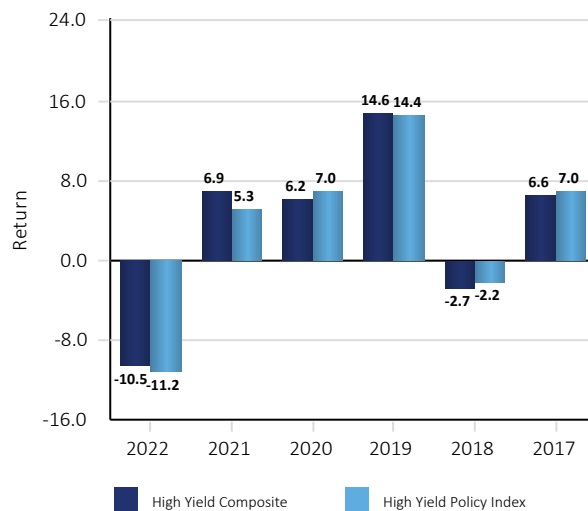
### Comparative Performance



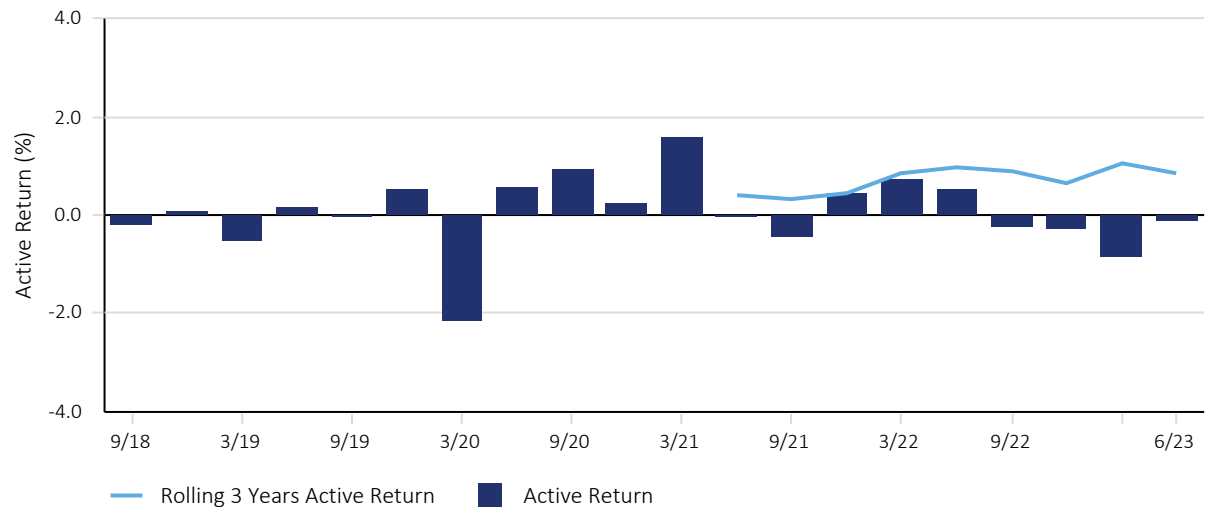
### Peer Group Analysis: IM U.S. High Yield Bonds (SA+CF)



### Comparative Performance



### Rolling 3 Years Performance



# Asset Allocation & Performance

## Global Smart Beta Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
<b>Global Smart Beta Composite</b>	<b>3.66</b>	<b>13.65</b>	<b>13.65</b>	<b>11.42</b>	<b>6.55</b>			<b>6.83</b>	<b>8/1/2017</b>	<b>2,041,666,498</b>
Global Smart Beta Policy Index	3.68	13.86	13.86	11.60	6.65			6.93		
MSCI AC World Index (Net)	6.18	16.53	16.53	10.99	8.10			8.16		
<b>U.S. Equity Smart Beta</b>	<b>4.37</b>	<b>14.75</b>	<b>14.75</b>	<b>13.90</b>	<b>8.92</b>			<b>9.26</b>	<b>8/1/2017</b>	<b>1,172,233,667</b>
Russell 1000 Comprehensive Factor Index	4.37	14.86	14.86	13.91	8.90			9.25		
<b>Developed Ex-U.S. Equity Smart Beta</b>	<b>2.25</b>	<b>11.22</b>	<b>11.22</b>	<b>6.74</b>	<b>2.71</b>			<b>3.41</b>	<b>8/1/2017</b>	<b>668,125,107</b>
FTSE Dev. Ex-U.S. Comprehensive Factor Index (N)	2.23	11.11	11.11	6.98	2.80			3.46		
<b>Emerging Markets Smart Beta</b>	<b>4.10</b>	<b>15.17</b>	<b>15.17</b>	<b>13.26</b>	<b>5.20</b>			<b>3.60</b>	<b>8/1/2017</b>	<b>201,307,724</b>
FTSE Emerging Comprehensive Factor Index (N)	4.51	15.67	15.67	13.58	5.45			3.97		
Russell 1000 Comprehensive Factor Index	4.37	14.86	14.86	13.91	8.90	11.34	12.00	11.05	8/1/2001	
FTSE Dev. Ex-U.S. Comprehensive Factor Index (N)	2.23	11.11	11.11	6.98	2.80	6.00	9.31	9.54	10/1/2001	
FTSE Emerging Comprehensive Factor Index (N)	4.51	15.67	15.67	13.58	5.45	4.57	12.51	13.50	10/1/2001	

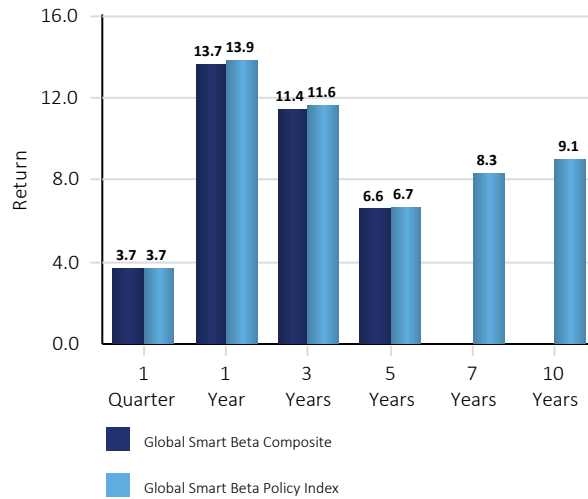


# Performance Summary

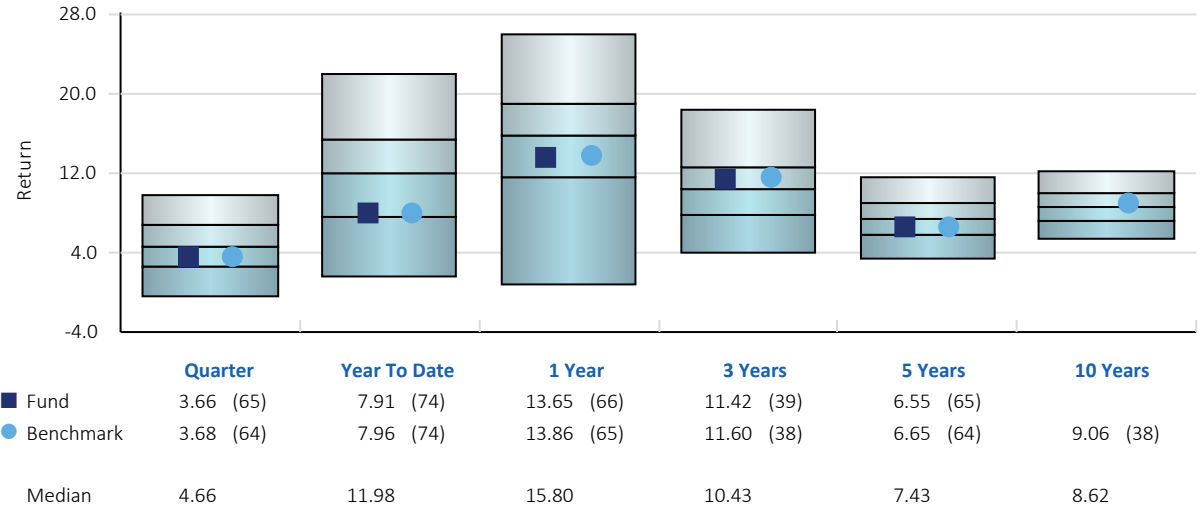
## Global Smart Beta Composite

Periods Ended June 30, 2023

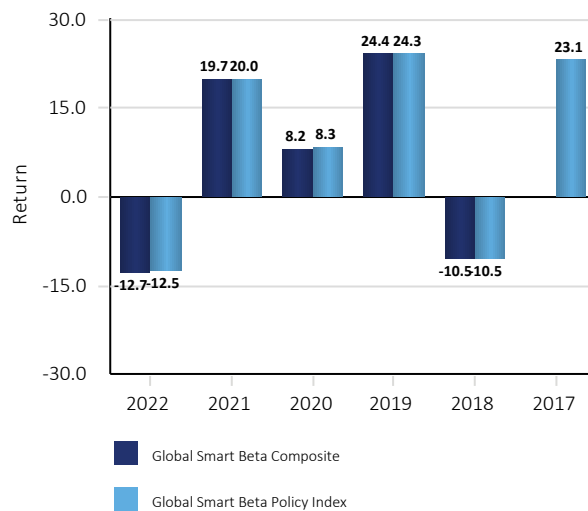
### Comparative Performance



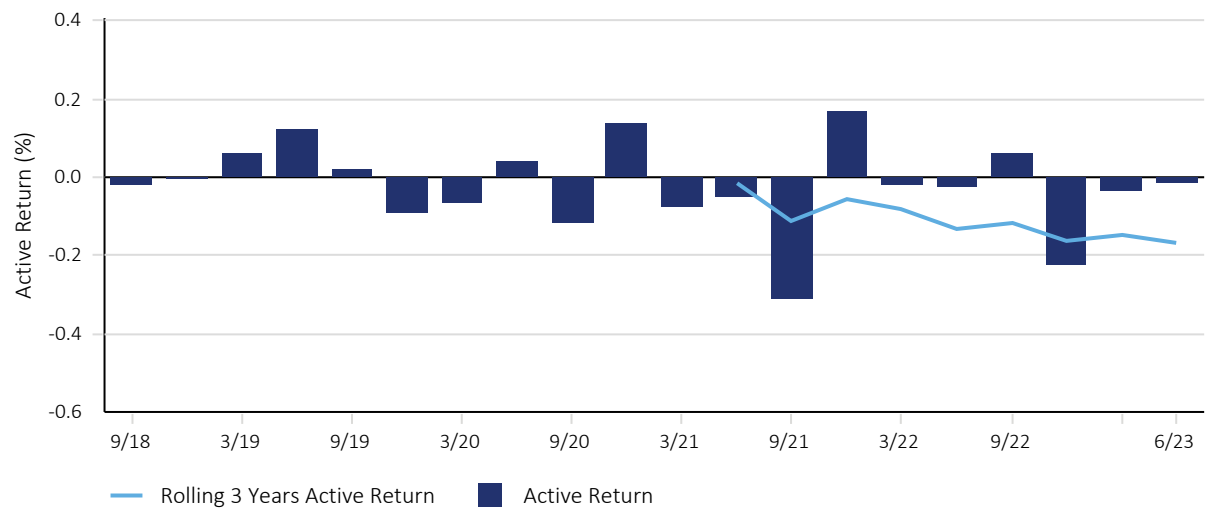
### Peer Group Analysis: IM Global Equity (SA+CF)



### Comparative Performance



### Rolling 3 Years Performance



# Appendix

# Cash Flow Summary

Total Fund

1 Quarter Ending June 30, 2023

	Begin Value	Contributions	Distributions	Net Transfers	Fees	Expenses	Capital Apprec./ Deprec.	End Value
<b>Total Fund</b>	<b>40,463,043,691</b>	<b>499,394,375</b>	<b>-791,549,025</b>		<b>-12,308,405</b>	<b>-693,839</b>	<b>971,083,818</b>	<b>41,128,970,614</b>
<b>Public Markets Composite</b>	<b>27,345,003,612</b>	<b>533,940,099</b>	<b>-758,751,383</b>	<b>-174,445,831</b>	<b>-1,147,136</b>	<b>-693,839</b>	<b>892,449,510</b>	<b>27,836,355,032</b>
<b>U.S. Equity Composite</b>	<b>8,221,740,327</b>	<b>25,899</b>		<b>-320,094,662</b>	<b>-25,899</b>		<b>658,541,281</b>	<b>8,560,186,945</b>
<b>Active Equity Composite</b>	<b>2,293,768,819</b>	<b>57,487</b>			<b>-57,487</b>		<b>173,340,565</b>	<b>2,467,109,384</b>
Blackrock Russell 1000 SAE	2,074,600,241	50,475			-50,475		165,873,399	2,240,473,640
BlackRock Russell 2000 SAE	219,168,578	7,012			-7,012		7,467,166	226,635,744
<b>Passive Equity Composite</b>	<b>5,927,877,646</b>	<b>-31,588</b>		<b>-320,000,000</b>	<b>31,588</b>		<b>485,199,915</b>	<b>6,093,077,561</b>
Mellon Russell 1000	5,621,007,908	-52,382		-310,000,000	52,382		477,064,633	5,788,072,541
Mellon Russell 2000	239,562,761	3,676		-10,000,000	-3,676		13,364,181	242,926,942
Synthetic Domestic Equity	67,306,978	17,118			-17,118		-5,228,899	62,078,078
Northern Trust Domestic Equity Transition	93,861			-94,662			801	
<b>International Equity Composite</b>	<b>6,485,432,248</b>	<b>517,471</b>		<b>-80,000,000</b>	<b>-517,471</b>	<b>-6,648</b>	<b>200,983,343</b>	<b>6,606,408,943</b>
<b>Active International Equity</b>	<b>3,773,790,823</b>	<b>431,911</b>			<b>-431,911</b>	<b>-6,648</b>	<b>126,165,571</b>	<b>3,899,949,746</b>
BlackRock Europe SAE	10,911,213						140,626	11,051,839
Oechsle Intl. Advisors	738,195						3,092	741,286
BlackRock EAFE SAE	1,685,615,988	106,831			-106,831		72,391,780	1,758,007,768
PanAgora Dynamic EAFE	608,023,040	60,262			-60,262	-163	22,138,324	630,161,201
Columbia EAFE	561,867,358					-4	20,855,805	582,723,159
<b>Active Emerging Markets Equity Composite</b>	<b>906,635,030</b>	<b>264,818</b>			<b>-264,818</b>	<b>-6,480</b>	<b>10,635,944</b>	<b>917,264,493</b>
BlackRock Emerging Markets SAE	507,315,090	62,489			-62,489		-1,648,288	505,666,802
Wellington Emerging Markets	399,319,939	202,329			-202,329	-6,480	12,284,232	411,597,691
<b>Passive International Equity</b>	<b>2,711,314,590</b>	<b>85,560</b>		<b>-80,000,000</b>	<b>-85,560</b>		<b>74,828,469</b>	<b>2,706,143,059</b>
BlackRock Canada	481,402,389	24,073		10,000,000	-24,073		19,382,814	510,785,203
Mellon Emerging Markets Fund	849,408,698	-12,198		-20,000,000	12,198		4,317,266	833,725,964

# Cash Flow Summary

Total Fund

1 Quarter Ending June 30, 2023

	Begin Value	Contributions	Distributions	Net Transfers	Fees	Expenses	Capital Apprec./ Deprec.	End Value
Synthetic International Equity	81,810,311	10,271			-10,271		6,621,913	88,432,225
BlackRock Passive EAFE	1,298,693,192	63,414		-70,000,000	-63,414		44,506,476	1,273,199,668
International Equity Transition	326,835						-10,698	316,137
<b>Active Fixed Composite</b>	<b>6,026,540,459</b>	<b>436,166</b>	<b>-4,491</b>	<b>-3,718,800,000</b>	<b>-436,166</b>	<b>-97,577</b>	<b>15,474,506</b>	<b>2,323,112,898</b>
<b>Total US Fixed Income Composite</b>	<b>9,745,493,437</b>	<b>443,033</b>	<b>-4,491</b>	<b>66,200,000</b>	<b>-443,033</b>	<b>-90,713</b>	<b>-67,544,482</b>	<b>9,744,053,752</b>
<b>Total Fixed Composite</b>	<b>10,137,091,063</b>	<b>443,033</b>	<b>-4,491</b>	<b>66,200,000</b>	<b>-443,033</b>	<b>-97,577</b>	<b>-59,650,427</b>	<b>10,143,538,569</b>
<b>Core Fixed Income Ex RV</b>	<b>7,845,047,767</b>	<b>328,076</b>	<b>-4,491</b>	<b>66,200,000</b>	<b>-328,076</b>	<b>-89,052</b>	<b>-73,416,058</b>	<b>7,837,738,166</b>
<b>Core Fixed Income Composite</b>	<b>8,972,743,579</b>	<b>328,076</b>	<b>-4,491</b>	<b>66,200,000</b>	<b>-328,076</b>	<b>-89,766</b>	<b>-80,398,767</b>	<b>8,958,450,555</b>
<b>Passive Fixed Composite</b>	<b>4,110,550,604</b>	<b>6,867</b>		<b>3,785,000,000</b>	<b>-6,867</b>		<b>-75,124,933</b>	<b>7,820,425,671</b>
Mellon Aggregate	4,074,155,878	-7,540		3,785,000,000	7,540		-67,444,576	7,791,711,302
Synthetic Fixed Income	36,394,726	14,407			-14,407		-7,680,357	28,714,369
<b>Active Core Plus Fixed Composite</b>	<b>4,862,192,975</b>	<b>321,209</b>	<b>-4,491</b>	<b>-3,718,800,000</b>	<b>-321,209</b>	<b>-89,766</b>	<b>-5,273,834</b>	<b>1,138,024,884</b>
MacKay Shields Core Plus	678,617,468	54,895		-676,300,000	-54,895		-1,761,331	556,137
Prudential Fixed Income	512,804,923			-506,500,000		-81,181	1,643,801	7,867,542
Principal Global Investors	669,351,474	54,780		-670,000,000	-54,780	-2,952	1,685,851	1,034,374
TCW Asset Management	709,904,318	113,350		-708,000,000	-113,350		1,341,291	3,245,609
Western Asset Mgmt	766,894,596	67,184		-760,000,000	-67,184	-4,919	-2,729,930	4,159,746
Blackrock	396,924,384	31,000	-4,491	-398,000,000	-31,000		1,529,193	449,087
<b>Relative Value Composite</b>	<b>1,127,695,812</b>					<b>-714</b>	<b>-6,982,709</b>	<b>1,120,712,389</b>
BlackRock Universal	619,902,547						-5,940,707	613,961,840
Prudential Universal	507,793,264					-714	-1,042,002	506,750,549
<b>Public Credit Composite</b>	<b>1,164,347,485</b>	<b>114,957</b>			<b>-114,957</b>	<b>-7,811</b>	<b>20,748,340</b>	<b>1,185,088,014</b>
<b>High Yield Composite</b>	<b>772,749,859</b>	<b>114,957</b>			<b>-114,957</b>	<b>-947</b>	<b>12,854,286</b>	<b>785,603,198</b>
Prudential High Yield	390,392,945					-947	6,368,347	396,760,344
Oaktree Capital Mgmt.	599,813						187,320	787,133

# Cash Flow Summary

Total Fund

1 Quarter Ending June 30, 2023

	Begin Value	Contributions	Distributions	Net Transfers	Fees	Expenses	Capital Apprec./ Deprec.	End Value
Aegon	381,757,101	114,957			-114,957		6,298,619	388,055,720
<b>Emerging Market Debt Composite</b>	<b>391,597,626</b>					<b>-6,864</b>	<b>7,894,054</b>	<b>399,484,816</b>
Prudential Emerging Markets Debt	391,597,626					-6,864	7,894,054	399,484,816
<b>Global Smart Beta Composite</b>	<b>1,999,736,205</b>	<b>160,733</b>		<b>-30,000,000</b>	<b>-160,733</b>	<b>-589,595</b>	<b>72,519,888</b>	<b>2,041,666,498</b>
Developed Ex-U.S. Equity Smart Beta	682,764,853	54,970		-30,000,000	-54,970	-363	15,360,616	668,125,107
Emerging Markets Smart Beta	193,937,691	15,514			-15,514	-589,232	7,959,265	201,307,724
U.S. Equity Smart Beta	1,123,033,661	90,250			-90,250		49,200,007	1,172,233,667
<b>Managed Short Term Cash Composite</b>	<b>501,003,769</b>	<b>532,792,963</b>	<b>-758,746,892</b>	<b>189,448,831</b>		<b>-19</b>	<b>20,055,425</b>	<b>484,554,077</b>
STIF	289,364,497	532,792,963	-758,746,892	189,891,481		-19	6,232,888	259,534,917
LARS	211,639,272						13,379,887	225,019,160
Cash - Securities Lending Income				-442,650			442,650	
<b>Private Markets Composite</b>	<b>13,118,040,078</b>	<b>-34,545,724</b>	<b>-32,797,643</b>	<b>174,445,831</b>	<b>-11,161,269</b>		<b>78,634,308</b>	<b>13,292,615,582</b>
<b>Private Equity/Debt</b>	<b>7,775,634,021</b>	<b>-35,065,724</b>			<b>-2,825,338</b>		<b>127,069,515</b>	<b>7,864,812,474</b>
Pathway Fund of Funds	6,701,031,808	23,984,636			-2,555,430		94,849,302	6,817,310,316
<b>Private Equity/Debt Long Perf</b>	<b>1,074,602,213</b>	<b>-59,050,360</b>			<b>-269,908</b>		<b>32,220,213</b>	<b>1,047,502,158</b>
LBO Composite	653,937,984	-54,377,130			-185,153		19,598,343	618,974,044
Venture Capital Composite	420,664,229	-4,673,230			-84,755		12,621,870	428,528,114
<b>Private Credit Composite</b>	<b>1,964,593,423</b>			<b>174,445,831</b>	<b>-4,214,541</b>		<b>43,712,843</b>	<b>2,178,537,557</b>
<b>Private Corporate Debt Composite</b>	<b>908,878,708</b>			<b>21,345,639</b>	<b>-1,967,599</b>		<b>19,654,185</b>	<b>947,910,933</b>
Tennenbaum CP Direct Lending	345,400,653			-4,980,080	-803,234		6,848,914	346,466,254
Monroe Capital	480,434,113			-10,101,043	-1,059,780		10,774,274	480,047,564
PPEF XXV B	83,043,942			36,426,761	-104,585		2,030,997	121,397,115

# Cash Flow Summary

Total Fund

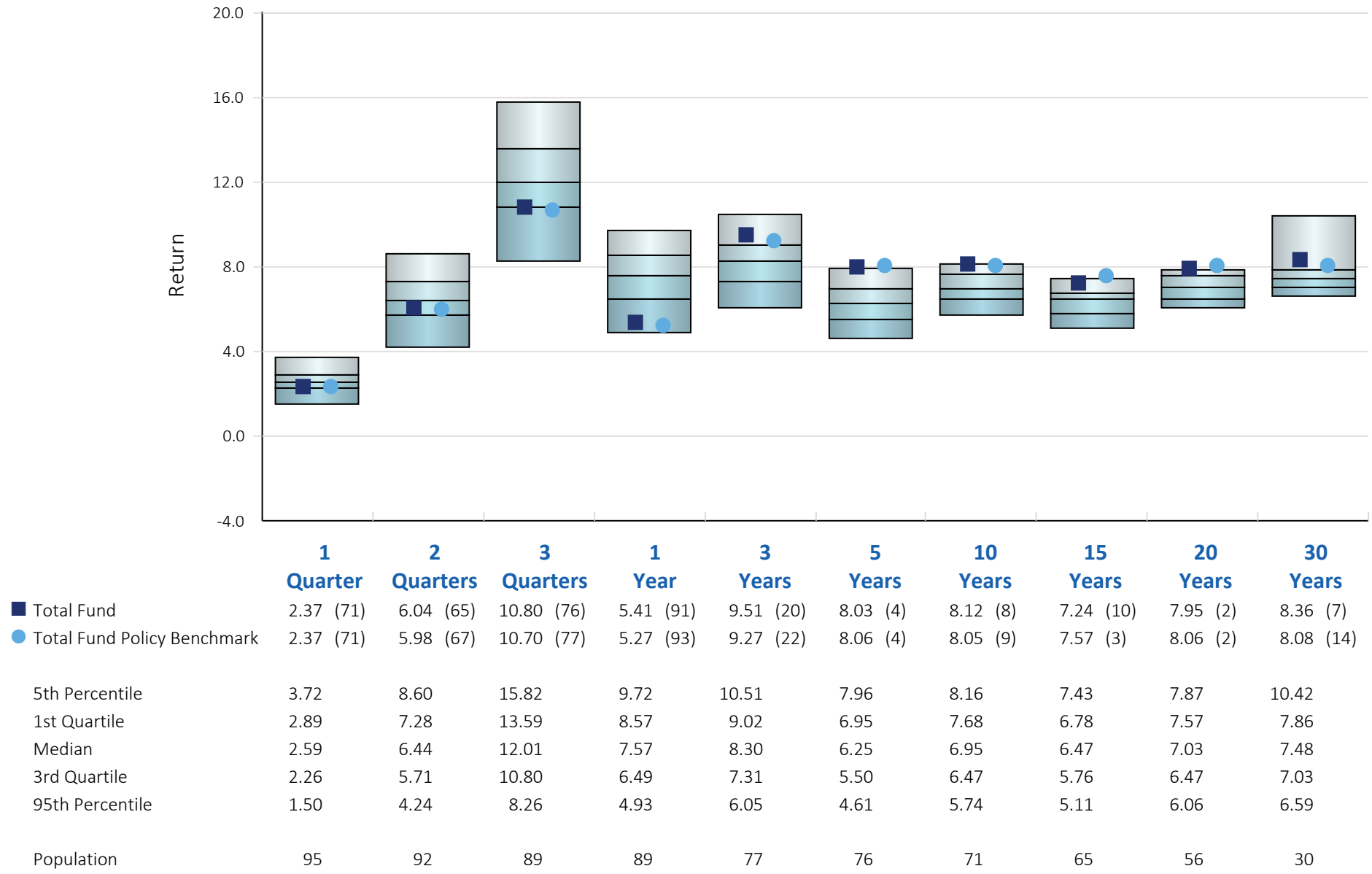
1 Quarter Ending June 30, 2023

	Begin Value	Contributions	Distributions	Net Transfers	Fees	Expenses	Capital Apprec./ Deprec.	End Value
<b>Private Real Asset Debt Composite</b>	<b>363,867,004</b>			<b>113,316,205</b>	<b>-509,004</b>		<b>6,504,631</b>	<b>483,178,836</b>
Principal Real Estate Debt II	12,907,473			-1,253,930	-27,157		-321,683	11,304,703
PGIM Real Estate Global Debt	172,876,292			8,433,219	-169,072		3,504,811	184,645,250
Kayne Anderson Real Estate Debt IV	79,787,587			8,235,764	-165,282		1,864,483	89,722,552
Heitman Credit	35,462,416			-651,965	-77,774		-359,411	34,373,266
IFM US Infrastructure Debt Fund	62,833,236			-1,446,883	-69,719		1,816,431	63,133,065
JP Morgan Global Transport Income Fund				100,000,000				100,000,000
<b>Opportunistic Credit Composite</b>	<b>691,847,711</b>			<b>39,783,988</b>	<b>-1,737,938</b>		<b>17,554,027</b>	<b>747,447,788</b>
KKR Global Corporate Debt	263,461,851			13,389,257	-666,529		4,986,646	281,171,225
Crestline Opportunistic Credit	166,783,366			13,019,802	-473,300		4,618,876	183,948,744
ARES PCS II	58,690,278			-849,425	-233,832		2,384,053	59,991,074
Audax Mezzanine Coinvest	10,242,155			1,401,013			313,763	11,956,931
Marathon SPS	78,295,990			10,000,000	-195,740		1,761,734	89,861,984
Arrowmark	95,326,103			-544,539			3,294,091	98,075,655
Audax Mezzanine V	19,047,969			3,367,880	-168,537		194,864	22,442,175
<b>Private Real Assets Composite</b>	<b>3,377,812,634</b>	<b>520,000</b>	<b>-32,797,643</b>		<b>-4,121,390</b>		<b>-92,148,050</b>	<b>3,249,265,551</b>
<b>Private Other Real Assets Composite</b>	<b>609,281,807</b>		<b>-5,159,399</b>		<b>-1,095,760</b>		<b>18,926,215</b>	<b>621,952,863</b>
UBS Farmland Investors	86,578,719		-400,000		-179,280		2,685,369	88,684,807
Forest Investment Associates	213,499,292		-1,600,000		-357,355		10,084,760	221,626,696
Brookfield Super-Core Infrastructure	309,203,796		-3,159,399		-559,125		6,156,086	311,641,359
<b>Private Real Estate Composite</b>	<b>2,768,530,827</b>	<b>520,000</b>	<b>-27,638,244</b>		<b>-3,025,630</b>		<b>-111,074,265</b>	<b>2,627,312,688</b>
UBS	553,147,355		-4,700,000		-508,473		-15,165,308	532,773,574
Clarion Partners	527,774,812		-3,650,000		-691,155		-49,811,750	473,621,907
RREEF America LLC	810,414,337		-3,665,200		-862,748		-32,228,880	773,657,509
Invesco Separate Account	877,194,323	520,000	-15,623,044		-963,255		-13,868,327	847,259,698
Settlement Proceeds								

# Plan Sponsor Peer Group Analysis

Total Fund vs All Public Plans > \$1B-Total Fund

Periods Ended June 30, 2023



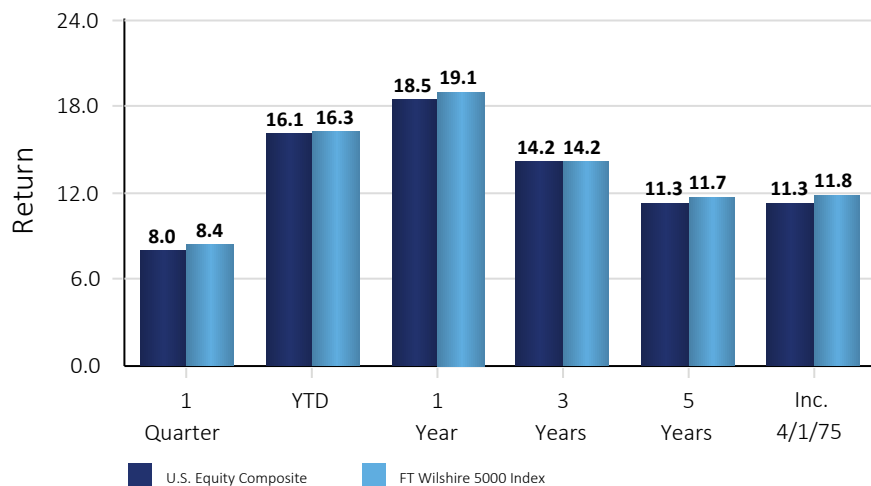
Parentheses contain percentile rankings.  
Calculation based on quarterly periodicity.

# Manager Summary

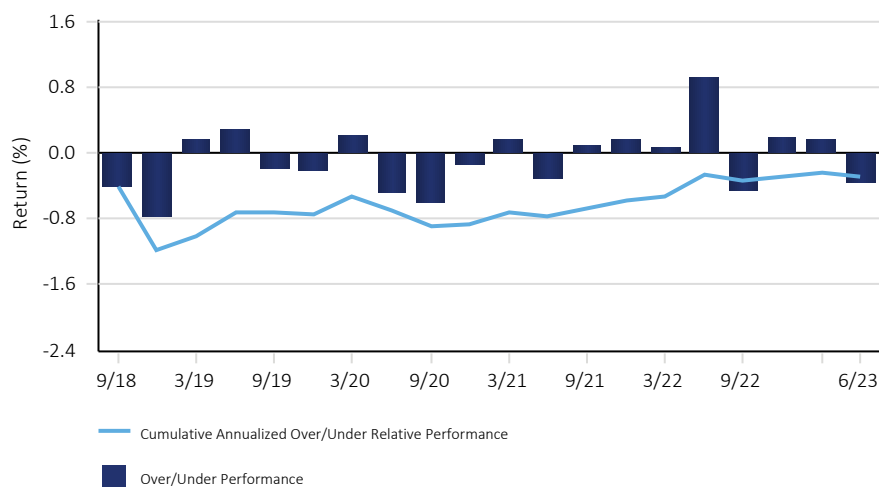
U.S. Equity Composite vs IM U.S. All Cap Equity (SA+CF)

Periods Ended June 30, 2023

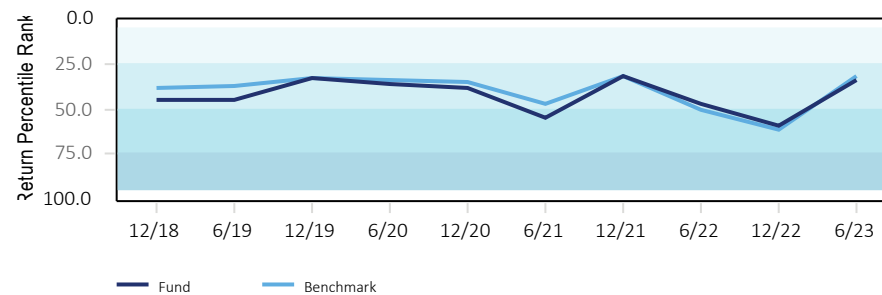
## Comparative Performance



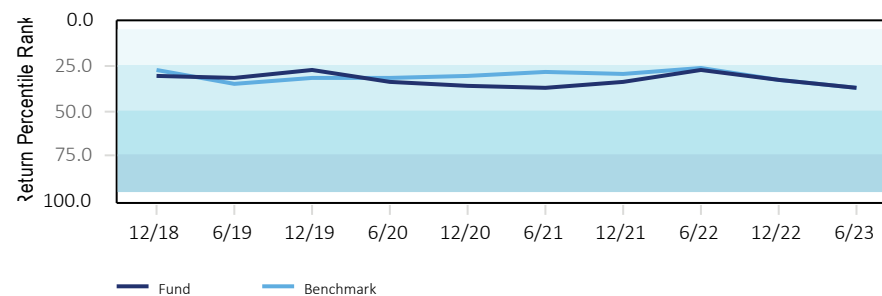
## Relative Performance



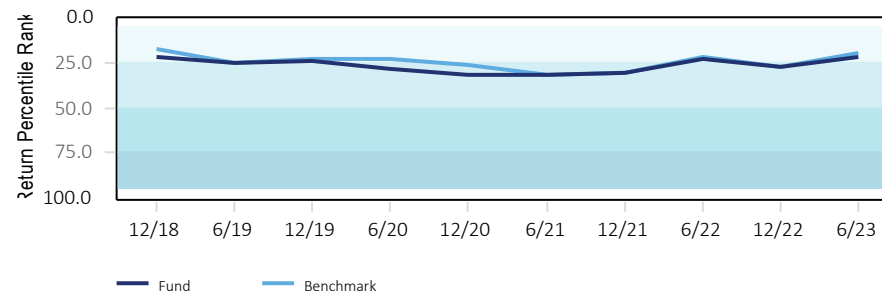
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



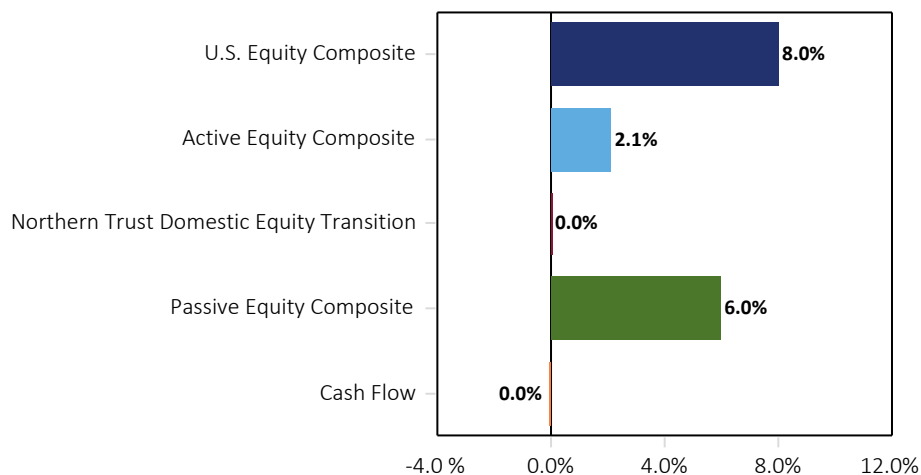


# Return and Risk Contribution

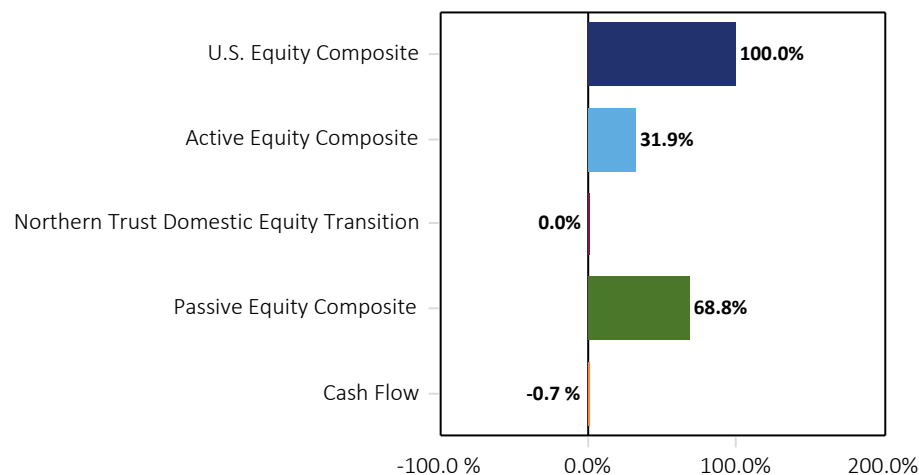
## U.S. Equity Composite

Periods Ended 1 Quarter June 30, 2023

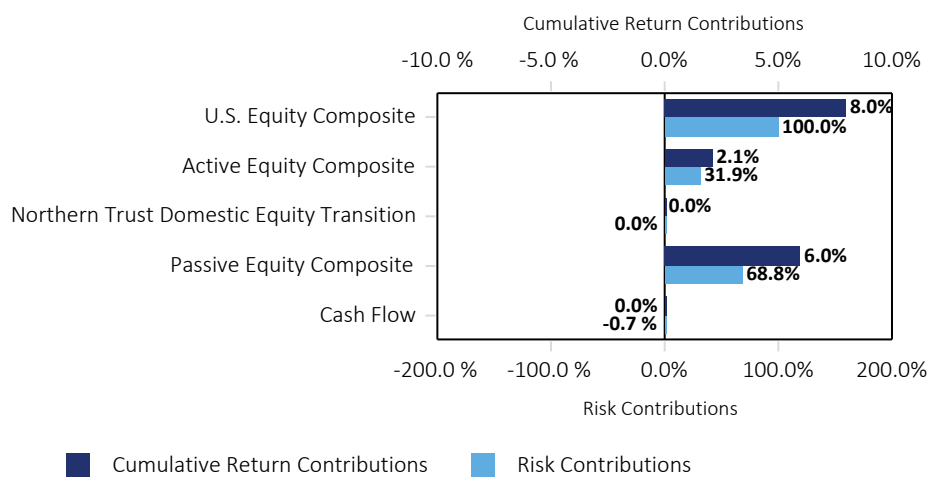
### Cumulative Return Contributions



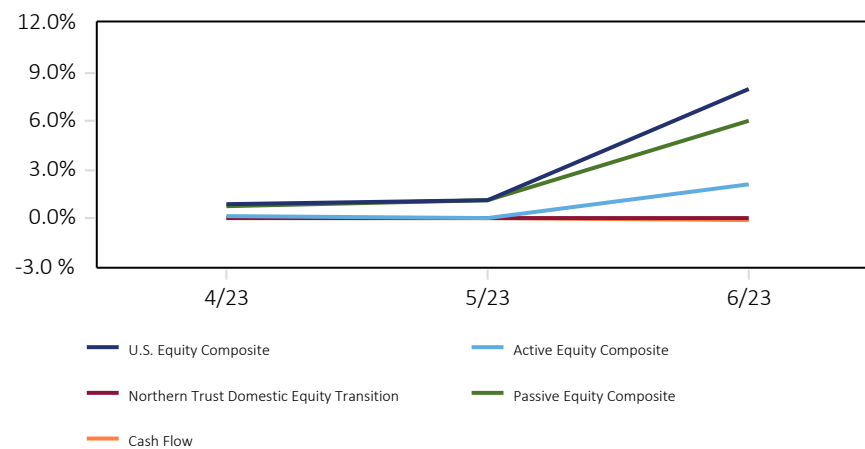
### Risk Contributions



### Cumulative Return and Risk Contributions



### Cumulative Return Contributions History

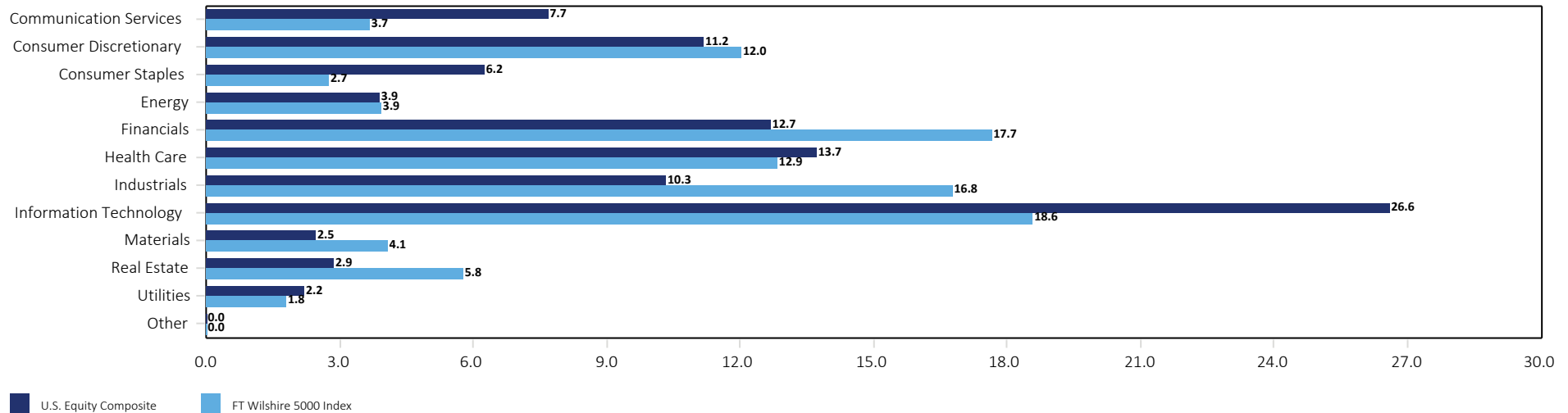


# Portfolio Characteristics

## U.S. Equity Composite

Periods Ended As of June 30, 2023

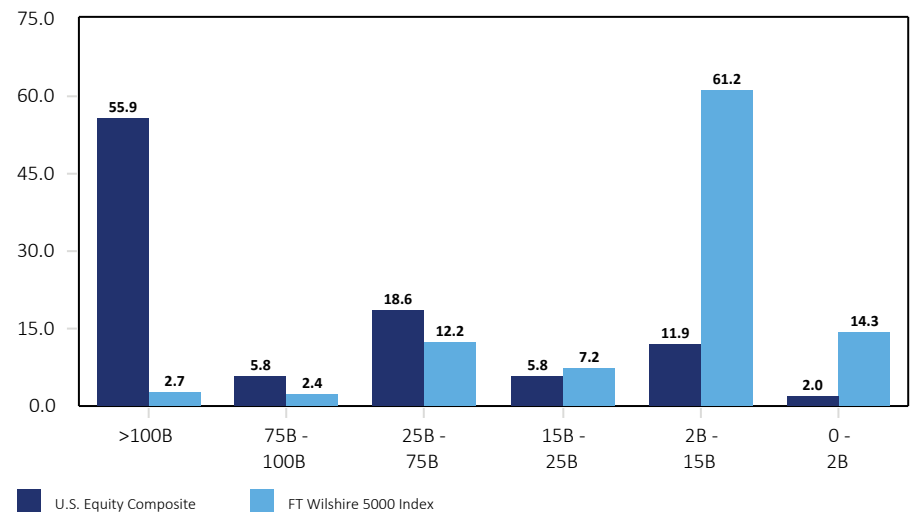
### Sector Weights (%)



### Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap \$	593,899,605,607	32,831,508,938
Median Mkt. Cap \$	1,901,740,090	890,097,080
Price/Earnings ratio	22.2	14.8
Price/Book ratio	4.4	3.0
5 Yr. EPS Growth Rate (%)	16.8	12.3
Current Yield (%)	1.5	1.3
Beta (5 Years, Monthly)	0.99	1.00
Number of Stocks	3,097	2,963

### Distribution of Market Capitalization (%)

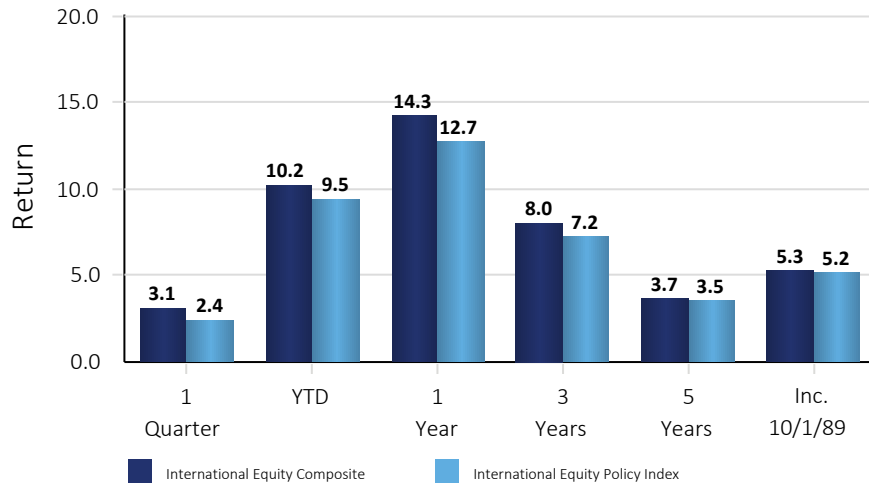


# Manager Summary

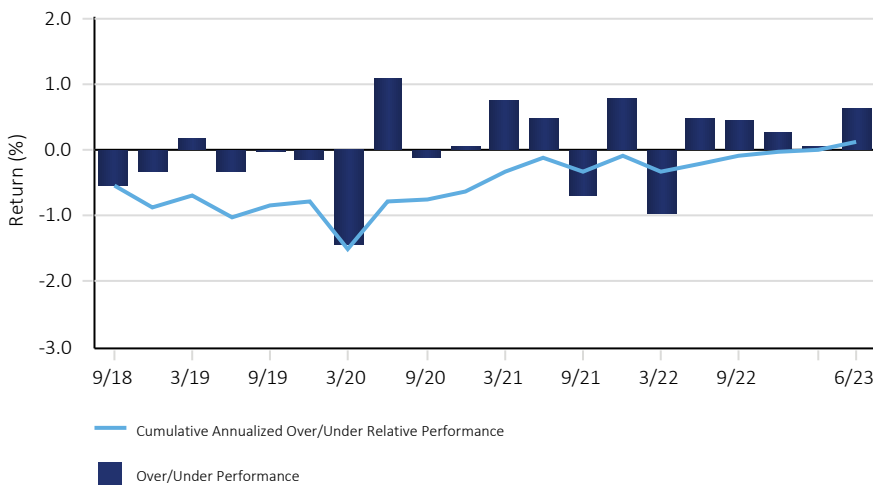
International Equity Composite vs IM International Equity (SA+CF)

Periods Ended June 30, 2023

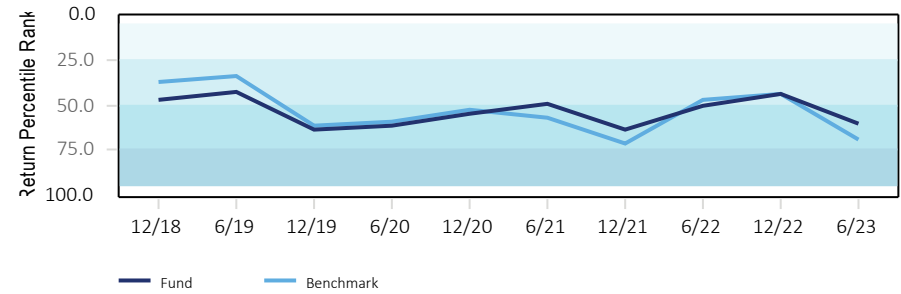
## Comparative Performance



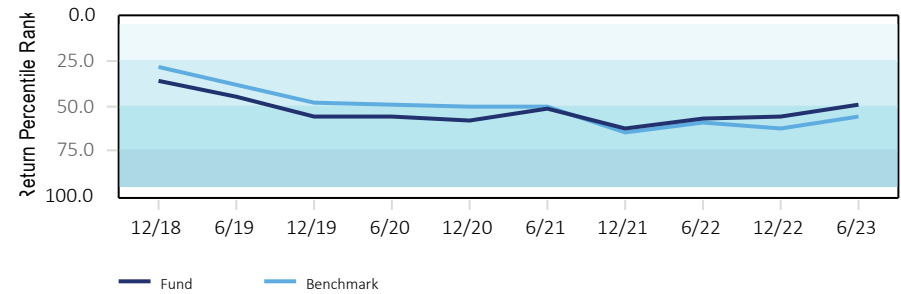
## Relative Performance



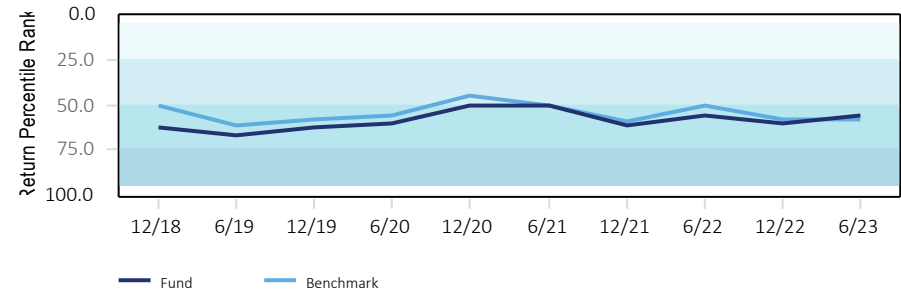
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking

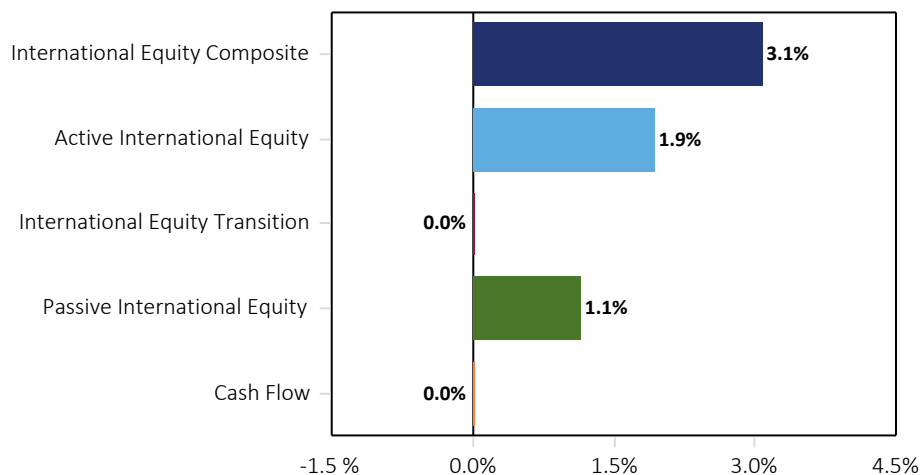


# Return and Risk Contribution

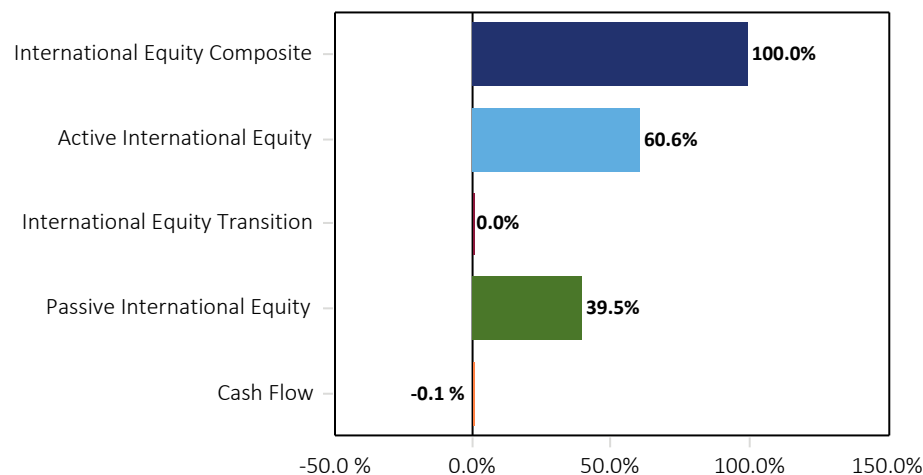
## International Equity Composite

Periods Ended 1 Quarter June 30, 2023

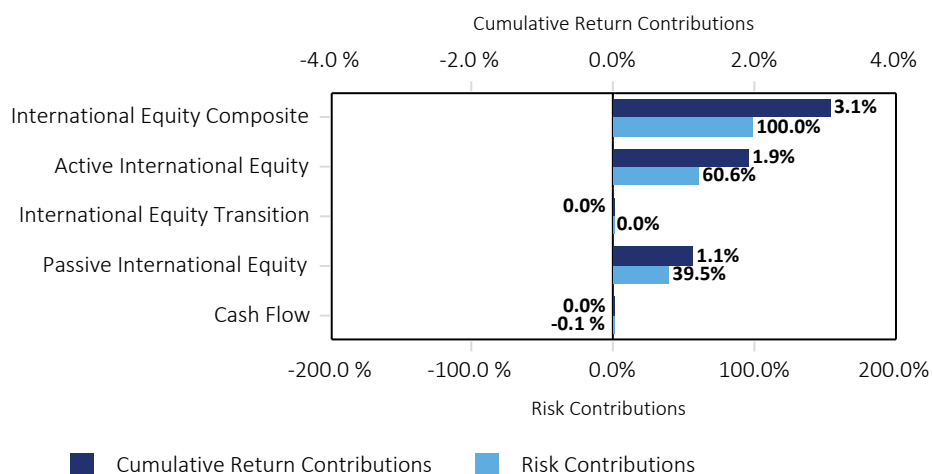
### Cumulative Return Contributions



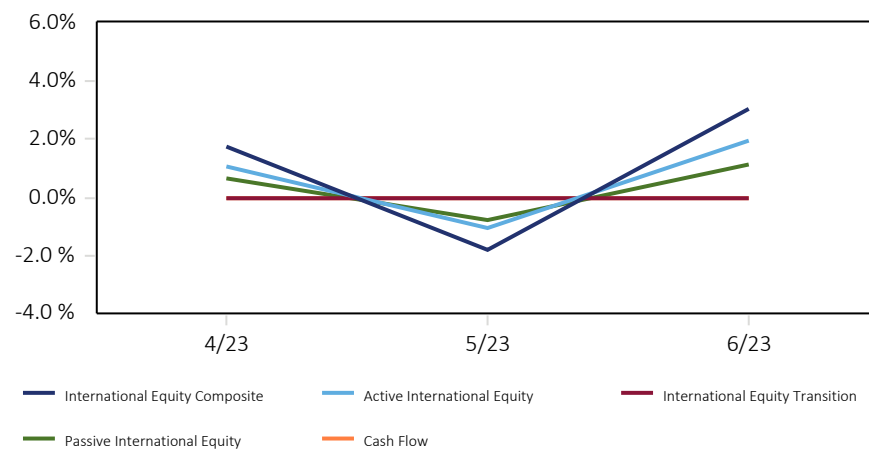
### Risk Contributions



### Cumulative Return and Risk Contributions



### Cumulative Return Contributions History

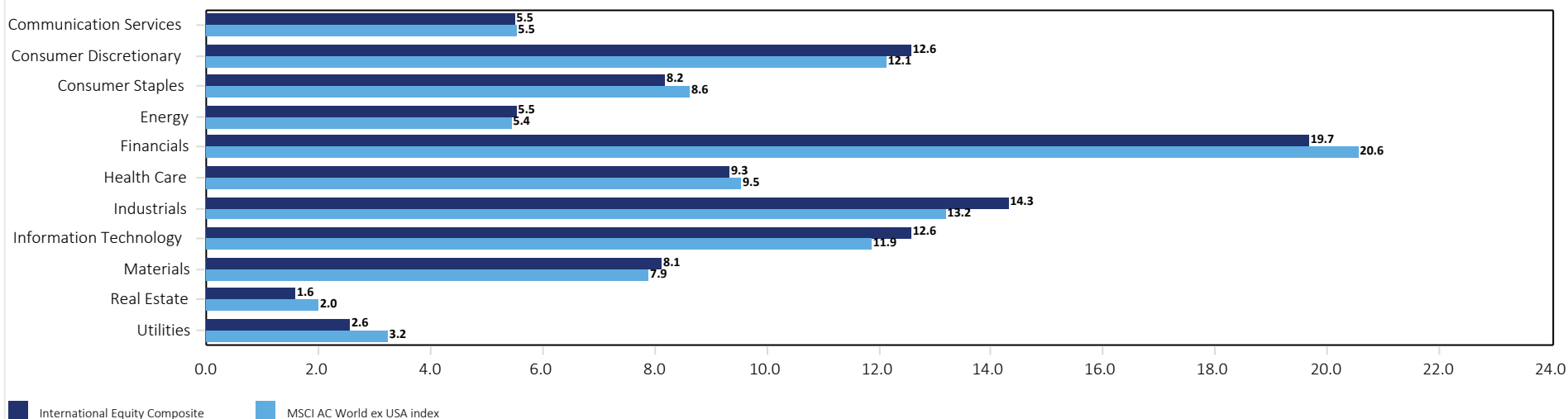


# Portfolio Characteristics

## International Equity Composite

Periods Ended As of June 30, 2023

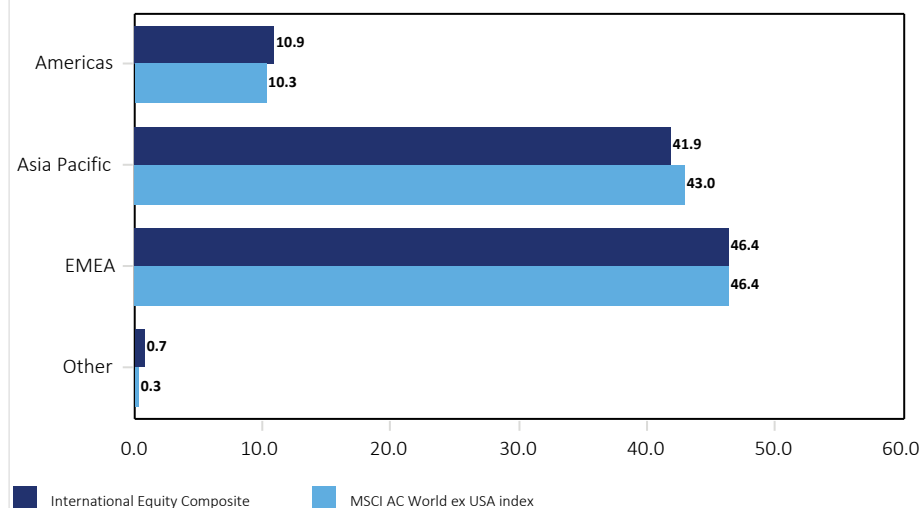
### Sector Weights (%)



### Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap \$	102,313,699,995	87,907,426,522
Median Mkt. Cap \$	9,148,462,132	9,034,750,856
Price/Earnings ratio	11.9	13.1
Price/Book ratio	2.4	2.4
5 Yr. EPS Growth Rate (%)	10.4	10.7
Current Yield (%)	3.0	3.3
Beta (5 Years, Monthly)	1.01	1.00
Number of Stocks	2,761	2,308

### Region Allocation



# Country/RegionAllocation

## International Equity Composite

Periods Ended June 30, 2023

	International Equity Composite	MSCI AC World ex USA index		International Equity Composite	MSCI AC World ex USA index
Canada	8.21	7.58	Brazil	1.72	1.55
United States	0.26	0.13	Chile	0.13	0.15
<b>Americas</b>	<b>8.47</b>	<b>7.71</b>	Colombia	0.02	0.03
Australia	4.65	4.54	Mexico	0.48	0.78
Hong Kong	1.78	2.13	Peru	0.11	0.05
Japan	14.56	14.48	<b>Americas</b>	<b>2.46</b>	<b>2.55</b>
New Zealand	0.09	0.16	China	6.84	7.36
Singapore	0.92	0.83	India	3.96	4.06
<b>Asia Pacific</b>	<b>22.00</b>	<b>22.15</b>	Indonesia	0.76	0.56
Austria	0.36	0.12	Korea	3.11	3.42
Belgium	0.73	0.50	Malaysia	0.31	0.37
Denmark	1.94	1.98	Philippines	0.09	0.18
Finland	0.42	0.71	Taiwan	4.08	4.33
France	7.65	7.41	Thailand	0.75	0.53
Germany	5.62	5.53	<b>Asia Pacific</b>	<b>19.90</b>	<b>20.81</b>
Ireland	0.61	0.93	Czech Republic	0.02	0.04
Israel	0.24	0.40	Egypt	0.01	0.02
Italy	1.39	1.39	Greece	0.19	0.13
Netherlands	3.98	3.57	Hungary	0.10	0.07
Norway	0.79	0.41	Kuwait	0.15	0.23
Portugal	0.11	0.12	Poland	0.21	0.21
Spain	1.92	1.65	Qatar	0.17	0.25
Sweden	1.57	1.95	Saudi Arabia	1.10	1.17
Switzerland	6.89	7.00	South Africa	0.82	0.87
United Kingdom	8.55	9.32	Turkey	0.15	0.15
<b>EMEA</b>	<b>42.75</b>	<b>42.97</b>	United Arab Emirates	0.27	0.36
<b>Developed Markets</b>	<b>73.22</b>	<b>72.82</b>	<b>EMEA</b>	<b>3.18</b>	<b>3.50</b>
			<b>Emerging Markets</b>	<b>25.54</b>	<b>26.87</b>
			<b>Frontier Markets</b>	<b>0.50</b>	<b>0.00</b>

# Country/RegionAllocation

International Equity Composite

*Periods Ended June 30, 2023*

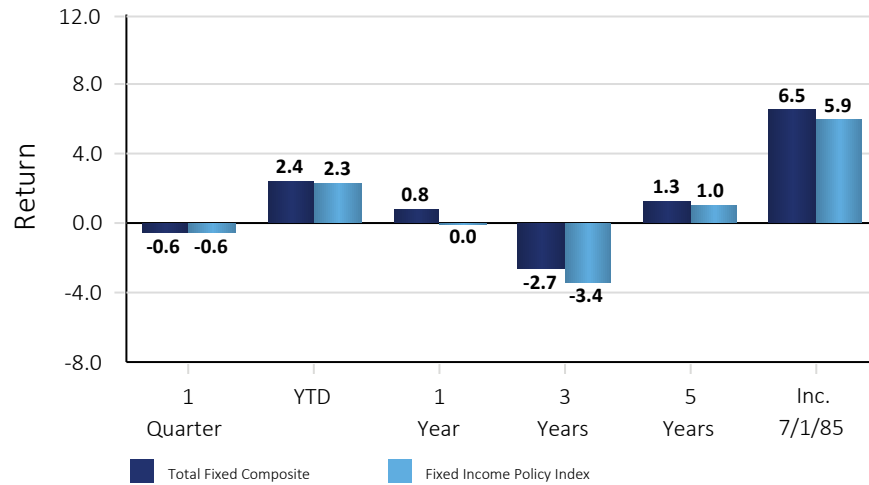
	International Equity Composite	MSCI AC World ex USA index
Cash	0.00	0.00
Other	0.74	0.31
<b>Total</b>	<b>100.00</b>	<b>100.00</b>

# Manager Summary

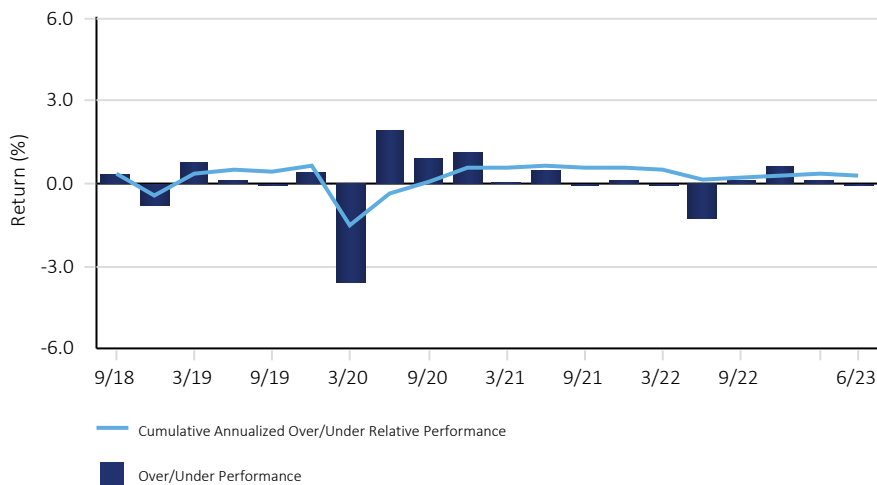
Total Fixed Composite vs IM U.S. Fixed Income (SA+CF)

Periods Ended June 30, 2023

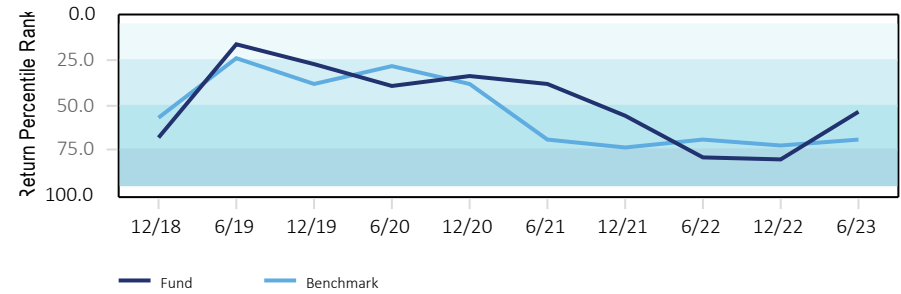
## Comparative Performance



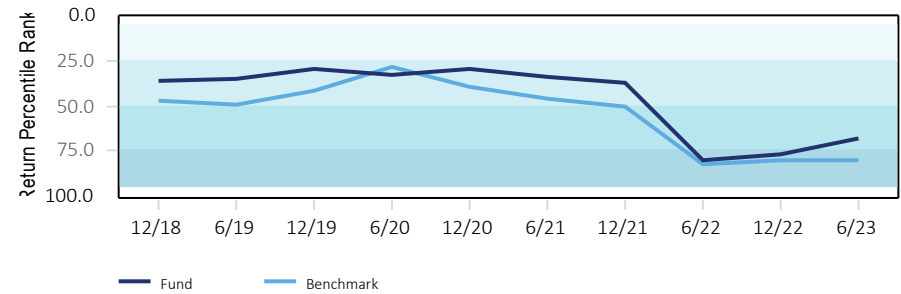
## Relative Performance



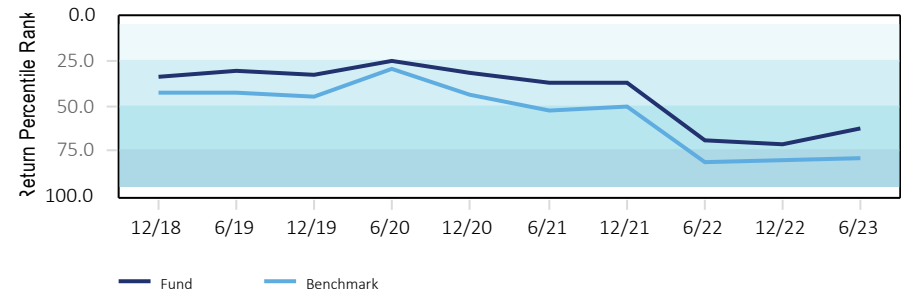
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



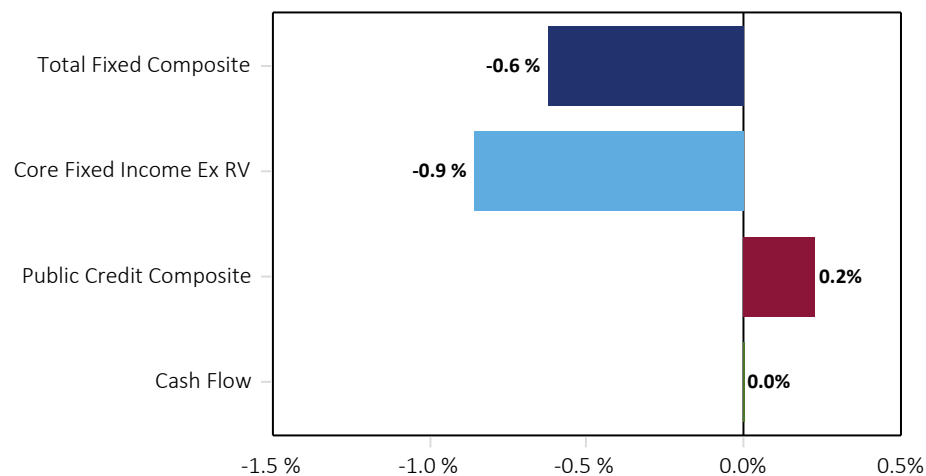


# Return and Risk Contribution

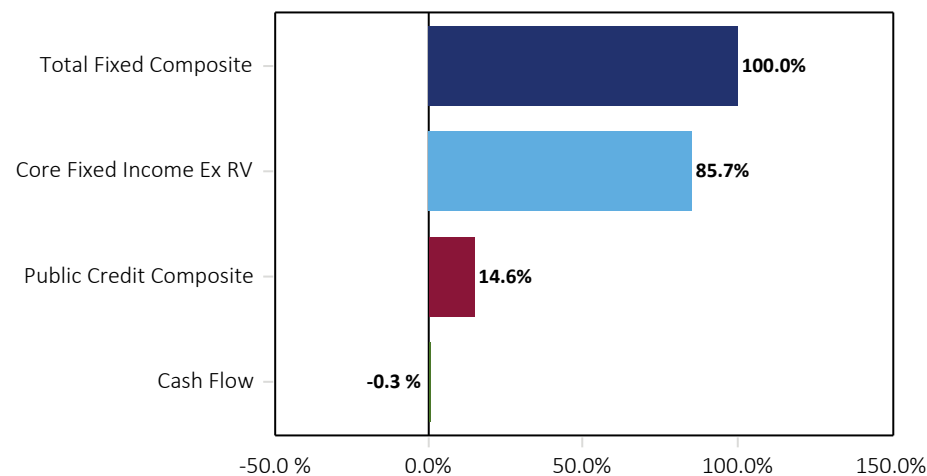
## Total Fixed Composite

Periods Ended 1 Quarter June 30, 2023

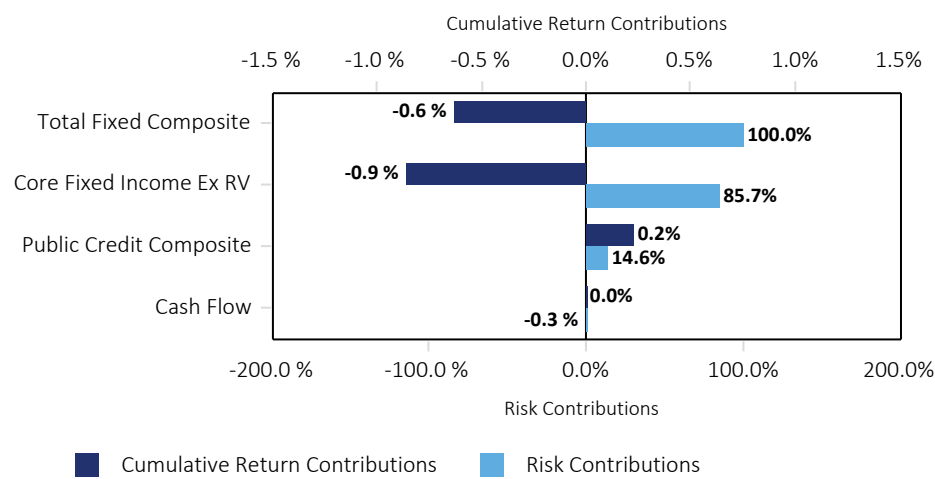
### Cumulative Return Contributions



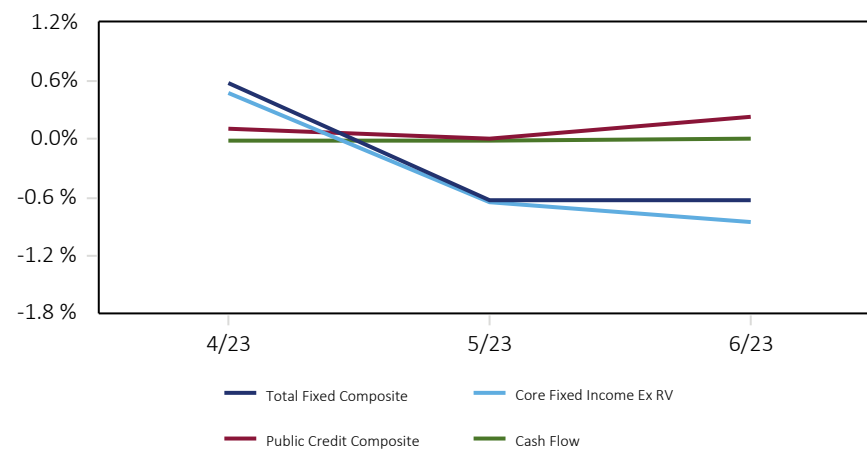
### Risk Contributions



### Cumulative Return and Risk Contributions



### Cumulative Return Contributions History



# Portfolio Characteristics

Total Fixed Composite vs Blmbg. U.S. Universal Index

*Periods Ended As of June 30, 2023*

## Portfolio Characteristics

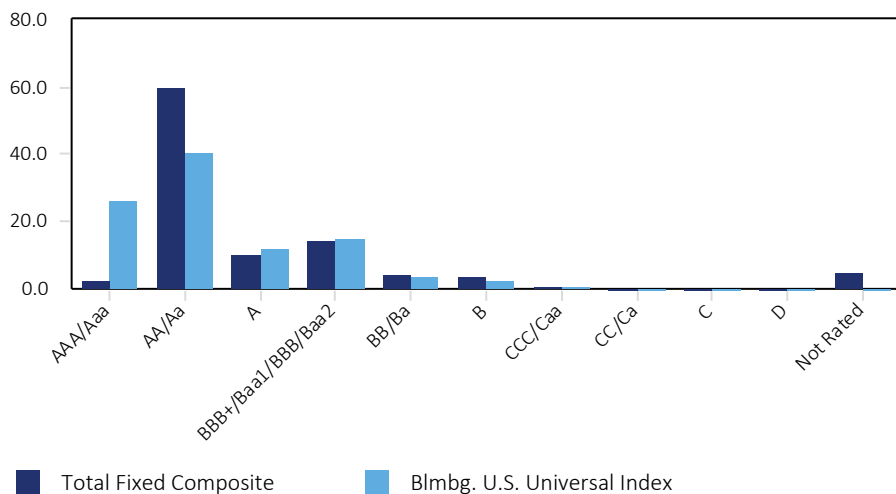
	Portfolio	Benchmark
Avg. Quality	AA	AA
Convexity	0.31	0.30
Coupon Rate (%)	3.27	3.21
Current Yield	3.73	5.17
Effective Duration	6.10	5.94
Yield To Maturity (%)	5.18	5.17
Years to Maturity	8.80	8.37
Holdings Count	14,588	20,148

# Portfolio Characteristics

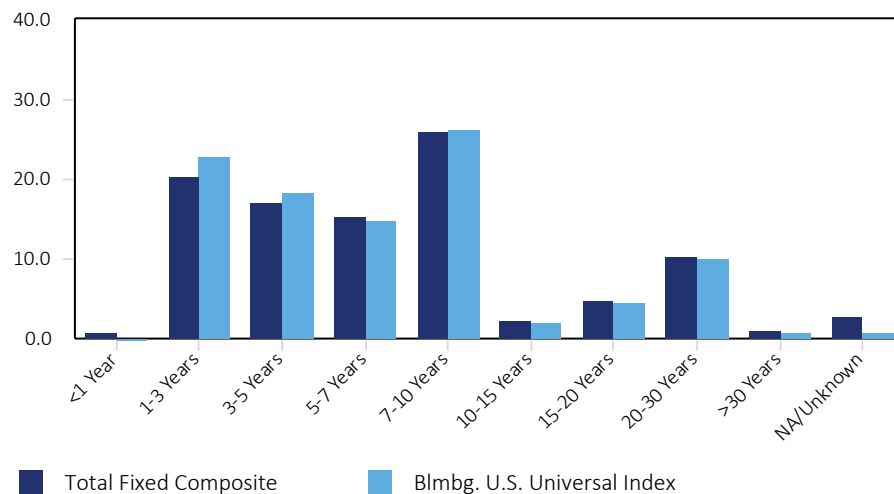
Total Fixed Composite vs Blmbg. U.S. Universal Index

Periods Ended As of June 30, 2023

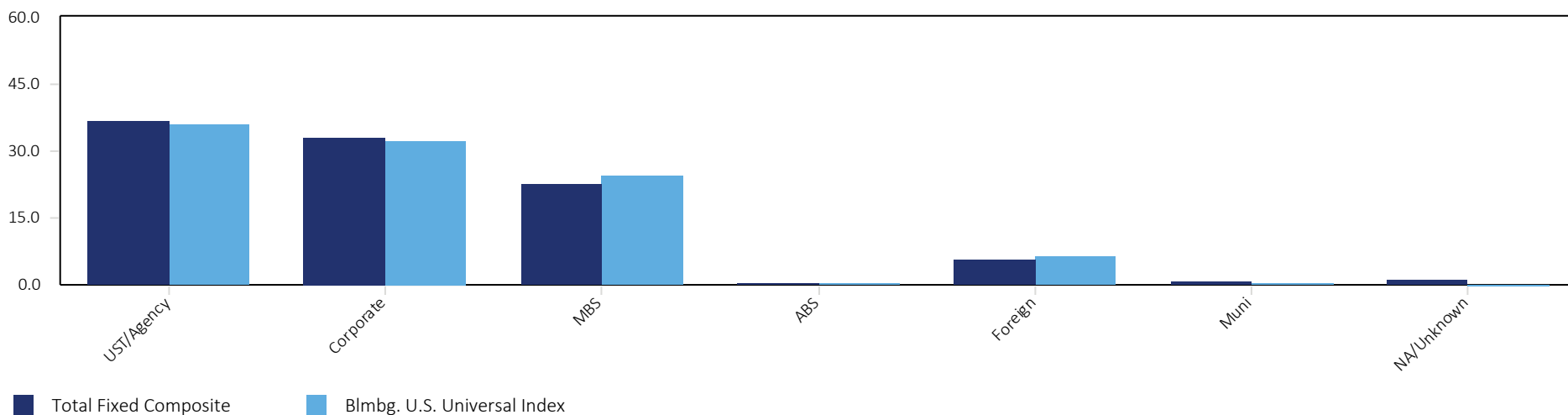
## Credit Quality Distribution (%)



## Maturity Distribution (%)



## Sector Distribution (%)

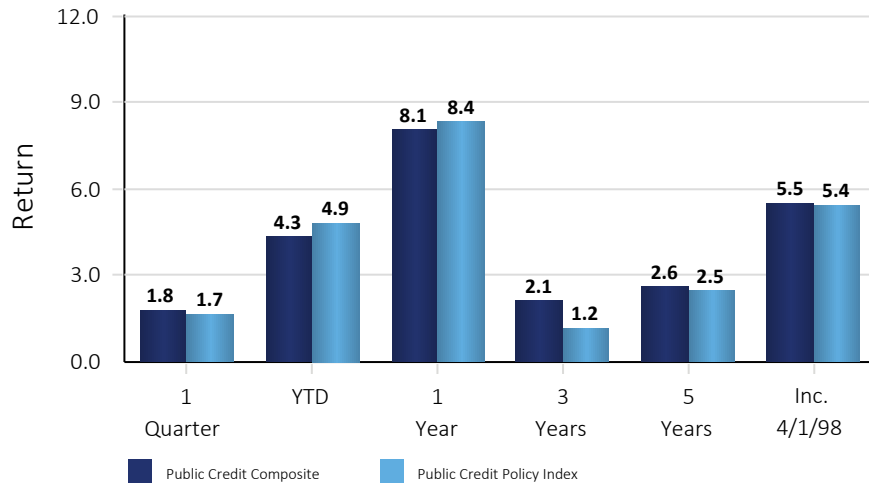


# Manager Summary

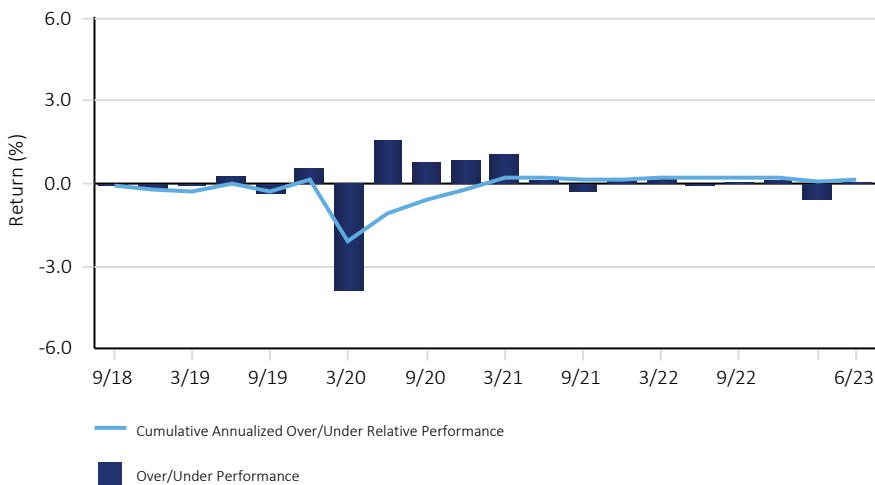
Public Credit Composite vs IM U.S. High Yield Bonds (SA+CF)

Periods Ended June 30, 2023

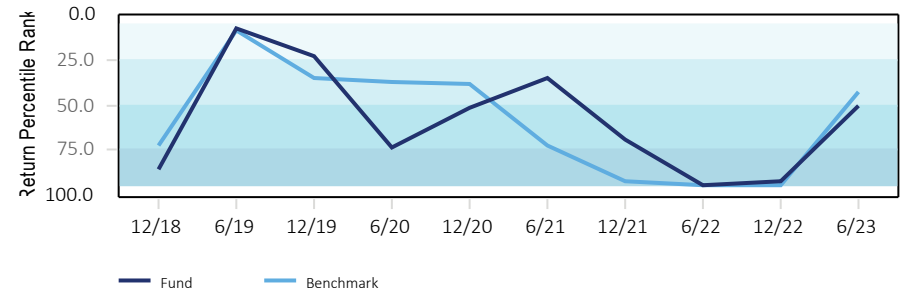
## Comparative Performance



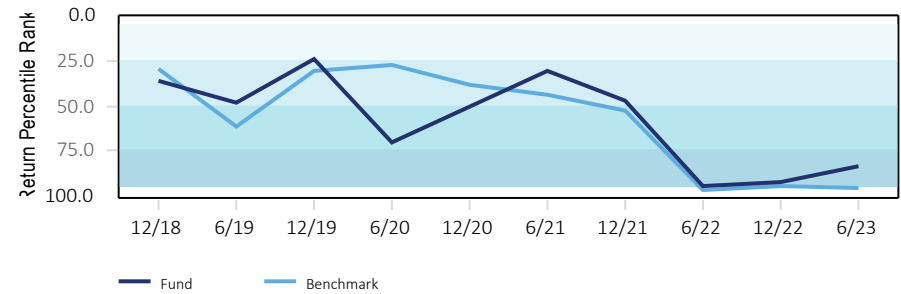
## Relative Performance



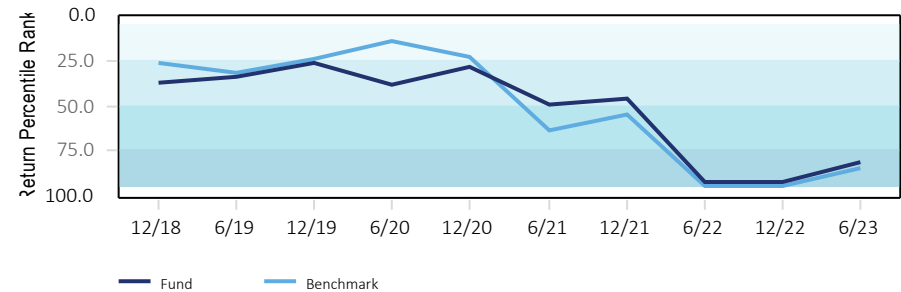
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking

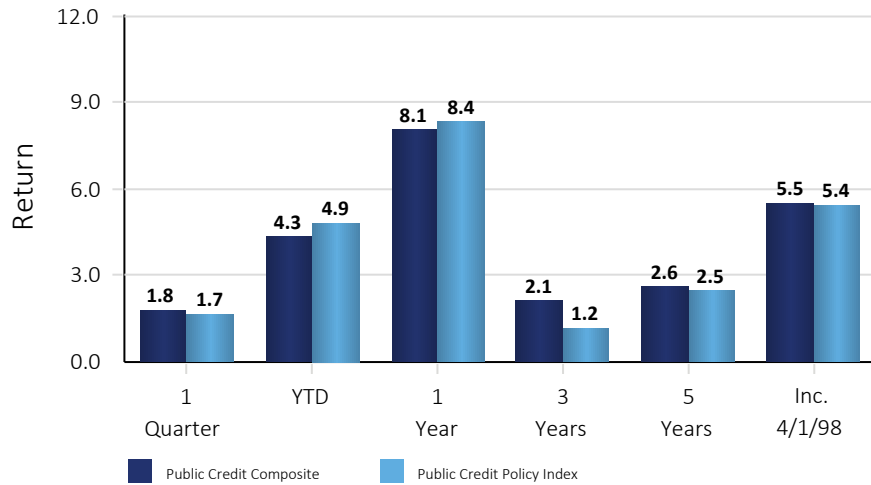


# Manager Summary

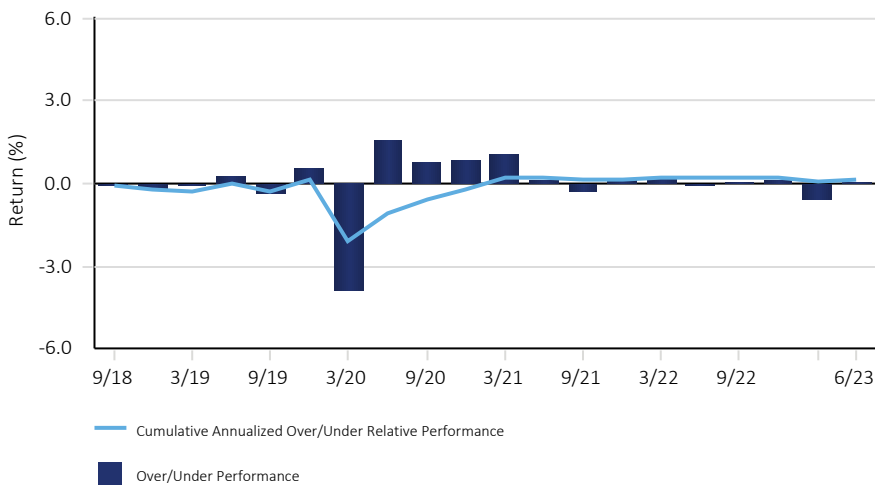
Public Credit Composite vs IM Emerging Markets Debt (SA+CF)

Periods Ended June 30, 2023

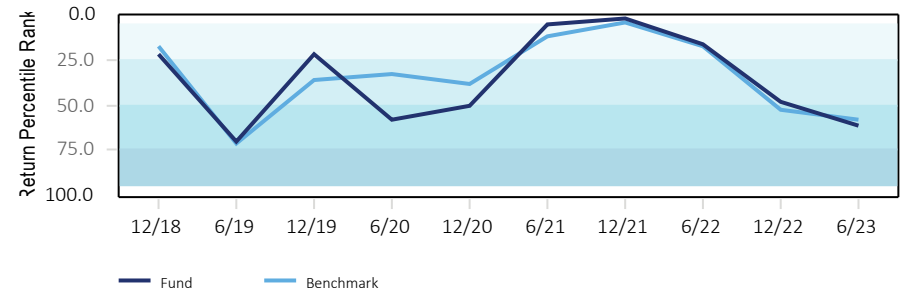
## Comparative Performance



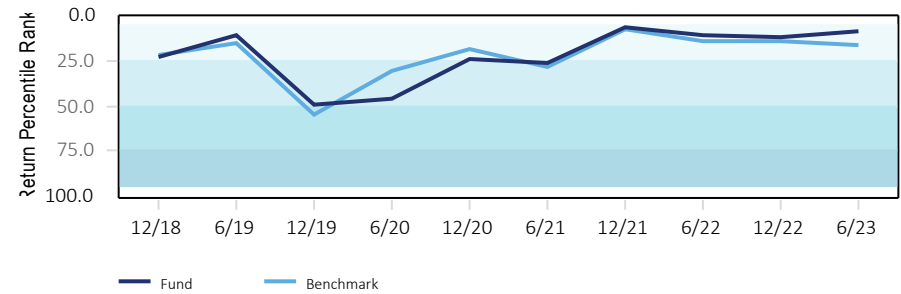
## Relative Performance



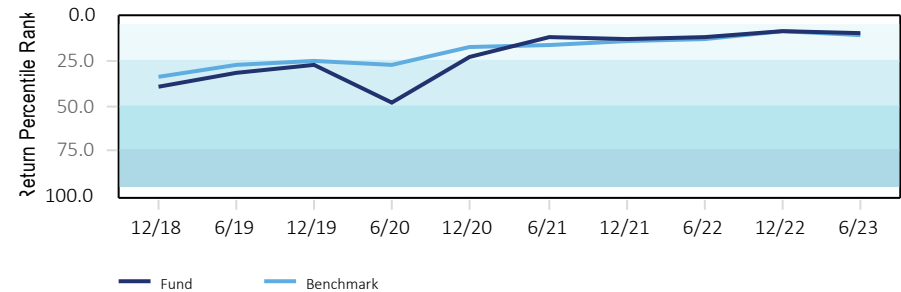
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking

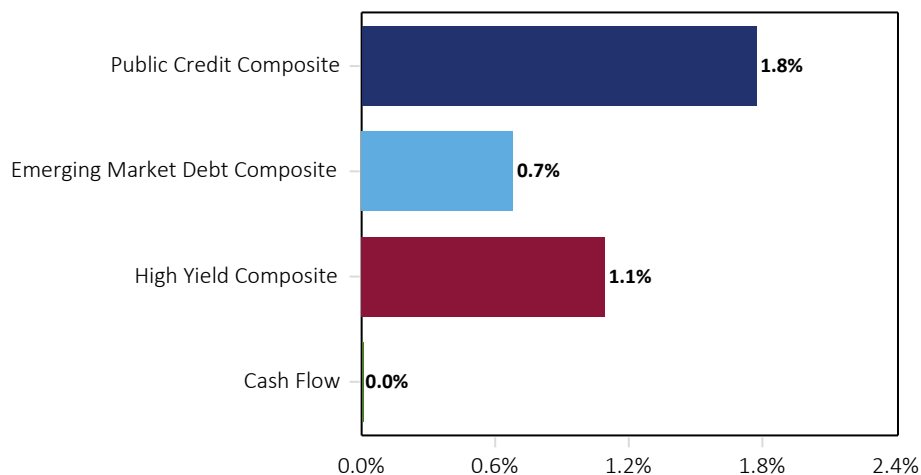


# Return and Risk Contribution

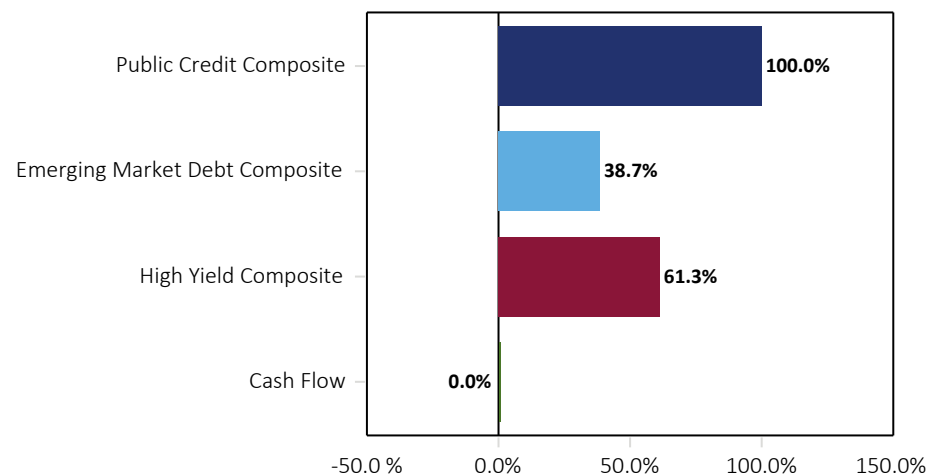
## Public Credit Composite

Periods Ended 1 Quarter June 30, 2023

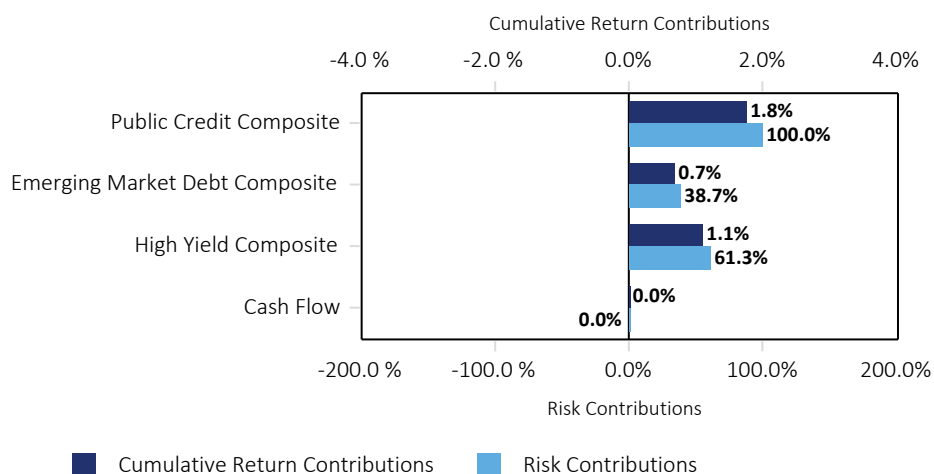
### Cumulative Return Contributions



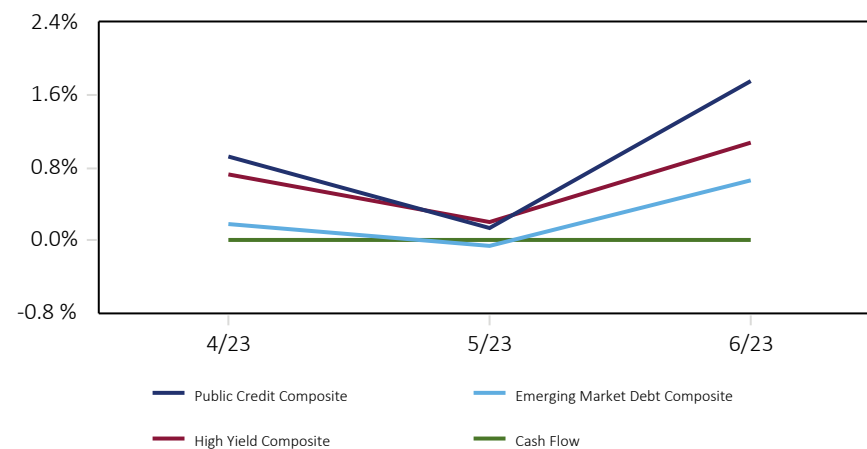
### Risk Contributions



### Cumulative Return and Risk Contributions



### Cumulative Return Contributions History



# Asset Allocation & Performance

## Private Markets Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
Private Markets Composite	0.51	-3.85	-3.85	20.55	15.86			15.67	10/1/2016	13,292,615,582
Private Equity/Debt	1.60	-5.67	-5.67	25.14	19.26	17.47	16.48	13.07	10/1/1985	7,864,812,474
Private Equity Policy Index	1.60	-5.67	-5.67	25.14	19.26	17.29	14.11	14.71		
Private Credit Composite	1.85	5.45	5.45	7.94	6.75			7.30	10/1/2016	2,178,537,557
Private Credit Policy Index	1.85	5.45	5.45	7.94	6.75			7.30		
Private Real Assets Composite	-2.86	-4.54	-4.54	13.47	9.91			9.74	10/1/2016	3,249,265,551
Private Real Assets Policy Index	-2.86	-4.54	-4.54	13.47	9.91			9.74		
Russell 3000 + 3%	9.19	22.52	22.52	17.30	14.73	15.71	13.35	15.18	1/1/1979	
S&P/LSTA Leveraged Loan Index + 1%	3.41	11.81	11.81	7.38	5.17	5.11	5.77	5.87	1/1/1997	
CPI + 5%	2.32	8.12	8.12	11.07	9.09	7.85		7.75	7/1/2012	

# Asset Allocation & Performance

## Private Credit Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
Private Credit Composite	1.85	5.45	5.45	7.94	6.75			7.30	10/1/2016	2,178,537,557
Private Corporate Debt Composite	1.91	5.54	5.54	8.42	6.97			7.17	1/1/2017	947,910,933
Tennenbaum CP Direct Lending	1.73	4.66	4.66	7.90	6.90			7.05	1/1/2017	346,466,254
Monroe Capital	2.07	6.03	6.03	8.68	6.83			7.40	4/1/2017	480,047,564
PPEF XXV B	1.83	6.81	6.81					5.07	3/1/2022	121,397,115
Private Real Asset Debt Composite	1.25	4.98	4.98	6.00	5.86	7.54		7.54	7/1/2013	483,178,836
Principal Real Estate Debt II	-2.70	-3.23	-3.23	3.68	4.87			5.62	10/1/2017	11,304,703
PGIM Real Estate Global Debt	1.85	5.87	5.87	6.23				6.21	10/1/2018	184,645,250
Kayne Anderson Real Estate Debt IV	1.92	6.60	6.60					6.08	6/1/2022	89,722,552
Heitman Credit	-1.26							-1.50	10/1/2022	34,373,266
IFM US Infrastructure Debt Fund	2.85							2.85	1/1/2023	63,133,065
JP Morgan Global Transport Income Fund									5/1/2023	100,000,000
Opportunistic Credit Composite	2.15	5.95	5.95					6.74	8/1/2021	747,447,788
KKR Global Corporate Debt	1.53	4.33	4.33	8.01				7.21	4/1/2019	281,171,225
Crestline Opportunistic Credit	2.31	12.10	12.10					7.10	8/1/2021	183,948,744
ARES PCS II	3.72	-1.85	-1.85					1.06	10/1/2021	59,991,074
Audax Mezzanine Coinvest	2.66	8.62	8.62					10.25	11/1/2021	11,956,931
Marathon SPS	1.77	7.08	7.08					6.20	11/1/2021	89,861,984
Arrowmark	3.48	7.00	7.00					5.27	1/1/2022	98,075,655
Audax Mezzanine V	0.12	4.78	4.78					27.61	6/1/2022	22,442,175
S&P/LSTA Leveraged Loan Index + 1%	3.41	11.81	11.81	7.38	5.17	5.11	5.77	5.87	1/1/1997	



# Asset Allocation & Performance

## Private Real Assets Composite

Periods Ended June 30, 2023

	Performance (%) net of fees									Market Value \$
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date	
<b>Private Real Assets Composite</b>	<b>-2.86</b>	<b>-4.54</b>	<b>-4.54</b>	<b>13.47</b>	<b>9.91</b>			<b>9.74</b>	<b>10/1/2016</b>	3,249,265,551
Private Real Assets Policy Index	-2.86	-4.54	-4.54	13.47	9.91			9.74		
<b>Private Real Estate Composite</b>	<b>-4.13</b>	<b>-7.23</b>	<b>-7.23</b>	<b>14.02</b>	<b>10.33</b>	<b>10.73</b>	<b>9.01</b>	<b>7.25</b>	<b>4/1/1987</b>	2,627,312,688
Private Real Estate Policy Index	-2.88	-10.73	-10.73	7.04	5.56	7.77	8.12	8.64		
<b>Private Other Real Assets Composite</b>	<b>2.93</b>	<b>8.85</b>	<b>8.85</b>	<b>6.59</b>	<b>4.99</b>			<b>4.92</b>	<b>10/1/2016</b>	621,952,863
CPI + 5%	2.32	8.12	8.12	11.07	9.09			8.71		
NCREIF Fund Index-ODCE (VW) (Net)	-2.88	-10.73	-10.73	7.04	5.56	7.77	6.86	7.42	1/1/1978	
CPI - All Urban Consumers (Unadjusted)	1.08	2.97	2.97	5.78	3.90	2.71	2.57	3.16	2/1/1913	
CPI + 5%	2.32	8.12	8.12	11.07	9.09	7.85	7.70	8.32	2/1/1913	

# Asset Allocation & Performance

## Private Real Estate Composite (G)

Periods Ended June 30, 2023

	Performance (%) gross of fees								
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date
Private Real Estate Composite (G)	-4.03	-6.83	-6.83	14.53	10.86	11.32	9.92	8.10	4/1/1987
Private Real Estate Composite (N)	-4.13	-7.23	-7.23	14.02	10.33	10.73	9.01	7.25	
Private Real Estate Policy Index	-2.88	-10.73	-10.73	7.04	5.56	7.77	8.12	8.64	
Clarion Partners (G)	-9.47	-11.48	-11.48	5.07	2.23	6.87		6.95	7/1/2005
Clarion Partners (N)	-9.60	-11.91	-11.91	4.58	1.70	6.24		6.14	
Invesco Separate Account (G)	-1.59	-2.71	-2.71	22.69	16.48	15.29	12.63	12.14	7/1/1996
Invesco Separate Account (N)	-1.70	-3.15	-3.15	22.11	15.92	14.66	11.69	11.15	
RREEF America LLC (G)	-3.98	-10.67	-10.67	12.31	10.55	11.40	10.66	10.83	4/1/1997
RREEF America LLC (N)	-4.08	-11.04	-11.04	11.82	10.04	10.84	9.61	9.86	
UBS (G)	-2.75	-2.58	-2.58	17.41	13.87	12.96	11.02	11.09	10/1/1998
UBS (N)	-2.84	-2.95	-2.95	16.94	13.38	12.45	10.37	10.46	
NCREIF Fund Index-ODCE (VW) (Net)	-2.88	-10.73	-10.73	7.04	5.56	7.77	6.86	7.42	1/1/1978

# Asset Allocation & Performance

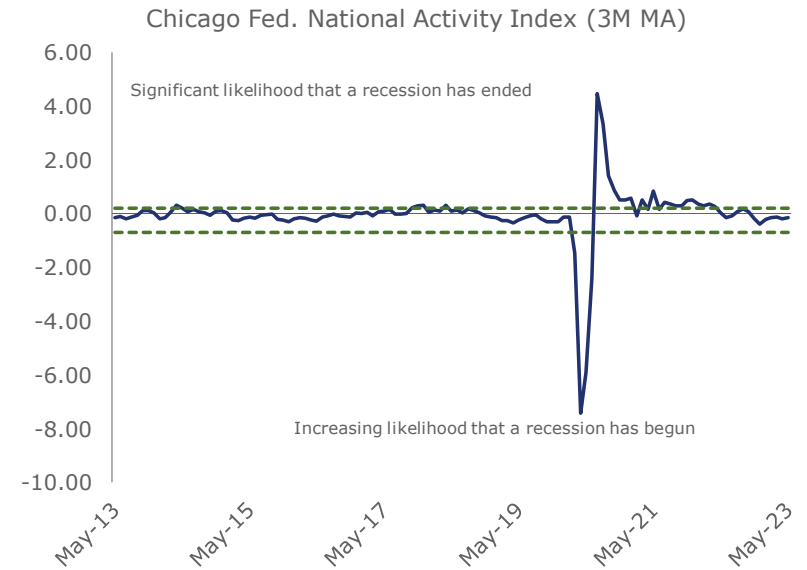
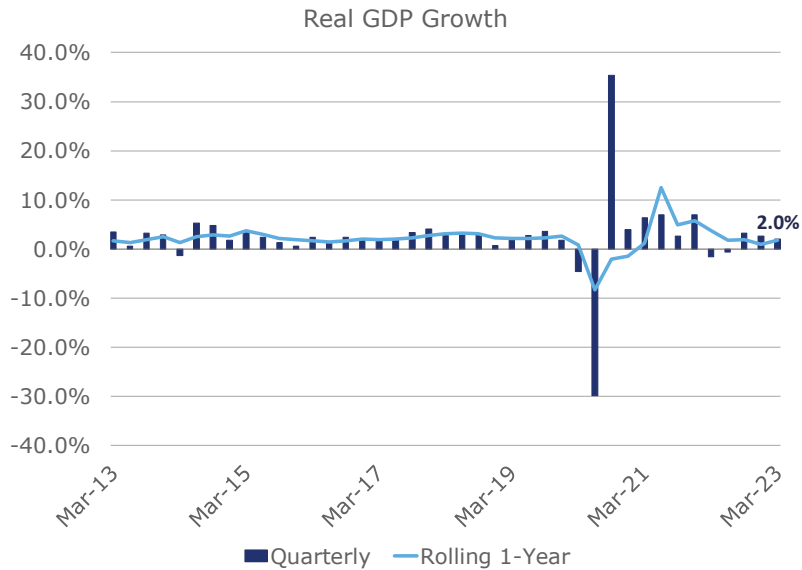
## Private Other Real Assets Composite

Periods Ended June 30, 2023

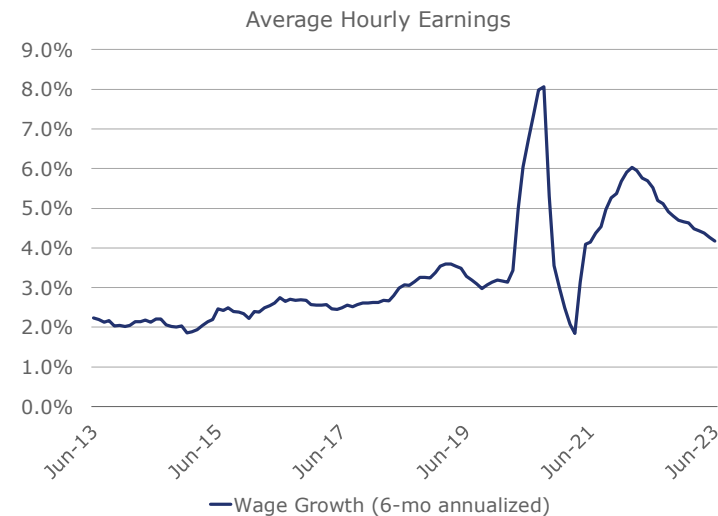
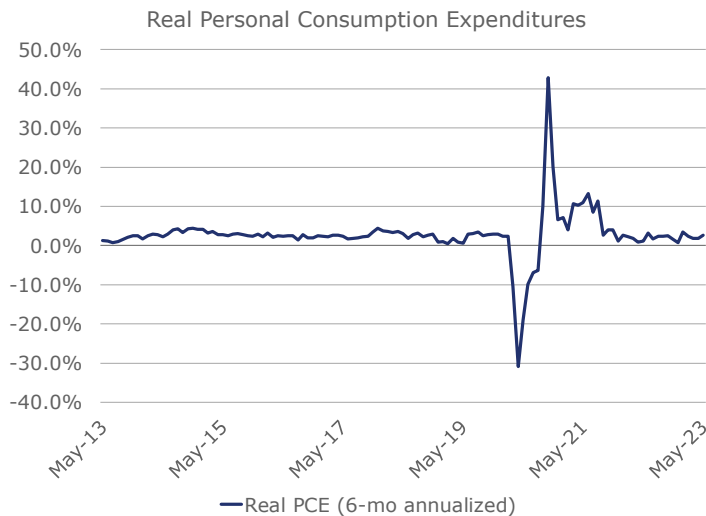
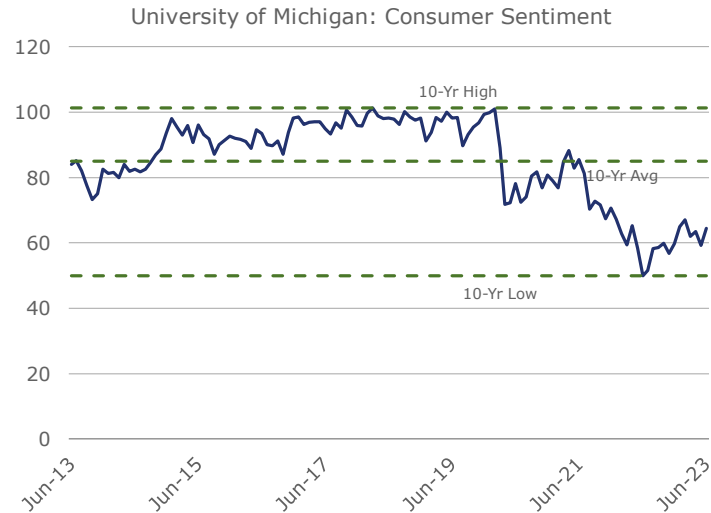
	Performance (%) net of fees								
	1 Quarter	FYTD	1 Year	3 Years	5 Years	10 Years	20 Years	Since Inception	Inception Date
Private Other Real Assets Composite	2.93	8.85	8.85	6.59	4.99			4.92	10/1/2016
CPI + 5%	2.32	8.12	8.12	11.07	9.09			8.71	
Forest Investment Associates	4.56	11.24	11.24	8.13	5.96	5.25		5.90	7/1/2012
CPI + 5%	2.32	8.12	8.12	11.07	9.09	7.85		7.75	
UBS Farmland Investors	2.90	6.20	6.20	5.22	3.96			7.07	7/1/2016
CPI + 5%	2.32	8.12	8.12	11.07	9.09			8.60	
Brookfield Super-Core Infrastructure	1.82	7.97	7.97					6.33	4/1/2022
CPI + 5%	2.32	8.12	8.12					10.11	
NCREIF Farmland Index	0.80	8.36	8.36	7.66	6.49	8.35	12.52	7.80	10/1/1980
NCREIF Timberland Index	1.71	11.13	11.13	8.67	5.80	5.90	7.04	10.82	4/1/1987

# Economic/Market Activity

# Economic Growth

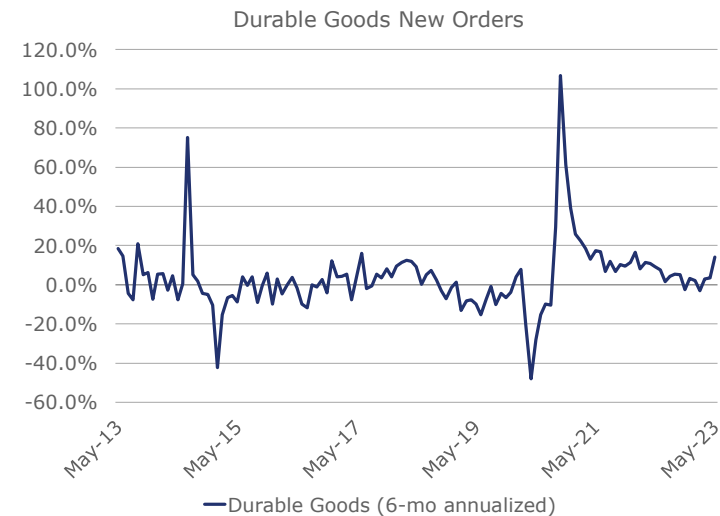
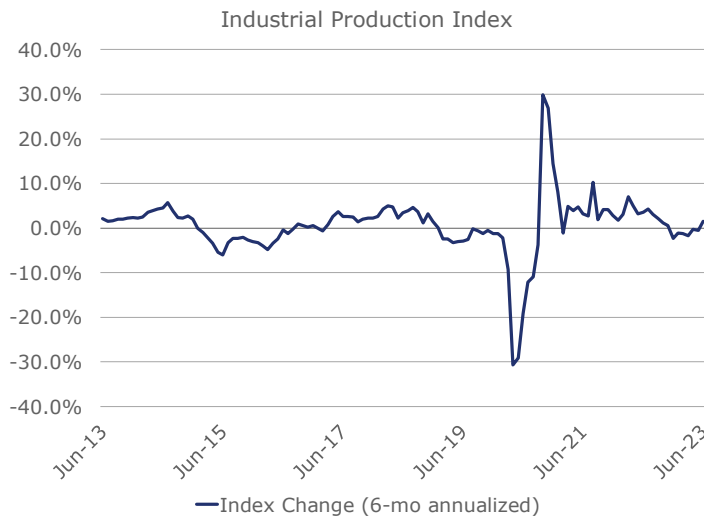
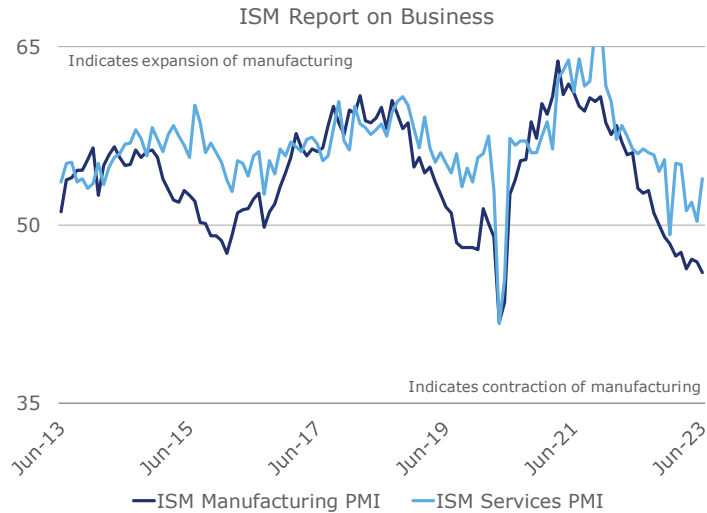


# Consumer Activity

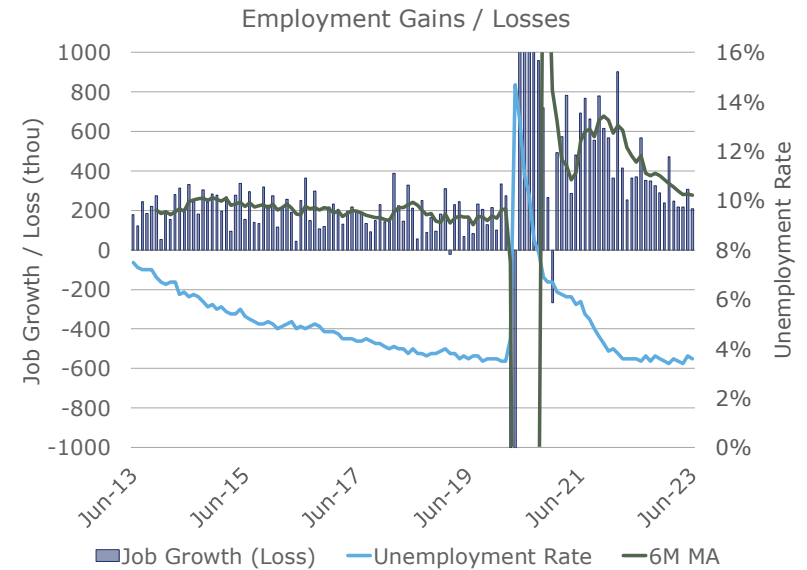
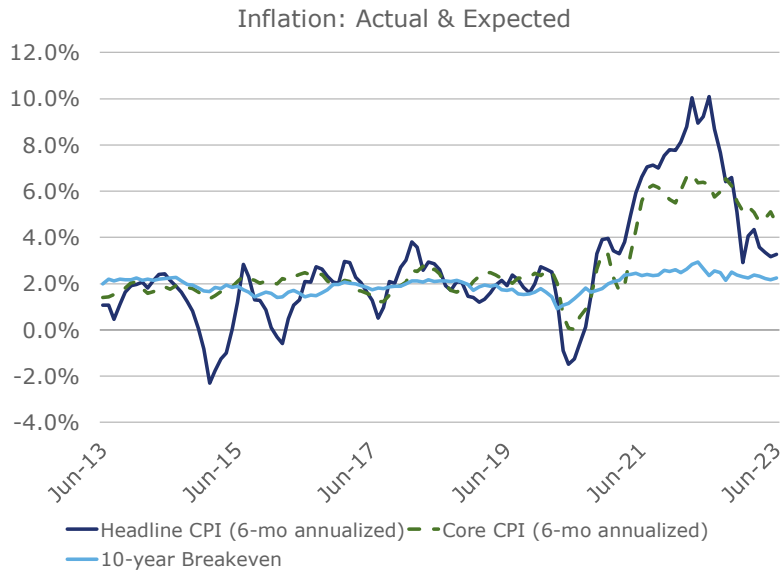


Data Sources: Bloomberg

# Business Activity



# Inflation and Employment



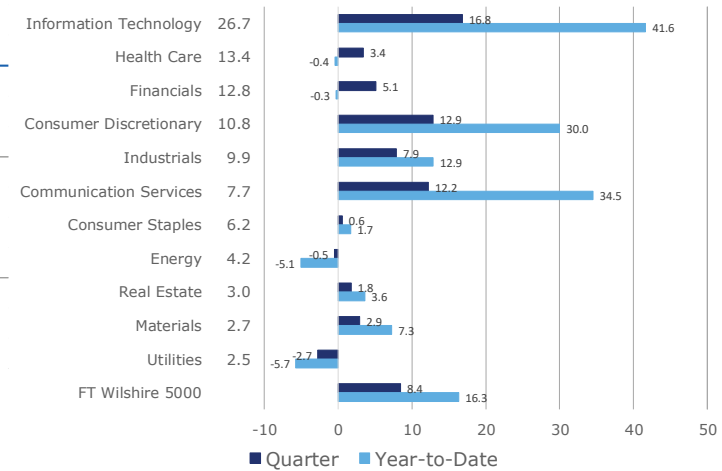


# U.S. Equity Market

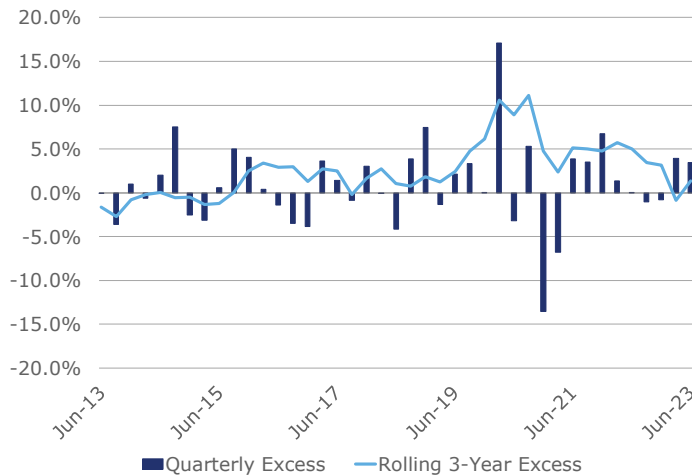
As of 6/30/2023

	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
FT Wilshire 5000	8.4	16.3	19.0	14.2	11.7	12.5
Wilshire U.S. Large Cap	8.7	17.0	19.6	14.4	12.3	12.9
Wilshire U.S. Small Cap	5.1	8.8	13.3	12.9	5.4	8.9
Wilshire U.S. Large Growth	14.2	32.1	28.7	15.5	14.9	15.5
Wilshire U.S. Large Value	2.6	2.7	9.9	12.9	9.5	10.2
Wilshire U.S. Small Growth	6.7	13.5	19.1	10.1	6.2	9.4
Wilshire U.S. Small Value	3.5	4.6	8.2	15.7	4.7	8.4
Wilshire REIT Index	3.3	6.7	-0.3	8.5	4.4	6.4
MSCI USA Min. Vol. Index	2.6	4.0	8.0	8.9	9.1	10.9
FTSE RAFI U.S. 1000 Index	5.0	6.7	13.2	17.4	10.4	11.2

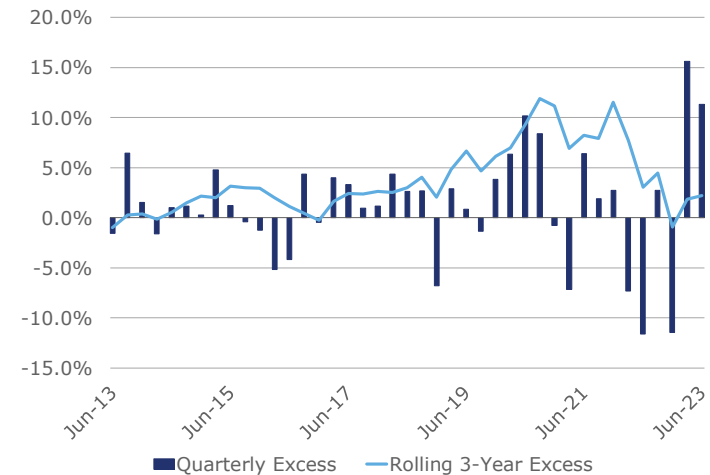
U.S. Sector Weight and Return (%)



Large Cap vs Small Cap



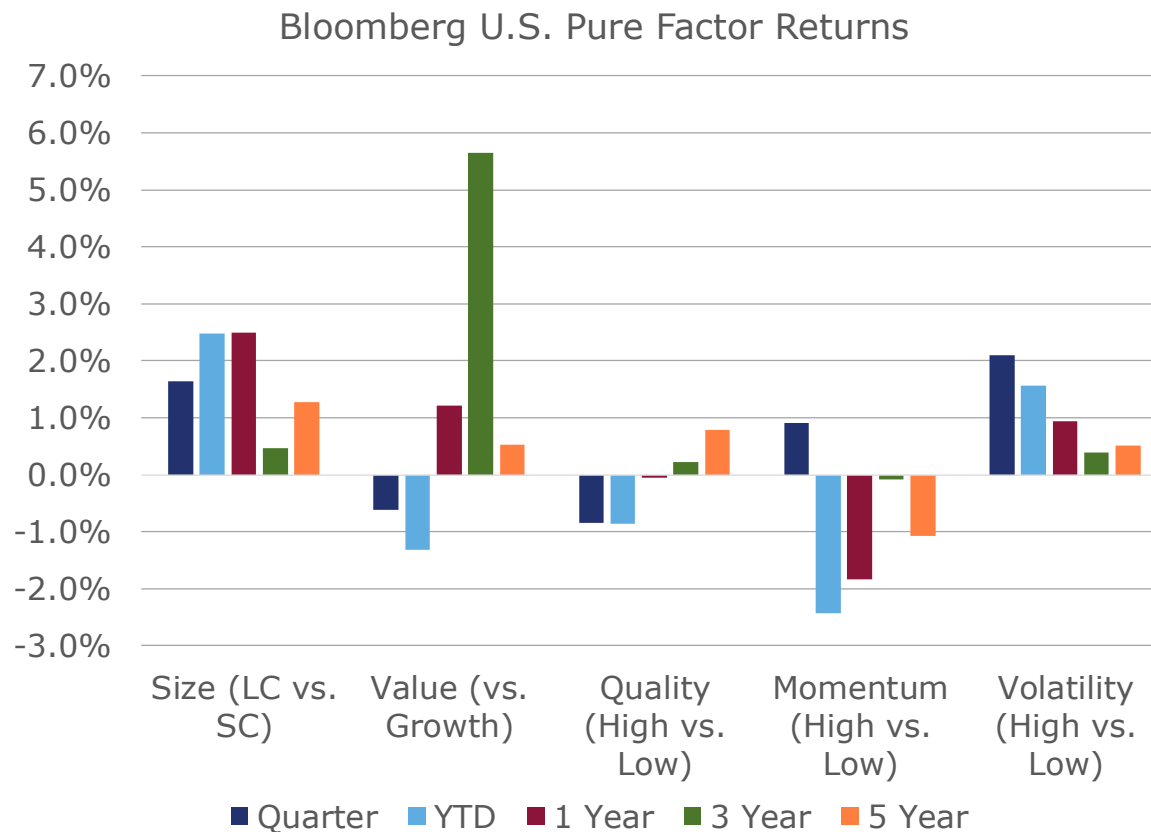
Large Growth vs Large Value



Data Sources: Bloomberg, Wilshire Atlas

## U.S. Factor Returns

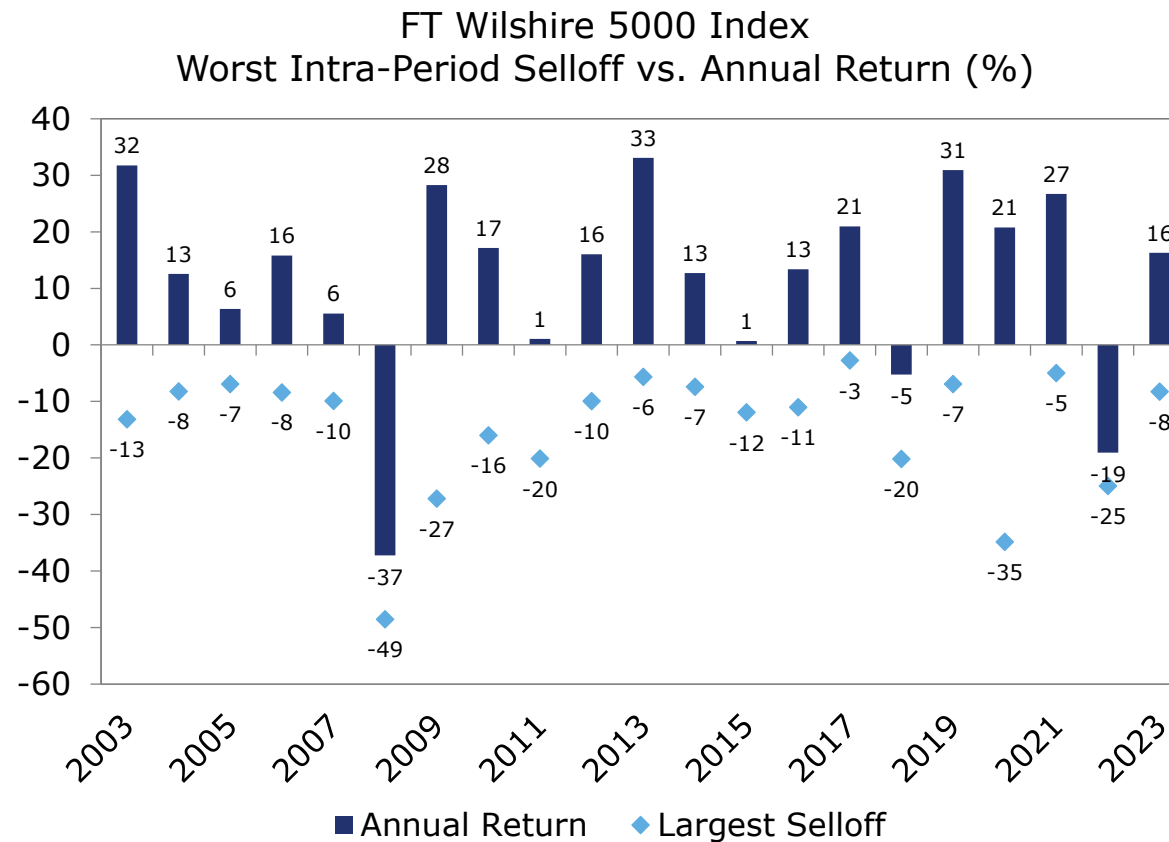
- Factor returns represent the contribution from large cap, value, etc. stocks within Bloomberg's Portfolio & Risk Analytics module
- Large cap and high volatility have mostly outperformed this year



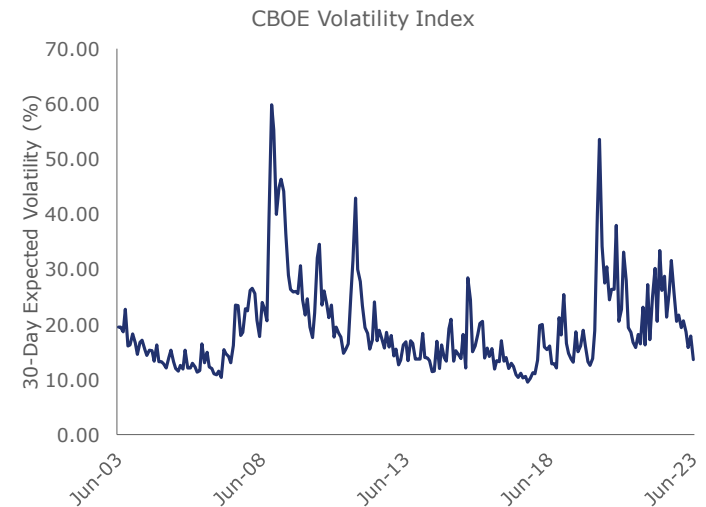
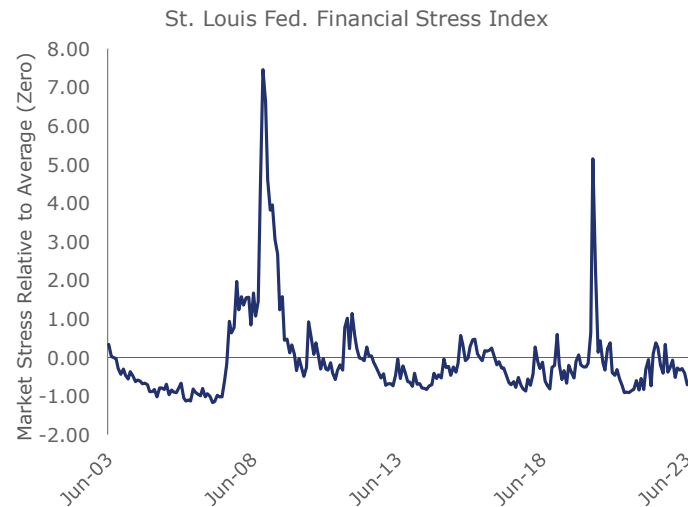
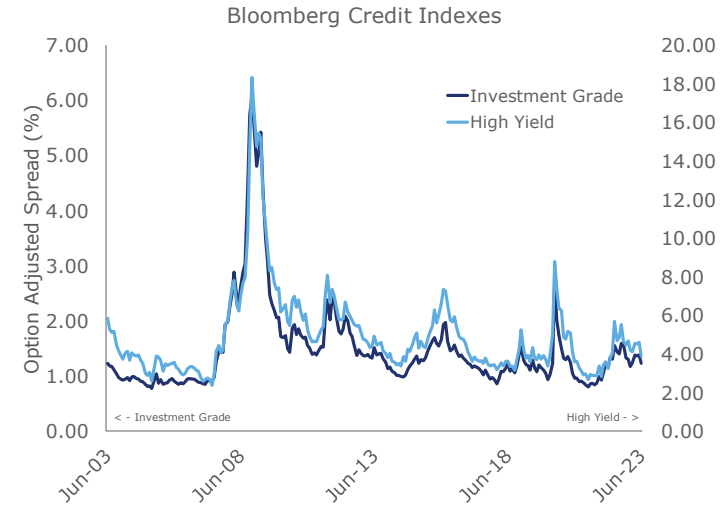
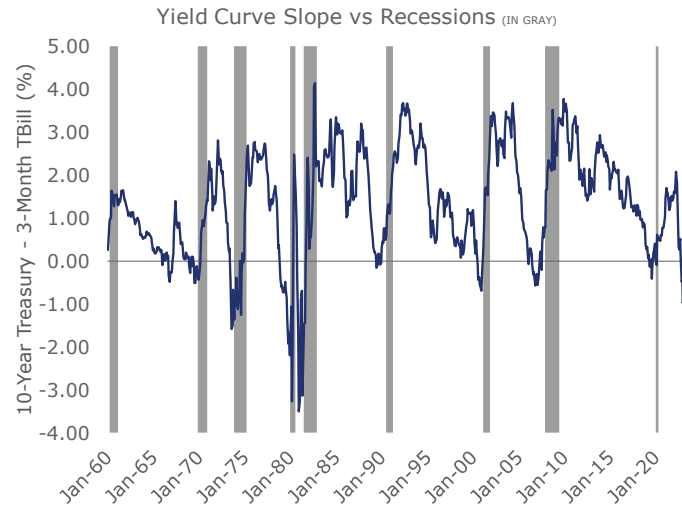
Data Sources: Bloomberg

# Annual Equity Market Selloffs

- U.S. equity suffered a meaningful selloff in Feb.-Mar. but is generally rebounding from 2022

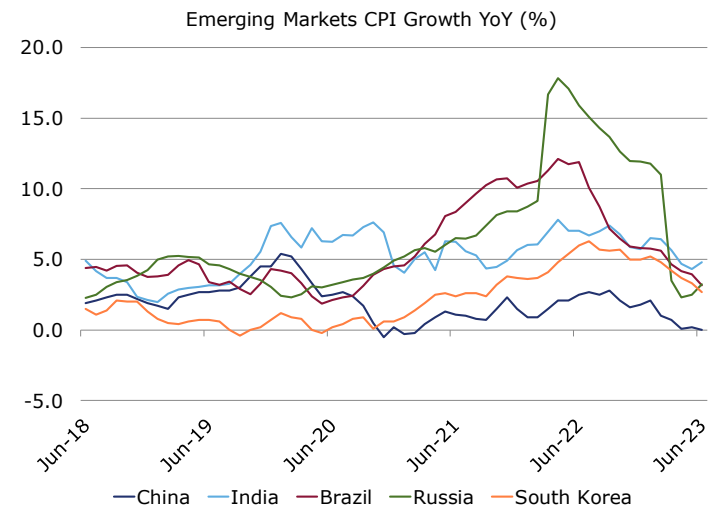
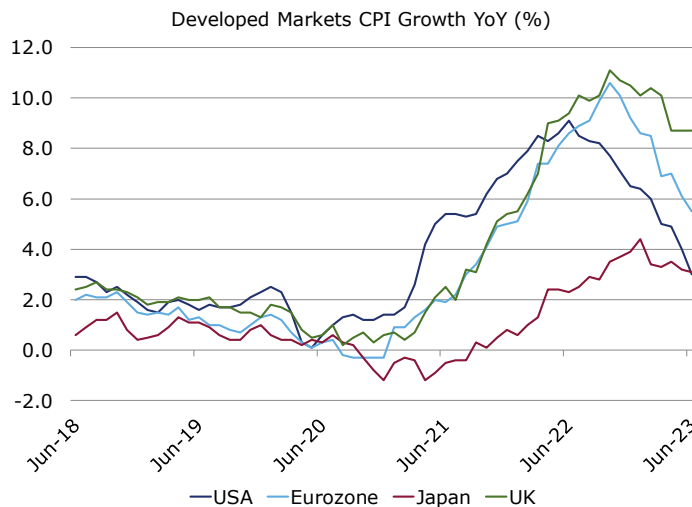
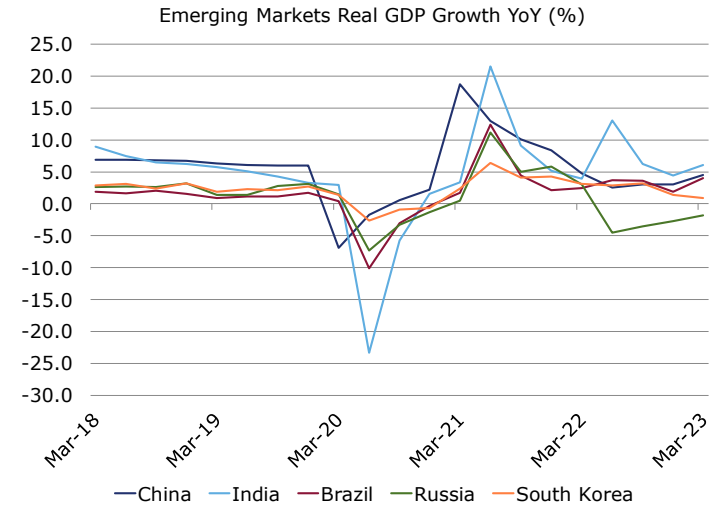
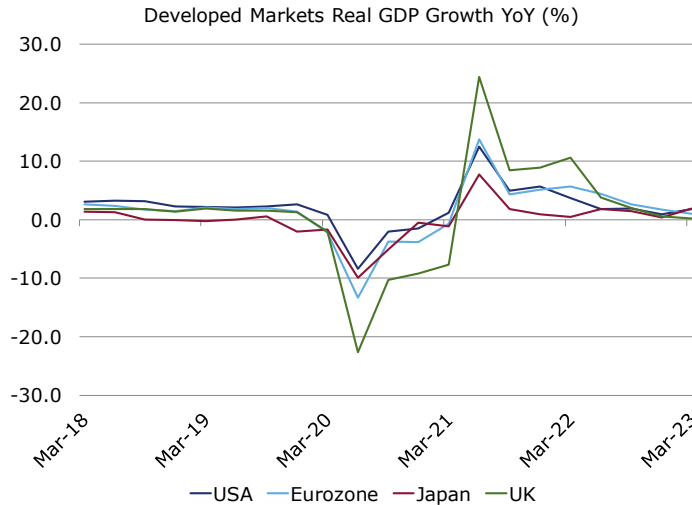


# Risk Monitor



Data Sources: Bloomberg

# Non-U.S. Growth and Inflation

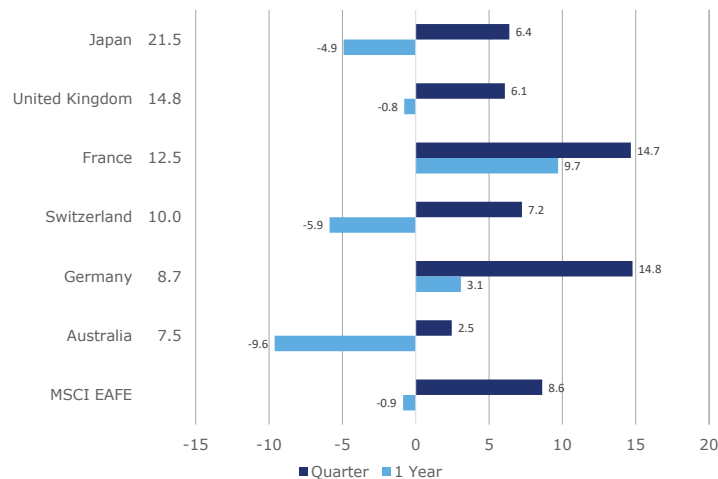


Data Sources: Bloomberg

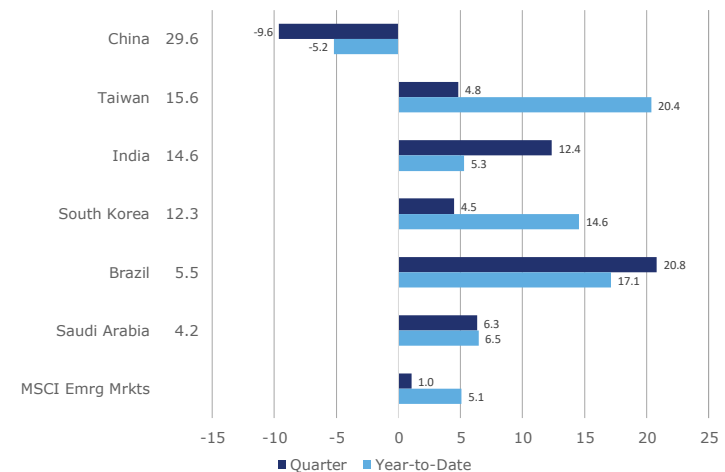
# Non-U.S. Equity Market

As of 6/30/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
MSCI ACWI ex-US (\$G)	2.7	9.9	13.3	7.7	4.0	5.2
MSCI EAFE (\$G)	3.2	12.1	19.4	9.5	4.9	5.9
MSCI Emerging Markets (\$G)	1.0	5.1	2.2	2.7	1.3	3.3
MSCI Frontier Markets (\$G)	2.2	4.8	4.6	3.4	-1.0	0.8
MSCI ACWI ex-US Growth (\$G)	2.1	11.0	13.7	4.3	4.4	6.0
MSCI ACWI ex-US Value (\$G)	3.2	8.5	12.9	11.2	3.3	4.5
MSCI ACWI ex-US Small (\$G)	2.2	7.2	11.5	8.6	3.1	6.2
MSCI ACWI Minimum Volatility	2.4	4.1	6.4	6.3	6.0	7.9
MSCI EAFE Minimum Volatility	1.8	7.7	9.9	3.4	2.1	5.2
FTSE RAFI Developed ex-US	3.4	10.4	17.4	13.2	4.5	5.7
MSCI EAFE LC (G)	4.6	12.6	18.1	12.3	6.9	8.2
MSCI Emerging Markets LC (G)	1.8	5.8	3.8	4.3	3.4	6.1

Developed Markets Weight and Return (%)



Emerging Markets Weight and Return (%)

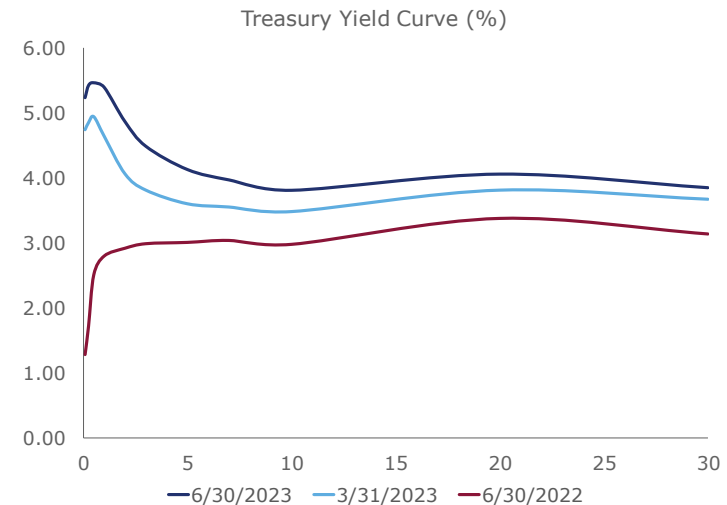
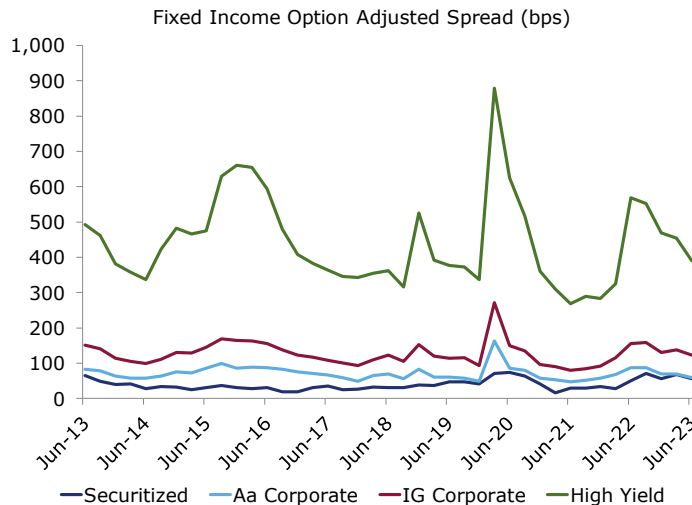


Data Sources: Bloomberg

# U.S. Fixed Income

As of 6/30/2023	YTW	DUR.	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg Aggregate	4.8	6.3	-0.8	2.1	-0.9	-4.0	0.8	1.5
Bloomberg Treasury	4.4	6.2	-1.4	1.6	-2.1	-4.8	0.4	1.0
Bloomberg Gov't-Rel.	4.9	5.3	-0.5	2.4	0.2	-2.9	1.1	1.7
Bloomberg Securitized	4.8	5.9	-0.6	1.8	-1.5	-3.6	0.1	1.2
Bloomberg Corporate	5.5	7.1	-0.3	3.2	1.5	-3.4	1.8	2.6
Bloomberg LT Gov't/Credit	4.8	14.3	-1.3	4.4	-2.6	-8.6	0.7	2.9
Bloomberg LT Treasury	4.0	16.0	-2.3	3.7	-6.8	-12.1	-0.9	1.8
Bloomberg LT Gov't-Rel.	5.2	11.8	0.3	5.5	1.2	-5.5	1.0	3.2
Bloomberg LT Corporate	5.4	13.0	-0.5	4.9	1.0	-6.2	1.6	3.5
Bloomberg U.S. TIPS *	3.8	7.4	-1.4	1.9	-1.4	-0.1	2.5	2.1
Bloomberg High Yield	8.5	3.5	1.7	5.4	9.1	3.1	3.4	4.4
S&P/LSTA Leveraged Loan	9.6	0.3	3.1	6.5	10.7	6.3	4.1	4.1
Treasury Bills	5.3	0.3	1.2	2.3	3.6	1.2	1.5	1.0

\* Yield and Duration statistics are for a proxy index based on similar maturity, the Bloomberg Barclays U.S. Treasury 7-10 Year Index

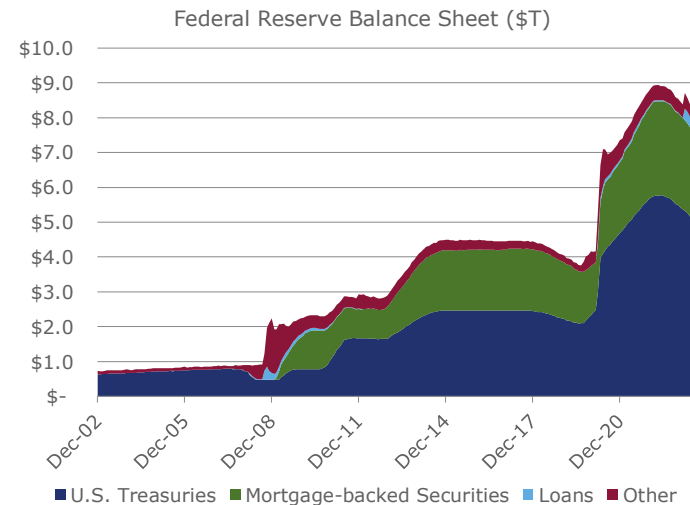
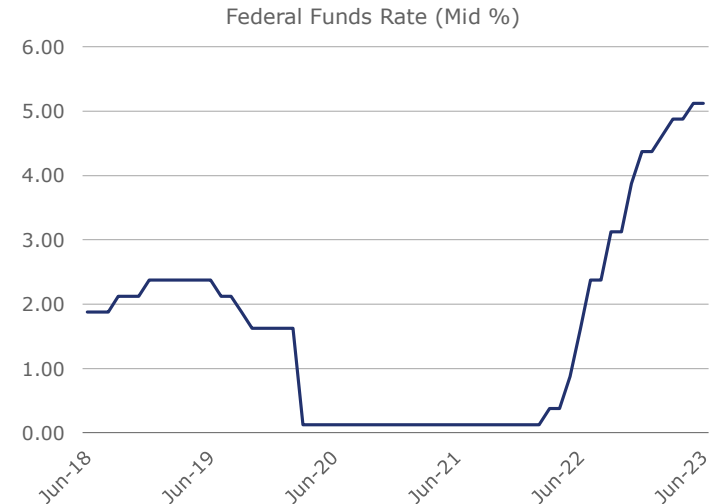


Data Sources: Bloomberg

# Federal Reserve

- The Federal Open Market Committee increased the rate an additional 25 basis points in May before pausing increases in June
- QE4 was larger than the 3 phases of quantitative easing – combined – following the global financial crisis
- The Fed's balance sheet has begun to shrink again during the past quarter

	Announced	Closed	Amount (bil)
QE1	11/25/2008	3/31/2010	\$1,403
QE2	11/3/2010	6/29/2012	\$568
QE3	9/13/2012	10/29/2014	\$1,674
QE4	3/23/2020	3/15/2022	\$4,779

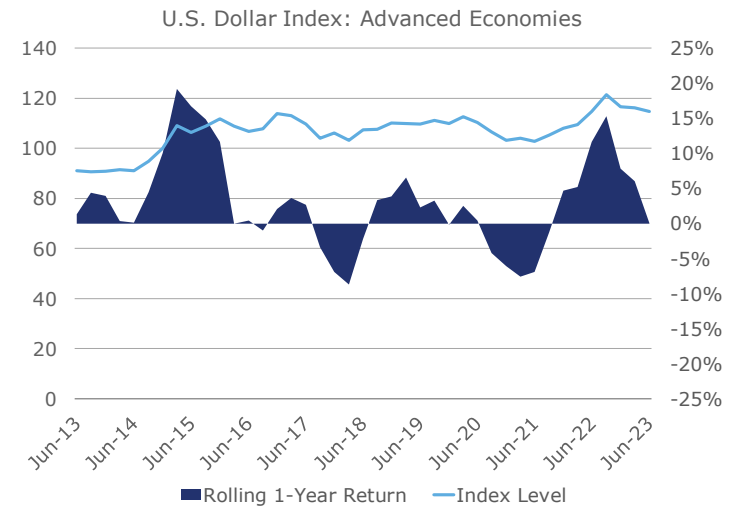
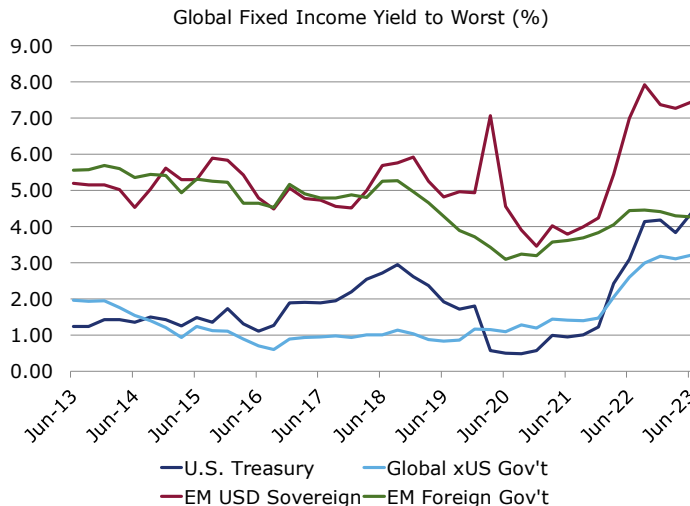




# Non-U.S. Fixed Income

As of 6/30/2023	Quarter	YTD	1 Year	3 Year	5 Year	10 Year
<b>Developed Markets</b>						
Bloomberg Global Aggregate xUS	-2.2	0.8	-1.8	-5.9	-2.7	-0.9
Bloomberg Global Aggregate xUS *	0.7	3.6	1.5	-2.1	1.0	2.5
Bloomberg Global Inflation Linked xUS	-2.0	3.3	-5.4	-6.6	-2.8	0.1
Bloomberg Global Inflation Linked xUS *	-2.5	1.4	-6.2	-5.1	-0.2	2.9
<b>Emerging Markets (Hard Currency)</b>						
Bloomberg EM USD Aggregate	1.1	3.3	5.6	-2.7	1.0	2.7
<b>Emerging Markets (Foreign Currency)</b>						
Bloomberg EM Local Currency Gov't	-1.4	1.7	2.3	0.0	1.6	1.0
Bloomberg EM Local Currency Gov't *	2.0	4.2	6.9	0.1	2.9	2.5
Euro vs. Dollar	0.6	1.9	4.1	-1.0	-1.4	-1.7
Yen vs. Dollar	-7.9	-9.1	-6.0	-9.2	-5.2	-3.7
Pound vs. Dollar	3.0	5.1	4.3	0.8	-0.8	-1.8

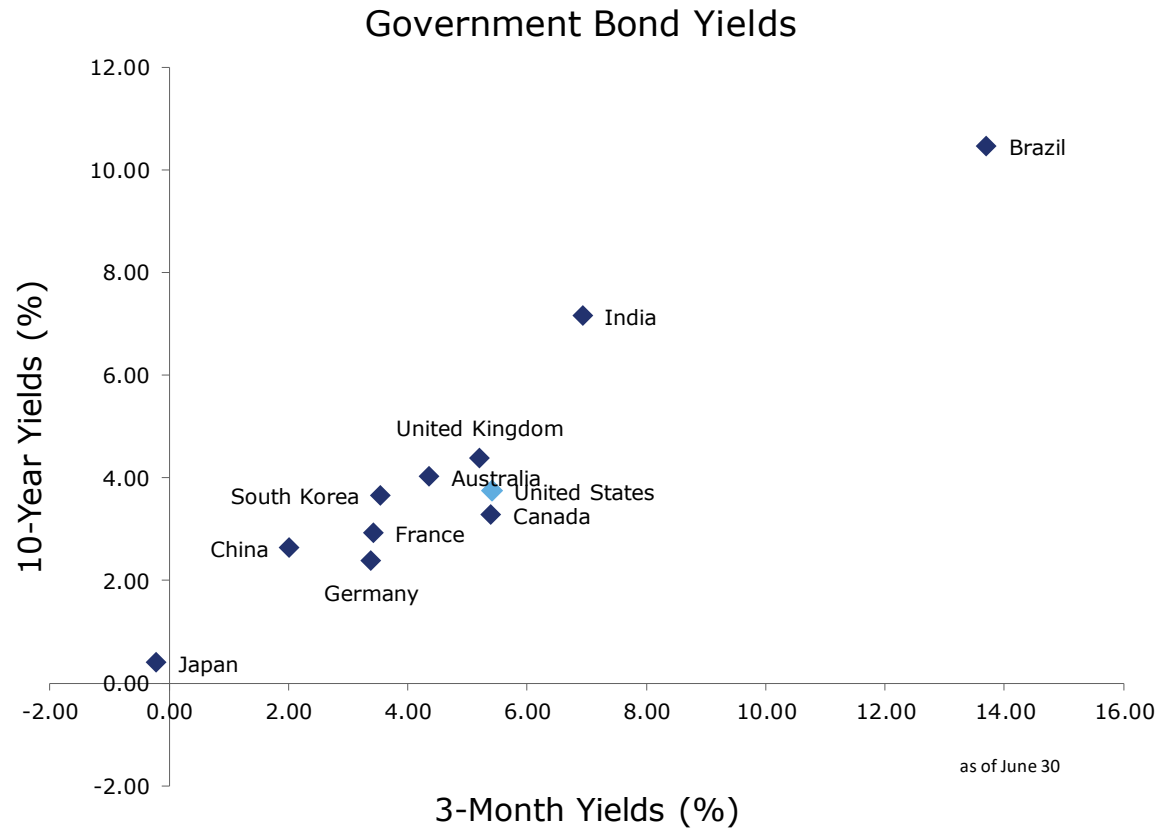
\* Returns are reported in terms of local market investors, which removes currency effects.



Data Sources: Bloomberg

# Global Interest Rates

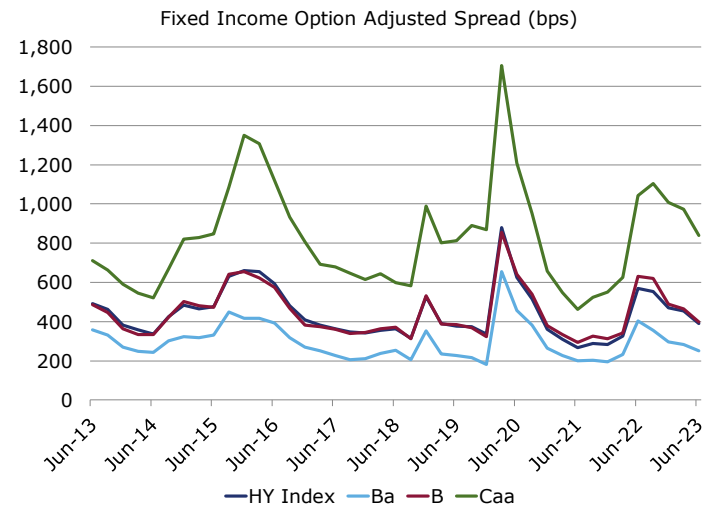
Short-term rates have turned positive in most larger countries; longer-term rates around 4.0% in the U.K. and the U.S.



# High Yield Bond Market

As of 6/30/2023

		YTW	QTR	YTD	1 YR	3 YR	5 YR	10 YR
Bloomberg High Yield		8.5	1.7	5.4	9.1	3.1	3.4	4.4
S&P LSTA Leveraged Loan		9.1	3.3	6.4	11.8	5.4	4.0	3.7
<b>High Yield Quality Distribution</b>	<b>Weight</b>							
Ba U.S. High Yield	47.9%	7.1	0.9	4.4	8.1	2.3	4.2	4.8
B U.S. High Yield	39.9%	8.7	1.9	5.4	9.9	3.1	3.1	4.0
Caa U.S. High Yield	11.2%	12.9	4.2	9.3	9.4	5.5	0.7	3.9
Ca to D U.S. High Yield	0.9%	22.2	11.5	7.5	18.7	15.7	-2.1	-4.4



# Policy Definitions

# Historical Hybrid Composition

## Total Fund Policy Benchmark

Periods Ended June 30, 2023

Policy Index	Weight (%)
<b>Apr-2023</b>	
Russell 3000 Index	20.42
Blmbg. U.S. Universal Index	22.36
MSCI AC World ex USA (Net)	16.04
Global Smart Beta Policy Index	4.86
Private Equity Policy Index	19.22
90 Day U.S. Treasury Bill	0.97
Private Credit Policy Index	4.86
Private Real Assets Policy Index	8.35
Public Credit Policy Index	2.92
<b>Jan-2023</b>	
Russell 3000 Index	20.16
Blmbg. U.S. Universal Index	22.09
MSCI AC World ex USA (Net)	15.84
Global Smart Beta Policy Index	4.80
Private Equity Policy Index	19.81
90 Day U.S. Treasury Bill	0.96
Private Credit Policy Index	4.69
Private Real Assets Policy Index	8.77
Public Credit Policy Index	2.88

Policy Index	Weight (%)
<b>Oct-2022</b>	
Russell 3000 Index	19.68
Blmbg. U.S. Universal Index	21.56
MSCI AC World ex USA (Net)	15.46
Global Smart Beta Policy Index	4.69
Private Equity Policy Index	20.78
90 Day U.S. Treasury Bill	0.94
Private Credit Policy Index	4.66
Private Real Assets Policy Index	9.42
Public Credit Policy Index	2.81
<b>Jul-2022</b>	
Russell 3000 Index	19.35
Blmbg. U.S. Universal Index	21.54
MSCI AC World ex USA (Net)	15.39
Global Smart Beta Policy Index	5.28
Private Equity Policy Index	21.03
90 Day U.S. Treasury Bill	0.88
Private Credit Policy Index	4.15
Private Real Assets Policy Index	8.86
Public Credit Policy Index	3.52

# Historical Hybrid Composition

## Total Fund Policy Benchmark

Periods Ended June 30, 2023

Policy Index	Weight (%)
<b>Apr-2022</b>	
Russell 3000 Index	20.17
Blmbg. U.S. Universal Index	23.84
MSCI AC World ex USA (Net)	16.04
Global Smart Beta Policy Index	5.50
Private Equity Policy Index	19.65
90 Day U.S. Treasury Bill	0.92
Private Credit Policy Index	3.39
Private Real Assets Policy Index	6.82
Public Credit Policy Index	3.67
<b>Jan-2022</b>	
FT Wilshire 5000 Index	20.77
Blmbg. U.S. Universal Index	24.55
MSCI AC World ex USA (Net)	16.52
Global Smart Beta Policy Index	5.67
Private Equity Policy Index	18.60
90 Day U.S. Treasury Bill	0.94
Private Credit Policy Index	3.04
Private Real Assets Policy Index	6.13
Public Credit Policy Index	3.78

Policy Index	Weight (%)
<b>Oct-2021</b>	
FT Wilshire 5000 Index	20.84
Blmbg. U.S. Universal Index	24.63
MSCI AC World ex USA (Net)	16.58
Global Smart Beta Policy Index	5.68
Private Equity Policy Index	18.90
90 Day U.S. Treasury Bill	0.95
Private Credit Policy Index	2.91
Private Real Assets Policy Index	5.72
Public Credit Policy Index	3.79
<b>Jul-2021</b>	
FT Wilshire 5000 Index	21.37
Blmbg. U.S. Universal Index	25.25
MSCI AC World ex USA (Net)	17.00
Global Smart Beta Policy Index	5.83
Private Equity Policy Index	17.51
90 Day U.S. Treasury Bill	0.97
Private Credit Policy Index	2.68
Private Real Assets Policy Index	5.51
Public Credit Policy Index	3.88

# Historical Hybrid Composition

## Total Fund Policy Benchmark

Periods Ended June 30, 2023

### Policy Index Weight (%)

#### Apr-2021

FT Wilshire 5000 Index	21.63
Blmbg. U.S. Universal Index	25.56
MSCI AC World ex USA (Net)	17.21
Global Smart Beta Policy Index	5.90
Private Equity Policy Index	16.74
90 Day U.S. Treasury Bill	0.98
Private Credit Policy Index	2.75
Private Real Assets Policy Index	5.30
Public Credit Policy Index	3.93

#### Jan-2021

FT Wilshire 5000 Index	21.94
Blmbg. U.S. Universal Index	25.93
MSCI AC World ex USA (Net)	17.45
Global Smart Beta Policy Index	5.98
Private Equity Policy Index	15.49
90 Day U.S. Treasury Bill	1.00
Private Credit Policy Index	2.86
Private Real Assets Policy Index	5.36
Public Credit Policy Index	3.99

### Policy Index Weight (%)

#### Oct-2020

FT Wilshire 5000 Index	21.78
Blmbg. U.S. Universal Index	25.74
MSCI AC World ex USA (Net)	17.32
Global Smart Beta Policy Index	5.94
Private Equity Policy Index	15.37
90 Day U.S. Treasury Bill	0.99
Private Credit Policy Index	3.04
Private Real Assets Policy Index	5.86
Public Credit Policy Index	3.96

#### Jul-2020

FT Wilshire 5000 Index	21.38
Blmbg. U.S. Universal Index	27.22
MSCI AC World ex USA (Net)	17.01
Global Smart Beta Policy Index	5.83
Private Equity Policy Index	14.44
90 Day U.S. Treasury Bill	0.97
Private Credit Policy Index	3.15
Private Real Assets Policy Index	6.11
Public Credit Policy Index	3.89

#### Apr-1979

Total Fund Policy Benchmark	100.00
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\* Policy weights prior to July 2020 available on following page

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# Iowa Public Employees' Retirement System

## Annual Asset Allocation Review

September 2023

# Contents

Background & Overview

Asset Allocation Inputs

Asset Liability Projections

Observations & Recommendations

Appendices

# Background & Overview

## Background & Overview

- The asset allocation decision is the most important decision an investor can make
  - The asset allocation decision drives 90% of return variability among portfolios
- The appropriate asset allocation policy is determined by an investor's risk tolerance and return expectation requirements
- Each investor's risk tolerance and return requirements should be viewed in the context of the liabilities that the assets are supporting
- Wilshire recommends revisiting the asset allocation decision every three to five years, or sooner, as market conditions warrant
  - IPERS reviews asset allocation annually and last reviewed in September 2022
- IPERS has liability discount rate assumption of 7.0% over the long term

## History of Asset Allocation Decisions – Last 5 Years\*

### ➤ 2019

1. Eliminate 7% allocation to public real assets (REITS, MLPs and TIPS)
2. International equities +2.5%, Global Smart Beta +3%
3. Core-plus Bond +1%, Public Credit +0.5%

### ➤ 2020

1. Core-plus Bond -8%
2. Private equity from +2%, Private credit +5%, Private real assets from +1%

### ➤ 2022

1. Core-plus Bond -1%, Public Credit -1%, All public equity allocations -1%
2. Private equity +4%, Private real assets +1%

\*No Changes made to asset allocation in 2017, 2018, and 2021

## Considerations

### 10-year horizon forward-looking return assumptions

- ✓ Long enough to reflect investment performance over a market cycle
- ✓ Short enough to reflect sensitivity to current market pricing

### 30-year horizon forward-looking return assumptions

- ✓ Latest 10-year forecasts are combined with Equilibrium assumptions, which do not explicitly reflect current market conditions

Risk and correlation assumptions are same across the two horizons

## Focus of the 2023 Asset Allocation Review

Wilshire and IPERS CIO established that the 2023 Asset Liability study should take into consideration the following objectives:

1. Can we reduce portfolio risk given the compressed equity risk premium and still meet our return objective?
2. Add to defensive diversification looking at core, short duration, and cash options
3. Would TIPS add any value to the portfolio?
4. Allow the current asset allocation to be fully implemented (private credit)



# Asset Allocation Inputs

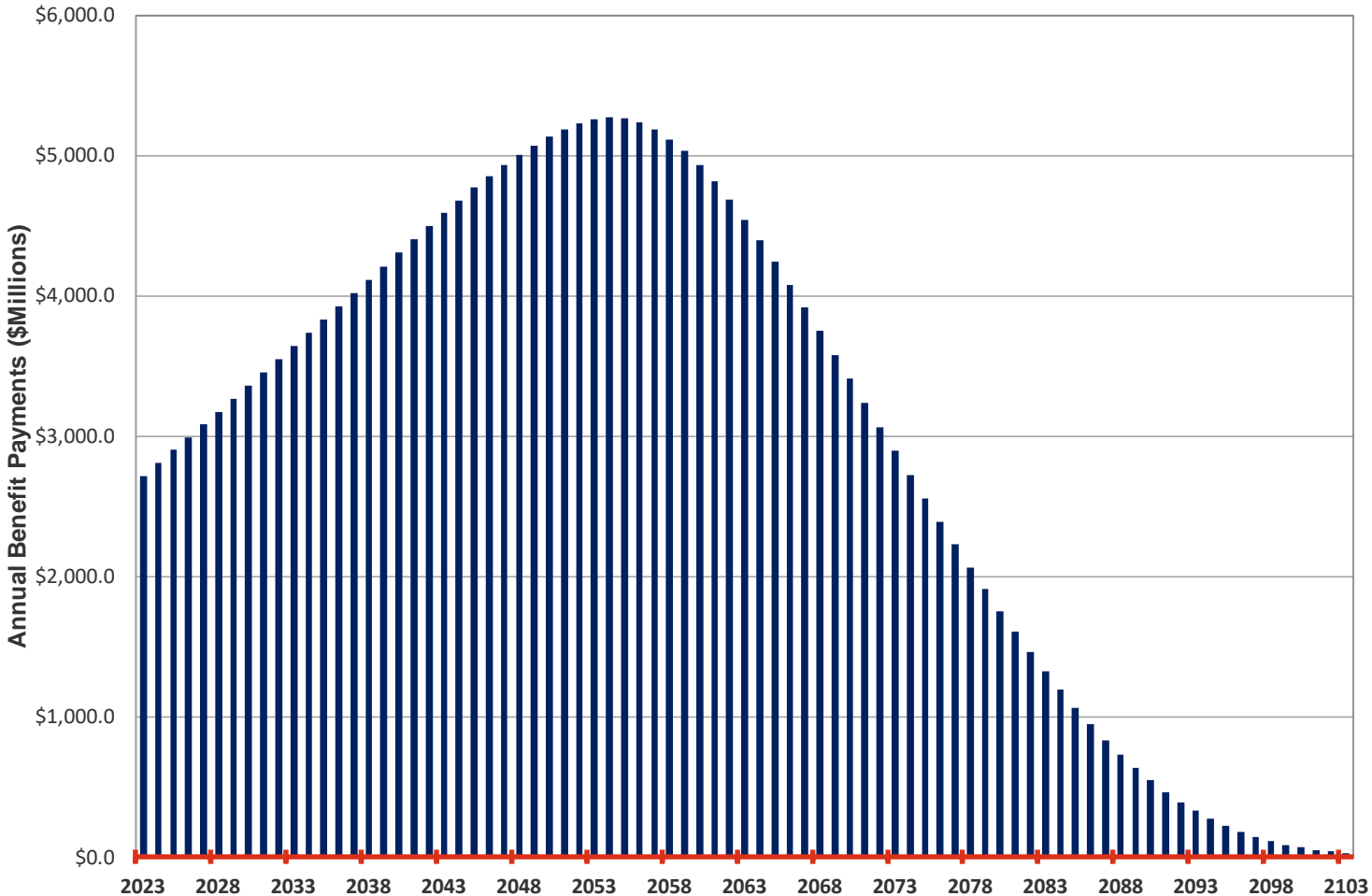


# Plan Status

\$ - Billion	June 30, 2022	June 30, 2023
<b>Asset and Liability Data</b>		
1. Actuarial Accrued Liability (AAL)	43.9	45.3
2. <u>Market Value of Assets (MVA)</u>	<u>40.1</u>	<u>41.1</u>
3. AAL MVA Funded Status (Unfunded Liability) (1. - 2.)	3.8	4.2
4. <u>AAL MVA Funded Ratio (2. / 1.)</u>	<u>91.5%</u>	<u>90.7%</u>
5. Actuarial Value of Assets (AVA)	39.4	41.0
6. AAL AVA Funded Status (Unfunded Liability) (1. - 5.)	4.5	4.3
7. <u>AAL AVA Funded Ratio (5. / 1.)</u>	<u>89.7%</u>	<u>90.3%</u>
<b>Economic Assumptions</b>		
Investment Return	7.00%	7.00%

- June 30, 2022, data was provided in the actuarial valuation reports by the plan actuary.
- June 30, 2023, liability data was provided by the plan actuary. Asset data is provided and calculated by Wilshire using data from the report and additional metrics provided by the actuary.

# Projected Benefit Payments

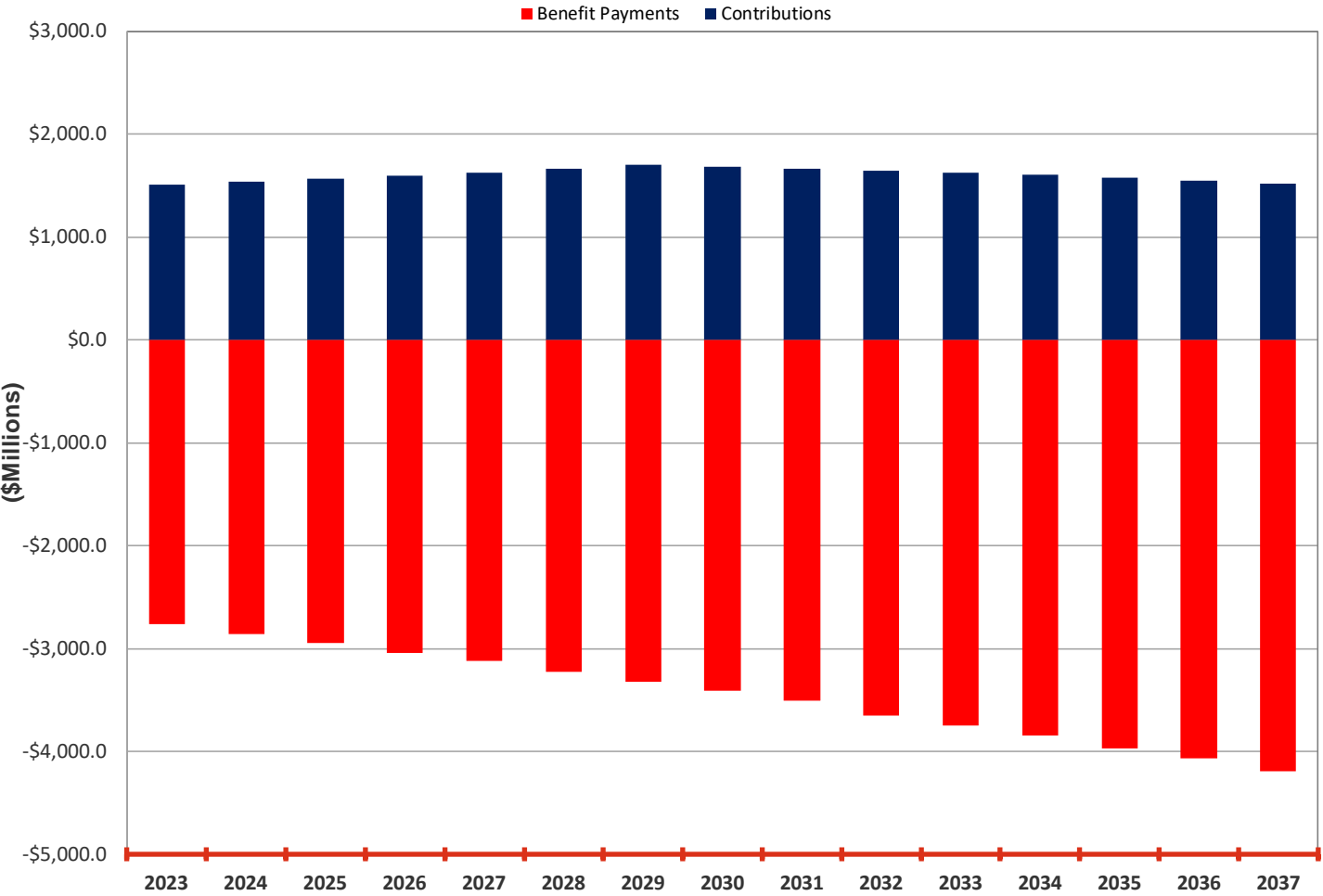


- Benefit payments provided by plan actuary.
- Closed group population, i.e., no new entrants assumed

## Current cash flow needs

The peak in liquidity needs (cash flow provided by actuary) for the current membership is in 32 years, when projected annual benefit payments increase from \$2.8 billion to \$5.3 billion

# Projected Cash In and Outflows



## Current cash flow needs

- Annual benefit payments are projected to increase, while annual contributions are projected to decrease over the long run
- The plan will remain cash flow negative over the foreseeable future
- This does not reflect any future contribution rate changes that may occur as funding status changes

# Capital Market Assumptions

Wilshire’s Capital Market Assumptions as of **June 30, 2023**

Wilshire’s asset class return, risk and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends

Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

Asset Classes	Expected Return 10 Years	Expected Return 20 Years	Expected Return 30 Years	Risk	Cash Yield
U.S. Equity	5.50	6.10	6.70	17.00	1.50
International Equity	6.85	7.20	7.50	19.05	2.95
Private Equity	9.00	9.40	9.85	29.65	0.00
Global Smart Beta	6.15	6.65	7.15	17.10	2.05
Public Credit	6.25	6.15	6.05	8.95	8.40
Private Credit	8.35	8.35	8.40	12.75	5.00
Core Fixed Income	4.85	4.85	4.80	4.70	4.95
Cash	3.85	3.70	3.55	0.75	3.85
TIPS	4.05	4.25	4.45	6.00	4.35
Short Duration Fixed Income	4.50	4.45	4.35	3.00	4.55
Private Real Assets	5.60	6.00	6.35	10.80	2.45

# Portfolios Modeled

Asset Class	Current Target	Optimization Constraints	7.00% Return Policy
U.S. Equity	21.00%	16% - 26% <sup>1</sup>	21.00%
International Equity	16.50%	11.5% - 21.5% <sup>1</sup>	13.00%
Private Equity	17.00%	17.0%	17.00%
Global Smart Beta	5.00%	5.0%	5.00%
<b>Total Growth Assets</b>	<b>59.50%</b>		<b>56.00%</b>
Public Credit	3.00%	3.0%	3.00%
Private Credit	8.00%	8.0%	8.00%
<b>Total Defensive Growth Assets</b>	<b>11.00%</b>		<b>11.00%</b>
Core Fixed Income	19.00%	14% - 24%	22.50%
Cash	1.00%	1.0%	1.00%
Short Duration Fixed Income	0.00%	0% - 5%	0.00%
<b>Total Defensive / Rate Sensitive Assets</b>	<b>20.00%</b>		<b>23.50%</b>
Private Real Assets	9.50%	9.5%	9.50%
<b>Total RA / Inflation Sensitive Assets</b>	<b>9.50%</b>		<b>9.50%</b>
<b>Total Assets</b>	<b>100.0%</b>		<b>100.0%</b>
<b>Expected Return - 10 Years (%)</b>	<b>7.06</b>		<b>6.99</b>
<b>Expected Return - 20 Years (%)</b>	<b>7.37</b>		<b>7.29</b>
<b>Expected Return - 30 Years (%)</b>	<b>7.67</b>		<b>7.57</b>
<b>Standard Deviation of Return (%)</b>	<b>13.19</b>		<b>12.62</b>
<b>+ / (-) in Expected Return - 10 Years (bps)</b>			<b>(7)</b>
<b>+ / (-) in Expected Return - 20 Years (bps)</b>			<b>(8)</b>
<b>+ / (-) in Expected Return - 30 Years (bps)</b>			<b>(10)</b>
<b>+ / (-) in SD of Return (bps)</b>			<b>(57)</b>
<b>Sharpe Ratio</b>	<b>0.24</b>		<b>0.25</b>

<sup>1</sup> U.S. Equity and International Equity are constrained to have market weight ratio. Currently at 62%/38%.

- Staff and Wilshire went through multiple iterations of modeling portfolios with the goal of:
  - Maintaining exposure to private assets and defensive growth
  - Adding to defensive assets (including a potential new short duration allocation
  - Reducing exposure to public equities
  - Maintain 7% return target over 10 years
- Following takeaways from the modeling that helps us arrive at a 7% return policy
  - In terms of defensive assets although we have an inverted yield curve the optimizer still prefers Core FI over cash and short duration to get to 7%
  - TIPS were evaluated to bring back into the portfolio to provide additional inflation diversification, but given their high correlation to bonds the optimizer did not favor them
  - Proposed 7% portfolio reduces International Equities and adds to Core Fixed Income

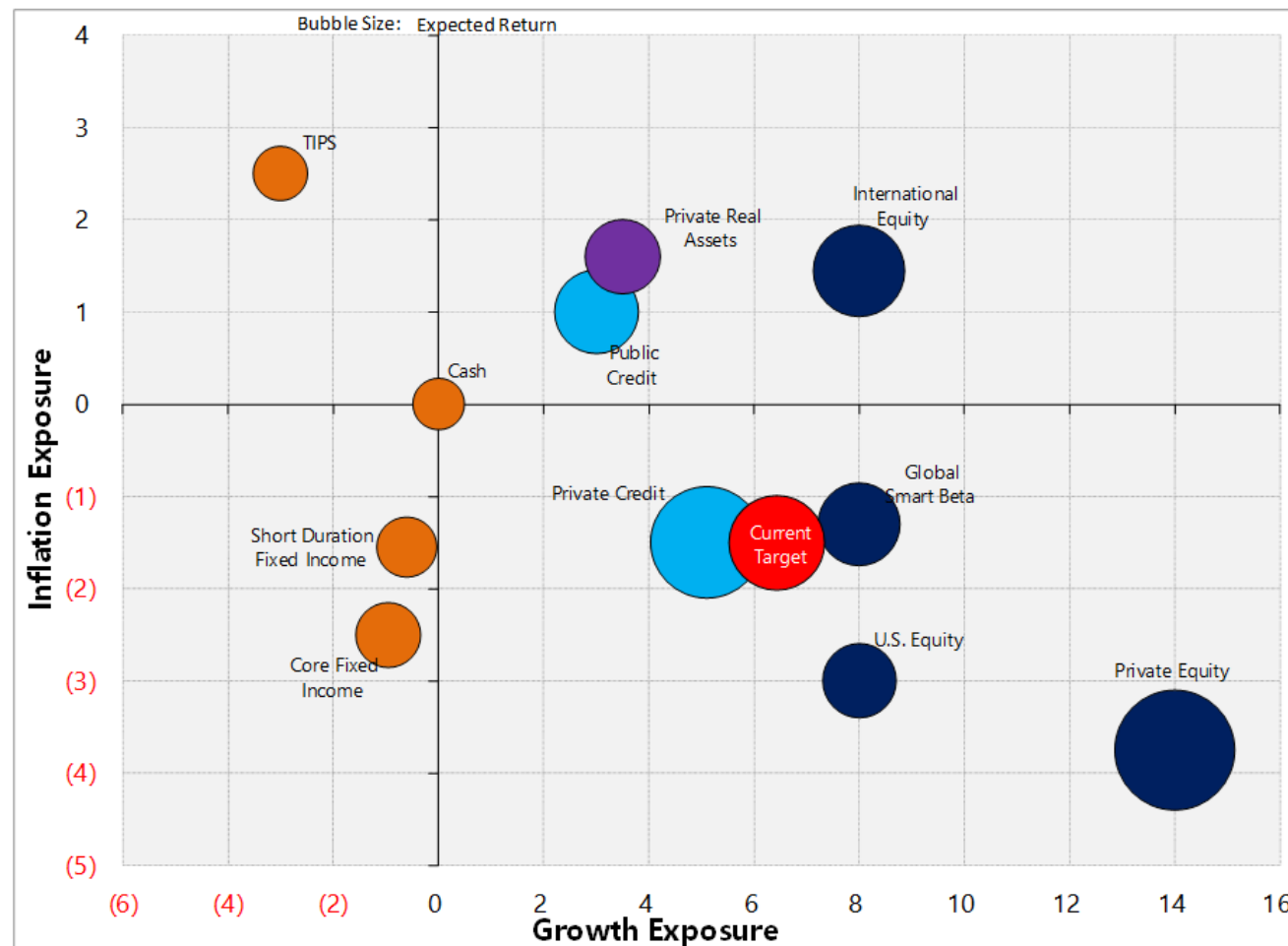
# Portfolios Modeled

Asset Class	Current Target	7.00% Return Policy
<b>Total Growth Assets</b>	59.50%	56.00%
<b>Total Defensive Growth Assets</b>	11.00%	11.00%
<b>Total Defensive / Rate Sensitive Assets</b>	20.00%	23.50%
<b><u>Total RA / Inflation Sensitive Assets</u></b>	<u>9.50%</u>	<u>9.50%</u>
<b>Total Assets</b>	100.0%	100.0%
<b>Expected Return - 10 Years (%)</b>	7.06	6.99
<b>Expected Return - 20 Years (%)</b>	7.37	7.29
<b>Expected Return - 30 Years (%)</b>	7.67	7.57
<b>Standard Deviation of Return (%)</b>	13.19	12.62
<b>Contribution to Asset Volatility (%):</b>		
<b>Growth</b>	86.2	84.9
<b>Defensive Growth</b>	6.7	7.0
<b>Defensive/Rate Sensitive</b>	2.2	3.0
<b>RA/Inflation Sensitive</b>	4.9	5.1
<b>Cash Yield</b>	2.8	2.8
<b>Growth Factor</b>	6.4	6.1
<b>Inflation Factor</b>	-1.5	-1.7
<b>Liquidity</b>		
<b>Market</b>	62.8	63.1
<b>Stressed</b>	17.2	20.3

## Economic Factor Exposure – Asset Classes

Concentrated factor tilts can represent portfolio vulnerability (e.g., reliance on growth markets)

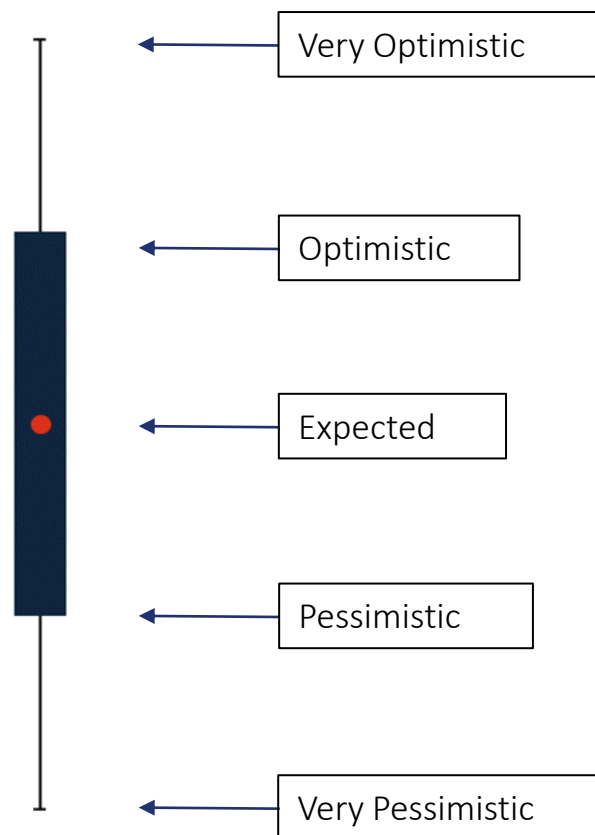
To the extent possible, a portfolio with factor neutrality is desirable for weathering unexpected future market environments



# Asset Liability Projections



# Box and Whisker Graphs



In each year of the simulation, there are 5,000 independent economic trial results.

**Expected:** 50% of the potential scenarios result in higher than this value and 50% results in lower

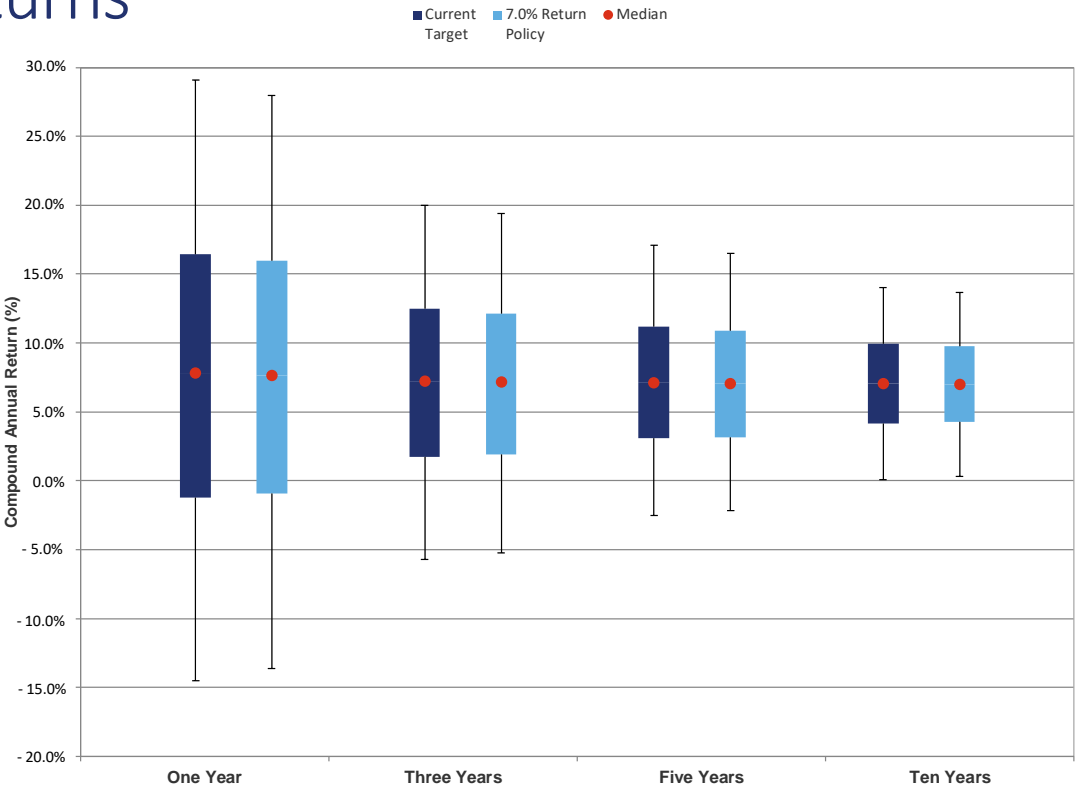
**Very optimistic:** Only 5% of the scenarios result in higher than this value and 95% result in lower

**Optimistic:** Only 25% of the scenarios result in higher than this value and 75% result in lower

**Pessimistic:** 75% of the scenarios results in higher than this value and 25% result in lower

**Very pessimistic:** 95% of the scenarios result in higher than this value and 5% result in lower

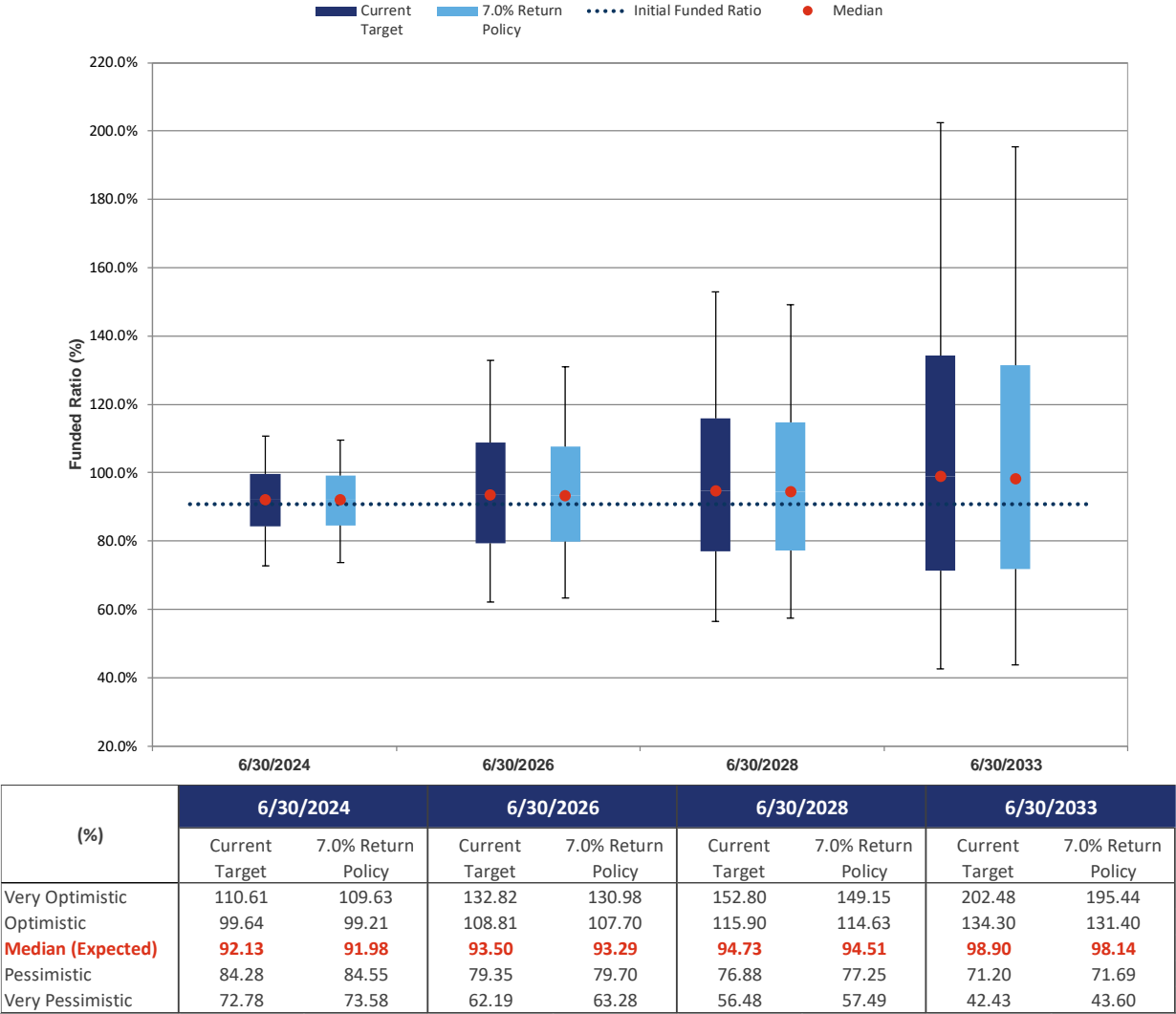
# Distribution of Returns\*



(%)	One Year		Three Years		Five Years		Ten Years	
	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy
Very Optimistic	29.09	27.97	19.99	19.40	17.10	16.53	14.04	13.67
Optimistic	16.47	15.97	12.49	12.16	11.19	10.91	9.93	9.74
<b>Median (Expected)</b>	<b>7.81</b>	<b>7.63</b>	<b>7.22</b>	<b>7.15</b>	<b>7.11</b>	<b>7.03</b>	<b>7.06</b>	<b>6.99</b>
Pessimistic	-1.24	-0.93	1.71	1.88	3.08	3.16	4.17	4.30
Very Pessimistic	-14.52	-13.60	-5.71	-5.25	-2.51	-2.17	0.06	0.29

\*For periods longer than one year, returns are compound annual.

# AAL MVA Funded Ratio



Shortfall Risk:

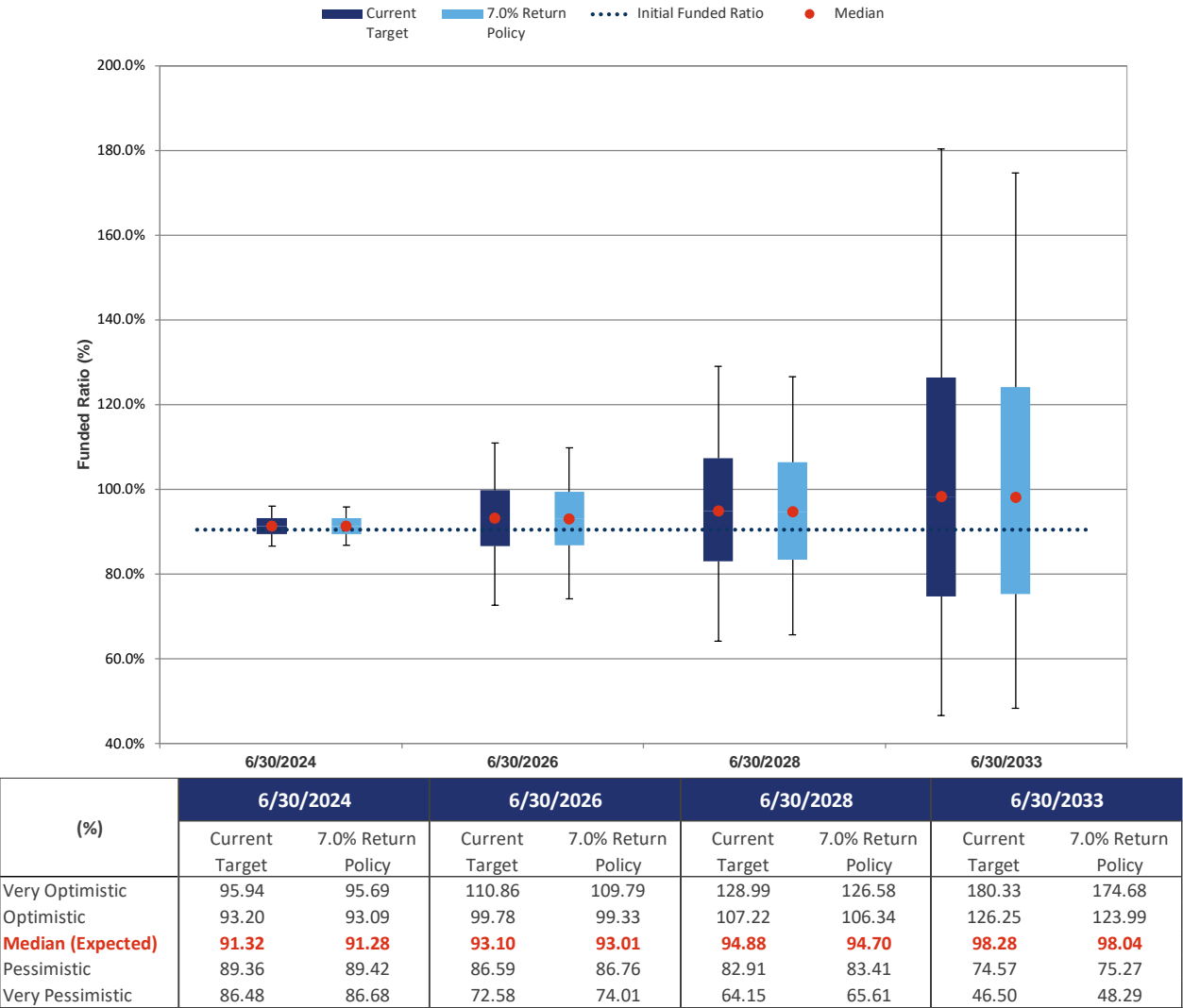
The potential for the current policy to have a lower median funded ratio than the alternative policies.

Drawdown Risk:

The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 90.7%

# AAL AVA Funded Ratio



Shortfall Risk:

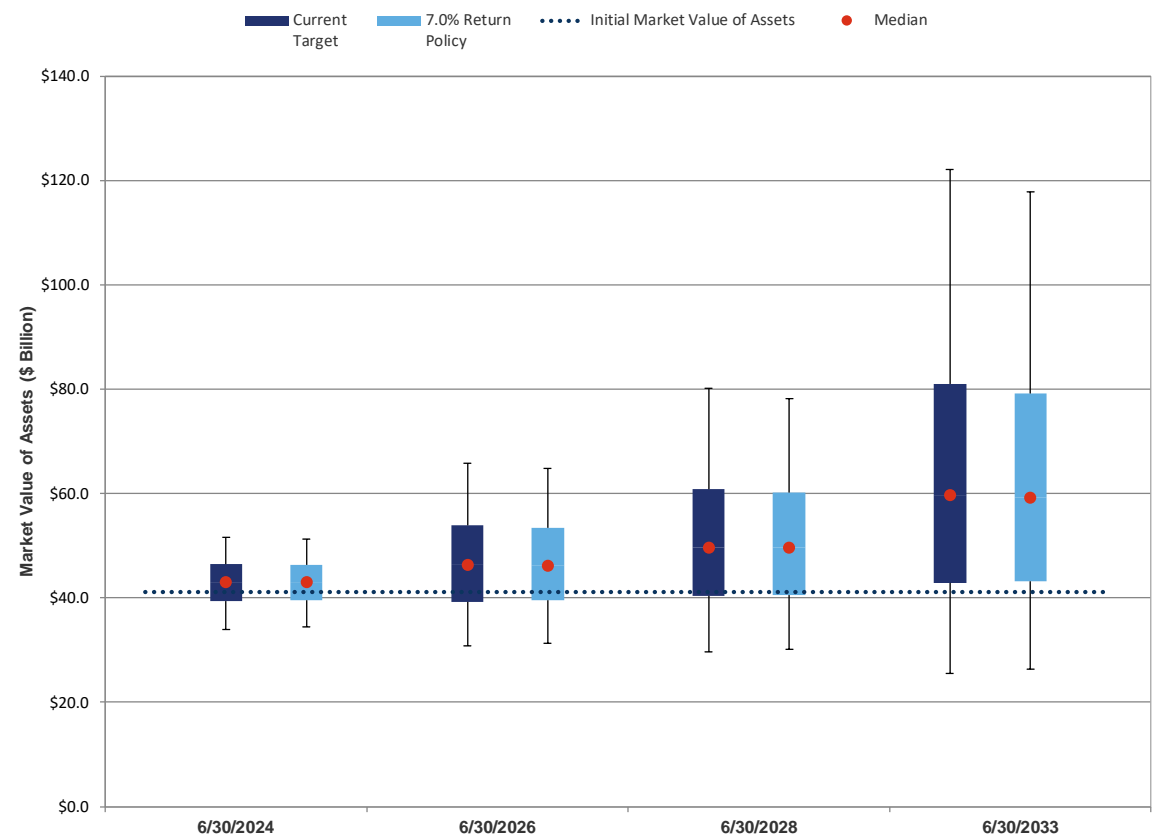
The potential for the current policy to have a lower median funded ratio than the alternative policies.

Drawdown Risk:

The potential for the current policy to have a lower “very pessimistic” funded ratio than the alternative policies.

Initial Funded Ratio = 90.3%

# Market Value of Assets – MVA



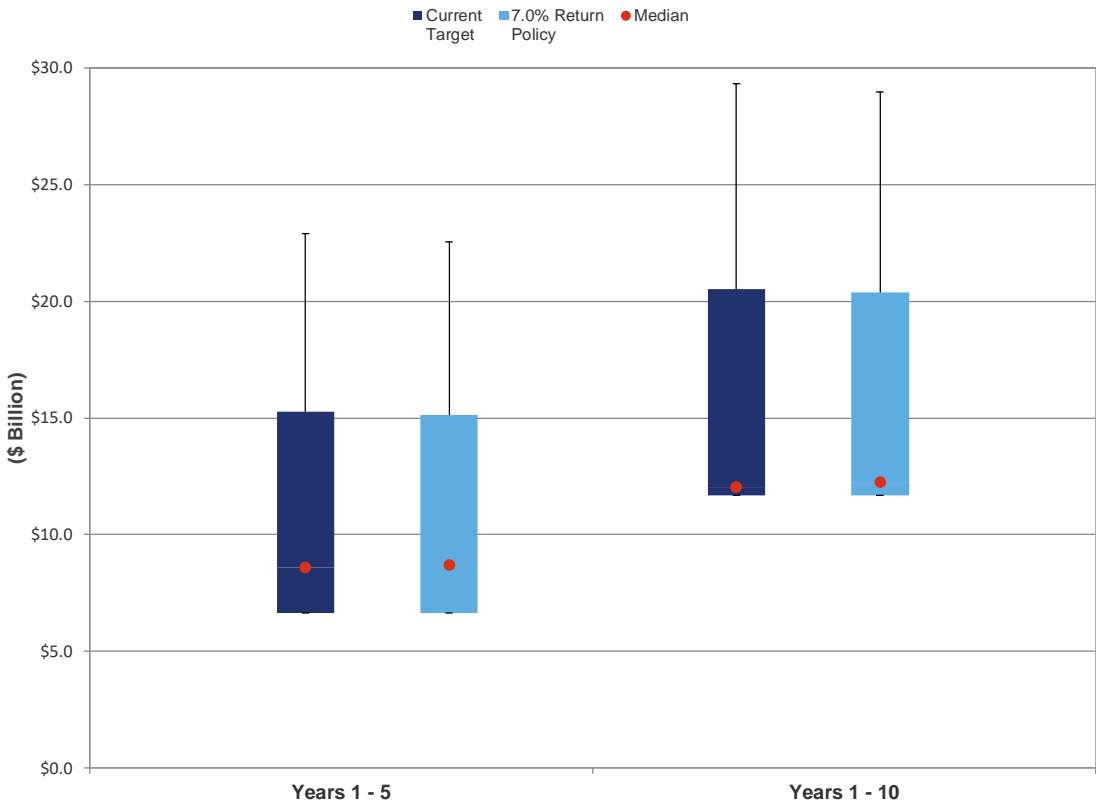
Shortfall Risk:  
The potential for the current policy to have a lower median market value of assets than the alternative policies.

Drawdown Risk:  
The potential for the current policy to have a lower “very pessimistic” market value of assets than the alternative policies.

Initial MVA = \$41.1 Billion

(\$ Billion)	6/30/2024		6/30/2026		6/30/2028		6/30/2033	
	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy
Very Optimistic	51.67	51.22	65.78	64.87	80.15	78.23	122.06	117.82
Optimistic	46.55	46.35	53.89	53.34	60.80	60.13	80.96	79.21
Median (Expected)	43.04	42.97	46.31	46.20	49.69	49.58	59.62	59.16
Pessimistic	39.37	39.50	39.30	39.47	40.32	40.52	42.92	43.22
Very Pessimistic	34.00	34.37	30.80	31.34	29.63	30.16	25.58	26.29

# MVA Economic Cost



(\$ Billion)	Years 1 - 5		Years 1 - 10	
	Current Target	7.0% Return Policy	Current Target	7.0% Return Policy
Very Pessimistic	22.9	22.5	29.3	29.0
Pessimistic	15.3	15.1	20.5	20.4
Median (Expected)	8.6	8.7	12.0	12.3
Optimistic	6.6	6.6	11.7	11.7
Very Optimistic	6.6	6.6	11.7	11.7

Shortfall Risk:

The potential for the current allocation to have a higher median economic cost than the alternative policies.

Drawdown Risk:

The potential for the current allocation to have a higher “very pessimistic” economic cost than the alternative policies.

EROA = 7.00%

Economic Cost is defined as the present value of contributions plus contributions necessary to fully fund the plan at the end of the projection period.

# Observations & Recommendation

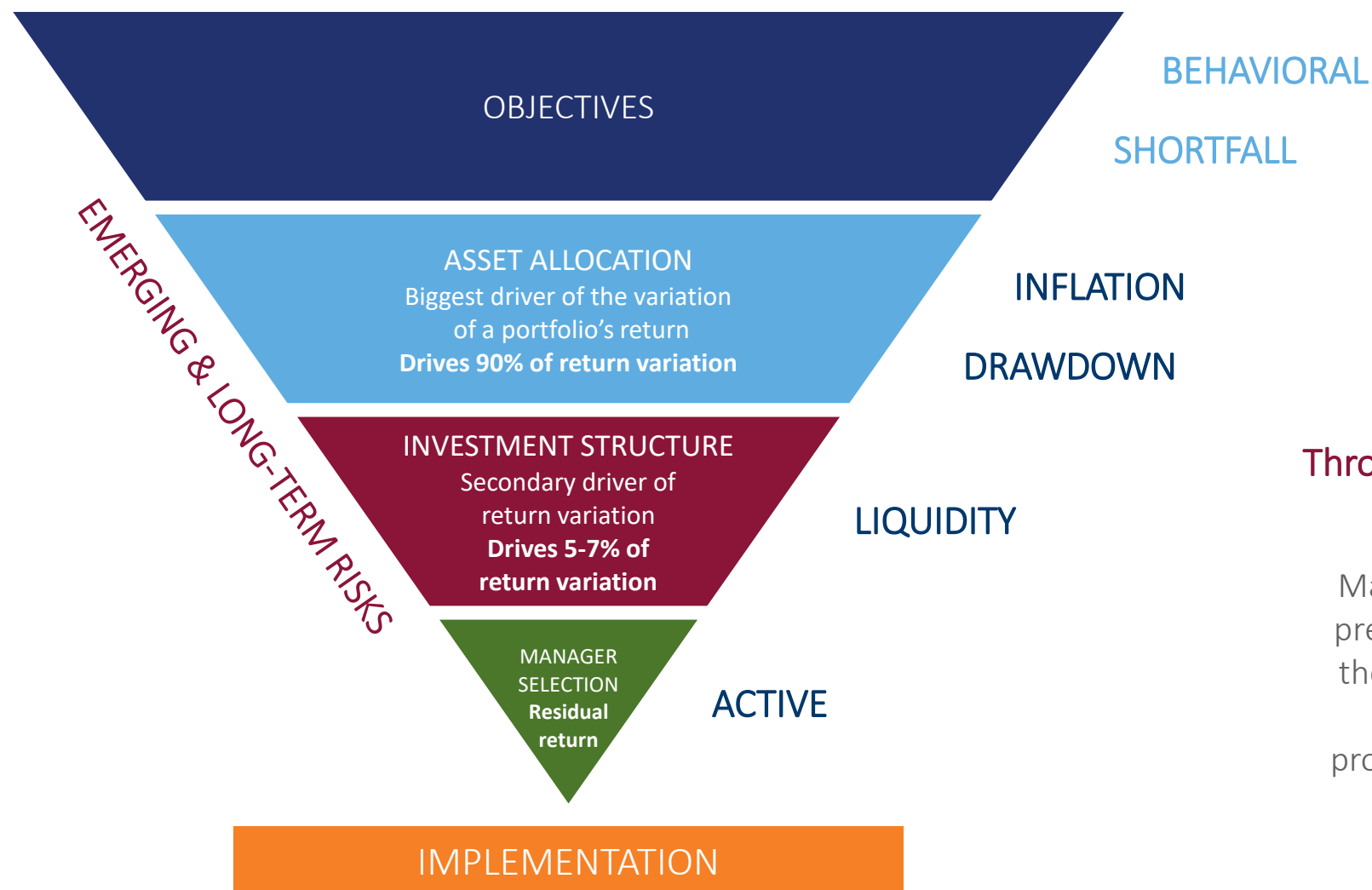
## Observations & Recommendation

- Although we revisit the allocation each year, that doesn't mean the portfolio needs to be changed dramatically to maintain efficiency
- Staff is still embarking on implementing changes to the private-markets portfolio
- Capital market environment is more favorable to rate sensitive assets than we have seen in a long time
- Wilshire is recommending adopting the proposed 7% return target portfolio:
  - Reduces International Equity by 3.5%
  - Add to Core FI by 3.5%
  - Reduces risk from 13.2% to 12.6% (approx. 9% decrease in fund risk)
  - Maintains 7% return target



# Appendix - Asset Allocation Approach

# Focus on Decisions That are Most Impactful



## Address Key Risks Throughout the Investment Process

Many of the six key risks are present at multiple points in the investment process, but each distinct step in the process is focused on one or two primary risks.

# Risk Assessment Framework

Wilshire's multi-dimensional view of risk integrates organizational and investment considerations into a comprehensive framework for evaluating strategic decisions.

**Shortfall:** Support distributions and long-term growth

**Behavioral:** Instill strong governance

**Drawdown:** Limit portfolio losses

**Inflation:** Preserve long-term purchasing power

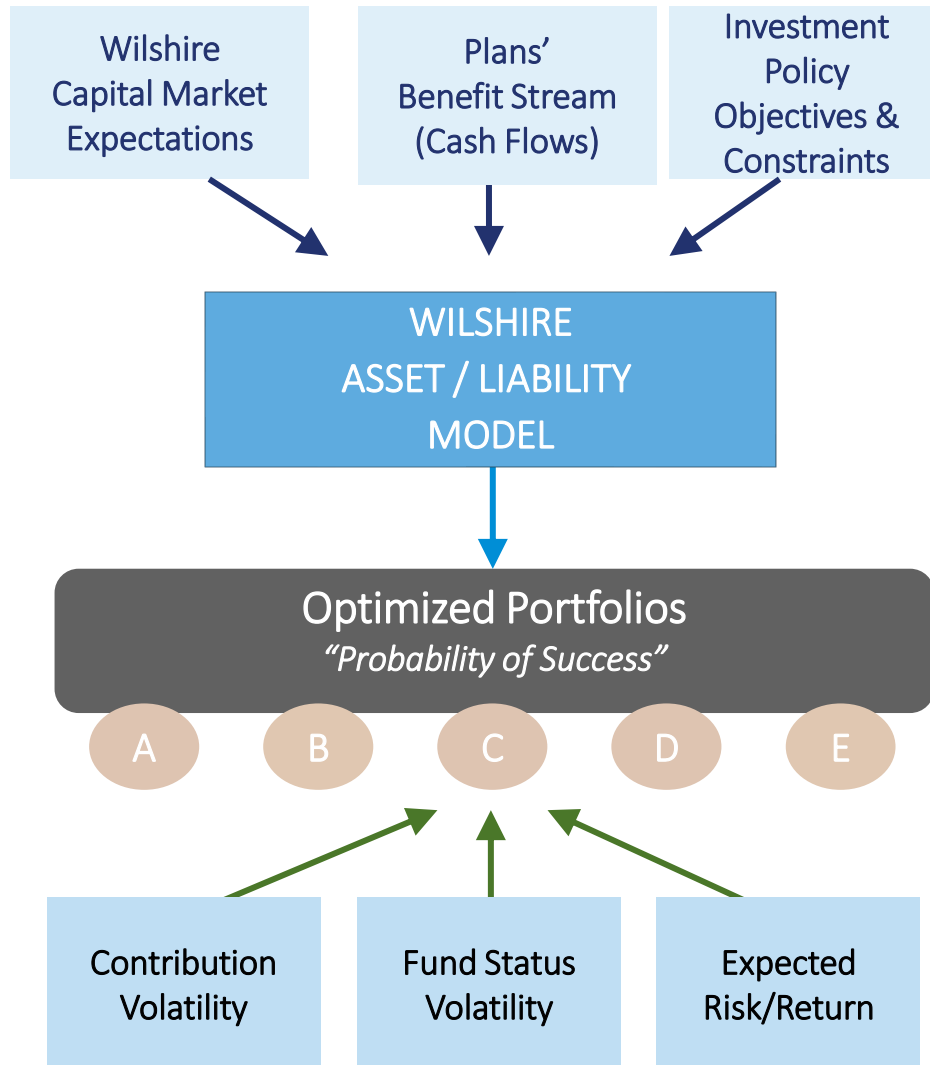
**Liquidity:** Balance near-term needs, long-term opportunities

**Active:** Ensure unique exposures

**Emerging & Long-Term:** Environmental, Social & Governance risks, such as externalities, intangibles and reputation may be linked to various risk lenses



# Asset Allocation Process



- The mission of a defined benefit plan is to fund benefits promised to participants
- The role of asset allocation is to manage risk in order to fulfill that core mission
  - **Maximize safety** of promised benefits
  - **Minimize cost** of funding these benefits
- Wilshire's Asset Liability Model provides methodology for selecting a target portfolio that considers both goals
- Rigorously developed capital market assumptions for risk and return (see appendix)
- Given that short-term volatility is also important, we identify the impact of the asset allocation decision on funded ratios, annual contribution requirements, and other metrics
- Strategic asset allocation is not a guide to outperforming in every market ... but it should provide a roadmap for success over a market cycle

# Appendix – Correlation Matrix



# Capital Market Assumptions

- Wilshire's Capital Market Assumptions as of **June 30, 2023**
- Wilshire's asset class return, risk and correlation assumptions are developed on multi-year forward looking expected rates of return and historical risk and correlation, adjusted to incorporate recent trends
- Public market return expectations represent a passive investment in the asset class (beta). They do not reflect value added from active management (alpha).

	U.S. Equity	International Equity	Private Equity	Global Smart Beta	Public Credit	Private Credit	Core Fixed Income	Cash	TIPS	Short Duration Fixed Income	Private Real Assets
Return - 10-Year (%)	5.50	6.85	9.00	6.15	6.25	8.35	4.85	3.85	4.05	4.50	5.60
Return - 20-Year (%)	6.10	7.20	9.40	6.65	6.15	8.35	4.85	3.70	4.25	4.45	6.00
Return - 30-Year (%)	6.70	7.50	9.85	7.15	6.05	8.40	4.80	3.55	4.45	4.35	6.35
Risk (%)	17.00	19.05	29.65	17.10	8.95	12.75	4.70	0.75	6.00	3.00	10.80
Correlations											
U.S. Equity	1.00										
International Equity	0.84	1.00									
Private Equity	0.72	0.67	1.00								
Global Smart Beta	0.95	0.94	0.73	1.00							
Public Credit	0.58	0.60	0.40	0.61	1.00						
Private Credit	0.68	0.60	0.44	0.68	0.76	1.00					
Core Fixed Income	0.28	0.08	0.30	0.20	0.32	0.24	1.00				
Cash	-0.05	-0.08	0.00	-0.06	-0.08	0.00	0.18	1.00			
TIPS	-0.05	0.06	-0.03	-0.01	0.22	0.00	0.60	0.20	1.00		
Short Duration Fixed Income	0.27	0.07	0.29	0.19	0.30	0.23	1.00	0.27	0.61	1.00	
Private Real Assets	0.53	0.49	0.48	0.53	0.59	0.61	0.16	-0.06	0.15	0.16	1.00

# Appendix – Asset Allocation Ranges

# Allowable Asset Allocation Ranges

Wilshire's Asset Allocation Committee (WAAC) maintains standard asset allocation parameters which reflect generally observed market practices for institutional asset owners. While Wilshire expects most client portfolios will fall within these asset allocation ranges. Wilshire recognizes and occasionally recommends portfolio allocations that may diverge from these general ranges based on a client's particular circumstances, goals or needs.

Asset Segment	Corporate DB	Public DB	E&F
Total Equity (Public+Private)	0% - 80%		
Private Equity (Aggregate)	0% - 15%	0% - 20%	0% - 30%
Fixed Income (Core/High-quality - Liquid IG)	10% - 100%	10% - 50%	
Other Fixed Income/Credit (Aggregate)	0% - 25%		
Private/Illiquid Credit (Aggregate)	0% - 15%		
High Yield	0% - 10%		
Other: EMD, Loans, Convertibles	0% - 7.5%		
Total Real Assets (Public + Private)	0% - 25%		
Total Real Estate (Public + Private)	0% - 25%		
RA Other: Commodities, Gold, Infra, GLI, MLPs, O&G, Timber	0% - 5%		
Marketable Alternatives (Aggregate)	0% - 12.5%		0% - 20%
Cash	0% - 5%		
Leverage	0% - 20%		
Total Private/Illiquid	0% - 25%	0% - 35%	0% - 50%

These thresholds were informed by allocation information from Greenwich Associates, and Wilshire Advisors, LLC, universe data and will be reviewed for reasonableness from time to time.

*\*Last Updated 12/2021*



# Appendix – Efficient Frontier

# Efficient Frontier Portfolios

Asset Class	Current Target	Optimization Constraints	Minimum Risk	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	Portfolio 6	Portfolio 7	Portfolio 8	Portfolio 9	Maximum Risk
U.S. Equity	21.00%	16% - 26% <sup>1</sup>	19.00%	19.50%	20.00%	21.00%	22.00%	22.50%	23.50%	24.50%	25.00%	26.00%
International Equity	16.50%	11.5% - 21.5% <sup>1</sup>	11.50%	12.00%	12.50%	13.00%	13.50%	14.00%	14.50%	15.00%	15.50%	16.00%
Private Equity	17.00%	17.0%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%	17.00%
Global Smart Beta	<u>5.00%</u>	5.0%	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>	<u>5.00%</u>
<b>Total Growth Assets</b>	<b>59.50%</b>		<b>52.50%</b>	<b>53.50%</b>	<b>54.50%</b>	<b>56.00%</b>	<b>57.50%</b>	<b>58.50%</b>	<b>60.00%</b>	<b>61.50%</b>	<b>62.50%</b>	<b>64.00%</b>
Public Credit	3.00%	3.0%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Private Credit	<u>8.00%</u>	8.0%	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>	<u>8.00%</u>
<b>Total Defensive Growth Assets</b>	<b>11.00%</b>		<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>	<b>11.00%</b>
Core Fixed Income	19.00%	14% - 24%	21.00%	24.00%	24.00%	22.50%	21.00%	20.00%	18.50%	17.00%	16.00%	14.50%
Cash	1.00%	1.0%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
TIPS	0.00%	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Short Duration Fixed Income	<u>0.00%</u>	0% - 5%	<u>5.00%</u>	<u>1.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
<b>Total Defensive / Rate Sensitive Assets</b>	<b>20.00%</b>		<b>27.00%</b>	<b>26.00%</b>	<b>25.00%</b>	<b>23.50%</b>	<b>22.00%</b>	<b>21.00%</b>	<b>19.50%</b>	<b>18.00%</b>	<b>17.00%</b>	<b>15.50%</b>
Private Real Assets	<u>9.50%</u>	9.5%	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>	<u>9.50%</u>
<b>Total RA / Inflation Sensitive Assets</b>	<b>9.50%</b>		<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>	<b>9.50%</b>
<b>Total Assets</b>	<b>100.0%</b>		<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>Expected Return - 10 Years (%)</b>	<b>7.06</b>		<b>6.95</b>	<b>6.97</b>	<b>6.99</b>	<b>7.00</b>	<b>7.01</b>	<b>7.02</b>	<b>7.03</b>	<b>7.04</b>	<b>7.05</b>	<b>7.06</b>
<b>Standard Deviation of Return (%)</b>	<b>13.19</b>		<b>12.09</b>	<b>12.29</b>	<b>12.47</b>	<b>12.67</b>	<b>12.86</b>	<b>13.04</b>	<b>13.24</b>	<b>13.43</b>	<b>13.63</b>	<b>13.82</b>
<b>+ / (-) in Expected Return - 10 Years (bps)</b>			<b>(11)</b>	<b>(9)</b>	<b>(7)</b>	<b>(6)</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>	<b>0</b>
<b>+ / (-) in SD of Return (bps)</b>			<b>(110)</b>	<b>(90)</b>	<b>(72)</b>	<b>(52)</b>	<b>(33)</b>	<b>(15)</b>	<b>5</b>	<b>24</b>	<b>44</b>	<b>63</b>
<b>Sharpe Ratio</b>	<b>0.24</b>		<b>0.26</b>	<b>0.25</b>	<b>0.25</b>	<b>0.25</b>	<b>0.25</b>	<b>0.24</b>	<b>0.24</b>	<b>0.24</b>	<b>0.23</b>	<b>0.23</b>

<sup>1</sup> U.S. Equity and International Equity are constrained to have market weight ratio. Currently at 62%/38%.

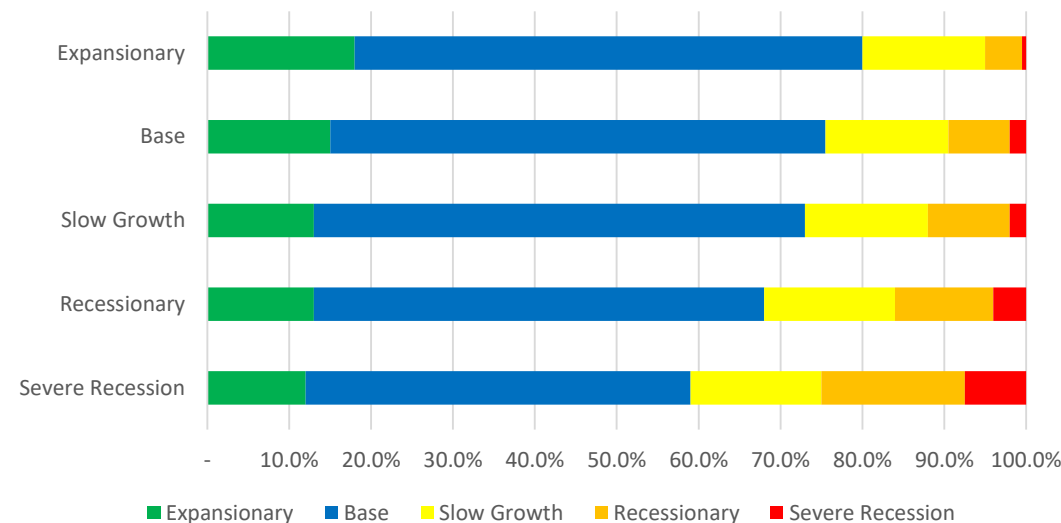
# Appendix – Regimes

# Efficient Frontier Portfolios

Managing drawdown risk –  
the “uncertainty around  
the uncertainty”

- Most simulation models assume returns are log-normally distributed
- Though reasonable in most years, left-tail events occur more frequently than predicted
- A regime switching model can help us pre-experience uncomfortable return paths that fall outside a normal distribution’s field of view

	expansionary	base	slow growth	recessionary	severe recession
expansionary	18.0%	62.0%	15.0%	4.5%	0.5%
base	15.0%	60.5%	15.0%	7.5%	2.0%
slow growth	13.0%	60.0%	15.0%	10.0%	2.0%
recessionary	13.0%	55.0%	16.0%	12.0%	4.0%
severe recession	12.0%	47.0%	16.0%	17.5%	7.5%





## Stress Testing: Regime Assumptions

- In below trend and worse environments, the portfolio's return expectations is materially lower and the volatility is materially higher
- Volatility in the below trend and worse environments are left-skewed, i.e. negative-skewed

	US Stocks	Dev xUS Stocks	EM Stocks	Prvt Mkts	Cash	Core Bonds	LT Bonds	US TIPS	HY	US RES	Private RE	Commodities	Current Target
<b>Expansionary/Above Trend Growth</b>													
Return (%)	10.50	11.50	11.75	16.50	4.10	4.35	4.30	3.55	8.20	10.75	11.00	9.10	10.97
Risk (%)	12.00	13.00	21.00	22.15	0.75	5.20	10.85	6.50	8.00	13.50	10.90	16.00	9.88
<b>Baseline/Trend Growth</b>													
Return (%)	5.50	6.50	6.75	9.00	3.85	4.85	4.80	4.05	6.20	5.75	6.00	6.10	7.06
Risk (%)	17.00	18.00	26.00	29.65	0.75	4.70	9.85	6.00	10.00	17.50	13.90	16.00	13.19
<b>Slow Growth/Below Trend</b>													
Return (%)	3.50	4.50	4.75	6.00	3.85	5.85	6.30	4.55	5.20	3.75	4.00	5.10	5.81
Risk (%)	22.00	23.00	31.00	37.15	0.75	5.70	11.85	7.50	12.00	21.50	16.90	18.00	16.99
<b>Recessionary/Negative Growth</b>													
Return (%)	(4.50)	(3.50)	(3.25)	(6.00)	3.35	6.85	7.80	6.55	1.20	(4.25)	(4.00)	2.10	(0.49)
Risk (%)	27.00	28.00	36.00	44.65	0.75	6.70	13.85	9.00	15.00	27.50	21.90	21.00	20.89
<b>Severe Recession/Deflation</b>													
Return (%)	(44.50)	(43.50)	(43.25)	(41.00)	2.85	14.85	19.80	16.55	(13.80)	(44.25)	(34.00)	(1.90)	(25.55)
Risk (%)	42.00	43.00	51.00	54.65	0.75	14.70	29.85	21.00	20.00	42.50	33.90	26.00	29.80

# Stress Testing: Regime Descriptions

## Regime Descriptions

- **Expansionary/Above Trend Growth** – Regime when the economy is coming out of a recession or the economy is running above long-run capacity. Wilshire does not project the economy to remain in this regime over longer periods.
- **Baseline/Trend Growth** – The long term expected state of the economy. Wilshire's capital market assumptions are based on this regime.
- **Slow Growth/Below Trend** – Regime when the economy is running at less than full capacity.
- **Recessionary/Negative Growth** – Regime when the economy has below zero growth. Wilshire expects the economy would be in a recession.
- **Severe Recession/Deflation** – Regime when the economy defined by significantly negative growth. Wilshire does not project the economy to remain in this regime over longer periods.

# Appendix – Economic Factor Exposures

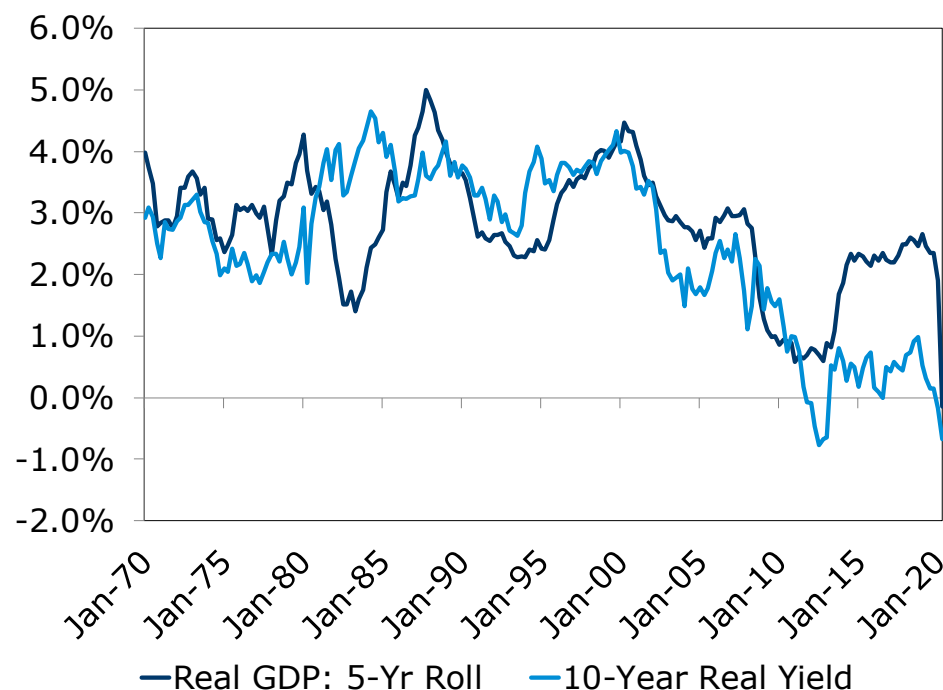
## Why Introduce Factors?

- **Risk Assessment:** Including factors within the asset allocation process provides an opportunity to measure asset class (and portfolio) exposures to key economic factors
- **Economic Efficiency:** If the underlying economic activity that drives asset performance can be identified, perhaps it can be used to assist in building economically-efficient portfolios
- **Portfolio Stability:** Macroeconomic risk factors – when separated from the valuation component inherent in investment pricing – may exhibit more stable correlations and, therefore, can better inform the allocation process



## Growth Proxy

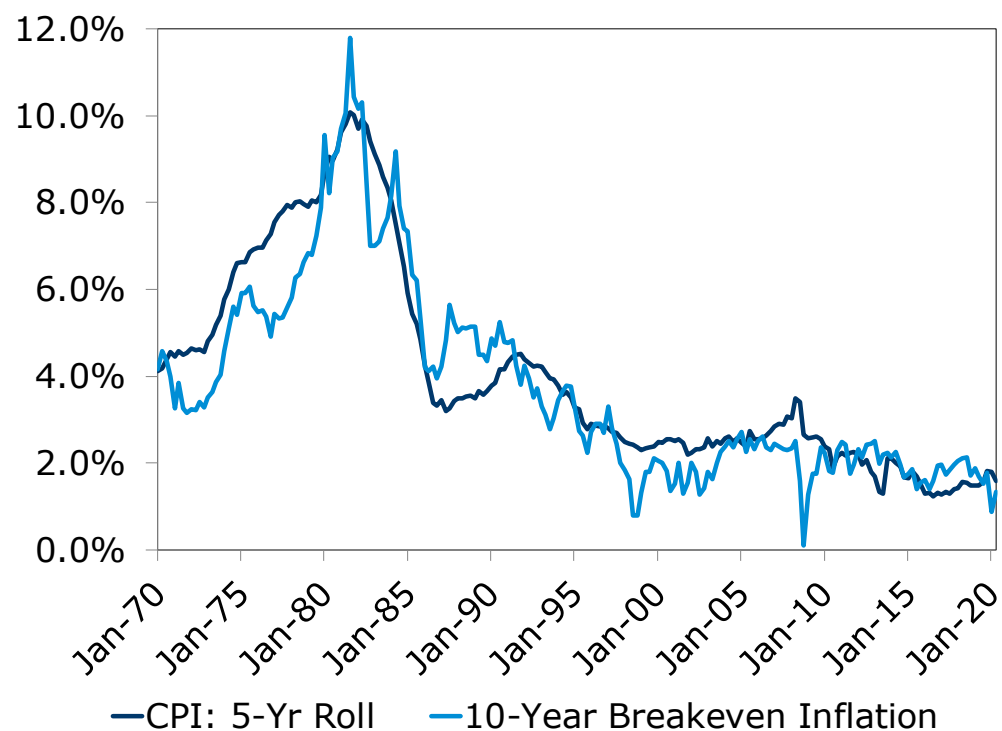
- Interest rates contain information and can reflect economic factors
- Nominal yields aggregate two important and distinct sources of economic information – real yields and expected inflation
- Disaggregating these factors should prove beneficial in developing a set of factors with improved explanatory power



Data Source: Federal Reserve, Bridgewater

## Inflation Proxy

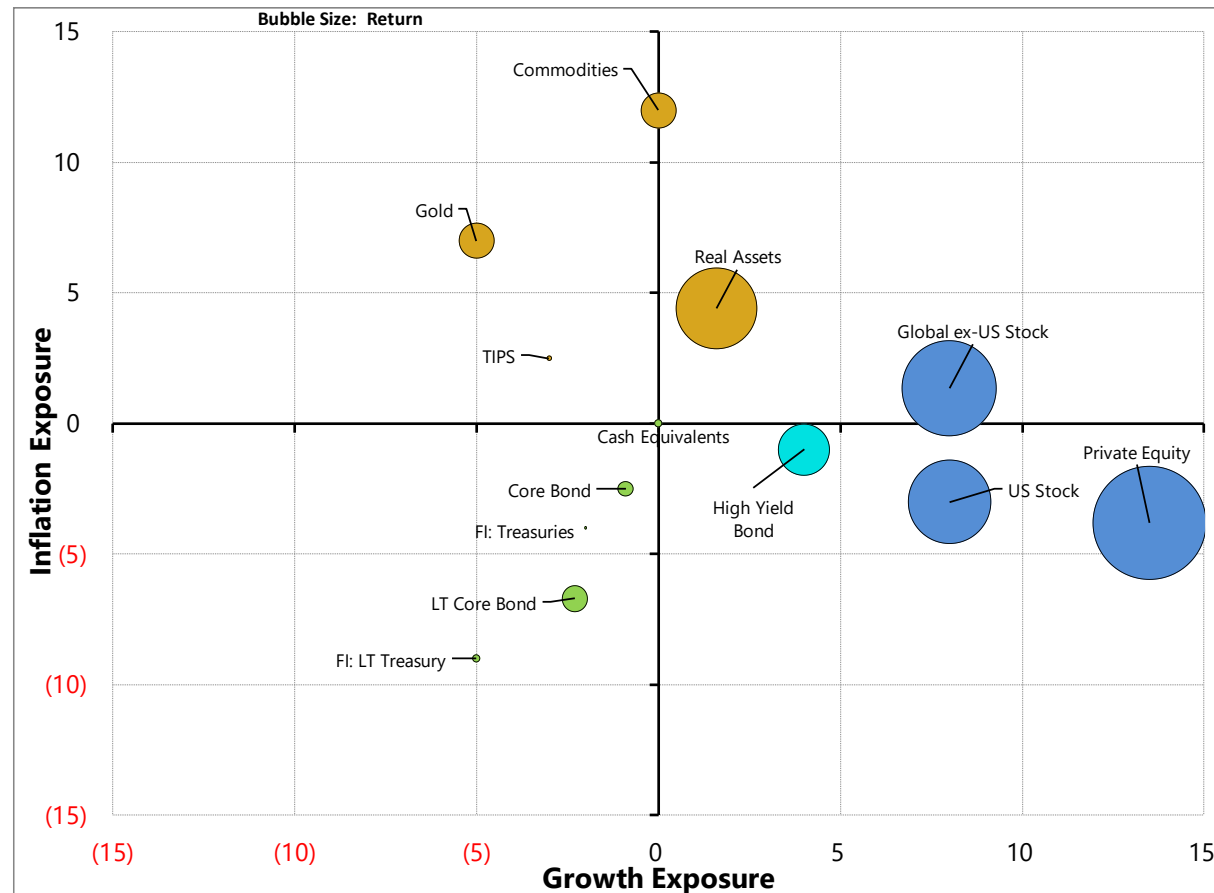
- Breakeven inflation is the market's expectation for inflation
- Tends to follow closely with actual, recent inflation and can act as a timely signal of trends in consumer prices



Data Source: Federal Reserve, Bridgewater

## Wilshire's Approach

- Employ a 2-factor regression model (growth and inflation) to formulate factor assumptions
- Growth proxy is enhanced by high yield bond spreads to better capture shifts in growth forecasts



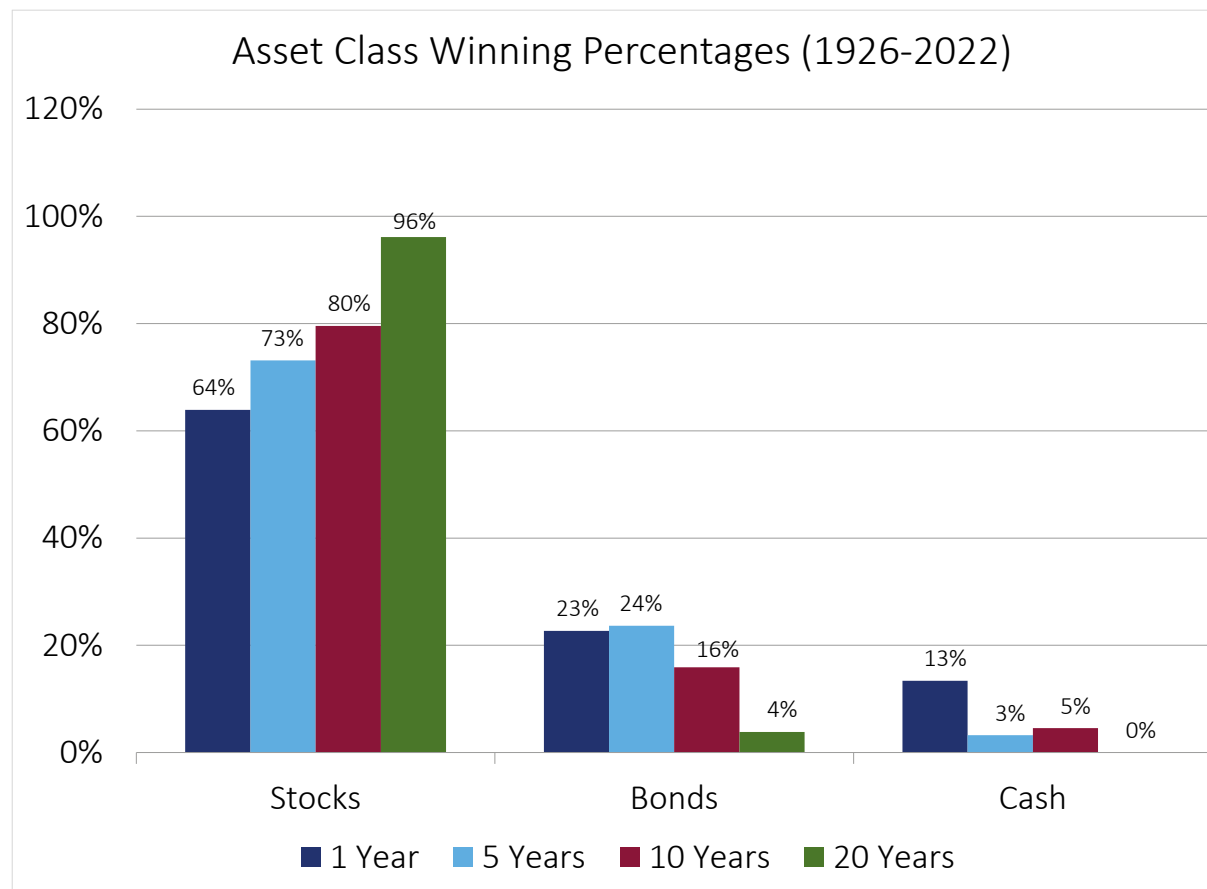
# Appendix – Liquidity

## Liquidity Risk: What Are The Consequences?

Default/Insolvency is the most severe outcome from having insufficient liquidity, but...

There are many other, more likely, disruptive impacts that a lack of liquidity can impose on an investment portfolio

- Liquidity breaches can rob an investor of their biggest advantage: a long-term investment horizon
- The timing and price of such sales dictated by liquidity needs rather than by explicit investment rationale
- Can destroy portfolio value and effectively strip a portfolio from its ability to recover from market sell-offs



# Wilshire Liquidity Metric

Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

## Market Level of Liquidity

- Quantified on scale from 0% (low liquidity) to 100% (high liquidity)
- Designed to capture general notion of marketable versus private/off-market transactions
  - Marketable asset classes typically reflect a 90% or 100%
  - Private asset classes reflect 0%
- Goal is to reflect the tradability of assets, which is helpful in connecting these values back to our definitional framework (i.e., to quantify the differences between Convertible Liquidity and Delayed Liquidity)

# Wilshire Liquidity Metric

Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

## Stressed Liquidity Metric

Includes a penalty process to reflect the loss in practical liquidity due to asset class volatility and sensitivity to particular economic environments

Penalty components:

1. **Growth Penalty:**
  - Impacts asset classes with vulnerability to slowing growth
  - Recognizes the hit to liquidity that can occur during growth related bear markets
2. **Inflation Penalty:**
  - Impacts asset classes with vulnerability to rising inflation
  - Recognizes the hit to liquidity that can occur during inflation driven bear markets
3. **Volatility Penalty:**
  - Impacts higher volatility asset classes
  - Recognizes the hit to liquidity that can occur from any form of volatility

# Wilshire Stressed Liquidity Metric

## Stressed Level of Liquidity Metric

Asset Class	Market Liquidity	Liquidity Penalty Components			Applied Penalty	Stressed Liquidity
		Growth	Inflation	Volatility		
US Equity	100	50		24	50	0
Dev ex-US Equity	100	50		26	50	0
EM Equity	90	50		40	50	0
Private Equity	0	50		40	0	0
Cash Equivalents	100				0	100
Core Bonds	100		8		8	86
High Yield Bonds	80	40		10	40	0
US Real Estate Securities	90	50		24	50	0
Private Real Estate	0	50		18	0	0
Commodities	90			20	20	55

Applied Penalty = Min(Max(Growth + Inflation, Volatility), Market Liquidity)

Stressed Liquidity \* = Market Liquidity - (1.75 x Applied Penalty)

*\* If less than 20, Stressed Liquidity is assumed to be 0*



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**Gregory S. Samorajski, CFA**  
Chief Executive Officer

**Kim Reynolds**  
Governor

**Adam Gregg**  
Lt. Governor

September 28, 2023

TO: IPERS Investment Board

FR: Sri Lakshminarayanan, CIO

RE: **Proposed Revisions to Investment Policies**

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### **Private Markets Investment Policy**

IPERS' current Private Markets Investment Policy is a long and enveloping document that addresses asset introductions, the policy and lastly the procedural aspects of illiquid portfolio management. Staff's concern was that over the years the Policy had become too wordy and instructional, reducing the effectiveness in communicating the Board's investment objectives for the private market program. Furthermore, specification of intricate constraints reduces the ability of staff and investments managers to be nimble and more topical in their decision making. The proposed change to the Policy attempts to address these concerns.

Areas deemed educational and/or procedural are being recommended for removal from the Policy with most of these procedural items being moved to an internal procedures document that shall be maintained by investment staff and reviewed on an annual basis.

I am proposing that the Board establish a review committee at this Board meeting with the purpose of conducting an initial review of the investment unit's processes and procedures. Any feedback from the review committee would be considered and incorporated into the final investment procedures document prior to the start of CY2024.

Given the extensive re-write of the Policy, it is not possible to detail every change that occurred from the existing Policy. Below is a summary of what I believe are the major policy revisions. However, I strongly recommend that you review the red line to the existing Policy to fully appreciate the scope of the changes. I look forward to discussing the proposed policy revisions in more detail at the Board meeting.

### **Summary of Proposed Revisions**

1. **Clear accountability is a key theme.** The proposed policy attempts to define the key policymaking duties of the Board and clearly delegate decision-making for all other matters to the investment staff, subject to the guidelines established in the policy and any statutory requirements or prohibitions.

2. **Focus on policy, not on instructions.** Several sections of the Policy are too “procedural” and such wordiness reduces the focus on the policies. As a result, lengthy investment philosophies, investment limitations, investment descriptions of each asset class, and procedures were eliminated or significantly reduced in the proposed policy.
3. **Investment processes and procedures.** The proposed policy requires the investment staff to maintain written processes and procedures around the private markets program, including the direct co-investment program. A final processes and procedures document would be in place prior to the implementation of the CY 2024 private market investment plan.
4. **Direct co-investments.** Investment staff are given authorization to make direct co-investments within the private credit and private real assets portfolios. In addition, the Investment Board grants staff the explicit authority to establish and maintain holding entities (such as Limited Liability Companies) to insulate the trust fund from single investment risks.

### **IPGS – Summary of Proposed Revisions**

1. **Clarity on tactical decisions by staff.**
  - a. The board has already authorized the CIO/staff to make tactical decisions on behalf of IPERS. The added language clarifies staff ability to buy/sell assets that may not be cleanly slotted into an existing asset class. For example, if staff would like to employ currency hedges or allocate a small amount to TIPS or short-term fixed income instruments, this language clarifies the limits to which such transactions can be made.
  - b. Furthermore, some of these assets may have to be invested through a fully funded vehicle such as a Collective Trust Fund or a cleared swap or FX forwards etc. So, existing restrictions were relaxed to give discretion to staff on choosing the most cost efficient and liquid instruments.
2. **New policy allocation and limits.**
  - a. We have incorporated the asset allocation recommendations into the redline, adjusting for our longer-term transition plan to Private Credit and Private Real Assets targets. The upper and lower limits have also been cleaned up to reflect an automatic +/-3% limits on all asset classes including Cash.
  - b. The Global Smart Beta Equities benchmark index has been updated to the current approximate market cap breakdown US, Developed International and Emerging markets.

## **APPENDIX - C -**

### **PRIVATE MARKETS INVESTMENT POLICY**

Pursuant to Iowa Code §97B, the Iowa Public Employees' Retirement System (IPERS) Investment Board (Board) establishes this Private Markets Investment Policy (Policy) that sets forth the responsibilities, investments, and long-term objectives for the program.

The Board shall annually review the Policy, the program's investment plan (Plan) and the performance of the private markets portfolios.

The staff shall annually review and recommend any proposed Policy revisions to the Board, inform the Board of its Plan—which shall include the commitment allocation decision and any subsequent adjustments that may occur based on market conditions or fundraising schedules, maintain investment processes and procedures for the Private Markets program, recommend the hiring of specific managers, and maintain and monitor a Board approved bench manager list for potential future investments. Investment staff are also authorized to make direct co-investments within the private markets program.

IPERS recognizes that private market investments are illiquid. Vehicles that maximize investor control are preferred. IPERS may utilize the following investment vehicles within the private markets program: individually managed account vehicle, private limited partnerships, limited liability companies and other types of commingled fund structures. In addition, IPERS may establish and maintain holding entities for the purpose of holding its investments and/or assets.

IPERS' private markets program consists of three portfolios: private equity, private credit and private real assets. The portfolios serve complementary roles within the program and at the total fund level. The role of private equity is to provide excess returns over the public equity markets. Private credit provides excess returns over the public credit markets, diversification and income. Private real assets provide diversification, income and an inflation hedge.

#### **I. PRIVATE MARKET PORTFOLIOS**

##### **A. Private Equity**

Private equity is equity capital that is not quoted or traded on a public exchange. Private equity investments are generally investments in buyout, venture capital or special situations funds, as well as co-investments alongside these types of funds. Private equity investments may also include secondary offerings or private equity interests from other investors purchased in the secondary market.

The long-term return objective is 300 basis points (3 percent) greater than the Russell 3000 Index, net of investment management fees, calculated on an internal rate of return (IRR) basis over rolling 10-year periods.

Performance on both the portfolio and the benchmark shall be calculated on an internal, or dollar-weighted, rate of return basis. In recognition of the fact that IRRs are not meaningful in the early years of a private equity investment's life, the IRR performance calculation for the benchmark may be adjusted so that contributions made in the most recent three years of the rolling 10-year period are assumed to earn 91-day U.S. Treasury Bill returns.

## B. Private Credit

Private credit is generally the investment in loans to companies, individuals and organizations for a variety of transactions, including asset-based and cash flow-based financings, recapitalizations, and acquisition-related financings. Private credit shall also include direct co-investments made in companies alongside IPERS' current private credit managers. For the purposes of this Policy, a direct co-investment is defined as debt financing sourced from an existing IPERS private credit manager deemed in good standing.

The long-term return objective for IPERS' private credit program is to exceed the Morningstar LSTA Leveraged Loan Index plus 1 percent, net of investment management fees, calculated on an internal rate of return basis over rolling five-year periods.

## C. Private Real Assets

Private real assets are physical assets that have intrinsic value due to their substance or properties and include investments in commercial real estate (real estate) and farmland, timber and infrastructure (other real assets). Private real assets shall also include direct co-investments made in companies alongside IPERS' current private real assets equity managers. For purposes of this Policy, a direct co-investment is defined as an equity investment sourced from an existing IPERS private real assets manager deemed in good standing.

### 1. Private Real Assets Portfolio

The long-term return objective for IPERS' private real assets program is to exceed CPI-U (NSA) by 500 basis points (CPI + 5 percent), net of investment management fees, calculated on a time-weighted basis over rolling 10-year periods.

## 2. Portfolio Investments

The return objective for the real estate portion of the program is to exceed the National Council of Real Estate Investment Fiduciaries' Open-End Diversified Core Index (ODCE), net of investment management fees, calculated on a time-weighted basis over rolling 10-year periods. Portfolio level returns will be utilized in the evaluation of manager performance.

The return objective for the other real assets portion of the program is to exceed CPI + 5 percent, net of investment management fees, calculated on a time-weighted basis over rolling 10-year periods.

## APPENDIX - C -

## PRIVATE MARKETS INVESTMENT POLICY

Pursuant to Iowa Code §97B, the Iowa Public Employees' Retirement System (IPERS) Investment Board (Board) establishes this Private Markets Investment Policy (Policy) that sets forth the responsibilities, investments, and long-term objectives ~~and policies for the program.~~ private market investments. ~~Allocations to the private markets program shall be determined through the asset allocation review process.~~

The Board shall annually review the Policy, the program's investment plan (Plan), and the performance of the private markets portfolios.

The staff shall annually review and recommend any proposed Policy revisions to the Board, inform the Board of its Plan - which shall include the commitment allocation decision and any subsequent adjustments that may occur based on market conditions or fundraising schedules, maintain investment processes and procedures for the Private Markets program, recommend the hiring of specific managers; and maintain and monitor a Board approved bench manager list for potential future investments. Investment staff are also authorized to make direct co-investments within the private markets program ~~credit and private real assets portfolios.~~

IPERS recognizes that private market investments are illiquid-in nature. Vehicles that maximize investor control are preferred. IPERS may utilize the following investment vehicles within the private markets program: individually managed account vehicle, private limited partnerships, limited liability companies and other types of commingled fund structures. In addition, IPERS may act to establish and maintain holding entities for the purpose of holding its investments and/or assets.

IPERS' private markets program consists of three portfolios: private equity, private credit and private real assets. The portfolios serve complementary roles within the program and at the total fund level. The role of private equity is to provide excess returns over the public equity markets; ~~P~~ private credit provides excess returns over the public credit markets, diversification and income; ~~while P~~ private real assets provide diversification, income and an inflation hedge.

~~Each of the program's portfolios are described below. Also integral to this Policy is Exhibit A, a description of permitted investments for the program's three portfolios, and Exhibit B, the program's procedural policies.~~

## I. PRIVATE MARKET PORTFOLIOS~~EQUITY~~

### A. Private Equity~~Definition~~

Private equity is equity capital that is not quoted or traded on a public exchange. Private equity investments are generally investments in buyout, venture capital, or special situations funds, as well as co-investments alongside these types of funds. Private equity investments may also~~but may~~ include secondary offerings or private equity interests from other investors purchased in the secondary market~~some co-investment alongside these types of funds. Exhibit A provides a more detailed description of the types of permitted investments.~~

## ~~B. Investment Philosophy~~

~~Traditional public equity markets have become increasingly efficient. The private equity market, however, remains inefficient and illiquid partially because of privately negotiated, non-auction pricing mechanisms. Return premiums exist for investors who accept the illiquid and inefficient characteristics of the private equity market, and who are willing to take an opportunistic investment approach.~~

~~Because of the inefficiencies found in the private equity market, successful investment requires an active, targeted and opportunistic approach. In an inefficient market, passive investment in a broad array of market segments is likely to lead to underperformance. Therefore, IPERS will delegate investment selection to an experienced, qualified manager. The Manager will utilize a systematic approach to the identification of and participation in specific investments. The following screening criteria will be utilized by the Manager as a key element of the systematic approach to the identification of suitable venture capital and special equity investment opportunities for the System:~~

- ~~—— Experience, qualifications and responsibilities of the general partners~~
- ~~—— Past investment results of the general partners~~
- ~~—— Quality of the general partners' deal flow sources~~
- ~~—— Demonstrated deal exiting capability on the part of the general partners~~
- ~~—— Special expertise of the general partner, unique deal flow source, or~~
  - ~~—— other competitive advantage~~
- ~~—— Limit of liability by the pension fund to the amount of their investment~~
  - ~~—— (for example limited partnerships)~~
- ~~—— General contribution of the opportunity to the diversification of the~~
  - ~~—— program~~

## ~~C. Return Objective~~

The long-term return objective is 300 basis points (3 percent) greater than the Russell 3000 Index, net of investment management fees, calculated on an internal rate of return (IRR) basis over rolling ~~ten~~10-year periods.



Performance on both the portfolio and the benchmark shall be calculated on an internal, or dollar-weighted, rate of return basis. In recognition of the fact that IRRs are not meaningful in the early years of a private equity investment's life, the IRR performance calculation for the benchmark may be adjusted so that contributions made in the most recent three years of the rolling ten-year period are assumed to earn 91-day U.S. Treasury Bill returns.

#### D.B. Private Credit Investment Policies

##### 1. Co-Investments and Secondaries

~~The Manager may utilize direct co-investments in companies alongside of IPERS' current general partners. For purposes of this Policy, a direct co-investment is defined as a direct investment in the equity of a portfolio company alongside an existing IPERS partnership deemed in good standing. A direct co-investment does not include a co-investment fund (a partnership organized with the goal of investing in multiple direct co-investments). In addition, the Manager may also participate in secondary offerings or purchase private equity interests from other investors on the secondary market.~~

##### 2. Investment Limits

- ~~a. The maximum investment in any limited partnership, group trust, or limited liability company vehicle shall not exceed 20 percent of the total capital committed by all partners at the time of the final closing for each fund, and shall not exceed \$80 million without the prior approval of the Board.~~
- ~~b. The maximum investment in any single direct co-investment shall not exceed \$15 million. IPERS' total investment in direct co-investments shall not exceed 15 percent of the IPERS private equity portfolio on a cost basis at the time of investment.~~

## II. Private Credit

### A. Definition

Private credit is generally the investment in loans to companies, individuals and organizations for a variety of transactions including asset-based and cash flow-based financings, recapitalizations and acquisition-related financings. Exhibit A provides a more detailed list of permitted private credit investments. Private credit shall also include direct co-investments made in companies alongside of IPERS' current private credit managers. For the purposes of this Policy, a direct

co-investment is defined as a debt financing sourced from an existing IPERS' private credit manager deemed in good standing.

## B. Investment Philosophy

~~Traditional public credit markets offer a relatively liquid market for issuers of debt securities and buyers of debt instruments. The private credit markets, where borrower and lender agree to terms via privately negotiated transactions, are by nature illiquid. Return premiums exist for investors who accept the illiquid and inefficient characteristics of the private credit market, and who are willing to take an opportunistic investment approach throughout the credit cycle.~~

## C. Return Objective

The long-term return objective for IPERS' private credit program is to exceed the MorningstarS&P/ LSTA Leveraged Loan Index plus 1 percent, net of investment management fees, calculated on an internal rate of return basis over rolling five-year periods.

## D. Investment Policies

### 1. Credit

~~IPERS may commit capital to partnerships or separate account vehicles for the purpose of investing in private credit or credit-like strategies with a primary focus on current income. IPERS will seek investment managers for private credit mandates that have expertise in underwriting credit and the operational resources required to adequately monitor and manage a large diversified loan or leasing portfolio.~~

### 2. Direct Credit Co-Investments and Secondaries

~~Managers may utilize direct credit co-investments in companies alongside of IPERS' current private credit or private equity mandates. For purposes of this Policy, a direct credit co-investment is defined as either (i) a co-investment alongside of an existing IPERS' private credit mandate deemed in good standing or (ii) a debt financing investment sourced from an existing IPERS' private equity partnership deemed in good standing. In addition, the Managers may also participate in secondary offerings or purchase private credit interests from other investors on the secondary market.~~

### 3. Investment Limits

- a. ~~The System's investment in any limited partnership, limited liability company vehicle or other type of fund structure shall not exceed 20 percent of the total capital committed by all partners at the time of the final closing for each fund.~~

~~The maximum investment in any single direct credit co-investment shall not exceed \$15 million. IPERS' total investment in direct credit co-investments shall not exceed 15 percent of the IPERS private credit portfolio on a cost basis at the time of investment.~~

### **III. Private Real Assets**

#### C.Private Real Assets~~Definition~~

Private real assets are physical assets that have intrinsic value due to their substance or properties, and include investments in commercial real estate (real estate) and farmland, timber and infrastructure (other real assets). Private real assets shall also include direct co-investments made in companies alongside of IPERS' current private real assets equity managers. For purposes of this Policy, a direct co-investment is defined as an equity investment sourced from an existing IPERS' private real assets manager deemed in good standing.

#### ~~A. Investment Philosophy~~

~~The primary role of the private real assets program is to provide diversification through low correlation with other portfolio asset classes; the secondary role is to provide income; and the third role is to provide inflation protection.~~

## Return Objectives

### 1. Private Real Assets ~~Portfolio~~Program

The long-term return objective for IPERS' private real assets program is to exceed CPI-U (NSA) by 500 basis points (CPI + 5 percent), net of investment management fees, calculated on a time-weighted basis over rolling ~~ten~~10-year periods.

### 2. ~~Portfolio~~Program Investments

The return objective for the real estate portion of the program is to exceed the National Council of Real Estate Investment Fiduciaries' Open-End Diversified Core Index (ODCE), net of investment management fees, calculated on a time-weighted basis over rolling ~~10~~ten-year periods. Portfolio level returns will be utilized in the evaluation of manager performance.

The return objective for the other real assets portion of the program is to exceed CPI + 5 percent, net of investment management fees, calculated on a time-weighted basis over rolling ~~10~~ten-year periods.

## Investment Policies

### ~~1. Investment Diversification~~

~~Real estate investments will constitute at least 50 percent of the private real asset investment value; other real assets will not exceed 50 percent of the private real assets investment value. The 50 percent minimum and 50 percent maximum above shall be applied to the sum of the private real asset portfolio's current investments at net asset value plus unfunded commitments.~~

~~Real estate investments shall be diversified such that core real estate constitutes at least 80 percent of the real estate portfolio and non-core and market-driven opportunity investments (as those terms are defined in Exhibit A) shall not exceed 20 percent of the real estate portfolio.~~

~~Staff will strive to ensure that IPERS' core real estate portfolio has property type and regional weightings that are within +/- 10 percent of the weightings reported by NCREIF for the ODCE Index.~~

~~IPERS will diversify its real estate investment manager structure such that no manager will manage more than 35 percent of the real estate program assets.~~

~~Timberland investments will be diversified by region, land class (raw land, pre-merchantable timber and merchantable timber), timber type and age class.~~

~~Farmland investments will be diversified geographically throughout the United States and by crop type. The three primary categories of crops that shall be included are commodity crops (corn, soybeans, wheat, cotton, etc.), vegetable crops (lettuce, green vegetables, etc.) and permanent crops (fruits, nuts, grapes, citrus, etc.).~~

~~Infrastructure investments shall be diversified geographically and across the transportation, energy and utility sectors.~~

## ~~2. Investment Limits~~

~~The maximum investment or co-investment in any single real estate or other real assets investment is 0.5 percent of IPERS' total Fund market value at the time of the commitment. IPERS shall not hold more than a 20 percent interest in any commingled fund vehicle.~~

## ~~3. Leverage~~

~~Leverage on real estate investments is limited to 40 percent at the manager portfolio level, 50 percent at the property level for core investments and 60 percent at the property level for non-core investments. These limits shall apply at the time of acquisition or the placement of debt. Changing market conditions or circumstances beyond IPERS' control that occur after acquisition or placement of debt may cause these limitations to be exceeded temporarily.~~

~~Given their stable cash flow and low variability of revenue, infrastructure assets can support more debt. For this reason, infrastructure investments may utilize up to 65 percent debt at the fund level and will be expected to use no more than 80 percent on any given asset. These limits will be reviewed on a case by case basis and determination of the debt level will be dependent on the investment type and risk characteristics of the investment.~~

~~Farmland and timberland investments shall not utilize leverage.~~

**EXHIBIT A**  
**INVESTMENT DESCRIPTIONS**

Permitted investments for each portfolio of the private markets investment program are described below:—

**~~I. PRIVATE EQUITY~~**

**~~A. U.S. and non-U.S. venture capital investments~~**

- ~~1. Early venture—Focuses on initial financing of start-up and early-stage companies. Companies at this stage often do not have fully formed management teams or completely defined products, and usually do not have sales or earnings.~~
- ~~2. Growth venture—Aims to provide expansion capital to mid- and late-stage companies that are increasing capacity and expanding market share.~~
- ~~3. Established growth venture—Focuses on investments in mature companies which are well-established in the market, operating profitably or at cash flow break-even and growing at an above-industry growth rate. Investment is made due to an opportunity for further expansion.~~

**~~B. U.S. and non-U.S. special equity investments~~**

- ~~1. Corporate finance—Includes leverage buy-out, management buy-out and influence block investment strategies.~~
- ~~2. Recovery securities—Includes equity and debt instruments of companies involved in turnaround, restructuring, deleveraging or bankruptcy situations.~~
- ~~3. Mezzanine securities—Placed between debt and equity in a company's capital structure, mezzanine securities are typically subordinated debt instruments for late-stage venture and mature companies, and offer income through a current coupon and equity participation through a warrant.~~
- ~~4. Other investments—Includes those investments not defined above. This category is designed to capture those innovative investment opportunities created by the marketplace that do not fit an existing category. The Manager may not invest in investments that would fall within this subcategory without specific approval from the staff.~~

## ~~II. PRIVATE CREDIT~~

### ~~A. Real Assets Credit~~

~~Any loan secured by a lien on the borrower's collateral. These loans will be predominately made in commercial real estate, which includes any income-producing real estate that is used solely for business purposes, such as retail centers, office complexes, hotels and apartments. Other examples of potential loans that may be made within real assets credit would include infrastructure, energy, trade finance and transportation loans. Real assets credit may also include strategies focused on leasing including transportation or other assets. These strategies will resemble credit-like return profiles, focused primarily on current income, and are reliant on third-party credit for the lease of the assets.~~

### ~~B. Middle Market Direct Lending~~

~~Primarily first lien senior secured floating rate loans to middle market companies. These loans are typically made for the purposes of leveraged buyouts, recapitalizations, acquisitions and funding of growth strategies by investors and/or businesses.~~

### ~~C. Opportunistic Credit~~

~~Investments in closed-end funds or separately managed accounts that invest in specific types of credit or lending strategies, or opportunistically invest across multiple types of credit and lending strategies. Opportunistic credit may encompass asset-based lending and/or cash-flow lending strategies.~~

## ~~III. PRIVATE REAL ASSETS~~

### ~~A. Real Estate~~

~~1. Core real estate investments are commercial properties located in the United States which derive their value primarily from current income production, and therefore represent lower risk profiles than non-core properties. It is anticipated that core investments will generate at least 70 percent of their total returns from income. Core investments are stabilized, substantially leased properties in the four major property types:~~

~~a. Office: Central business district or suburban.~~

~~b. Retail: Neighborhood centers, community centers, regional/super-regional centers (malls), specialty centers, power centers and single tenant properties.~~

- ~~c. Industrial: Flex space, research and development facilities, warehouse and other (manufacturing and office showroom).~~
  - ~~d. Apartments: High-rise, low-rise and garden-type apartments.~~
- ~~2. Non-core real estate investments are commercial properties located in the United States that represent a higher risk profile than core properties. It is anticipated that non-core investments will generate at least 50 percent of their total return from income over the underwriting period. These investments include the following:~~
- 
- ~~a. Properties which are acquired primarily for high appreciation potential, and are expected to derive their value primarily from appreciation returns.~~
  - ~~b. Properties which would be core except for an identifiable and correctable deficiency such as the need for lease-up, renovation, or conversion of an existing property, or the need for development adjacent to an existing owned property.~~
- ~~3. Market driven opportunities are tactical investments in commercial properties located in the United States that have been approved by IPERS staff due to the perceived opportunity for IPERS to earn a higher risk-adjusted return than what can be provided by core private real estate investments. These investments include the following:~~
- ~~a. Specialty property types including, but not limited to: hotel, self-storage, senior living and raw land.~~
  - ~~b. Development of assets (build to core) on a very selective basis. IPERS will not assume construction risk but may assume lease-up risk.~~
- ~~4. The private real estate investment program shall not include special-purpose facilities such as casinos and factories, which generally carry unacceptable business risks.~~

#### ~~B. Other Real Assets~~

- ~~1. Farmland investments are equity ownership in commercial agricultural properties. IPERS will seek to build a farmland portfolio that is well-diversified geographically throughout the United States and by crop type. The three primary categories of crops that shall be included are commodity crops (corn, soybeans, wheat, cotton, etc.), vegetable crops (lettuce, green vegetables, etc.) and permanent crops (fruits, nuts, grapes, citrus, etc.).~~



- ~~2. The timberland portion of private real assets may be invested in three primary regions across the United States: Pacific Northwest, Southeast and Northeast. In addition, this portion of the program will be diversified by land class (raw land, pre-merchantable timber and merchantable timber), timber type and age class.~~
- ~~3. IPERS may invest in partnerships or funds that invest predominantly in stabilized, income producing infrastructure assets (aka brownfield infrastructure), which may include transportation (toll roads, bridges, tunnels, sea ports, airports, etc.) and energy and utility (gas, electricity, water, etc.) infrastructure assets.~~

**EXHIBIT B**  
**PROCEDURAL POLICIES**

**~~I. DUE DILIGENCE~~**

~~Due diligence shall be performed through the selection, evaluation, acquisition, monitoring and disposition stages of the investment process. Thorough due diligence shall be accomplished by the following means:~~

- ~~A. Establishing and adhering to investment evaluation criteria which shall identify key sources of risk to be monitored during the life of each investment.~~
- ~~B. Reviewing the track record of the manager; evaluating the risk of loss and the potential for gain of each investment; evaluating the suitability of the financial structure; and evaluating costs, time horizon and the manager's exit strategy.~~
- ~~C. Negotiating and structuring fundamental rights and protections with each manager which shall permit remedial action when necessary. These basic rights and protections shall include where appropriate distribution covenants and specific "exit" or voting rights in the event of a change of control or material adverse change.~~
- ~~D. Seeking special reporting covenants to apply throughout the life of the investment.~~
- ~~E. Reviewing each investment at least annually to determine whether retaining the investment is warranted on a risk-adjusted basis within the context of IPERS' total portfolio and relative to the investment objectives established for that particular investment.~~
- ~~F. Maintaining an investment Watch List. It is expected that over time some investments shall experience difficulty due to economic or market-specific factors. IPERS staff and consultant shall maintain the Watch List, which will set forth the key issues to monitor and action plans to improve investment results.~~
- ~~G. Specifying the valuation methodology for the life of the investment. The timing of valuations shall vary across the portfolio. IPERS preference is to have independent third party appraisers utilized by the manager for determining value. IPERS shall reserve the right to engage its own appraiser to value the investments, and may adopt and maintain its own valuation accounting conventions.~~
- ~~H. Controlling investment risks by limiting the potential of any one investment to negatively impact long-term results, IPERS and its Manager will diversify the~~

~~portfolio in the following areas: manager/general partner, vintage year, geographic and economic region, industry, and investment type.~~

- ~~I. Ensuring that no investment is made or held without a qualified manager or independent fiduciary under contract to provide the appropriate investment monitoring and guidance.~~

## ~~II. INVESTMENT POLICIES~~

### ~~A. Investment Roles~~

- ~~1. The Board shall approve the Private Markets Investment Policy (Policy) and the portfolio Investment Plans (Plans); retain qualified managers; and review at least annually the performance of the private markets portfolios.~~
- ~~2. The staff shall recommend to the Board the Policy and the Plans; recommend the hiring of specific managers; maintain and monitor a Board approved bench manager list for potential future investments; approve investment allocations to specific managers and investment opportunities; monitor, communicate and meet with managers; monitor and evaluate investment performance; negotiate business terms and compensation packages; develop implementation plans; coordinate the receipt and distribution of capital between the managers with respect to investments and dispositions; and serve on any advisory boards or committees associated with the approved investments.~~
- ~~3. The staff shall determine the annual maximum investment commitment amount and communicate such amounts to the Manager(s) in writing. The annual commitment amount decision will be based on portfolio diversification, current allocation, target allocation, expectations for future pace of drawdowns and distributions, expected market environment, etc. Staff will inform the Board of its annual commitment allocation decision and also of any subsequent adjustments that may occur based on market conditions or fundraising schedules.~~
- ~~4. The Managers shall acquire, manage and dispose of private market investments on behalf of IPERS in accordance with the Policy, the Plans, and the terms of the investment agreement executed between IPERS and the Manager, or any applicable investment vehicle's governing documentation. They shall also communicate key issues and overall performance to the Board, staff and consultant.~~

~~For fund-of-fund or fund-of-one investments, the Manager shall actively negotiate partnership agreements on behalf of IPERS or the fund's investors. The foremost duty of the Manager in negotiating partnership agreements shall be to ensure that the interests of the general partner are aligned with the interests of IPERS and the other limited partners. The Manager shall negotiate terms that adequately compensate the general partner for its efforts, while ensuring that the partnership is structured so that IPERS is treated fairly and is adequately compensated for the risk taken by investing in the partnership.~~

- ~~5. The consultant shall monitor the private markets program for compliance with the Policy and the Plans, and shall recommend revisions to the Policy, the Plans, the manager roster and the investments. The consultant shall further be responsible for identifying investment opportunities and participating with staff in conducting manager searches and negotiating business terms and performance compensation packages. Technical advice and support also shall be provided. Finally, the consultant shall provide performance measurement analysis. The Board and staff shall expand or contract these responsibilities as needed.~~

#### ~~B. Evaluation and Review of Policy~~

~~The Policy shall be reviewed, by the staff and consultant no less than annually. Any proposed Policy revisions shall be submitted for approval to the Board.~~

#### ~~C. Investment Vehicles~~

~~IPERS recognizes that private market investments are illiquid in nature. Vehicles that maximize investor control are preferred. IPERS may utilize the following investment vehicles within the private markets program: individually managed account vehicle, private limited partnerships, limited liability companies and other types of commingled fund structures. In addition, IPERS may act to establish and maintain title holding entities for the purpose of taking title to and holding its investments and/or assets.~~

#### ~~D. Private Market Investment Plans~~

~~The Plans for each portfolio of the private markets investment program are established to identify and communicate the investment goals and needs of the program's portfolios for each calendar year. The particular needs for each Plan will be established in light of the structure, objectives, and performance of the existing program, as well as current market opportunities. The Plans will be reviewed and revised annually.~~

## Investment Policy and Goal Statement

### I. INTRODUCTION

The Iowa Public Employees' Retirement System (IPERS or System) is governed by Iowa Code chapter 97B. System assets are held in trust and invested for the exclusive purposes of providing benefits to participants and their beneficiaries, minimizing contributions, and defraying reasonable expenses of administering the System. The investment activities of the System are governed by the "prudent person" rules as defined in §97B.7A. The investment policy and the investment strategies will be periodically reviewed to ensure they conform to §§97B.7A and 97B.8A.

The Investment Board (Board) is the trustee of the IPERS Trust Fund (Fund). The Board shall establish the System's tolerance for investment risk, and shall diversify the System's investments to minimize the risk of unacceptable large losses and to maximize the rate of return, unless under the circumstances it is clearly not prudent to do so. The Board also adopts the actuarial assumptions and methods, approves the retention of service providers in matters relating to the actuarial valuation of the System's assets and liabilities, and adopts the System's contribution rate funding policy. A list of the statutory and administrative duties of Board and staff is provided in Appendix A.

The chief investment officer (CIO), under the supervision of the chief executive officer (CEO), is responsible for the administration of the System's investment program pursuant to the policies of the Board.

### II. INVESTMENT OBJECTIVES

The investment activities will be designed to provide a return on the Fund that, when coupled with the periodic contributions of the membership and employers, will meet or exceed the benefit funding requirements of the plan over time while staying within the Board's tolerance for risk expressed in this policy.

The objective of the CIO is to execute the asset allocation policy established by the Board (the policy benchmark defined in this policy), and to attempt to add value relative to the policy benchmark while staying within the Board's tolerance for active risk.

### III. DECISION MAKING

The Board is responsible for establishing broad policy guidelines and benchmarks that will enable the Fund to achieve its investment objectives. Board decisions are required in the following areas:

1. Establish asset allocation targets through adoption of a policy benchmark
2. Establish acceptable ranges around the policy benchmark targets

3. Establish the Fund- and program-level benchmarks
4. Establish the active risk budget

Beyond these broad policy decisions, the Board delegates to the CIO all other decision-making relating to the investment of IPERS assets, subject to the guidelines established in this policy and any statutory requirements or prohibitions.

The Board may utilize the services of investment consultants to assist them in their decision-making. Such services include, but are not limited to, conducting asset-liability and asset allocation studies, investment performance reviews, policy reviews and topical studies.

#### IV. ASSET ALLOCATION

The Board's asset allocation policy is established in the policy benchmark and the asset class ranges specified in Appendix B. The policy benchmark weights set the Board's target exposure to each asset class, measured on a market value basis, while the asset class ranges establish the ranges within which actual weights may fluctuate. Positioning within a specified asset class range is acceptable and constitutes compliance with the policy benchmark.

IPERS' assets are divided into two groups for allocation purposes: *private markets* and *public markets*. Private market assets are generally illiquid, infrequently priced investments with long horizons. The Board has established a private markets investment policy. ~~specifying investment objectives, benchmarks, etc. for these types of assets.~~ (See Appendix C)

It is the responsibility of the CIO to manage the allocation weights within the public market asset class ranges and keep them close to target, unless the CIO decides to tactically over- or under-weight a particular public market asset class. However, staff cannot quickly rebalance private markets to target weights due to the illiquid nature of private market assets, so any excess or deficiency between actual and target allocation for private market assets as a whole will be proportionately reallocated across all public market asset classes when rebalancing occurs.

The policy benchmark return is the sum of the products of the policy benchmark weights and the respective policy benchmark index returns for the period, with the exception that IPERS' actual weights and actual returns for each private market asset class shall be used in the calculation. If staff utilizes derivatives for rebalancing or tactical allocation decisions, the notional amount of derivatives contracts shall be used in calculating compliance with policy benchmark weights and asset class ranges.

## V. ACTIVE RISK ALLOCATION AND MANAGEMENT

“Alpha” is the excess return resulting from active management decisions. IPERS believes positive alpha can be earned by employing a combination of active strategies that have low return correlation with one another, exhibit low correlation with beta returns and higher correlation to liability returns.

The Board has established an active risk budget in Appendix B as a means of controlling the active risk in the IPERS Trust Fund. The active risk budget consists of two components: risk allocated for external active management and risk allocated for internal active management through tactical allocation decisions. Active risk is measured as tracking error, which is the standard deviation of excess returns.

IPERS will seek to maintain a diversified alpha portfolio, and may utilize any strategy that in the discretion of the CIO will enhance the risk-adjusted return of the alpha portfolio, including but not limited to traditional long-only, long/short, portable alpha, derivative overlay and leveraged strategies. The CIO must formally authorize any tactical allocation decisions, and each decision shall be documented and tracked for performance evaluation purposes. Tactical allocation decisions by staff shall not result in allocations that would violate the asset class ranges set by the Board.

IPERS’ investment in an investment manager’s actively managed strategies shall not exceed 20 percent of the manager’s total actively managed assets under management. The CIO shall have discretion to determine what types of similar products offered by a manager can be included in the definition of “actively managed strategies” for purposes of this calculation.

Cost efficiency is important, and the CIO should seek to implement active strategies with a high conversion ratio of active return (after fees) to the risk deployed. Active strategies shall use performance incentive fee structures, where appropriate, to ensure the economic interests of IPERS and the manager are properly aligned.

Investment staff has been granted the authority to buy and sell ~~exchange-traded futures contracts and exchange-traded funds (ETFs)~~liquid and cost-efficient financial instruments for the purpose of implementing risk management or tactical asset allocation strategies. Tactical positions that are taken on assets that do not form a part of the policy will be accounted for in the Cash asset class on a net notional exposure basis. Investment staff is also authorized to invest in swaps for an Alternative Risk Premia internal investment program (the “ARP Program”), and may create or utilize limited liability corporations (LLCs) for the purpose of implementing the ARP Program.

## VI. EXTERNAL INVESTMENT MANAGEMENT



The Board shall approve the hiring of investment management and investment consulting services. The CIO has full authority to terminate investment manager contracts provided the Board is notified of the termination prior to the effective date of the termination. The CIO also has full authority to negotiate and renegotiate contract terms and fees.

The CIO is responsible for ensuring that adequate due diligence is being performed in the evaluation of potential and existing investment managers. The CIO may hire operational due diligence consultants, attorneys, auditors and other service providers as needed to assist in the due diligence and performance evaluation of external investment management firms.

External investment managers shall have full discretion to direct and manage the investment and reinvestment of assets allocated to their accounts in accordance with this document, applicable federal and state statutes and regulations, and the executed contracts. Each contract for a public market active management strategy shall clearly define investment objectives, permitted investments, concentration limits, risk budgeting parameters and performance benchmarks.

Investment managers shall have full discretion to establish and execute trades through accounts with one or more securities broker/dealers as the managers may select. However, the System may require investment managers to clear trades through clearing brokers that are under contract to IPERS in order to control risk and costs. Investment managers will attempt to obtain “best execution” with respect to all transactions. Best execution is defined as the process and price that results in the best overall performance impact, taking into account market conditions at the time of the trade. IPERS will generally discourage a manager’s use of soft dollar arrangements for IPERS’ account, but may allow it if the usage is regularly monitored for reasonableness.

The CIO will provide the Board a summary of active management performance at least quarterly, and will highlight any concerns regarding performance, personnel turnover, or changes in the organization or investment process. The investment consultant will provide the Board semi-annual performance reviews of total Fund, asset class, and manager performance. To the extent possible, investment results will be reviewed in the context of risk-adjusted returns.

Any voting rights of securities held in any separate account, or any collective, common, or pooled fund will be exercised by the manager, trustees, or agents of said account or fund in accordance with their own proxy voting policies, provided that such policies have been reviewed by the System and deemed to be in the best economic interests of IPERS. The System shall periodically review each investment manager’s proxy voting policy and its compliance with such policies.



## **VII. RISK MANAGEMENT**

The Fund's risk management objectives are to: (1) maintain the asset allocation as close to the policy benchmark as possible through rebalancing, and (2) manage the active risk of the alpha portfolio such that its tracking error does not exceed the upper limit established in the active risk budget in Appendix B.

The CIO and Chief Risk Officer (CRO) shall develop appropriate policies and procedures for the measurement, monitoring, management and reporting of risk to the Board, CEO and staff. The CRO is responsible for obtaining and/or developing the appropriate systems, models, tools and reporting processes that will allow for the timely and efficient management of investment risk. The CRO shall report any breach of risk limits established in this policy to the Board as soon as possible after the discovery of any material breach.

## **VIII. CUSTODY**

The Treasurer of the State of Iowa (Treasurer) is the custodian of the Fund. The Treasurer will hold the System's assets in a custody/recordkeeping account in a master custody bank located in a national money center and in the international sub-custodian banks under contract to the custodian bank. The Treasurer shall consult with the Board prior to selecting the master custody bank. A formal written agreement shall be established between the Treasurer and any third-party custodian. The custodian bank agreement shall be reviewed periodically by the CIO and Board.

Certain strategies involving derivatives may require the use of a prime broker or clearing broker who will hold the System's cash or securities per the terms of a collateral agreement or futures clearing agreement. IPERS shall seek to ensure that such brokers do not require IPERS to post margin amounts that materially exceed the minimum required margin amounts set by an exchange or the terms of a collateral agreement.

## **IX. SECURITIES LENDING**

The primary objective of the securities lending program shall be to safely generate income from lending the System's securities to qualified borrowers. The program will only utilize lending agents that agree to indemnification provisions in the event of a counterparty insolvency.

Cash collateral received against loans of securities shall be prudently invested in a low-risk investment strategy that invests only in: (1) commingled funds or money market funds managed in accordance with the regulations and criteria specified in Rule 2(a)(7) promulgated under the Investment Company Act of 1940, or (2) separate accounts that have investment guidelines identical to those required of a 2(a)(7) fund, or (3) overnight repurchase agreements collateralized with obligations issued by the United States Treasury or obligations issued by agencies or government-sponsored entities of the

United States government. The key investment objectives for investing the cash collateral shall be to: (1) safeguard principal; (2) maintain adequate liquidity; and (3) consistent with the foregoing objectives, optimize the spread between the collateral earnings and the rebate paid to the borrower of securities.

The Investment Board may select its own securities lending agent or authorize the Treasurer to manage the securities lending program in accordance with the risk guidelines established herein. Staff shall execute a formal written agreement between any lending agent (or the Treasurer, as the case may be) and IPERS stipulating the risk parameters and performance benchmarks of the program, which shall be in accordance with these guidelines. The securities lending program will be annually reviewed by the Board, and the ongoing operation of such program shall be subject to periodic reauthorization by the Board.

## **X. DERIVATIVES**

The System recognizes that derivative instruments can be useful tools in portfolio and risk management, but can also introduce unique risks. The CIO shall develop written policies and procedures to control the risks associated with derivatives, but at a minimum such procedures shall require: (1) a counterparty credit rating equivalent to at least “A” for over-the-counter derivatives; (2) payment netting arrangements; (3) daily marking-to-market; and (4) collateralization of net amounts owed under the contracts after meeting minimum threshold for transfers.

The CIO shall ensure that the derivatives policies and procedures are addressed in any external management services contract, as necessary. The CIO shall develop procedures for monitoring the use and exposure of derivatives within an investment manager’s account. Mortgage-backed and asset-backed securities are not derivatives for the purpose of this policy.

## **XI. OTHER POLICIES**

### **A. Social Investing**

As fiduciaries, the IPERS Investment Board, staff and investment managers must perform their duties for the exclusive benefit and in the best economic interest of the System’s members and beneficiaries. The System and the Board will not support investment policies or strategies which seek to promote specific social issues or agendas through investment or divestment of IPERS’ assets. To act otherwise could be construed as a violation of fiduciary duty and could endanger the System’s tax-exempt status.

### **B. Securities Monitoring and Litigation**

IPERS has a fiduciary duty to preserve trust assets to meet the retirement promises made to its members. Included in this duty is the obligation to recover investments

in public securities that incur losses as a result of corporate mismanagement and/or fraud. To preserve trust assets, the Board has adopted a securities monitoring and litigation policy to guide the System's involvement in and monitoring of securities litigation. (See Appendix D)

#### C. Confidential Investment Information

Iowa Code §22.7 and §97B.17(2)e provide that certain records and information in IPERS' possession are considered confidential and thus are exceptions to Iowa's Open Records (chapter 22) laws. Included in the exceptions is information which, if released:

1. Could result in a loss to the System or to the provider of the information.
2. Would give advantage to competitors and serve no public purpose.
3. Would violate trade secrets which are recognized and protected by law.

While the staff shall provide the Board with all essential information about the investment program, communication of information that is confidential under the above Iowa Code provisions will be identified as such in the communication.

Iowa Code §97B.8A(5), an explicit exception to Iowa's Open Meetings (chapter 21) laws, reinforces the need and obligation to maintain the confidentiality of such information by expressly authorizing the Board to hold closed sessions for discussion of this information.

#### D. Ethics

Fiduciaries of the System must exercise the highest standards of care in acting for the exclusive benefit of the plan participants. IPERS has adopted an ethics policy to govern the activities of Board members, staff, consultants and managers as it relates to the System. (See Appendix E)

If the CEO, CIO, CRO, any investment officer, or any IPERS attorney is in possession of information which would lead a reasonable person familiar with such matters to conclude that an investment, a commitment to an investment, or a decision to engage or terminate a contracted service provider, contradicts the fiduciary duties of the party or parties having the final authority to take such actions, it is the Board's expectation that the issue will be placed on a Board meeting agenda for review.

#### E. Leverage

The CIO may utilize leverage within staff tactical decisions up to the maximum negative allocation allowed by the asset class ranges for cash as specified in Appendix B. The CIO may also allow the use of leverage within external active investment management strategies and products consistent with the active risk

budget. ~~The private markets investment policy in Appendix C addresses the use of leverage for private market investments.~~

F. Board Meetings

Board meeting dates for the fiscal year shall be set by members of the Board at the first meeting of the fiscal year. At the first meeting in each fiscal year, the voting Board members shall elect a chair and vice chair.

Parties wishing to present items for the Board's next meeting agenda shall file a written request with the chair at least five business days prior to the meeting. To the extent there is no law, statute, or administrative rule governing a procedure, Board meetings shall be governed by the procedural rules established in the latest version of *Robert's Rules of Order*.

**APPENDIX A**  
**STATUTORY RESPONSIBILITIES OF THE INVESTMENT BOARD AND STAFF**

1. The Board shall annually adopt an Investment Policy and Goal Statement. *Iowa Code §§97B.7A and 97B.8A*
2. The Board shall at least annually conduct a review of the investment policies and procedures utilized by the System. *Iowa Code §97B.8A.2(a)*
3. The Board shall at least annually conduct a public meeting to review the policies and the investment performance of the Fund. *Iowa Code §97B.8A.2(a)*
4. With the approval of the Board, the Treasurer of State may conduct a program of lending securities in the IPERS portfolio. *Iowa Code §12.8.3*
5. The Board shall review and approve the hiring of each investment manager and investment consultant. *Iowa Code §97B.4.3(f)*
6. The Board shall select the actuary for the System, and shall adopt the mortality tables and actuarial assumptions and methods the actuary will use for the annual actuarial valuation. *Iowa Code §§97B.4.3(c) and 97B.8A.3*
7. The CEO will consult with the Board prior to employing a CIO. *Iowa Code §97B.4.3(a)*
8. The Board shall participate in the annual performance evaluation of the CIO. *Iowa Code §97B.8A.2(c)*
9. The CEO shall consult with the Board on the budget program for the System. *Iowa Code §97B.4.2(c)*
10. The Treasurer of State shall consult with the Board prior to selecting any bank or other third party for purposes of investment asset safekeeping, other custody, or settlement services. *Iowa Code §97B.7.2*
11. The Board shall consist of seven voting members and four nonvoting members. Four voting members of the Board shall constitute a quorum. *Iowa Code §97B.8A*
12. Staff shall provide advance notice to the public of the time, date, tentative agenda and place of each Board meeting in compliance with Iowa Code chapter 21.
13. The Board shall set the salary of the CEO. *Iowa Code §97B.3.1*

## APPENDIX B ASSET ALLOCATION POLICY AND ACTIVE RISK BUDGET

### I. Asset Allocation Policy<sup>1</sup>

Asset Class	Asset Class Ranges	Policy Benchmark Weights	Policy Benchmark Index
<b>Equities</b>		<del>42.5</del> <u>39</u> %	
Domestic Equities	<del>19%-25%</del> <u>+/- 3%</u>	21%	Russell 3000
International Equities	<del>+/- 3%14.5%-20.5%</del>	<del>16.5</del> <u>13</u> %	MSCI ACWI ex-U.S. (Net)
Global Smart Beta Equities	<del>+/- 3%5%-7%</del>	5%	Custom Index <sup>2</sup>
<b>Fixed Income</b>		<del>29.5</del> <u>26</u> %	
Core Fixed Income	<del>+/- 3%21.5%-27.5%</del>	<del>22</del> <u>25.5</u> %	Bloomberg U.S. Aggregate
Public Credit	<del>+/- 3%3%-7%</del>	3%	Custom Index <sup>3</sup>
<b>Cash</b>	<del>+/- 3%-2%-4%</del>	1%	Merrill Lynch 91-Day T-Bill
<b>TOTAL PUBLIC MARKETS</b>		<del>69</del> <u>8.5</u> %	
	Asset Class Targets	Policy Benchmark Weights	Policy Benchmark Index
Private Equity	17%	Actual <sup>4</sup>	Portfolio <sup>5</sup>
Private Credit	5.5%	Actual <sup>4</sup>	Portfolio <sup>5</sup>
Private Real Assets	9%	Actual <sup>4</sup>	Portfolio <sup>5</sup>
<b>TOTAL PRIVATE MARKETS</b>		<del>30</del> <u>1.5</u> %	

<sup>1</sup>On September 17, 2020, ~~and~~ September 22, 2022, ~~and~~ September 28, 2023, the Investment Board revised the Asset Allocation Policy, as reflected in the table below. However, the Board stipulated that core fixed income assets should be reduced as needed to fund new allocations to the private markets. Therefore, beginning October 1, 2020 and revised as of October 1, 2022 and October 1, 2023, the target weight for private equity will be increased to 17 percent and core fixed income will be lowered to ~~19~~22.5 percent, with target weights being adjusted quarterly in the future to reflect the progress in funding the increased allocations to private credit and private real assets.

<u>Asset Class</u>	<u>Current Weight</u>	<u>Target Weight</u>	
<u>Core Fixed Income</u>	<u>25.5%</u>	<u>22.5%</u>	
<u>Private Credit</u>	<u>5.5%</u>	<u>8%</u>	
<u>Private Real Assets</u>	<u>9%</u>	<u>9.5%</u>	

<sup>2</sup>This benchmark index is defined as ~~60~~56 percent Russell 1000 Comprehensive Factor Index + ~~34~~30 percent FTSE Developed ex U.S. Comprehensive Factor Index + 10 percent FTSE Emerging Comprehensive Factor Index.

<sup>3</sup>This benchmark index is defined as 67 percent Bloomberg U.S. High Yield 2% Issuer Capped Index + 33 percent JP Morgan EMBI Global Index.

<sup>4</sup>The benchmark weight for each private market asset class is the actual percentage of each asset class relative to the total fund portfolio.

<sup>5</sup>The benchmark index for each private market asset class is the return of the portfolio itself.

## II. Active Risk Budget

	Target <sup>6</sup>	Upper Limit <sup>6</sup>
<b>Total Fund</b>	<b>1.50%</b>	<b>3.00%</b>
External Managers	1.00%	2.50%
Investment Staff	1.00%	2.50%

<sup>6</sup>Measured as tracking error (the standard deviation of excess return) at the Total Fund level.



**RFP I-2023-2**  
**Absolute Return Strategies**  
**Hiring Recommendations**  
**September 28, 2023**

**The Evaluation Committee recommends the Investment Board approve the hiring of the following 7 investment firms/strategies for the Absolute Return search, subject to final due diligence and successful contract negotiations:**

<b>Firm Name</b>	<b>Strategy Name</b>
DCM Systematic	Diversified Alpha
Neuberger Berman	Insurance-Linked Strategies
Contrarian Capital Management	Emerging Markets Distressed
Kosmos	Life Insurance Paired Policies
Orion	Orion Commodities Fund
Invesco	Dynamic Multifactor Strategy
Jupiter	Strategic Absolute Return Bond

IPERS issued an RFP on December 5, 2022, with the purpose of identifying absolute return investment products that could potentially be used in a portable alpha strategy. One-hundred and twenty-nine respondents applied to the RFP by the January 20, 2023, deadline. The evaluation of the strategies was conducted in three phases. Phase 1 consisted primarily of the collection of quantitative and certain qualitative information from potential Managers. The information was then blindly evaluated and scored based on a pre-determined algorithm to obtain a sub-group of the highest scoring strategies to advance to Phase 2. Of the 129 respondents, 34 were asked to apply to Phase 2 and 33 submitted applications.

Phase 2 of the RFP process was a questionnaire that again blindly evaluated the remaining potential strategies. Managers were notified and required to submit additional detailed information concerning their investment processes, portfolio construction and risk management processes, as well as other aspects of the strategy or firm. The Evaluation Committee comprised of Sriram Lakshminarayanan, Sheldon Lien, and John Fujiwara read and scored each of the semifinalist's responses to the questionnaire. Based on the Evaluation Committee's scores, 11 strategies were identified for further evaluation. The 11 strategies identified for further evaluation next were revealed to the Evaluation Committee and virtual interviews were conducted with each Manager in July/August 2023. The virtual interviews narrowed the 11 strategies down to seven finalists to be advanced to Phase 3.

Phase 3 will consist of on-site interviews with the seven firms and visits will be scheduled in a prudent manner. On-site visits will allow IPERS' staff to evaluate the potential Managers' operations, stability, and ability to work with IPERS. IPERS reserves the right to modify the assessment process as necessary. Notices of intent to award will be issued after completion of Phase 3 and board approval. Regardless of issuance of a notice of intent to award, a proposal may be rejected in IPERS' sole discretion if the bidder and IPERS cannot agree on contract terms and conditions.

Brief profiles of the 7 strategies recommended for hiring are provided on the following pages.





**FIRM NAME:** DCM Systematic Advisors SA

**Corporate Headquarters:** Rue du Mont-Blanc 7, 1201 Geneva, Switzerland

**Ownership Structure:** Wholly and equally owned by the three principals (Anthony Dearden, Jerome Callut and Gaetan Maraite)

**Firm Wide Assets Under Management:** \$563mn (as of 6/30/23)

**Product Name:** DCM Diversified Alpha

**Product Benchmark:** Unfunded Strategy

**Product Asset Inception Date:** February 2016

**Product Assets Under Management:** \$554mn (as of 6/30/23)

**Product Style Description:** Multi-strategy, non-trend CTA

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	<b>Year Ended 6/30/23</b>	<b>3 years Ended 6/30/23</b>	<b>5 years Ended 6/30/23</b>
Annualized Return	-0.63%	5.42%	5.92%
Annualized Risk	5.80%	8.67%	11.20%

*Note: product benchmark returns and risk shown are based on the net returns with no reference benchmark.*



**FIRM NAME:** Neuberger Berman Group LLC

**Corporate Headquarters:** 1290 Avenue of The Americas, New York, NY 10104

**Ownership Structure:** Neuberger Berman is a private, 100% independent, employee-owned investment manager with approximately 700 current employee-owners as of June 30, 2023. We believe this aligns the firm's interests with those of our clients, supporting our investment culture of partnership and reinforcing our track record of high retention rates amongst our senior investment professionals. Inherent in this culture of partnership is a commitment to innovation, and a firm-wide drive to uncover new solutions as markets and client needs evolve. As a firm with no external shareholders or corporate parent, Neuberger Berman employees are the shareholders and key decision-makers in how the firm is governed.

**Firm Wide Assets Under Management:** \$443,054m as of 6/30/2023

**Product Name:** NB Insurance-Linked Strategies Fund LP

**Product Benchmark:** There is no relevant benchmark for our actively managed event-linked strategy. Some clients use an absolute return target while others look at the Swiss Re Cat Bond Index or Eureka hedge ILS Advisers Index. We would propose the latter, which consists of 30+ managers in the space (including NB ILS). However, most other managers are either more catastrophe bond-centric or collateralized re specific, whereas we are focused on the private ILW market.

**Product Asset Inception Date:** June 2009

**Product Assets Under Management:** \$2,645m as of 6/30/2023

**Product Style Description:** The NB Insurance-Linked Strategies Fund (the "Fund" or "NB ILS") seeks to generate attractive risk-adjusted returns that are demonstrably uncorrelated with traditional asset classes through investments in insurance-linked securities in catastrophe risk markets.

**Historical Product Gross Excess Returns and Risk vs. Benchmark:**

	<b>Year Ended 12/31/22</b>	<b>3 years Ended 12/31/22</b>	<b>5 years Ended 12/31/22</b>
Annualized Return	5.04%	6.24%	6.26%
Annualized Risk	3.75%	2.91%	3.01%

*Product Benchmark data was not provided. Refer to the Product Benchmark response above.*



**FIRM NAME:** Contrarian

**Corporate Headquarters:** Greenwich, CT

**Ownership Structure:** Limited Liability Company

**Firm Wide Assets Under Management:**

Firm wide AUM as of August 1, 2023: \$4.0 billion

**Product Name:** Contrarian Emerging Markets Fund, L.P.

**Product Benchmark:** The Product's benchmarks are iShares MSCI Emerging Markets, symbol: EEM and The J.P. Morgan Emerging Markets Bond Index Plus (EMBI+), symbol: JPEIPLUS

**Product Asset Inception Date:** Contrarian Emerging Markets Strategy Inception Date: January 1, 2006

**Product Assets Under Management:** Contrarian Emerging Markets Strategy AUM as of August 1, 2023: \$1.9 billion

**Product Style Description:** Contrarian Emerging Markets (CEM) is a global strategy that focuses on long and short investments in large, liquid credit opportunities of emerging markets issuers and issuers that have exposure to emerging markets. Investments may include stressed, distressed, and defaulted corporate and sovereign debt, post-reorganized equity, special situations, and opportunistic shorts with an emphasis on downside protection through detailed fundamental analysis and thorough understanding of jurisdictional risk.



**FIRM NAME:** Contrarian cont.

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	<b>Year Ended 6/30/23</b>	<b>3 years Ended 6/30/23</b>	<b>5 years Ended 6/30/23</b>
<b>Contrarian Emerging Markets Fund, L.P.</b>			
Annualized Return <sup>1</sup>	13.5%	10.6%	-3.1%
Annualized Risk <sup>2</sup>	19.8%	18.7%	23.1%
<b>J.P. Morgan Emerging Markets Bond Index Plus (EMBI+)</b>			
Annualized Return	2.3%	-8.4%	-3.5%
Annualized Risk	13.0%	12.7%	12.1%
<b>MSCI Emerging Markets Index</b>			
Annualized Return	-4.7%	-1.5%	-3.0%
Annualized Risk	22.2%	17.6%	18.7%

<sup>1</sup> Annualized return is calculated as the annualized excess returns of the fund, net of a 1.5% management fee and 20% incentive fee, over the relevant benchmark. Financial data for 2023 is unaudited and final results may vary materially.

<sup>2</sup> Annualized risk is calculated as the annualized standard deviation of the excess returns of the fund over the benchmark. Bloomberg Short Treasury (I00225US) was used as the benchmark.



**FIRM NAME:** Kosmos

**Corporate Headquarters:** 601 Union St, Suite 3900 Seattle, WA 98101

**Ownership Structure:** Privately held LLC

**Firm Wide Assets Under Management:** \$1.3 billion

**Product Name:** Kosmos Life Insurance Paired Policy Limited Partnership

**Product Benchmark:** iShares 7-10 Year Treasury ETF (IEF)

**Product Asset Inception Date:** 2011

**Product Assets Under Management:** \$0.9 billion

**Product Style Description:** High grade stable income

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	<b>Year Ended 6/30/23</b>	<b>3 years Ended 6/30/23</b>	<b>5 years Ended 6/30/23</b>
Annualized Return	6.33%	9.19%	3.46%
Annualized Risk	8.01%	6.49%	7.47%

*Notes:*

*Annualized Return is calculated as quarterly Kosmos Composite LP Fund Net Returns less quarterly iShares 7-10 Year Treasury Bond ETF returns annualized for each time-period.*

*Annualized Risk is calculated as the annualized standard deviation of quarterly Kosmos Composite LP Fund Net Returns over the iShares 7-10 Year Bond ETF returns in each period.*



**FIRM NAME:** Orion Commodities Management LP (“OCM”)

**Corporate Headquarters:** New York, NY, USA

**Ownership Structure:** Private company; wholly owned by the Founder and Group CEO, Oskar Lewnowski

**Firm Wide Assets Under Management:** 1.1bn USD

**Product Name:** Orion Commodities Fund LP (“OCF”)

**Product Benchmark:** N/A; absolute return

**Product Asset Inception Date:** November 2015

**Product Assets Under Management:** 1.1bn USD

**Product Style Description:** OCF employs a discretionary metals sector-specialist strategy that invests across global precious, base, and ferrous metals markets. The investment philosophy is to utilize our fundamental, macroeconomic, and technical expertise to detect potential sources of abnormal returns in the metals monitored by the investment team.

- Trading style: relative-value (arbitrage, calendar spreads, carry trades) and directional positions (outrights, options)
- Asset types: metals derivatives (futures, forwards, options, swaps, OTC) and exchange-deliverable physicals (warrants)
- Markets traded: CME (US), LME (UK), SHFE (China), SGX (Singapore), and OTC (global)

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	<b>Year Ended 6/30/23</b>	<b>3 years Ended 6/30/23</b>	<b>5 years Ended 6/30/23</b>
Annualized Return	-2.81%	1.89%	3.90%
Annualized Risk	3.60%	3.80%	3.58%



**FIRM NAME:** Invesco

**Corporate Headquarters:** 1331 Spring St NW, Atlanta, GA 30309

**Ownership Structure:** Invesco is a publicly owned company whose shares are listed on the New York Stock Exchange under the symbol "IVZ" and is a constituent of the S&P 500 index. Employees and employee trusts hold approximately 7% of the shares in Invesco as of February 28, 2023.

**Firm Wide Assets Under Management:** \$1,538.25 billion as of June 30, 2023.

**Product Name:** Russell 1000 Invesco Dynamic Multifactor Long/Short Index

**Product Benchmark:** Russell 1000 Index

**Product Asset Inception Date:** November 7, 2017

**Product Assets Under Management:** As of June 30, 2023, the Invesco Dynamic Multifactor suite of strategies had \$6.10 billion in assets under management.

**Product Style Description:** The Russell 1000 Invesco Dynamic Multifactor Long Short Index ("DMF L/S") reflects the performance of a combination of component indices with different weights: DMF (+100%) and the Russell 1000 Index (-100%), which seeks to isolate the excess return stream of DMF by hedging out the market beta. The DMF strategy reflects a dynamic combination of factor exposures drawn from constituent stocks of the Russell 1000 Index with the objective to outperform Russell 1000 on a total return and risk-adjusted return basis over a full market cycle, with high active share and multifactor exposure.

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	Year Ended 6/30/23	3 years Ended 6/30/23	5 years Ended 6/30/23
Annualized Return (%)	0.9	5.0	2.4
Annualized Risk (%)	6.8	10	7.9

*Effective fee approximated at 0.30%.*

**Other IPERS Mandates:** Since 1996, IPERS has entrusted Invesco to manage a direct US real estate separately managed account on behalf of the plan. Currently this mandate has market value of approximately \$1.225 billion.



**FIRM NAME:** Jupiter Asset Management Limited.

**Corporate Headquarters:** Jupiter's headquarters is in London, United Kingdom.

**Ownership Structure:** Jupiter Fund Management (JFM) plc is the ultimate parent company of the Jupiter Group and is a public limited company, listed on the London Stock Exchange.

**Firm Wide Assets Under Management:** \$65.3 billion, as of June 30, 2023.

**Product Name:** Jupiter Strategic Absolute Return Bond

**Product Benchmark:** Federal Funds Effective Overnight Rate

**Product Asset Inception Date:** June 1, 2017

**Product Assets Under Management:** \$729.6 million, as of June 30, 2023.

**Product Style Description:** Jupiter Strategic Absolute Return Bond is a multi-sector, macro-oriented fixed income strategy that takes directional and relative value positions in Developed and Emerging Market sovereign bonds, foreign exchange and inflation instruments with limited exposure to credit risk.

The strategy is designed to produce a positive return regardless of movements in traditional markets through a combination of top-down and bottom-up fundamental macro analysis and risk-controlled portfolio construction.

**Historical Excess Returns and Risk (net of fees) vs. Product Benchmark:**

	<b>Year Ended 6/30/23</b>	<b>3 years Ended 6/30/23</b>	<b>5 years Ended 6/30/23</b>
Annualized Return	-3.21%	1.85%	2.94%
Annualized Risk	3.32%	2.50%	2.84%

*Source: Jupiter, I USD Acc share class, net of fees (40bps base rate + 10% participation).*

*Benchmark: Federal Funds Effective Overnight Rate.*

*The YTD excess return is not an annualized figure.*



**BETA REPORT**  
**IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM PORTFOLIO**  
**PRELIMINARY (Unreconciled) MARKET VALUES AT**  
**9/15/2023**

	Actual	Overlay	Total	Policy	Difference
<b>PUBLIC MARKETS</b>					
Domestic	\$ 8,499,204,366	\$ (104,739,386)	\$ 8,394,464,979	\$ 8,470,467,897	\$ (76,002,918)
International	\$ 6,621,853,911	\$ 89,272,218	\$ 6,711,126,129	\$ 6,655,367,634	\$ 55,758,495
Global Smart Beta	\$ 2,017,728,345		\$ 2,017,728,345	\$ 2,015,415,383	\$ 2,312,962
<b>Total Equities</b>	<b>\$ 17,138,786,621</b>		<b>\$ 17,123,319,453</b>	<b>\$ 17,141,250,914</b>	<b>\$ (17,931,461)</b>
Core Fixed Income	\$ 8,781,643,573	\$ 17,990,443	\$ 8,799,634,016	\$ 8,871,098,136	\$ (71,464,120)
Public Credit	\$ 1,199,236,596		\$ 1,199,236,596	\$ 1,210,066,842	\$ (10,830,246)
Cash	\$ 454,034,442	\$ (2,523,275)	\$ 451,511,167	\$ 400,630,238	\$ 50,880,929
<b>PRIVATE MARKETS</b>	<b>\$ 13,306,935,339</b>		<b>\$ 13,306,935,339</b>	<b>\$ 13,257,590,440</b>	<b>\$ 49,344,899</b>
Private Equity	\$ 7,820,695,556		\$ 7,820,695,556	\$ 7,783,673,203	\$ 37,022,353
Private Credit	\$ 2,231,029,408		\$ 2,231,029,408	\$ 2,223,906,629	\$ 7,122,778
Private Real Assets	\$ 3,255,210,375		\$ 3,255,210,375	\$ 3,250,010,607	\$ 5,199,768
<b>TOTAL FUND</b>	<b>\$ 40,880,636,571</b>			<b>\$ 40,880,636,571</b>	<b>\$ -</b>

	Actual	Overlay	Total	Policy	Difference
<b>PUBLIC MARKETS</b>					
Domestic	20.79%	-0.26%	20.53%	20.72%	-0.19%
International	16.20%	0.22%	16.42%	16.28%	0.14%
Global Smart Beta	4.94%		4.94%	4.93%	0.01%
<b>Total Equities</b>	<b>41.92%</b>		<b>41.89%</b>	<b>41.93%</b>	<b>-0.04%</b>
Core Plus	21.48%	0.04%	21.53%	21.70%	-0.17%
Public Credit	2.93%		2.93%	2.96%	-0.03%
Cash	1.11%	-0.01%	1.10%	0.98%	0.12%
<b>PRIVATE MARKETS</b>	<b>32.55%</b>		<b>32.55%</b>	<b>32.43%</b>	<b>0.12%</b>
Private Equity	19.13%		19.13%	19.04%	0.09%
Private Credit	5.46%		5.46%	5.44%	0.02%
Private Real Assets	7.96%		7.96%	7.95%	0.01%
<b>TOTAL FUND</b>	<b>100.00%</b>			<b>100.00%</b>	<b>0.00%</b>

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**IPERS Portfolio Structure and Allocations**  
**Quarter End June 30, 2023**  
**\$41.1 Billion**

<b>Public Markets – 68% of Total Fund (Equities 42%)</b>				
<b>Domestic Equity \$8.6 Billion 20.8%</b>		<b>International Equity \$6.6 Billion 16.1%</b>		<b>Global Smart Beta \$2.0 Billion 5.0%</b>
<b>Active \$2.5 Billion 28.8%</b>	<b>Passive \$6.1 Billion 71.2%</b>	<b>Active \$3.9 Billion 59.0%</b>	<b>Passive \$2.7 Billion 41.0%</b>	<b>Passive \$2.0 Billion 100.0%</b>
BlackRock (R1000 SAE) \$2.2 billion	BNY Mellon (R1000) \$5.8 billion	BlackRock (EAFE SAE) \$1.8 billion	BlackRock (EAFE) \$1.3 billion	UBS (U.S. Equity Smart Beta) \$1.2 billion
BlackRock (R2000 SAE) \$226.6 million	BNY Mellon (R2000) \$242.9 million	Columbia (EAFE) \$582.7 million	BlackRock (Canada) \$510.8 million	UBS (Developed ex U.S. Smart Beta) \$668.1 million
	Parametric (Synthetic) \$62.1 million	Panagora (Dynamic EAFE) \$630.2 million	BNY Mellon (Emerging) \$833.7 million	UBS (Emerging Market Smart Beta) \$201.3 million
		BlackRock (Emerging SAE) \$505.7 million	Parametric (Synthetic) \$88.4 million	
		Wellington (Emerging) \$411.6 million		

Terminated managers with residual amounts in their accounts are not included.

**IPERS Portfolio Structure and Allocations**  
**Quarter End June 30, 2023**  
**\$41.1 Billion**

<b>Public Markets – 68% of Total Fund (Fixed Income and Cash 26%)</b>				
Core-Plus Fixed Income \$9.0 Billion 21.8%			Public Credit \$1.2 Billion 2.9%	Cash \$484.6 Million 1.2%
Active \$1.1 Billion 12.7%		Passive \$7.8 Billion 87.3%	Active \$1.2 Billion 100.0%	
BlackRock (Core Plus) \$0.4 million	Western Asset (Core Plus) \$4.2 million	BNY Mellon Agg (Core) \$7.8 billion	Aegon USA (High Yield) \$388.1 million	BNY Mellon (Cash) \$259.5 million
Principal Global (Core Plus) \$1.0 million	MacKay Shields (Core Plus) \$0.6 million	Parametric (Synthetic) \$28.7 million	PGIM (High Yield) \$396.8 million	LARS Liquid Assets (Cash) \$225.0 million
PGIM (Core Plus) \$7.9 million	TCW (Core Plus) \$3.2 million		PGIM (Emerging Market Debt) \$399.5 million	
BlackRock Universal (Relative Value) \$614.0 million	PGIM Universal (Relative Value) \$506.8 million			

Terminated managers with residual amounts in their accounts are not included.

**IPERS Portfolio Structure and Allocations**  
**Quarter End June 30, 2023**  
**\$41.1 Billion**

Private Markets – 32% of Total Fund				
Private Equity \$7.9 Billion 19.1%	Private Real Assets \$3.2 Billion 7.9%	Private Credit \$2.2 Billion 5.3%		
Pathway Capital (Private Equity) \$7.9 billion	Clarion Partners (RE Equity) \$473.6 million	Tennenbaum Capital (Direct Lending) \$346.5 million	Principal Global II (Real Assets Credit) \$11.3 million	Audax Mezz Coinvest (Opportunistic Credit) \$12.0 million
	Invesco (RE Equity) \$847.3 million	Monroe Capital (Direct Lending) \$480.0 million	PGIM RE Global Debt (Real Assets Credit) \$184.6 million	Audax Mezz V (Opportunistic Credit) \$22.4 million
	RREEF (RE Equity) \$773.7 million	Pathway Capital (Direct Lending) \$121.4 million	Kayne Anderson IV (Real Assets Credit) \$89.7 million	Arrowmark (Opportunistic Credit) \$98.1 million
	UBS Realty (RE Equity) \$523.8 million		Heitman Credit (Real Asset Credit) \$34.4 million	Crestline Opp Credit (Opportunistic Credit) \$183.9 million
	Forest Investment (Timber) \$221.6 million		IFM USIDF (Real Asset Credit) \$63.1 million	Marathon SPS IA (Opportunistic Credit) \$89.9 million
	UBS Farmland Investors (Farmland) \$88.7 million		JP Morgan GTIF (Real Asset Credit) \$100.0 million	ARES PCS II (Opportunistic Credit) \$60.0 million
	Brookfield (Infrastructure) \$311.6 million			KKR Goldfinch (Opportunistic Credit) \$281.2 million

# Alpha Report

For periods ending June 30, 2023

*α*

# IPERS' Active Manager Alpha Scorecard

Net of Fees as of 2Q23	2Q23	1 Year	3 Year	5 Year	SI	Perf	Org	People	Process
<b>Domestic Equity</b>									
BlackRock - Russell 1000 SAE	-0.59%	-0.52%	NA	NA	-0.22%				
BlackRock - Russell 2000 SAE	-1.81%	0.06%	0.27%	NA	1.39%				
<b>International Equity</b>									
BlackRock – EAFE SAE	1.34%	3.74%	1.86%	NA	1.26%				
Columbia - EAFE	0.76%	-0.90%	-1.64%	NA	-1.80%				
PanAgora - Dynamic EAFE	0.68%	0.63%	2.04%	NA	0.30%				
Wellington - Emerging Markets	2.12%	0.74%	-0.03%	1.23%	0.12%				
BlackRock - Emerging Markets SAE	-1.24%	0.09%	-0.79%	NA	-0.64%				
<b>Core Fixed Income</b>									
BlackRock - Universal	-0.37%	0.28%	NA	NA	0.90%				
PGIM - Universal	0.38%	4.89%	NA	NA	0.02%				
<b>Public Credit</b>									
PGIM - High Yield	-0.12%	-1.46%	1.11%	NA	0.66%				
Aegon USA - High Yield	-0.13%	-2.00%	0.59%	-0.15%	0.30%				
PGIM - Emerging Market Debt	0.49%	2.33%	0.83%	0.03%	0.65%				
<b>LARS</b>									
Aspect Capital	3.18%	3.22%	NA	NA	0.95%				
Graham Capital Management	5.90%	-0.24%	11.58%	0.58%	5.03%				
P/E Global	2.05%	2.40%	3.85%	0.59%	4.31%				
PIMCO	5.82%	NA	NA	NA	14.91%				
PGIM Wadhwani	-0.77%	-11.12%	9.11%	0.57%	6.19%				
Welton Global	-1.34%	-12.68%	1.04%	NA	1.04%				
ARP	0.28%	-2.58%	NA	NA	-2.58%				



No Concerns



Minor Concerns



Material Concerns

# IPERS' Active Manager Listing

MANAGER	INCEPTION DATE	MANDATE	BENCHMARK
<b>Domestic Equity</b>			
BlackRock - Russell 1000 SAE	May 2022	Large Cap	Russell 1000
BlackRock - Russell 2000 SAE	May 2019	Small Cap	Russell 2000
<b>International Equity</b>			
BlackRock – EAFE SAE	May 2019	Developed EAFE	MSCI EAFE Index (net)
Columbia - EAFE	May 2019	Developed EAFE	MSCI EAFE Index (net)
PanAgora - Dynamic EAFE	May 2019	Developed EAFE	MSCI EAFE Index (net)
Wellington - Emerging Markets	February 2009	Global Emerging Markets	MSCI Emerging Markets (net)
BlackRock - Emerging Markets SAE	May 2019	Global Emerging Markets	MSCI Emerging Markets (net)
<b>Core Fixed Income</b>			
BlackRock - Universal	November 2020	Relative Value	Bloomberg Barclays U.S. Universal
PGIM - Universal	March 2021	Relative Value	Bloomberg Barclays U.S. Universal
<b>Public Credit</b>			
PGIM - High Yield	June 2019	High Yield	Bloomberg US HY 2% Capped Index
Aegon USA - High Yield	February 2012	High Yield	High Yield Policy Index
PGIM - Emerging Market Debt	April 2016	Emerging Market Debt	JP Morgan EMBI Global
<b>LARS</b>			
Aspect Capital	March 2022	Diversified Trend	Absolute Return
Graham Capital Management	December 2016	Tactical Trend	Absolute Return
P/E Global	December 2016	FX Strategy	Absolute Return
PIMCO	July 2022	Commodity Alpha	Absolute Return
PGIM Wadhvani	March 2017	Keynes Leveraged Quantitative Strategy	Absolute Return
Welton Global	June 2021	Welton Global	Absolute Return
ARP	November 2022	Alternative Risk Premium	Absolute Return



# **Private Market Program Manager Updates**

For periods ending June 30, 2023

IOWA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

September 28, 2023



# IPERS' PMP Manager Scorecard

	1 Year	5 Year	10 Year	SI	Performance	Organization	People	Process
<b>Private Equity</b>								
Multi-Strategy								
Pathway	-5.7%	19.3%	17.5%	13.1%				
<b>Private Credit</b>								
Direct Lending								
BlackRock	4.7%	6.9%	N/A	7.1%				
Monroe	6.0%	6.8%	N/A	7.4%				
Pathway	6.8%	N/A	N/A	5.1%				
Opportunistic								
Arrowmark	7.0%	N/A	N/A	5.3%				
Ares Private Credit Solutions II	-1.9%	N/A	N/A	1.1%				
Audax Mezzanine Fund V	4.8%	N/A	N/A	27.6%				
Audax Mezzanine Co-Invest Fund	8.6%	N/A	N/A	10.3%				
Crestline	12.1%	N/A	N/A	7.1%				
KKR	4.3%	N/A	N/A	7.2%				
Marathon	7.1%	N/A	N/A	6.2%				
Real Assets								
Heitman CREDIT	N/A	N/A	N/A	-1.5%				
IFM USIDF	N/A	N/A	N/A	2.9%				
PGIM Global Real Estate Debt	5.9%	N/A	N/A	6.2%				
Principal Real Estate Debt II	-3.2%	4.9%	N/A	5.6%				
Kayne Anderson Real Estate Debt IV	6.6%	N/A	N/A	6.1%				
JP Morgan GTIF	N/A	N/A	N/A	N/A				
<b>Private Real Assets</b>								
Real Estate								
Clarion Partners	-11.9%	1.7%	6.2%	6.1%				
Invesco	-3.2%	15.9%	14.7%	11.2%				
RREEF	-11.0%	10.0%	10.8%	9.9%				
UBS Realty	-3.0%	13.4%	12.5%	10.5%				
Other Real Assets								
Brookfield	8.0%	N/A	N/A	6.3%				
Forest Investment Associates	11.2%	6.0%	5.3%	5.9%				
UBS Farmland	6.2%	4.0%	N/A	7.1%				



No Concerns



Minor Concerns



Material Concerns

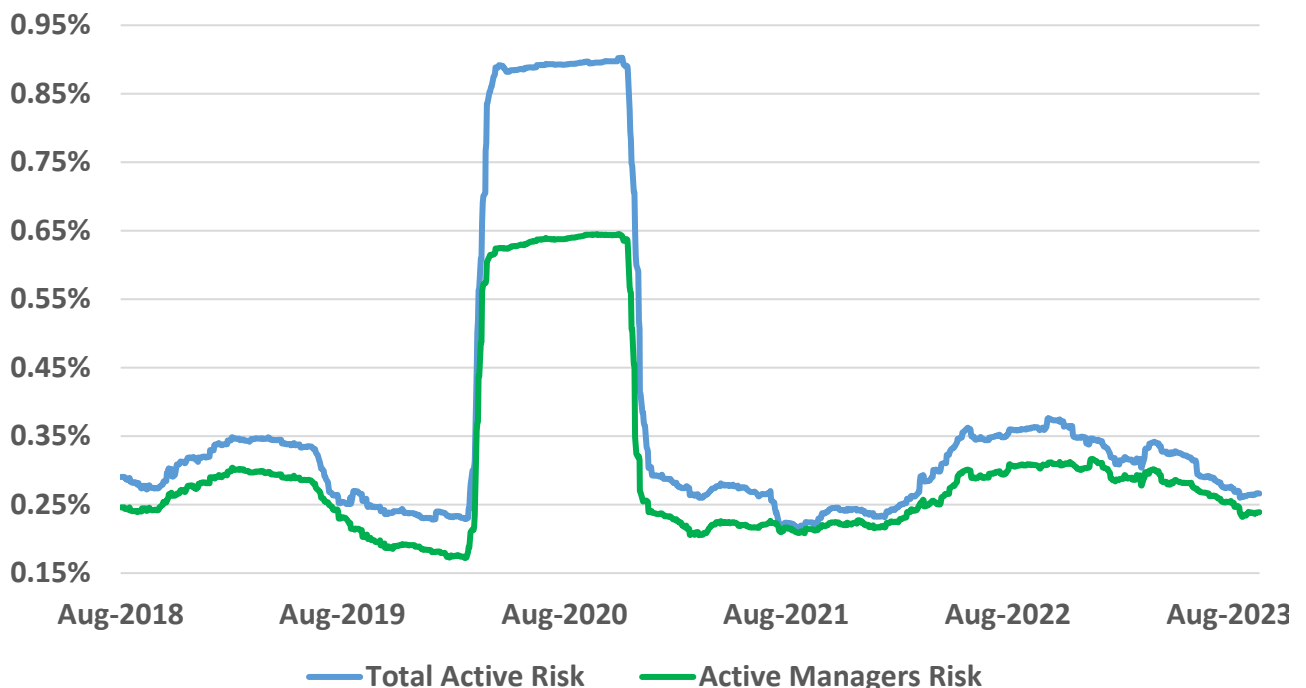
## Active Risk –180 Days (Sep 2023)

	Active	Passive	Misfit	Total
<b>Equities</b>				
Domestic Equities	0.07%	0.01%	0.00%	0.08%
International Equities	0.11%	0.02%	0.00%	0.12%
Global Smart Beta Equities	-	0.01%	0.00%	0.01%
<b>Fixed Income</b>				
Core-Plus Fixed Income	0.14%	0.09%	0.01%	0.17%
Public Credit	0.03%	-	0.00%	0.03%
<b>Cash/LARS</b>	0.08%	-	-	0.08%
<b>Asset Allocation</b>	-	0.08%	-	0.08%
<b>Total Public Markets</b>	<b>0.24%</b>	<b>0.13%</b>	<b>0.03%</b>	<b>0.27%</b>

<b>Target</b>	1.50%
<b>Upper Limit</b>	3.00%

- Plan-level Total Active Risk reduced from 0.32% to 0.27%
- Active risk expected to drop further for the next few months
- Core-Plus Fixed Income active risk is ticking down and will be for the next few months

## External Active Risk –180 Days (Sep 2023)



# 2024

## Board Meetings

JANUARY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FEBRUARY						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

MARCH						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

APRIL						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

MAY						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

JUNE						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

JULY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

AUGUST						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPTEMBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

OCTOBER						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### March 22, 2024

CY2023 Investment Performance

### June 20, 2024

Private Markets Program Review

### September 25-26, 2024

Continuing Education Session

FY2024 Investment Performance Review

Asset Allocation

Investment Policy and Goal Statement

### December

12/5/24 - Investment Board & BAC Mtg

(Actuarial Valuation Presentation)